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The impact of residential and recreational urban spaces design on children play behavior

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THÈSE

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La conception des espaces urbains résidentiels et récréatifs à travers le jeu des enfants

The impact of residential and recreational urban spaces design on children play behavior

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La conception des espaces urbains résidentiels et récréatifs à travers le jeu des enfants

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Janvier 2024

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Introduction

Cette thèse déploie son analyse à partir de la présence de l'enfant dans les configurations variées de l'espace public urbain. Elle privilégie une lecture des ambiances pour appréhender la manière dont le corps des enfants est mobilisé par son environnement. L'étude s'attache ainsi à adopter une analyse dynamique de la façon dont l'enfant s'insère, s'émeut et s'adapte au sein de l'espace public. Le concept d'affordance établi par le psychologue James J. Gibson occupe une place centrale dans cette étude (Gibson, 1979). Il permet de déployer une lecture des propriétés du bâti en ce qu'elles stimulent, offrent ou « appellent » certaines activités. Parmi celles-ci, le jeu, librement choisi, contribue au développement global de l'enfant.

Notre approche se confronte à une littérature scientifique dense et variée qui a examiné l'impact du jeu en extérieur sur le comportement et le développement de l'enfant. Au tournant des années 1970, il semble que la libre présence des enfants dans l'espace public urbain tende à se restreindre et à poser la question de l'émergence de systèmes de surveillance corrélée à l'idée d'une vulnérabilité de l'enfant dans la ville. Non sans liens, les infrastructures et environnements de jeu, qui apparaissent d'abords insuffisants, se développent pour configurer dans l'espace urbain des îlots séparés formant des aires de jeu créées par les adultes. Cette thèse envisage de repartir du corps en mouvement de l'enfant pour envisager son champ de perception et, plus loin, son rapport à la ville (Breviglieri, 2014). L'approche écologique et sensible aux ambiances permettra de poser un regard expérimental et évaluatif sur les espaces urbains présents dans le quotidien des enfants.

La thèse interroge une variété de conceptions d'espaces (résidentiels ou proprement ludiques) de la ville dans son lien aux comportements de jeu des enfants. Pour cela, elle propose d'investiguer quatre environnements urbains hétérogènes en Égypte et en France. L'étude des dimensions récréatives et résidentielles prend alors appui sur une « approche de recherche par enquête comparative causale » et des « études de cas intrinsèque » (Groat & Wang, 2013).

Cette enquête de terrain est menée en trois phases, avec des enfants « d'âge moyen » choisis au hasard, entre cinq et douze ans. Elle comprend des observations comportementales structurées centrées sur le comportement de l'enfant. Ces observations sont complétées par une étude des activités cognitives perceptuelles engagée dans l'effectuation de dessins et de photographies, et par la réalisation d'entretiens informels associés occasionnellement à des parcours commentés. Les données recueillies ont été analysées dans le cadre de la « théorie du triptyque de l'espace » et de la « théorie des affordances ». Ce cadre a pour objet de clarifier les écarts de perception et de représentation entre celles qui appartiennent au concepteur de l'environnement urbain et celles qui appartiennent à l'enfant dans son expérience physique et culturelle de l'espace. Il est

possible d'extraire de cette étude des thèmes capables de renouveler certaines orientations de la fabrique de la ville. Ces thèmes convergent pour repenser à la fois la place de l'enfant dans la ville, et la manière dont celle-ci peut générer des environnements intergénérationnels favorisant le bien-être des citoyens.

« Une ville où l'enfant serait le prince et le père de l'homme » (Aillaud, 1972).

Mots-clés :

Lecture sensible croisée - espaces urbains résidentiels et récréatifs - porosité spatiale - patterns comportementaux de jeu - affordances - analogie spatiale - perceptions - potentialités - ambiance expériences sensibles - aménagement des espaces amis des enfants.

1. Problématique

Garvey a défini le jeu comme étant « un comportement choisi librement, dirigé personnellement et intrinsèquement motivé » (Garvey,1990). Dans ce sens, les enfants perçoivent le contenu de leurs jeux en fonction de leurs propres idées et intérêts. Ainsi, le jeu permet à l'enfant d'explorer et de comprendre le monde qui l'entoure. Le jeu actif est un outil important pour assurer le développement global des enfants (Blinkert, 2004) au niveau physique, social, émotionnel, et cognitif (Metin, 2003).

Les recherches distinguent dès lors entre deux types de jeux : cognitif et social (Rubin, 2001). D'une part, les jeux cognitifs prennent plusieurs formes : jeu fonctionnel, jeu constructif, jeu exploratoire, jeu dramatique, jeux avec des règles, et le comportement de non-jeu. De l'autre part, le jeu social peut être sous forme de jeu solitaire, parallèle, ou en groupe (Rubin, 2001). Dorénavant, il peut exister une grande variabilité dans les capacités des enfants et dans leurs niveaux de développement en fonction de leurs groupes d'âges ainsi que le contexte culturel et les situations auxquelles ils font face. Au cours de la première phase, les bébés et les enfants de bas âge (0-3 ans) découvrent le monde qui les entourent à travers des actions basiques, telles que le réflexe de succion, le *grasping* (le réflexe d'agrippement), ou les réflexes d'attention (écouter ou regarder) (Piaget 1956, Santrock 1994). Durant la deuxième phase, les enfants (3 - 5/6 ans) commencent à penser symboliquement ; ils deviennent capables de se représenter le réel. Ainsi, ils apprennent à utiliser des mots de leur langue et des images pour représenter les objets. A ce stade, la famille reste toujours la pierre angulaire dans la vie des enfants, cependant leur interaction avec les autres enfants devient plus importante. Si le jeu, la créativité et l'imagination deviennent plus élaborés ; l'immaturité cognitive conduit, pourtant, à la formulation de nombreuses idées « illogiques » sur le monde (Piaget 1956, Santrock 1994). Les grands enfants (5/6 – 12 ans) atteignent le stade des opérations concrètes, dans le sens où ils sont désormais capables d'utiliser des opérations mentales pour résoudre des problèmes réels et concrets (Hoff 2003, Piaget 1962). La pensée de l'enfant devient alors plus logique et organisée. C'est durant cette tranche d'âge que les relations entre pairs jouent un rôle important dans le développement des enfants ; ils commencent ainsi à privilégier des types de jeux complexes (jeu en groupe) tout en tenant en considération le milieu qui les entourent (Chawla, 1992). Dans ce cadre, les enfants « d'âge moyen » accordent un intérêt particulier à la découverte de l'environnement qui les entoure ; c'est pourquoi cette tranche d'âge était le cible de notre étude. Il faut savoir que durant la phase de l'adolescence (12 ans et plus), l'égoïsme éprouvé par les enfants durant le stade précédent commence à disparaître. Désormais, ils réfléchissent mieux à la façon dont les autres perçoivent les différentes situations (Piaget 1956, Santrock 1994).

De nombreuses recherches ont étudié l'importance du jeu - notamment le jeu en extérieur - pour favoriser le bien-être des enfants en améliorant leurs opportunités de

comprendre les espaces urbains de la communauté locale environnante (Wardle, 2000; Fjortoft, 2001). Dans cette perspective, le jeu est susceptible d'augmenter le niveau d'activité physique chez l'enfant et lui apprend à respecter l'environnement naturel (Fjortoft, 2004). En effet, chaque type de jeu affecte différemment le bien-être des enfants dans le sens où chacun des différents types stimule certains aspects du développement des enfants. Le jeu fonctionnel favorise ainsi leur développement physique (Barbour, 1999), le jeu constructif et le jeu dramatique maintiennent leur développement cognitif (Lillard et al., 2013), tandis que le jeu en groupe et les jeux à règles stimulent leur développement social (Coplan et al., 2015). Ainsi, l'essence du jeu n'est pas uniquement perçue comme un comportement intrinsèquement motivé, voir quelque chose que les enfants font à leur rythme, suivant leurs propres idées, à leur manière et pour leurs propres raisons ; il s'agit plus d'un moyen qui leur permet d'acquérir des avantages physiques, émotionnels, cognitifs, psychologiques et sociaux à long terme. De plus, le jeu permet d'aider les enfants à surmonter leurs peurs et à gérer leurs émotions. C'est outil d'aide à la prise de décision, à la découverte d'intérêts, au développement du cerveau et à l'amélioration de l'apprentissage scolaire (Lester et Russell 2008). Néanmoins, la libre présence des enfants dans l'espace public urbain et la possibilité qu'ils jouent à l'extérieur tendent à se restreindre. Au cours des dernières décennies, la présence des enfants dans les espaces communautaires locaux, comme les rues vivantes, les quartiers et les espaces publics, semble être limitée d'une façon étonnante (Lester et Russell 2008). Ainsi, les enfants se trouvent dans leur seule dimension fragiles dans des espaces bien déterminés par les adultes et des aires de jeux séparées. Il faut savoir que même si certaines études mettent en valeur les avantages du jeu dans les communautés locales et les environnements naturels ; toutefois les enfants n'ont pas toujours l'opportunité de jouer en plein air en raison des attitudes peu accueillantes à leur égard. De plus, le jeu est codifié par les adultes qui imposent aux enfants de jouer dans des lieux protégés et surveillé. L'exercice de jouer à l'extérieur est ainsi en recul dû à un cumul de facteurs auxquels les enfants font face ; à titre d'exemple, l'emploi du temps chargé des enfants, la surveillance des adultes et l'augmentation des activités structurées imposées par ces adultes. De plus, il n'existe pas autant d'environnement permettant aux enfants de pratiquer différents types de jeux ; ils ont plutôt accès à des jeux de type standardisé. Le jeu libre extérieur, droit fondamental de l'enfant, est devenu marginalisé, voir un « luxe inabordable» (Elkind 2008).

L'histoire de la présence des enfants dans la ville et leurs endroits de jeu préférés, notamment les rues, les quartiers résidentiels et les espaces publics ludiques, est au centre de nos intérêts. En effet, c'est dans les rues et les quartiers résidentiels que le jeu libre autodirigé a vu le jour (Lacey, 2007). Les études socio-urbaines ont illustré que les rues résidentielles sont des espaces plus attrayants pour les enfants grâce à leur diversités et complexités qui offrent un large éventail de thèmes de jeu. Or, le mouvement urbain moderne, notamment le fonctionnalisme urbain et ses crises, ont changé les règles du jeu avec l'augmentation du trafic routier et la montée des enjeux environnementaux. C'est

pourquoi il y a une forte volonté de remettre le piéton au centre des projets d'aménagement. Dans les villes modernes, l'environnement de jeu a connu un changement majeur par rapport aux générations précédentes. Les espaces urbains récréatifs publics sont devenus ainsi un deuxième air de jeu nécessitant la mise en place des mesures d'apaisement de la circulation afin de redonner une place aux enfants pour jouer. Historiquement, les places publiques étaient originellement considérées comme des jardins privés pour la noblesse, l'aristocratie et la bourgeoisie. Au XVIII^e siècle, la représentation de ces jardins était un objet de revendication politique. La Révolution française a ainsi revendiqué l'ouverture des places au public afin d'assurer l'égalité de traitement entre tous les individus. Parmi les différents types des espaces publics, l'espace public récréatif a pris, de plus en plus, une place spécifique au cœur des projets urbains. Sous le Second Empire (1852-1870), Paris s'est transformé et les travaux de Haussmann ont bouleversé la capitale. Haussmann a ainsi créé des places similaires aux configurations urbaines actuelles, chaque quartier devait avoir un espace public vert urbain (jardins) et des chemins de promenade plantés. Cependant, ces espaces publics verts n'étaient pas l'objet d'activités de loisirs. Il faut attendre jusqu'à l'entre-deux-guerres afin que ces jardins acquièrent leurs qualités de terrains de jeux. Peu après, un nouveau type d'espace public vert est apparu, il s'agit des jardins au sein desquels sports et jeux sont intégrés, c'est le cas par exemple du parc Kellermann dans le XIX^e arrondissement de Paris et le parc de la Butte Rouge dans le XIX^e arrondissement (Delaunay, 2018). La littérature française nous montre que la période des années 1960-1970 a focalisé sur l'étude du rôle de l'espace dans le développement des enfants (Chombart de Lauwe, 1976 ; Bonnin, 1977 ; Perrot, 1977) et le développement des approches d'apprentissage par le jeu (Caillois 1^{ère} éd, 1958 ; Henriot, 1969). Cependant, dans les années 1980, de nombreuses critiques s'opposaient au repositionnement des zones de loisirs dans les espaces verts. Dans ce cadre, les espaces verts ont été conçus par des paysagistes qui ont accordé plus d'attention à l'aménagement environnemental qu'à la production des significations pédagogiques. Dans les années 1990, les standards industriels auxquels répondait la préfabrication d'objets standardisés étaient bien établis. Vers la fin des années 2000 et jusqu'au début des années 2010, les aires de jeux ont été renouvelées. Dorénavant, de nombreux chercheurs ont souligné l'importance de l'espace public quotidien en tant que site valable pour les jeux informels des enfants et une dimension de leur bien-être (Beunderman et al., 2007). Ainsi, jouer dans les espaces publics est important pour les enfants afin de maintenir un sentiment d'appartenance à la communauté. Le jeu des enfants dans les espaces publics contribue à la construction de leurs réseaux sociaux, puisqu'ils ont l'opportunité d'interagir les uns avec les autres (Curnier, 2015). Worpole et Knox (2007) ont précisé que l'importance des espaces publics revient surtout à leur capacité de créer les opportunités de socialisation et le développement de liens communautaires. Ces espaces permettent aux enfants de nouer des amitiés et d'apprendre les règles de la vie sociale.

La saisie des représentations et des usages des espaces publics par les enfants nous permet de comprendre que, contrairement aux adultes, les enfants ont leur propre manière de percevoir, de vivre et de comprendre ces espaces. A cet égard, Breviglieri (2014) a souligné, dans son article « La vie publique de l'enfant », qu'adopter l'approche écologique sensible permet d'associer l'ambiance, les configurations spatiales, le corps des enfants dans l'espace, leurs mouvements et leurs perceptions, aux caractéristiques physiques de l'environnement entourant. Dès lors, il est intéressant d'étudier pourquoi les enfants préfèrent certains lieux dans les villes et comment établissent-ils des liens avec les lieux de jeu. Il faut savoir que relativement peu d'études se sont intéressées à l'analyse des expériences vécues par les enfants dans leurs espaces urbains communautaires quotidiens, là où ils peuvent jouer activement et librement.

L'écart existant entre l'espace tel qu'il est conçu par les adultes vis-à-vis des enfants est ainsi au cœur de cette étude. Ces derniers développent leurs perceptions en fonction de leur capacité, leur culture, leur situation sociale, et leur expérience antérieure.

2. Objectifs

Cette recherche vise à étudier l'impact des espaces, résidentiels et récréatifs urbains, sur le comportement de jeu des enfants. Il s'agit d'analyser les configurations physiques des espaces et leurs qualités d'usage définies par Marc Breviglieri (2015) sous le concept de « potentialités ». Dans cette thèse, les « potentialités » spatiales procèdent des configurations des typologies des espaces urbains résidentiels et récréatifs, créant ainsi l'enveloppe ambiante qui détermine à son tour le degré de liberté des enfants et les différentes opportunités de jeux dont ils disposent. Cette étude vise ainsi à mieux comprendre comment les « potentialités » agissent en tant qu'éléments spatio-ludiques.

La question du bien-être de l'enfant est au cœur de cette recherche à travers l'analyse du comportement de jeu et la conception urbaine de nos villes, tout en étudiant comment ces deux facteurs s'influencent mutuellement.

Cinq « potentialités » spatiales sont au cœur de cette étude :

1. Sites comportementaux : Les sites comportementaux sont entendus comme une unité de base pour l'analyse comportementale des espaces. Il s'agit de mettre l'accent sur le degré d'interdépendance entre les éléments vivants (les enfants et leurs comportements) et non vivants (les caractéristiques physiques du site et ses limites spatio-temporelles, ainsi que les objets et les activités qu'il contient) qui constituent le site (Podolska 2014).

2. Continuité et fluidité du mouvement : Cette fluidité est assurée par la définition claire des voies d'activité afin de renforcer une circulation fluide de jeu et augmenter les opportunités de jouabilités (Cosco et al. 2010).

3. Diversité des matériaux utilisés : Ce fait est assuré par la mise en place d'une diversité de textures, de couleurs, et de matériaux (Christidou et al. 2013).

4. Variabilité topographique : La variabilité des niveaux du sol est garantie en introduisant des lieux pour jouer au-dessus ou au-dessous du sol (Fjortoft 2004).

5. Présence de différentes aspérités physiques spatiales: Il s'agit des objets et des éléments présents dans un espace géographique comme les plantes, les animaux ou les matériaux souples. Ces éléments peuvent être changés ou modifiés. Autrement dit, on parle des lieux qui peuvent être réaménagés, des lieux interactifs dans le sens où ceux sont des espaces dynamiques continuellement en changement ou peuvent être modifiés (Zamani 2013).

3. Méthodologie

L'expérience des enfants dans la ville est un sujet complexe qui nécessite d'être abordé en s'appuyant sur une approche multidisciplinaire (Kyttä, 2002 ; et Depeau, et al., 2010). Pour ce faire, cette recherche se base sur « une approche de recherche croisée et causale » et « une étude de cas intrinsèque » (Groat et Wang 2013). Le but ultime est d'avoir une analyse croisée des différents espaces urbains à travers l'étude des occurrences des comportements de jeu (cognitifs et sociaux), ainsi que la perception de l'enfant sur son environnement et ses préférences de certains espaces (les préférences sont essentiellement liées aux expériences sensibles des enfants créant ainsi leur propre "enveloppe ambiante" de l'espace).

3.1 Méthodes de collecte des données

Les types de méthodes de collecte de données se divisent essentiellement entre trois méthodes, à savoir la méthode quantitative, la méthode qualitative et méthode mixte. Les trois méthodes à la fois ont été mobilisées par les chercheurs étudiant les expériences vécues des enfants dans les différents lieux de leur vie quotidienne (Punch 2002).

Dans ce cadre, le sujet de notre étude a exigé la mise en place de l'approche ethnographique tout en adoptant la méthode de collecte de données qualifiées de « mosaïque » ou mixte, notre étude regroupe des techniques quantitatives et qualitatives à la fois (Figure 1). Cette approche nous permet de mieux comprendre comment les enfants se disposent de l'espace qui reflète leurs expériences ainsi que leurs perceptions, de telles expériences et perceptions sont différents par rapport aux adultes.

La stratégie d'échantillonnage a été ainsi privilégiée dans cette étude. Elle consiste en effet à recueillir de l'information auprès d'un échantillon de quarante-six (46) enfants

sélectionnés au total. Les enfants ont été divisés en deux groupes et l'égalité du genre a été respectée. Le choix des enfants a été hasard, la participation était à titre volontaire et le consentement des parents a été pris dès le début. Le public ciblé de cette étude est les enfants appartenant au groupe d'âge moyen (entre 5 et 12 ans), considérés comme étant les utilisateurs les plus importants des espaces urbains extérieurs (Chawla 1992; et Hoff 2003).

Le travail de terrain a été conduit en trois phases ayant des conditions météorologiques et des horaires quasiment similaires. La première phase était basée sur des observations comportementales structurées et centrées sur l'enfant. Le groupe A (30 enfants) était le cible de cette première phase, le but était de mesurer les occurrences de différents types de jeux dans tous les espaces urbains, sous l'observation uniquement visuelle de leurs parents et sans leurs interférence physique. Les observations structurées ont été complétées par des observations qualitatives comportementales par le biais de notes descriptives et de sketches permettant d'étudier la motricité chez les enfants et leurs gestes tactiles durant l'utilisation de ces espaces.

Chaque enfant a été observé pendant 40 minutes. Le tableau d'observation adopté est basé sur les tableaux développés par Cosco et al. (2010) et Podolska (2014). Ce tableau a permis d'enregistrer la durée (calculée par incréments d'une minute) pendant laquelle l'enfant s'est engagé dans les jeux : à savoir jeu fonctionnel, jeu constructif, jeu exploratoire, jeu dramatique, jeux avec règles, et comportements avec aucun jeu, ainsi que, jeu en solo, jeu parallèle, et jeu en groupe.

Les enfants quittant le site, avant les 40 minutes, ont été exclus des échantillons et ont été remplacés par d'autres. Ce fut le même cas pour les enfants qui interagissent avec les autres d'une façon négative ou qui adoptent un comportement agressif. Cependant, si un enfant a passé la plupart des 40 minutes en combat avec un autre, il a été classé parmi la catégorie « comportement négatif-non social ». Rubin (2001) conçoit l'agressivité comme étant une interaction agonistique non ludique avec un autre enfant. Cela inclut les coups de main, les coups de pied, l'empoignement, les menaces et l'expression de mécontentement, de colère ou la désapprobation hostile. Il faut noter ici que le comportement négatif non social n'est pas toujours de l'adversité, parfois c'est la voie vers l'amitié de jeu. Ainsi, l'exclusion des enfants ayant un comportement agressif dominant pourrait être répertoriée comme l'une des limites de la recherche. Les observations ont été évidemment menées d'une façon discrète sans que les enfants le remarquent afin d'éviter le changement de leur comportement une fois conscients qu'ils sont surveillés.

Les tables d'observation ont été accompagnées d'une carte de l'espace urbain concerné. Nous avons esquissé une cartographie comportementale pour chaque enfant sélectionné afin d'enregistrer la localisation des différentes activités ludiques et les mouvements de l'enfant durant cette période.

Ouvrons ici une parenthèse, cette étude s'appuie sur l'échelle d'observation du jeu établie par Kenneth Rubin (2001), d'où il a élaboré les différentes définitions de types de jeux (cognitive and social). Nous nous en servons, dans notre étude, comme moyen d'observation pour accomplir la classification des jeux durant notre travail de terrain (Rubin, 2001).

Pour la classification des types cognitifs selon Rubin (2001) :

- Jeu fonctionnel : Une simple répétition de mouvements musculaires, avec ou sans objets.
- Jeu de construction : L'enfant mobilise ses connaissances antérieures cumulé du jeu fonctionnel pour réunir un ensemble d'éléments ou d'objets séparés, ce qui pourrait devenir une construction ou une création.
- Jeu exploratoire : L'enfant acquit des connaissances visuelles ou auditives sur l'environnement.
- Jeu dramatique : Une activité d'imitation durant laquelle l'enfant imagine et met en scène divers rôles (i.e. balancer une poupée, jouer le rôle d'un médecin, d'une infirmière ou d'un enseignant). Il faut savoir que le choix de l'activité d'imitation est intrinsèquement lié au contexte socio-culturel de l'enfant ; ce qui explique les nuances de choix.
- Jeux à règles: Ce type de jeu impose des règles qui doivent être suivies par les joueurs, caractérisés par la logique et la discipline. Ainsi, les enfants plus âgés sont plus capables à élaborer une stratégie et un planning de jeu.
- Comportement sans jeu « *no play behavior* » : Ce type est codé pendant que les enfants observent tout simplement les autres ou bien se discutent entre eux, se déplacent, ou même restent inactifs.

Le jeu permet non seulement le contact physique ; mais aussi la négociation sociale qui permet aux enfants de contribuer à la construction collective des cultures. Dans ce sens, quand les enfants jouent, ils utilisent leur propre langage, leurs règles et leurs valeurs qui les aident à développer leurs propres identités (Casey, 2010). Dorénavant, l'action de jeu peut surmonter les frontières mises en avant par les différences culturelles et le handicap. Ainsi, pour les enfants, sujets d'isolement social, l'action de jeu peut être un moyen important afin qu'ils créent des liens avec d'autres enfants (Dunn, 2004).

Pour aller plus loin, Fanny Delaunay (2018) a considéré que le jeu est une coproduction, il est le résultat d'un échange entre les individus et les règles sociales qu'ils représentent. Le jeu est une activité individuelle (je joue mon jeu), tout en étant imprégné des valeurs et des codes spécifiques d'une société donnée (je joue avec les règles socioculturelles acquises).

Ainsi, Rubin (2001) a également distingué entre les différents types de jeux sociaux comme suit :

- Jeu solitaire : L'enfant joue seul ou indépendamment des autres.
- Jeu parallèle : L'enfant s'engage à la même activité de jeu qu'un autre enfant, mais il n'engage pas dans le jeu avec lui, il joue indépendamment.
- Jeu en groupe : L'enfant joue avec les autres en créant des relations basées sur la reconnaissance mutuelle.

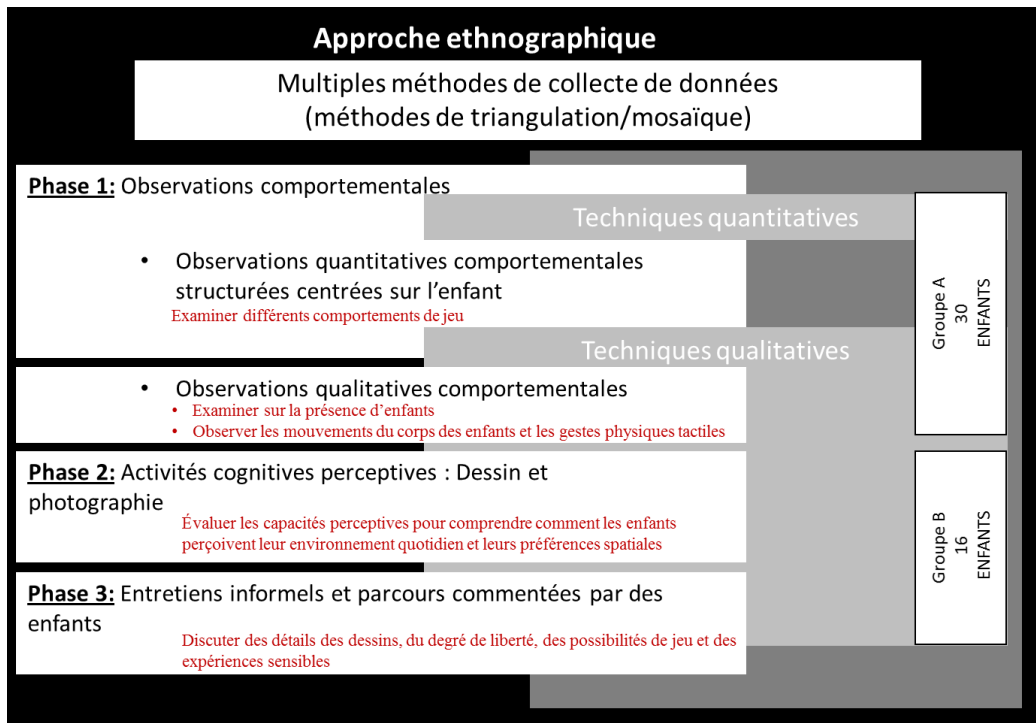
En outre, Rubin a expliqué que les catégories de jeu cognitif doivent être imbriquées dans les catégories de jeu social (solitaire, parallèle et de groupe). Ainsi, il existe 18 comportements imbriqués les uns dans les autres (solitaire-fonctionnel, solitaire-constructif etc.). Rubin a également précisé que si l'observateur remarque qu'un enfant s'adonne à deux activités simultanément, il doit préciser où se trouve le centre d'attention de l'enfant. Il a illustré cette idée à travers des exemples descriptifs, ainsi un enfant peut, à la fois, dessiner une image (type de jeu constructif) et chanter (type de jeu fonctionnel). Rubin a précisé que dans une telle situation, il est important que l'observateur remarque où se trouve le centre d'attention de l'enfant. Les indices contextuels sont ici un facteur déterminant (par exemple : est-ce que l'enfant fredonne des morceaux de chansons tout en dessinant avec le groupe ? Ou est-ce qu'il chante fortement et prend des pauses de dessin pour chanter des refrains). Malgré cette analyse approfondie, l'une des limites de cette étude est que cette classification permet de repenser les tensions et les compatibilités entre les différents types de jeu, socialement et cognitivement. Alors que, d'un point de vue critique, une telle classification pourrait empêcher l'enchevêtrement et la consolidation entre les différents types de jeu, en créant des limites nettes entre chaque type ce qui empêchent la transition facile d'un type à l'autre.

La deuxième et la troisième phases ont ciblé le groupe B (16 enfants). Durant la deuxième phase, nous avons offert aux enfants de prendre part à des activités cognitives perceptuelles, qui sont des dessins et des photographies, dans le but d'évaluer comment ils perçoivent leur environnement quotidien. Il est intéressant d'ajouter que la deuxième phase nous a pavé la voie d'initier une conversation avec les enfants, facilitant ainsi le déroulement de la troisième phase. La troisième phase s'est appuyée sur des entretiens informels durant lesquels les informations personnelles sur les enfants ont été collectées. Durant cette phase, les enfants ont expliqué les détails de leurs dessins ainsi que leurs lieux secrets de jeux, ceci parfois nécessite des parcours commentés par des enfants.

La revue de littérature nous montre en effet que la combinaison entre la méthode quantitative nord-américaine [basée sur des observations centrées sur l'enfant (G. Moore 1986; Cosco 2010)] et la méthode qualitative [valorisée dans les travaux du CRESSON (Centre de Recherche sur L'espace Sonore et L'environnement Urbain)] a été rarement

mobilisée dans les recherches françaises étudiant la place de l'enfant dans l'espace. Dorénavant, notre recherche se base sur une approche socio-ethnographique multisensorielle qui articule les méthodes quantitatives et qualitatives. Le but est à la fois d'aider les enfants à s'exprimer d'une manière plus claire auprès des adultes, ainsi que de formuler une image plus claire sur l'expérience de jeu des enfants dans les différents espaces.

Figure 1: La combinaison entre plusieurs formes de production des données



Source : l'auteur

3.2 Les cas d'études

Notre étude de terrain a été menée dans les villes du Caire, en Égypte, et du Paris, en France. Les espaces urbains résidentiels et récréatifs sont les deux catégories spatiales urbaines sujettes d'examen. Au Caire, les zones étudiées sont Abassia, un prototype des rues résidentielles urbaines égyptiennes, et Héliopolis Sporting Club (HSC), exemple d'espace récréatif urbain privé ou clos. À Paris, les zones étudiées sont le quartier éco-résidentiel de Cité jardins et l'espace public urbain récréatif de Châtelet-Les Halles.

Si les sites de chaque catégorie urbaine sont similaires en termes de typologies spatiales, ils restent cependant distincts au niveau de la porosité spatiale et les configurations spatiales saisies / déterminées à travers / via les potentialités spatiales. La porosité spatiale est déterminée / établie sur deux niveaux ; premièrement, le degré d'ouverture et de fermeture des frontières spatiales extérieures délimitant le territoire de

l'espace ; deuxièmement, la perméabilité spatiale entre les typologies spatiales. Dans ce cadre, « l'enveloppe ambiante » créée dans chacune des zones étudiées, à Paris et au Caire, se distingue nettement de l'autre (Said, 2010) - (tableau 1).

Voyons alors de près les zones sujettes d'étude. Au Caire, la zone résidentielle Abassia est composée de neuf unités résidentielles le tout s'articule autour d'une rue axiale. Il s'agit d'un quartier intégralement résidentiel avec un niveau de densité de population modérée et une surface d'environ 20000 m². Les résidents sont de niveaux socio-économiques moyens. Topographiquement parlant, un mur de retenu entoure le quartier ainsi qu'une barrière en brique pour délimiter le quartier d'un pont à circulation modérée. Abassia est conçu comme une zone résidentielle plate et unique qui se dispose d'une seule porte d'entrée.

La porosité extérieure du quartier nous montre que ses frontières spatiales sont dotées d'un degré de fermeture moyen. Le style architectural des bâtiments est fonctionnaliste (style boîte à chaussures), les bâtiments sont composés de 14 étages avec des toits plats et des façades aux couleurs douces. Le quartier recèle un jardin marqué par ses différents matériaux du sol, ses petits arbustes surélevés et ses trottoirs en tuiles. Des petites ruelles étroites (*al-hara* [passages piétons]), aménagés entre les bâtiments, relient entre le seul point d'accès au quartier et ses différentes composantes spatiales comme : la zone de rassemblement - plus haut que le niveau de la rue, la cour (dotée d'un degré de fermeture élevé) ; les trottoirs entourant les bâtiments et les caves de bâtiments (utilisés comme abris, lieux de stockage ou parkings privés).

La porosité interne entre les différentes composantes spatiales du quartier est de très haute perméabilité assurant ainsi la fluidité de circulation au sein du quartier (Figures 2 et 3).

Quant au Héliopolis Sporting Club (HSC), il est d'une surface d'environ 70 000 m², dont 30 000 m² sont des espaces urbains sociaux et 2000 m² sont consacrés aux jeux des enfants. HSC est un des clubs sportifs sociaux (SSC) en Égypte, le club inclut des espaces urbains sociaux et sportifs exclusifs, tout en offrant la chance à ses membres de se rencontrer. Ces espaces récréatifs clos ont été introduits pour la première fois en Égypte durant le temps de l'occupation britannique. Le club est entouré par une ceinture d'arbres et un mur. Il existe une porte d'entrée principale et cinq portes d'entrée secondaires, le tout est surveillé par des hommes de sécurité pour garantir l'accès uniquement des membres. Dès lors, la porosité externe du club nous montre que ses frontières spatiales jouissent d'un degré de fermeture élevé. Ainsi, selon Said (2010), HSC peut être considéré comme un espace urbain récréatif intergénérationnel privé ou clos. La variabilité de services sociaux et sportifs présentés aux membres est intéressant à voir, tels qu'un jardin de thé, plusieurs

terrasses avec une vue sur le club, un terrain de football, des courts de tennis, un complexe de piscines, des terrains de croquet et des courts de squash. Il existe également une mosquée, un gymnase, des distributeurs automatiques, une banque, un supermarché, des restaurants, un parking et une salle d'exposition à structure légère. La présence des enfants dans les typologies de HSC est très remarquée, car les parents laissent leurs enfants jouer librement et se déplacer dans les différentes typologies confinées par le mur du club, en s'appuyant sur la sécurité et la communauté environnante convergente.

Les composantes spatiales du HSC sont fortement segmentées et limitées par des grillages ce qui favorise ainsi la création d'une « ambiance mosaïque ». Les composantes spatiales fonctionnent plutôt comme des îlots séparés (Said 2010), et sont divisées en : allées et voies de circulation, boulevards, jardins ouverts, aire de jeux et zones de rassemblement ouvertes. Gamal Said (2010) a défini une ambiance mosaïque comme un espace urbain principal divisé intérieurement en des « micro-ambiances » voisines non-mixtes. L'ambiance mosaïque est assurée à travers la diversité des micro-ambiances et leurs séparations liées au zonage d'îlots fonctionnels différenciés. Sur le plan sensoriel, une forte rupture sensorielle est sentie entre « l'extérieur » et « l'intérieur » ou en lors du déplacement d'une zone à une autre. Le détachement physique a joué alors un rôle majeur dans la composition d'une structure sensorielle d'isolement, favorisant ainsi les ruptures sensorielles ou la ségrégation sensor-spatiale et le confinement. Les composantes spatiales du HSC se disposent dès lors d'une faible porosité spatiale interne grâce à une basse perméabilité intermédiaire (figures 4 et 5).

A Paris, le quartier éco-résidentiel Cité jardins - en banlieue parisienne - est d'une surface approximative de 60000 m² avec neuf groupes résidentiels de bâtiments, il est densément construit avec des espaces verts excessifs. Topographiquement, le quartier est plus haut que le niveau de la rue. Il est entouré d'un mur et se dispose de huit portes successives accessibles, ce fait garantit un degré d'ouverture oscillant entre moyen et élevé. Le quartier est intégralement résidentiel, et les résidents sont de niveau socio-économique entre moyen et moyen supérieur. Le style architectural est inspiré du style français haussmannien. Les bâtiments sont de cinq étages et se disposent des toits inclinés et des chiens-assis. Les façades des bâtiments sont richement décorées aux couleurs douces.

Le quartier recèle une zone de rassemblement et des espaces ouverts délimités par des cascades, des parapets, et des escaliers ; un jardin visuellement identifiable (plus haut que le niveau de la zone de rassemblement public) ; un passage piéton connectant les différentes composantes spatiales du quartier (ce passage en béton est visuellement identifiable par sa couleur et ses niveaux d'inclinaison) ; quatre cours entourées de bâtiments (les bâtiments sont séparés par des petites rues de Chaussée menant aux zones de parking et il y a également des trottoirs autour des bâtiments. Ils sont entourés de barrières avec un code d'entrée privé. L'accès aux bâtiments est ainsi réservé uniquement

aux résidents). D'autres composantes naturelles marquent également le quartier comme des dispositifs aquatiques et des arbustes. Par conséquent, la porosité interne entre les différentes composantes spatiales englobées est de très haute perméabilité (Figures 6 et 7).

Quant à l'espace urbain récréatif de Châtelet–Les Halles, il est considéré comme un des espaces publics ouverts quotidiens intergénérationnels. Notre terrain s'effectue précisément au « Jardin Nelson-Mandela », anciennement nommé « Jardin des Halles », au centre de Paris au 1er arrondissement. L'espace urbain est construit sur une dalle couvrant les services souterrains du centre commercial des Halles et de la gare de Châtelet-Les Halles, d'environ 30000 m², impliquant ainsi un simple accès et une ventilation. Une re-conception de l'espace a été réalisée, entre les années 2010 et 2018, par l'agence d'architecture SEURA et le paysagiste Philippe Raguin. Toute la zone est surélevée avec des escaliers, et elle est délimitée par l'église Saint Eustache et des rues secondaires. La Porosité extérieure de cet espace ludique nous montre que ses frontières spatiales sont dotées d'un degré d'ouverture élevé.

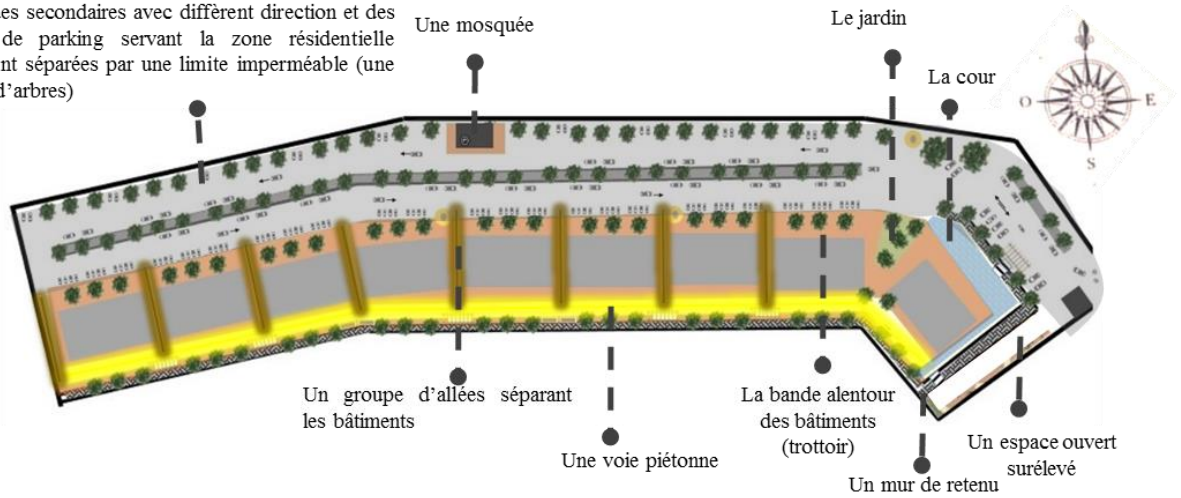
Cet espace récréatif recèle des terrains de football, une grande prairie avec de la végétation, une zone d'échecs, un kiosque musical surélevé, un petit amphithéâtre, deux terrains de jeux, et d'autres services extérieurs. Le projet est d'une grande complexité organisationnelle spatiale, il est subdivisé en un certain nombre d'espaces fonctionnels segmentés et délimités tangiblement. L'espace recèle des allées, voies de circulation, boulevards, jardins ouverts, aires de jeux, et zones de rassemblement ouvertes. Les frontières entre les différentes composantes de l'espace sont semi-fermées ou confinées assurant ainsi un degré de perméabilité spatiale moyenne, ce fait s'illustre à travers un flux du mouvement linéaire et l'interconnexion des différentes zones. Il est important de noter que la surveillance parentale pour protéger s'apparente à la présence des inconnus sur le site ainsi que des sans-abris et des alcooliques (Figures 8 et 9).

Tableau (1) : Le tissu urbain et les potentialités spatiales dans les deux espaces urbains résidentiels et récréatifs

Catégorie spatiale urbaine		Espaces urbains récréatifs		Espaces urbains résidentiels	
Les cas d'études		Châtelet-Les-Halles	Héliopolis Sporting club (HSC)	Quartier éco-résidentiel cité jardins	Zone résidentielle Abassia
Potentiels spatiaux	Contexte urbain	Espace public récréatif urbain	Espace urbain récréatif privé et fermé	Quartier résidentiel urbain semi-public/privé	Quartier résidentiel urbain semi-public/privé
	Surface	30 000 m ²	70 000 m ²	60 000 m ²	20 000 m ²
	Degré d'ouverture et de fermeture	<ul style="list-style-type: none"> • Définition spatiale élevée • Haut degré d'ouverture 	<ul style="list-style-type: none"> • Définition spatiale élevée • Haut degré de fermeture 	<ul style="list-style-type: none"> • Définition spatiale élevée • Degré d'ouverture moyen 	<ul style="list-style-type: none"> • Définition spatiale élevée • Degré de fermeture moyen
	Différentes typologies spatiales incluses	<ul style="list-style-type: none"> • Des allées, voies de circulation ou boulevards • Jardins • Aires de jeux • Zones de rassemblement 	<ul style="list-style-type: none"> • Des allées, voies de circulation ou boulevards • Jardins • Aires de jeux • Zones de rassemblement 	<ul style="list-style-type: none"> • Voies piétonnes • Jardins • Cours • Les rues du service et les lots de parkings privés • Les bandes alentour des bâtiments et ses poches • Zones de rassemblement 	<ul style="list-style-type: none"> • Voies piétonnes • Des allées "AL-HARA" - "المار" • Un jardin • Cours « AL-HOSH » - « الموش » • Les rues du service et les lots de parkings privés • Les bandes alentour des bâtiments et ses poches • Une zone de rassemblement
	Niveaux de perméabilité spatiale entre les typologies	<ul style="list-style-type: none"> • Perméabilité spatiale moyenne • Limites visuelles et tangibles 	<ul style="list-style-type: none"> • Basse perméabilité spatiale • Typologies spatiales fermées et limitées 	<ul style="list-style-type: none"> • Perméabilité spatiale élevée 	<ul style="list-style-type: none"> • Perméabilité spatiale élevée
Description de la porosité	<ul style="list-style-type: none"> • Typologies visuelles confinées par les bases élevées en béton non continu • Typologies tangibles très confinées avec des grillages • Espaces fonctionnels segmentés • Îlots fonctionnels (ambiance Mosaïque) 	<ul style="list-style-type: none"> • Typologies très confinées avec des grillages et des limites tangibles • Espaces fonctionnels segmentés • Îlots fonctionnels (ambiance Mosaïque) 	<ul style="list-style-type: none"> • Des typologies spatiales bien définies • Fluidité du mouvement entre les typologies • Bon réseau de circulation dans tout le quartier. • Bonne interaction spatiale • Lien avec les zones adjacentes • Accès invitant 	<ul style="list-style-type: none"> • Des typologies spatiales bien définies • Fluidité du mouvement entre les typologies • Bon réseau de circulation dans tout le quartier. • Bonne interaction spatiale • Lien dans les zones adjacentes • Accès invitant 	
Potentialités spatiales de chaque typologie spatiale	(1) Entité de sites comportementaux	<ul style="list-style-type: none"> • Des sites d'activités multiples • Bonne définition fonctionnelle Sauf (zone de rassemblement)	<ul style="list-style-type: none"> • Des sites d'activités multiples • Des sites d'activités uniques (certaines zones de rassemblement) • Bonne définition fonctionnelle 	<ul style="list-style-type: none"> • Des sites d'activités multiples • Bonne définition fonctionnelle 	<ul style="list-style-type: none"> • Des sites d'activités uniques • Bonne définition fonctionnelle
	(2) Continuité et fluidité du mouvement	<ul style="list-style-type: none"> • Voies d'activités internes clairement définies • Continuité et fluidité des mouvements entre sites d'activités multiples Sauf (zone de rassemblement)	<ul style="list-style-type: none"> • Voies d'activités internes clairement définies • Continuité et fluidité des mouvements entre sites d'activités multiples • Pas d'voies d'activités qui séparent intérieurement dans les sites d'activités uniques et non divisé (certaines des zones de rassemblement) 	<ul style="list-style-type: none"> • Voies d'activités internes clairement définies • Continuité et fluidité des flux entre les paramètres d'activité 	<ul style="list-style-type: none"> • Pas d'voies d'activités qui séparent intérieurement dans les sites d'activités uniques et non divisé
	(3) Diversité des matériaux utilisés à travers différentes typologies	<ul style="list-style-type: none"> • Grande variabilité de texture, de couleur et de matériaux. Sauf (zone de rassemblement)	<ul style="list-style-type: none"> • Grande variabilité de texture, de couleur et de matériaux. 	<ul style="list-style-type: none"> • Grande variabilité de texture, de couleur et de matériaux. 	<ul style="list-style-type: none"> • Absence de diversité des matériaux utilisés pour chaque typologie
	(4) Variabilité topographique à travers différentes typologies	<ul style="list-style-type: none"> • Variabilité topographique notable (marches, pentes, escaliers, parapets et bases) 	<ul style="list-style-type: none"> • Variabilité topographique notable (pente, marches assises, parapets et rampes) 	<ul style="list-style-type: none"> • Variabilité topographique notable (marches, pentes, escaliers, parapet, falaises, pelouses, rampes et ponts) 	<ul style="list-style-type: none"> • Variabilité topographique notable (des parapets, murs de soutènement inclinés, escaliers et trottoirs)
	(5) La présence de différentes caractéristiques spatiales urbaines	<ul style="list-style-type: none"> • Présence élevée de différentes caractéristiques spatiales urbaines (bancs et différents types de végétation comme Grande quantité d'arbres offrant une énorme quantité d'ombre) 	<ul style="list-style-type: none"> • Présence élevée de différentes caractéristiques spatiales urbaines (bancs et différents types de végétation comme Grande quantité d'arbres offrant une énorme quantité d'ombre) 	<ul style="list-style-type: none"> • Présence élevée de différentes caractéristiques spatiales urbaines (fontaines, pergolas, bancs et différents types de végétation comme grande quantité d'arbres offrant une énorme quantité d'ombre) 	<ul style="list-style-type: none"> • Présence élevée de différentes caractéristiques spatiales urbaines (différents types de végétation, bancs urbains, pergolas, statues et éléments flexibles)
Surveillance parentale, présence des enfants et possibilités de jeu	<ul style="list-style-type: none"> • Une surveillance parentale et une présence des enfants notables • Présence d'étrangers, de sans-abris, d'alcooliques et des rues publiques environnantes • Les parents limitent le territoire de leurs enfants. 	<ul style="list-style-type: none"> • La présence d'enfants est très remarquée • Les parents permettent aux enfants de jouer librement dans les murs délimités du club • Haute sécurité et communauté environnante convergente. 	<ul style="list-style-type: none"> • La présence des enfants jouant est notable • Les parents des enfants limitent le territoire de leurs enfants afin qu'ils ne soient pas autorisés à jouer hors des portes du quartier. 	<ul style="list-style-type: none"> • La présence des enfants jouant est notable au quartier. • Les parents des enfants limitent le territoire de leurs enfants afin qu'ils ne soient pas autorisés à jouer hors du quartier. 	

Figure 2: Cartographie des différentes typologies spatiales dans le quartier résidentiel d'Abassia, Le Caire, Égypte

Deux rues secondaires avec différent direction et des places de parking servant la zone résidentielle seulement séparées par une limite imperméable (une rangée d'arbres)



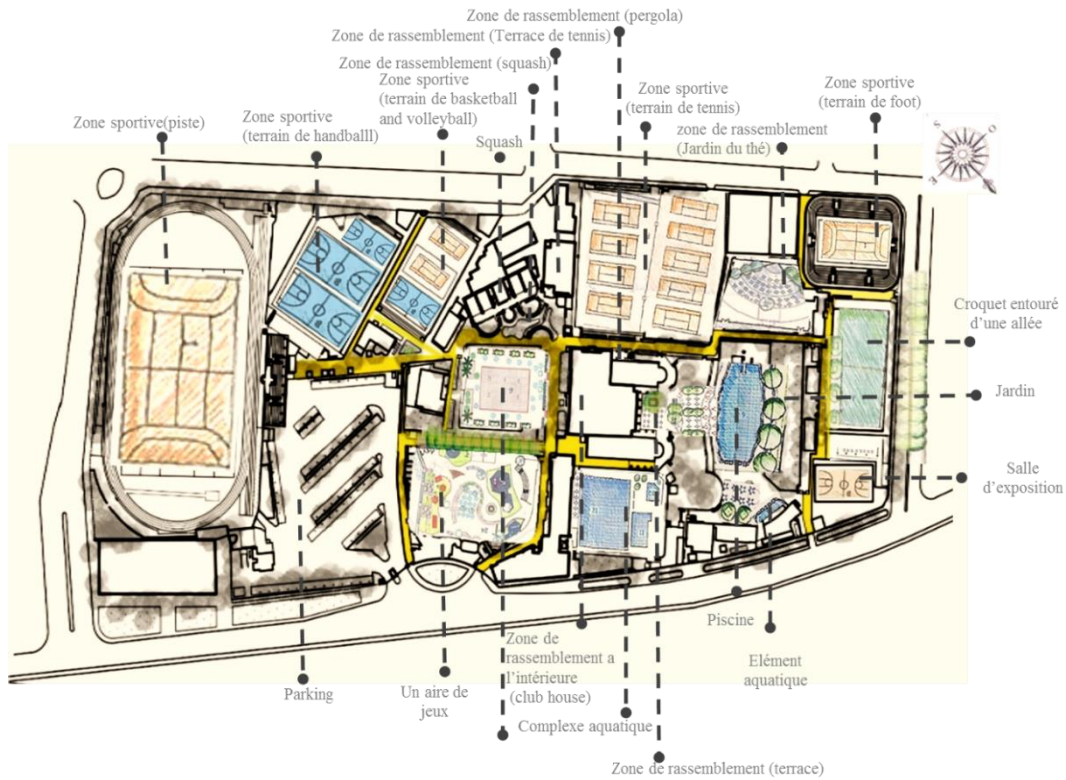
Source : l'auteur

Figure 3: Vue générale du quartier résidentiel d'Abassia, Le Caire, Égypte



Source : l'auteur

Figure 4: Cartographie des différentes typologies spatiales du Héliopolis Sporting Club (HSC), Le Caire, Égypte



Source : <https://www.google.com.eg/>, photo édité par l'auteur

Figure 5: Vue générale du club Héliopolis (HSC), Le Caire, Égypte



Source : l'auteur

Figure 6: Cartographie des différentes typologies spatiales dans le quartier Cité jardins, banlieue parisienne, France



Source : <https://www.google.com.fr/>, photo éditée par l'auteur

Figure 7: Vue générale du quartier Cité jardins, banlieue parisienne, France



Source : l'auteur

Figure 8: Cartographie des différentes typologies spatiales à Châtelet-Les Halles, 1ere arrondissement, Paris France



Source : URL . <https://www.google.com.fr/>, photo éditée par l'auteur

Figure 9: Vue générale de Châtelet-Les Halles, 1ere arrondissement, Paris, France

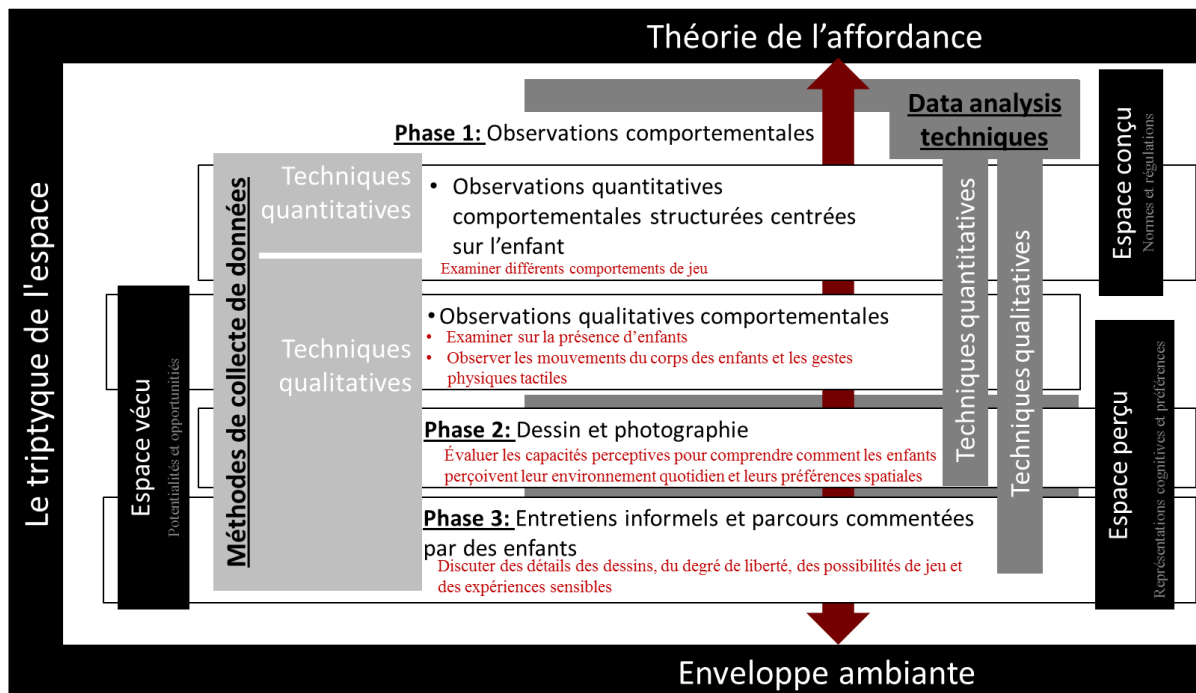


Source : <http://www.google.com.fr/>

4. Analyse des données

Le processus de l'analyse de l'ensemble des données a exigé que nous nous disposions d'une bonne maîtrise des outils d'analyse des données quantitative (*Student-t-tests*) et qualitatives. La combinaison de ces deux outils nous permet de mesurer la variabilité des données liées à la présence des enfants dans l'espace urbain et leurs différents types de comportement de jeu en fonction des catégories urbaines (résidentielles et récréatives). Cette méthode nous permet également d'explorer les expériences sensorielles quotidiennes des enfants, leurs perceptions de l'environnement et préférences de lieu, le degré de liberté, ainsi que les liens possibles existants entre « les potentialités spatiales » et « les opportunités de jeu, les gestes tactiles et l'ambiance des espaces vécus » (Figure 10).

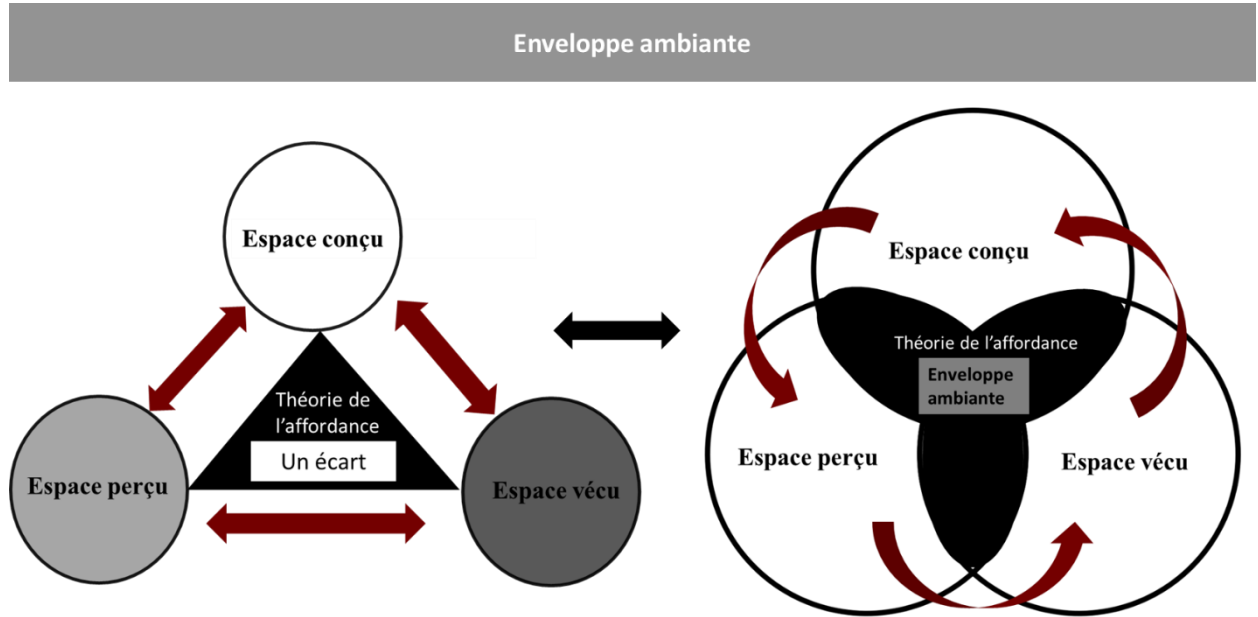
Figure 10: Analyse des données à lumière les théories du triptyque de l'espace et de l'affordance



Source : l'auteur

Dans ce cadre, les données ont été analysées à la lumière de la « théorie du triptyque de l'espace » (Lefebvre 1992) et la « théorie des affordances » (Gibson 1979). Le but ultime est de combler l'écart entre la conception d'aménagement urbaine proposée par les paysagistes et la perception des enfants de leurs environnements vécus (Gibson 1979, Bourdieu 1986, Heidegger 1996), (Figure 11).

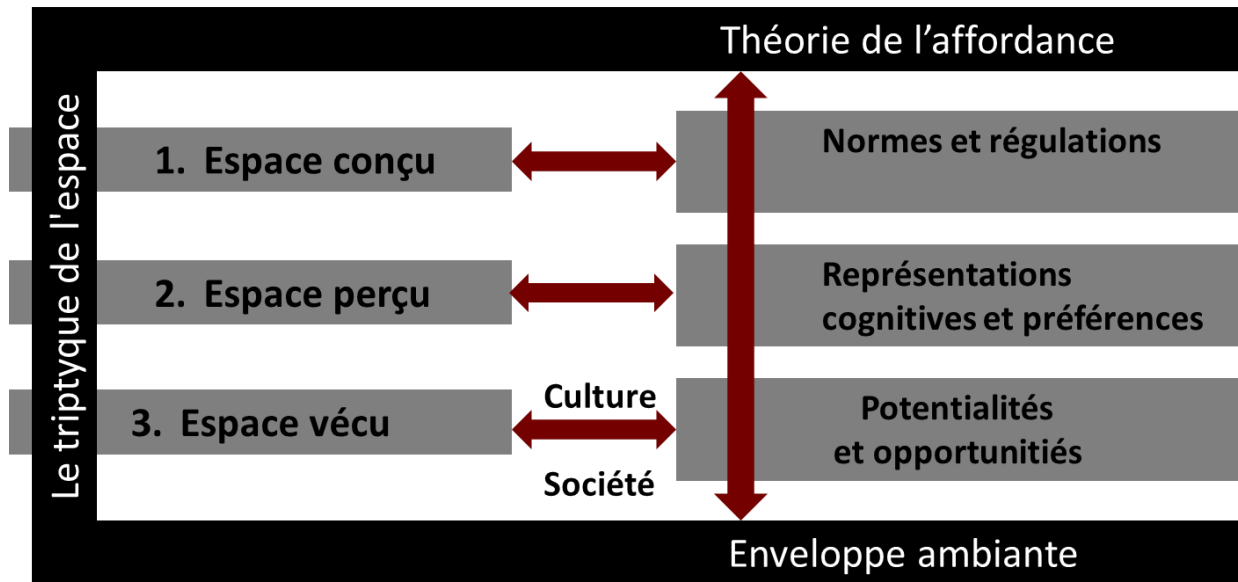
Figure 11: L'intégration des théories du triptyque de l'espace et de l'affordance



Source: l'auteur

La théorie des affordances se fonde sur la mutualité de l'acteur et son environnement dans le sens où le couplage acteur - environnement est inséparable (Gibson 1979). Cependant, la théorie du triptyque de l'espace a introduit un courant d'études fondées sur les critiques du structuralisme, de la phénoménologie, des affordances, et de l'existentialisme. Le triptyque a présenté les trois niveaux d'espace connu sous le concept «le triptyque de l'espace» : conçu, perçu, et vécu (Lefebvre 1992). Ces niveaux d'espace aident à appréhender la signification de l'espace. La mobilisation des deux théories nous permet d'approfondir la question du lien entre la production d'espaces sociaux urbains et les enveloppes ambiantes. L'enveloppe ambiante est le résultat de l'usage dynamique des espaces sociaux, en termes de pratiques spatiales, de perceptions et d'expériences vécues des utilisateurs (Monnet, 2014 ; Monnet, 2018, Monnet, 2020, Thibaud, 2007, Said, 2010).

Figure 12: Différents niveaux d'espace



Source: l'auteur

4.1 Conception spatial standardisée et pattern de jeu

Nous analysons les patterns de jeux offerts aux enfants dans les quatre sites étudiés, un intérêt particulier sera accordé à l'analyse des différences existantes entre les conceptions, les normes et les réglementations de ces espaces.

La lecture croisée des deux catégories urbaines (résidentiel et récréatif), nous montre les différents niveaux de l'influence des porosités spatiales sur les préférences de lieu de jeux et les patterns de jeux des enfants.

Il a été remarqué que certains enfants étaient plus attirés par les espaces urbains clôturés-sécurisés (jouissant d'un degré de fermeture moyen ou élevé). Dans ce sens, les enfants étaient plus capables de localiser les fonctions des différents îlots spatiales (i.e. lieux de jeux, lieux de rassemblement). Cette idée a été expliquée dans les travaux de Ackerely (2003), les lieux ayant des fonctions urbaines identifiables offrent un sens élevé de « propriété » et de « contrôle ». Sur ce point, Cohen et al. (1999) indiquent que le sentiment de sécurité des enfants est intrinsèquement lié au degré d'enclos de l'espace de jeu. Par conséquent, les enfants ont préféré les espaces clôturés-sécurisés (à voir l'espace récréatif HSC et les deux zones résidentielles) au sein desquelles ils peuvent jouir de leur liberté ; contrairement à l'espace récréatif Châtelet-Les Halles.

Jones (2000) a traité le sujet de perméabilité spatiale en distinguant entre « espaces monomorphes » et « espaces polymorphes ». Dans ce cadre, il a présenté les espaces

monomorphes en tant que des sous-îlots isolés à usage unique non attrayants pour les enfants. En contrepartie, il a précisé que les espaces polymorphes sont des sous-espaces multifonctionnels et perméables dotés de structures, imposées par les adultes, qui peuvent être réutilisées différemment par les enfants dans leurs thèmes de jeu. Ainsi, Jones prévoit l'importance des espaces perméables, hétérogènes et flexibles qui permettent aux enfants de créer leurs propres géographies personnelles et identités.

Les propos théoriques de Jones ont été empiriquement prouvés dans les deux catégories urbaines sujettes de notre étude. En effet, les espaces urbains récréatifs fonctionnent comme des îlots fonctionnalisés et isolés, autrement dit « mosaïque ». Cependant, les espaces urbains résidentiels sont caractérisés par la présence des espaces intégrés perméables. Dans ce cadre, certains enfants, au sein des espaces récréatifs urbains, ont déclaré qu'ils se sentaient emprisonnés dans les aires de jeux clôturées ou entourées de grands arbres.

Les données, issues des observations structurées du comportement de jeu des enfants, ont été analysées par le « Student-t test » afin d'évaluer les différents patterns de jeu des enfants au sein des différents espaces urbaines. Il s'agit de mesurer la différence entre les données issues des quartiers résidentiels et des espaces urbains récréatifs en termes d'occurrence de différents types de comportements jeux cognitifs et sociaux (tableau 1 et Figure 13).

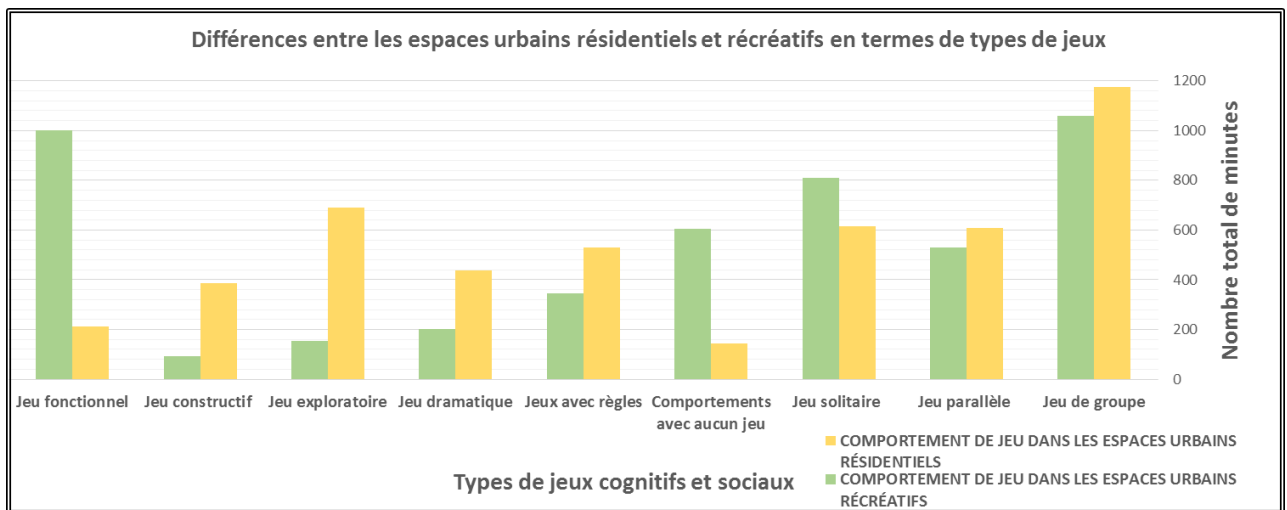
En général, les différents types de jeux cognitifs ont été omniprésents, à des degrés différents, aux espaces urbaines résidentiel et récréatif. Ainsi, il a été remarqué que le jeu de construction, le jeu exploratoire et le jeu dramatique étaient prédominants dans les espaces urbaines résidentiels par rapport aux espaces récréatifs. Ce fut contrairement le cas du jeu fonctionnel, le jeu à règles et le comportement sans jeu qui étaient, à leur tour, omniprésents fortement au sein des espaces urbaines récréatifs.

Cependant, cette schématisation n'était pas si claire pour le cas des différents types de jeu social. Dans ce cadre, la nature de l'espace (résidentiel ou récréatif) n'était pas toujours un facteur décisif – statistiquement parlant - encourageant la mise en place d'un type précis de jeu. Néanmoins, il est intéressant ici de souligner que même si les différences existants n'étaient pas statistiquement significatives, le jeu solitaire « jeu en solo » était prédominant dans les espaces récréatifs, alors que le « jeu parallèle » et le « jeu en groupe » étaient plus présents dans les espaces résidentiels.

Tableau 1: Différences statistiques entre les espaces urbains résidentiels et récréatifs en termes de jeu cognitif et de jeu social

Student t-Test										
Type de jeux		Espaces urbains récréatifs N=60			Espaces urbains résidentiels N=60			Signification	En faveur	
		Nombre d'enfants engagés	Minutes moyennes par enfant	Déviati on standard	Nombre d'enfants engagés	Minutes moyennes par enfant	Déviati on standard			
Jeux cognitifs	1	Jeu fonctionnel	51	33,40	16,10	32	7,07	6,08	Significatif P< 0,001	Récréatif
	2	Jeu constructif	13	3,07	4,77	26	12,83	10,43	Significatif P< 0,001	Résidentiel
	3	Jeu exploratoire	18	5,13	6,10	35	23,00	10,73	Significatif P< 0,001	Résidentiel
	4	Jeu dramatique	17	6,73	9,38	29	14,57	12,0	Significatif P< 0,001	Résidentiel
	5	Jeux avec règles	37	11,50	5,59	36	17,70	11,33	Significatif P< 0,001	Récréatif
	6	Comportements avec aucun jeu	52	20,17	10,73	20	4,83	5,00	Significatif P< 0,001	Récréatif
Jeux sociaux	A	Jeu solitaire	58	27,00	12,27	45	20,50	10,05	Non significatif P=0,02	Récréatif
	B	Jeu parallèle	48	17,70	10,41	48	20,33	10,80	Non significatif P=0,34	Résidentiel
	C	Jeu de groupe	49	35,30	12,00	46	39,17	14,45	Non significatif P=0,26	Résidentiel

Figure 13: Différence entre les comportements de jeu dans les espaces urbains résidentiels et récréatifs



Source : l'auteur

Pour une analyse plus détaillée, nous allons montrer les différents taux de représentations des jeux « cognitif » et « social » au sein des deux catégories urbaines dans chacun des pays étudiés. En effet, le taux de représentation est mesuré via le calcul du temps moyen (en minutes) passé à jouer.

En Égypte, l'omniprésence des types de jeux « dramatique » et « exploratoire » n'a pas été déterminé, d'une approche statistiquement significative, par la catégorie urbaine, voir espace récréatif ou résidentiel. Pourtant, nous avons repéré que le taux de représentation du « jeu fonctionnel » et du « comportement sans jeu » était statistiquement

plus important, d'une manière significative, au sein de l'espace urbain récréatif. Alors que le taux de représentation du « jeux constructif » et « jeu à règle » était statistiquement plus important au sein de l'espace urbain résidentiel. Pour le jeu social, le type du « jeu solo » a été omniprésent significativement – au sens statistique – au sein de l'espace récréatif, tandis que le « jeu de groupe » a été significativement présent dans l'espace résidentiel.

En France, le taux de représentation du « jeu fonctionnel » et du « comportement sans jeu » était statistiquement plus important au sein de l'espace urbain récréatif. Alors que le « jeu exploratoire » était statistiquement omniprésent dans l'espace urbain résidentiel. En ce qui concerne le taux de représentation des autres types de comportement de jeu cognitif, nous n'avons pas en effet repéré une différence statistiquement significative entre les espaces urbains résidentiels et récréatifs. Quant au « jeu social », le taux de représentation effectif du « jeu en groupe » et du « jeu en solo » n'a pas été statistiquement déterminé par la catégorie d'espace urbaine ; en d'autres termes il n'y avait pas ici de différence statistiquement significative entre les espaces urbains résidentiels et récréatifs. (Figures 14 et 15).

Figure 14: Le taux de représentation des différents comportements de jeu au sein des espaces urbains résidentiels et récréatifs en Égypte

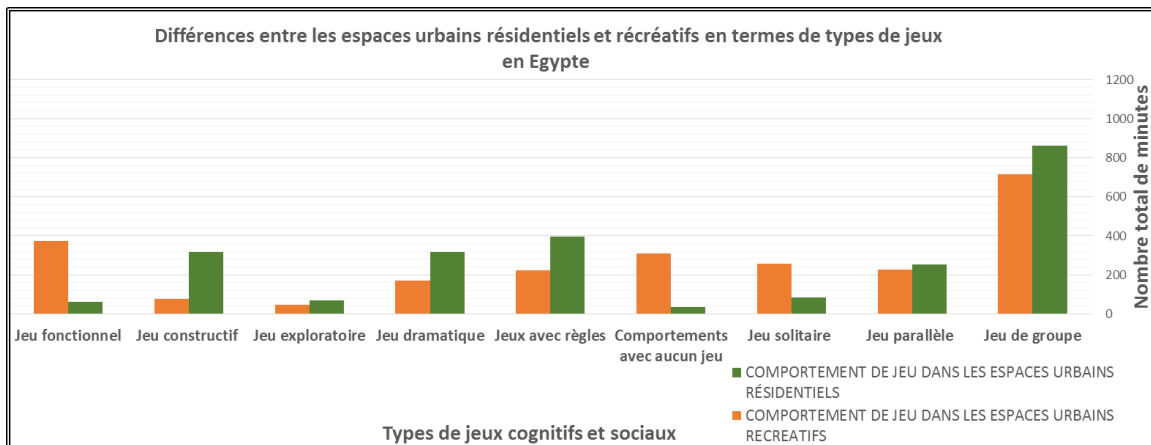
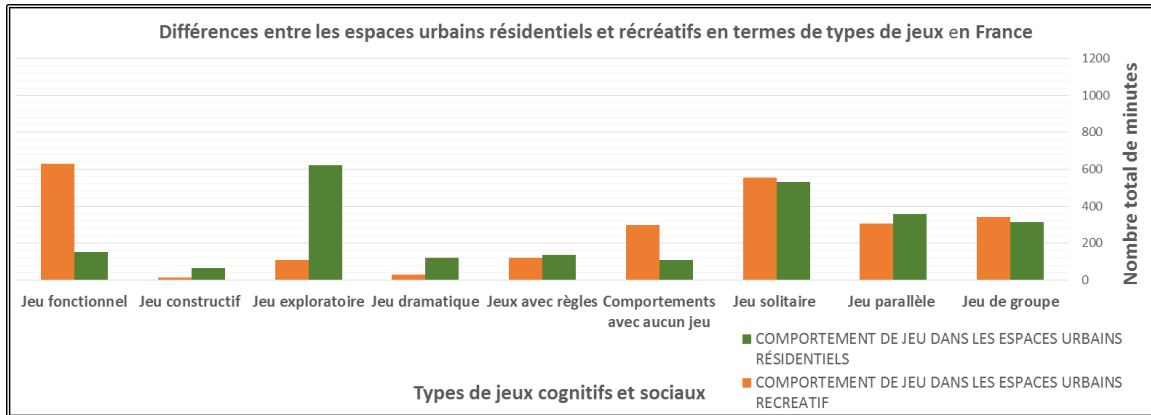


Figure 15: Le taux de représentation des différents comportements de jeu au sein des espaces urbains résidentiels et récréatifs en France



Source: l'auteur

La question du genre a été également prise en compte dans les deux terrains étudiés (Figures 16 et 17). En France, la question du genre n'a pas joué un rôle significatif dans la détermination du temps moyen passé à jouer (que ça soit pour le jeu cognitif ou social). Pourtant, en Égypte il faut faire une petite nuance. Si la question du genre n'a pas joué un rôle significatif dans la détermination du comportement du « jeu constructif », « jeu exploratoire », « jeux à règles », « comportement sans jeu », ainsi que tous les types du « jeu social ». Elle a quand même joué un rôle significatif dans les cas du « jeu dramatique » (en faveur des filles) et « jeu fonctionnel » (en faveur des garçons). L'interprétation ci-dessus pourrait être associée à la nature de la société patriarcale dominante en Égypte.

Figure 16: Le question du genre comme déterminant du comportement de jeu en Égypte

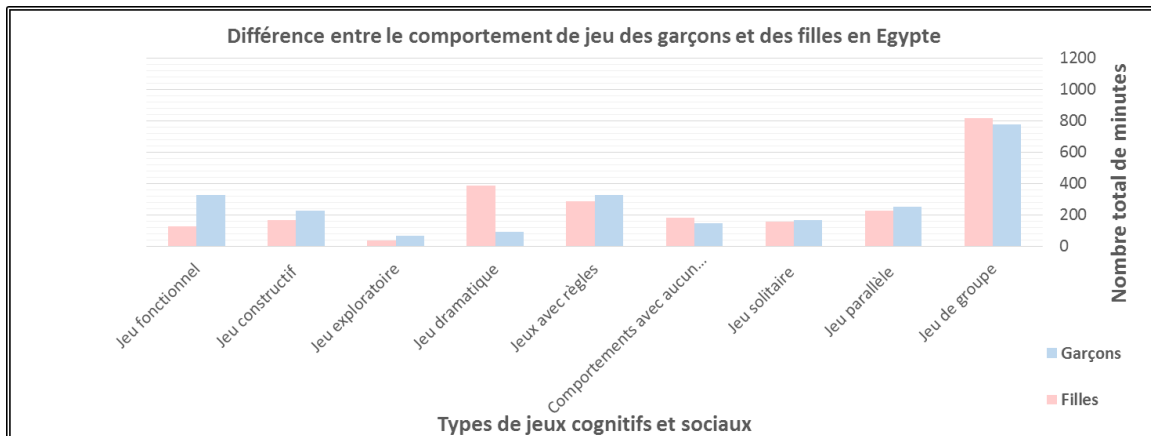
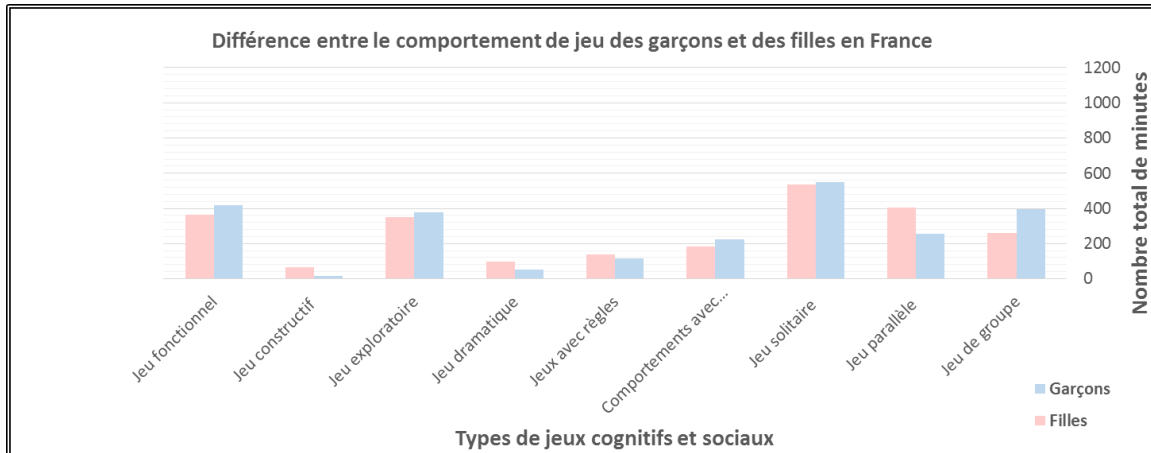


Figure 17: Le facteur du genre comme déterminant du comportement de jeu en France



Source: l'auteur

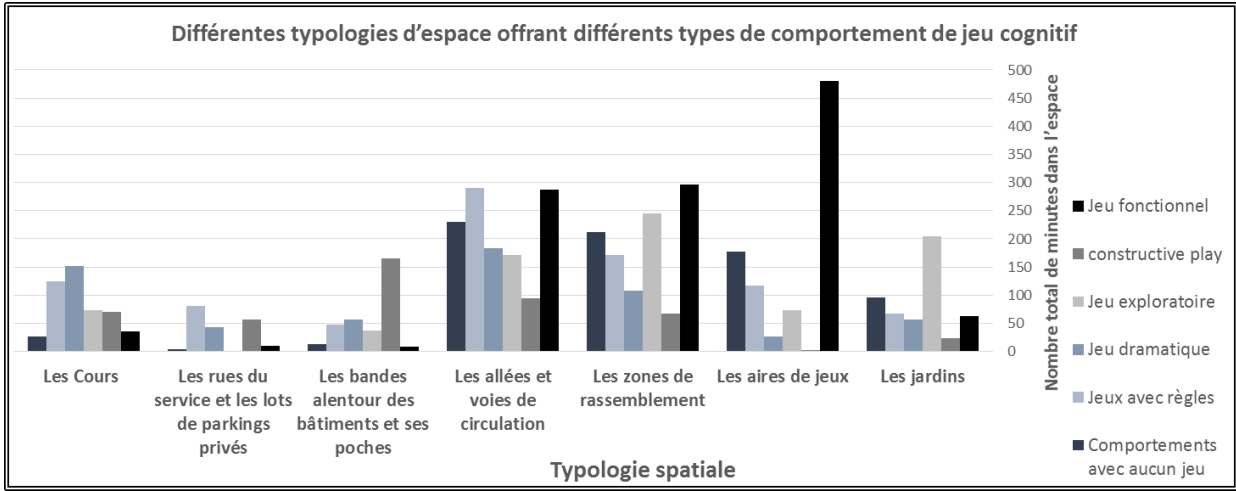
4.2 Analogie spatiale et représentations cognitives perceptuelles

Les enfants perçoivent l'espace qui les entoure sous forme d'entités segmentées, ils n'ont pas ainsi une véritable vue d'ensemble (Titman, 1994). Dès lors, il est intéressant d'analyser la perception de l'espace chez les enfants dans les quatre sites sujet d'études.

Au sein des différents espaces étudiés, chaque typologie spatiale (ou en d'autres termes chaque composante spatiale) est marquée en effet par la présence d'un comportement de jeu spécifique prédominant et d'un taux varié de présence des enfants. Les composantes spatiales sont réparties entre : zones de rassemblement, cours, plates-bandes autour des bâtiments, caves de bâtiments, rues du service axial reliant des lots de parkings privés, allées et voies de circulation, jardins et aires de jeux. L'analyse des données, issues des observations structurées et du mappage comportemental, nous montre que les enfants perçoivent l'espace en fonction de leurs expériences de jeu vécues (Figures 18 et 19).

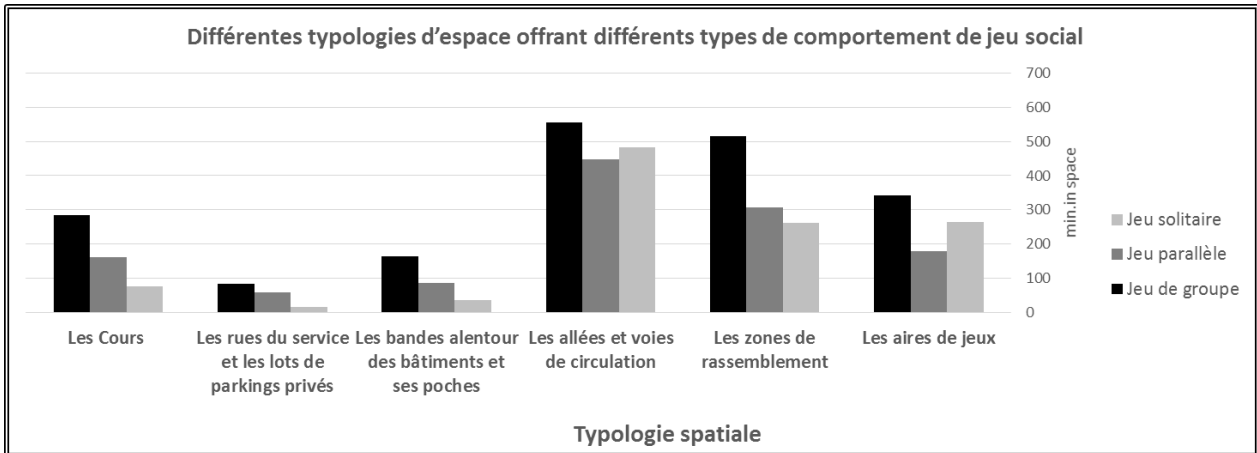
Dans ce cadre, les allées et les zones de rassemblement étaient les lieux plus attirants pour les enfants, presque la moitié de l'échantillon observé dans notre étude était là-bas. Au deuxième place, les cours et les jardins ont été des lieux encourageant la présence de quasiment le quart de l'échantillon observé. Quant aux aires de jeux, 15 % des enfants observés (cible de notre étude) y étaient présents. En contrepartie, les plates-bandes autour des bâtiments ainsi que les caves des bâtiments ont été des lieux négligés par les enfants et rarement cités, considérés plutôt comme des zones privées. Finalement, les rues du service axial reliant les lots de parkings privés n'accueillaient que 6 % des enfants ; considérées – par les enfants - comme des lieux non sécurisés dans le sens où leurs parents refusent qu'ils y aillent pour jouer (Figure 20). L'ensemble de ces éléments sera analysé en détail dans les pages suivantes.

Figure 18: Les types de jeux cognitifs offerts dans les différents espaces urbains



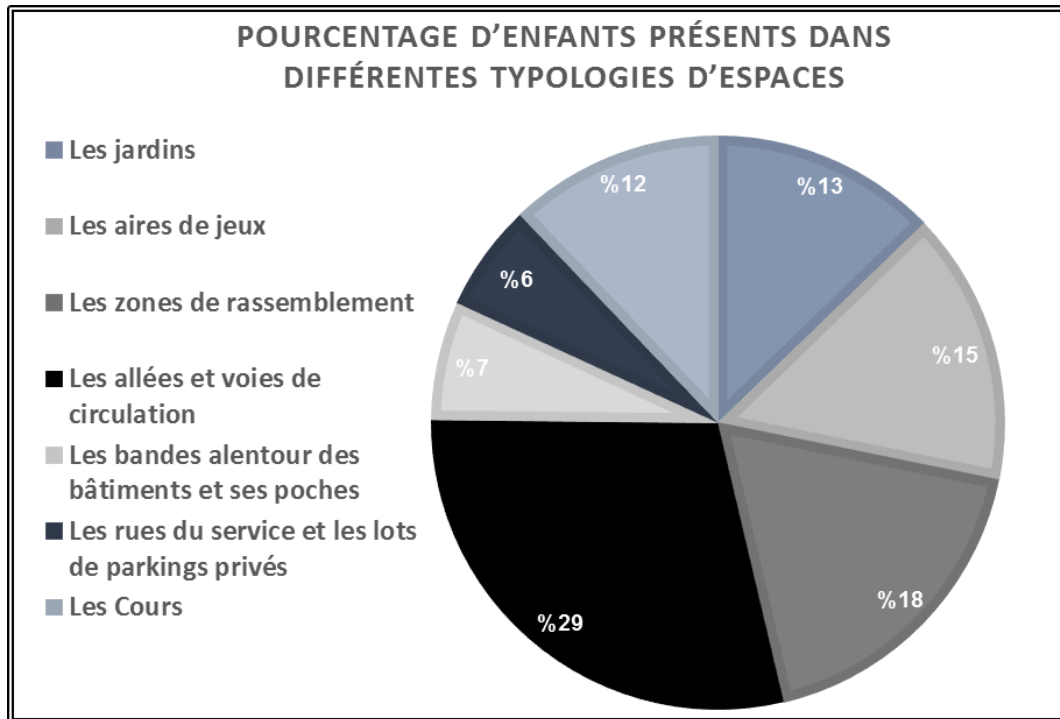
Source : l'auteur

Figure 19: Les types de jeux sociaux offerts dans les différents espaces urbains



Source : l'auteur

Figure 20: Répartition du taux de présence des enfants



Source : l'auteur

1. Les jardins

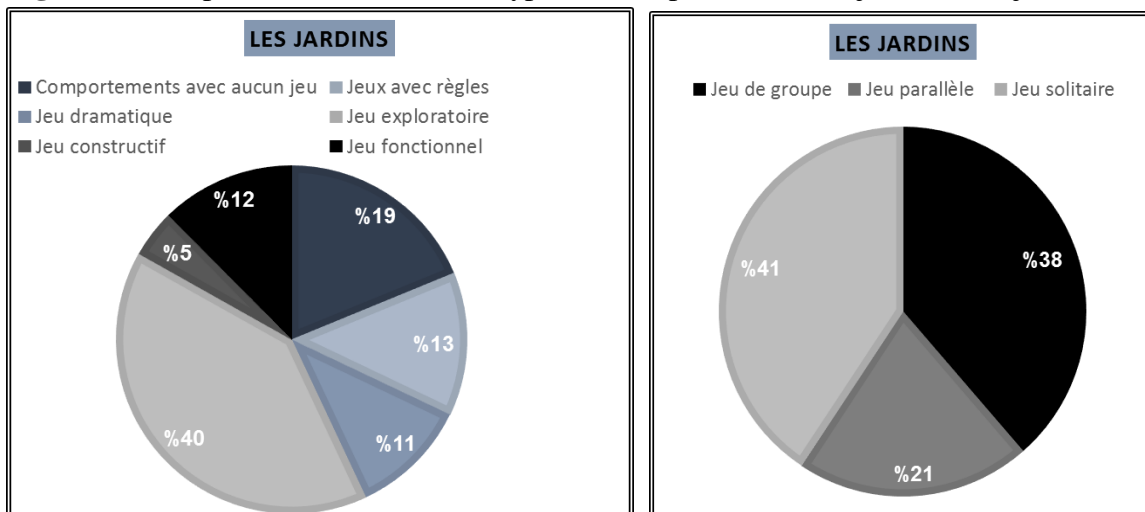
Le « jeu exploratoire » a été le type le plus représenté parmi les différents types des jeux cognitifs (un taux de 40% sur l'ensemble des jeux cognitifs - Figure 21). Nous pouvons dire que ce taux élevé est dû essentiellement à la présence des éléments naturels « dynamiques » comme les arbres, les palmiers et les fleurs. En effet, ces éléments stimulent les capacités exploratoires chez les enfants pour découvrir le monde qui les entoure (Fjortoft 2001). Autrement dit, l'environnement naturel présente des caractéristiques spatiales créant ainsi un paysage de jeu potentiel qui stimule les différents sens chez les enfants. A titre d'exemple, l'existence d'un grand tronc d'un arbre permet aux enfants de chercher comment faire pour le grimper. De même, une pelouse en pente est une surface encourageant les enfants à s'y glisser. Dans ce sens, les enfants perçoivent les fonctions de l'environnement et les utilisent pour créer leurs propres thèmes de jeu. C'est ainsi que la structure et la complexité de l'environnement déterminent la nature de ses fonctions.

La complexité de l'environnement est manifestée à travers la variété des éléments de végétation : les arbres comme élément idéal à grimper, les arbustes pour s'y cacher, et les champs ouverts pour jouer cache-cache. Ces affordances correspondaient à la perception intuitive des enfants à l'égard des éléments naturels ; une telle perception détermine largement le comportement ludique des enfants. Dans les jardin, la nature saisonnière

permet aux enfants de se sentir comme étant dans un laboratoire, ce qui développe leur créativité. La complexité de la nature des jardins s'explique par le fait qu'on trouve des éléments d'ordre matériel (i.e. la boue, l'eau, les arbres) ainsi que des éléments d'ordre immatériels (objets vivants) comme les oiseaux ou les vers. Les enfants ont ainsi accès à des éléments qui inspire leur pensée créative.

Les jardins permettent également aux enfants d'avoir une interaction sociale avec les autres ce qui stimule leur compétences de communication. Ainsi, le taux de représentation du « jeu en groupe » a été significativement important (38% de l'ensemble de jeu social - Figure 21). Les résultats ci-dessus sont cohérents avec les travaux de Heft (1988) dans le sens où elle a expliqué que le jardin est un paysage de jeu ayant des caractéristiques spatiales qui offrent une variété de structures pour accueillir différentes activités de jeu.

Figures 21: Répartition des différents types de comportements de jeu dans les jardins



Source : l'auteur

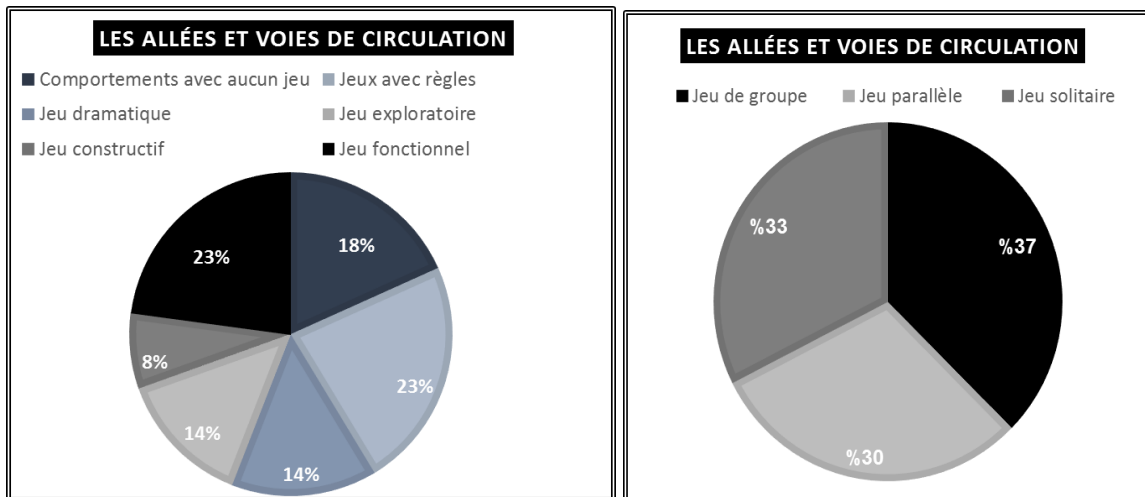
2. Les allées et les voies de circulation

Les allées paraissent l'espace le plus adéquat pour l'exercice des « jeux fonctionnels » et « jeux avec des règles », chacun des deux représenta - séparément – 23 % de l'ensemble des jeux cognitifs (Figure 22). En effet, les allées jouent un rôle important dans la configuration des espaces ; elles fonctionnent comme des « liens » qui permettent aux enfants de se connecter à leurs zones visées. Selon Cosco (2010), les formes des allées ainsi que leurs différents matériaux donnent la chance aux enfants de pratiquer des activités variées. A titre d'exemple, les voies bouclées attirent plus les enfants à comparer avec les voies linéaires. En effet, les voies bouclées tendent à favoriser plus l'exercice des activités physiques, ce que veut dire une expérience plus agréable pour les enfants. Les voies linéaires obligent par contre les enfants à faire des « allers-retours » avec les jouets à roues,

ceci peut provoquer les disputes entre les enfants. Ces disputes peuvent effectivement ouvrir la porte vers l'émergence de règles de civilité qui, à leur tour, peuvent contrôler les thèmes créés pour le type de jeu à règles. Nécessairement, c'est entre l'accord et le non-accord des enfants que le jeu est né.

Les allées offrent ainsi aux enfants l'opportunité de vivre une expérience de jeu active tout en jouissant d'une libre circulation au sein de l'espace, ce fait est considéré comme catalyseur central de leur créativité. La plupart des enfants aiment effectivement être présents où se passe l'action et se déroule la vie de la communauté. C'est pourquoi les allées sont un site d'attractions particulières incomparables aux autres lieux. Elles aident à développer l'identité visuelle chez les enfants tout en leur encourageant à explorer les divers environnements de jeu.

Figures 22: Répartition des différents types de comportements de jeu dans les allées

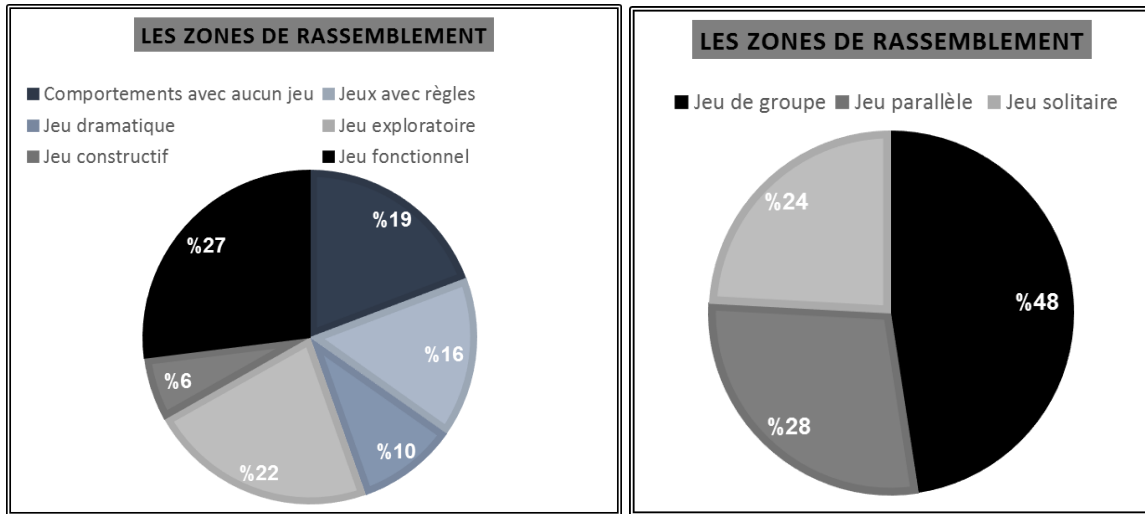


Source : l'auteur

3. Les zones de rassemblement

Les zones de rassemblement et les espaces ouverts favorisent les comportements de jeux, à la fois, cognitifs et sociaux. Dans ce cadre, le « jeu fonctionnel » et le « jeu exploratoire » - comme types de jeu cognitif - ainsi que le « jeu en groupe » - comme type de jeux social - étaient les prédominants avec des taux de représentation respectifs de 27 %, 22 % et 48 % (Figures 23). En effet, les zones de rassemblement tendent à assimiler les activités ludiques formelles et informelles. Elles permettent aux enfants de jouer ensemble ce qui renforce le degré d'interaction sociale. Nos observations sur les terrains rejoignent l'analyse de Valentine, (2004), qui a souligné que les espaces de jeu préférés par les enfants sont ceux qui leur permettent de jouer d'une manière flexible.

Figures 23: Répartition des types de comportement de jeu dans les zones de rassemblement



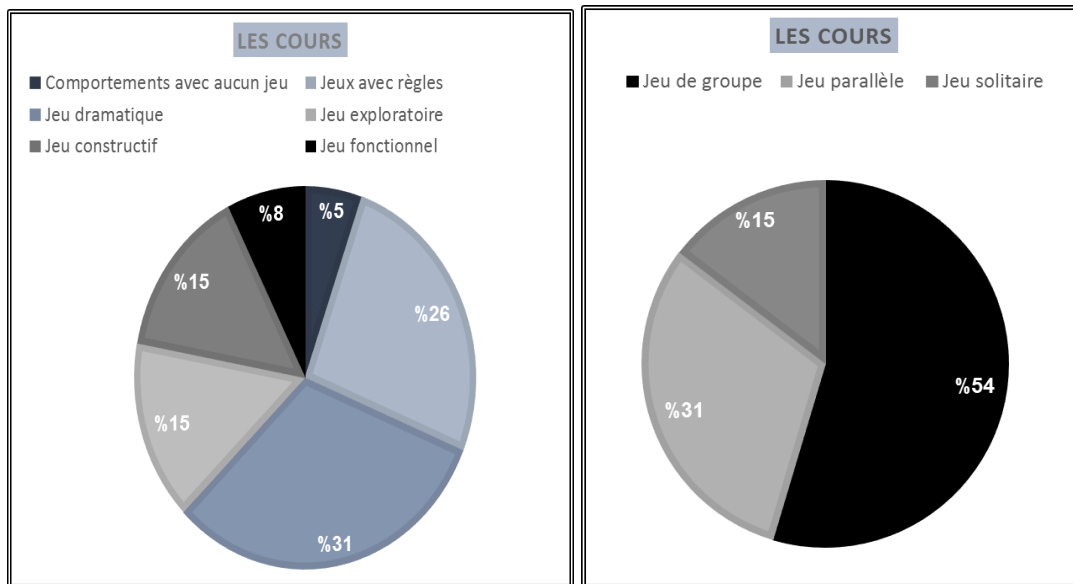
Source : l'auteur

4. Les Cours

En effet, le « jeu dramatique » et les « jeux à règles » étaient les deux types prédominants ici sur l'ensemble des jeux cognitifs, ayant ainsi des taux de représentation respectifs de 31 % et 26 %. Tandis que les jeux sociaux représentent un total de 54% (Figures 24). Il a été remarqué que les enfants citent majoritairement la cour comme étant leur espace préféré dans les différents sites résidentiels étudiés, elles semblent stimuler leurs créativité tout en assurant le sentiment d'appartenance et de bien-être chez eux. Nos observations vont de pair avec l'analyse de Chawla (1992) qui a expliqué dans son ouvrage « *Childhood Place Attachments* » que ces espaces évoquent un sentiment de sécurité, d'intimité, de chaleur, et de contrôle. Elle a également décrit les cours comme étant « des points d'ancrage personnels pendant l'enfance et l'âge adulte ». As Chawla pointed out in her study that, “*Children are attached when they value the place not for the satisfaction of physical needs, but for its own intrinsic qualities.*” (Chawla, 1992). In

Les résultats étaient conformes aux analyses de Marc Breviglieri (2013) sur la différence entre la ville ludique et la ville garantie. Breviglieri et Landoulsi (2016) ont considéré les cours comme une source de qualifications spatiales qui permettent de clôturer et d'envelopper les activités de ses utilisateurs, créant ainsi l'ambiance de l'espace. Les cours intérieures ont également été associées au sentiment de territoires identifiables et d'appartenance, ceci renforce certains comportements et interactions sociaux (Breviglieri et Landoulsi, 2016, Said, 2016).

Figures 24: Répartition des types de comportements de jeu dans les cours

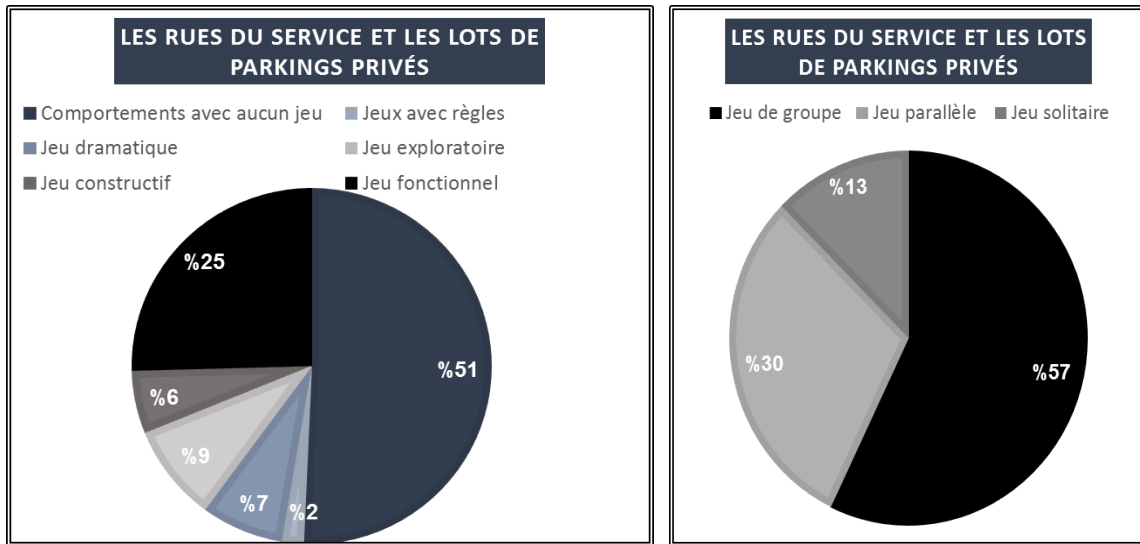


Source : l'auteur

5. Les rues du service et les lots de parkings privés

Les rues et les zones de parking favorisent le « comportement sans jeu », comme type de jeu cognitif, et le « jeu en groupe », comme type de jeu social, ayant ainsi des taux de représentation respectifs de 51 % et 57 % (Figures 25). En effet, tous les deux sont considérés comme des espaces informels des rassemblements. Dans cette étude, nous considérons que les rues et les zones de parking sont des endroits offrant de multiples affordances et opportunités. Tout de même, elles fonctionnent en tant qu'endroit social pour y jouer, aidant ainsi à forger l'identité des enfants. En d'autres termes, quand les enfants jouent dans les rues, ils font face à la complexité du monde réel dans le sens où une intégration multiculturelle se produit via le jeu. Il faut rappeler ici les travaux Lauren Lacey (Lacey, 2007) qui a indiqué que les rues et les zones de stationnement (parking) sont des lieux préférés par les enfants pour exercer les jeux de rue.

Figures 25: Répartition des types de comportement de jeu dans les rues et les zones de parking

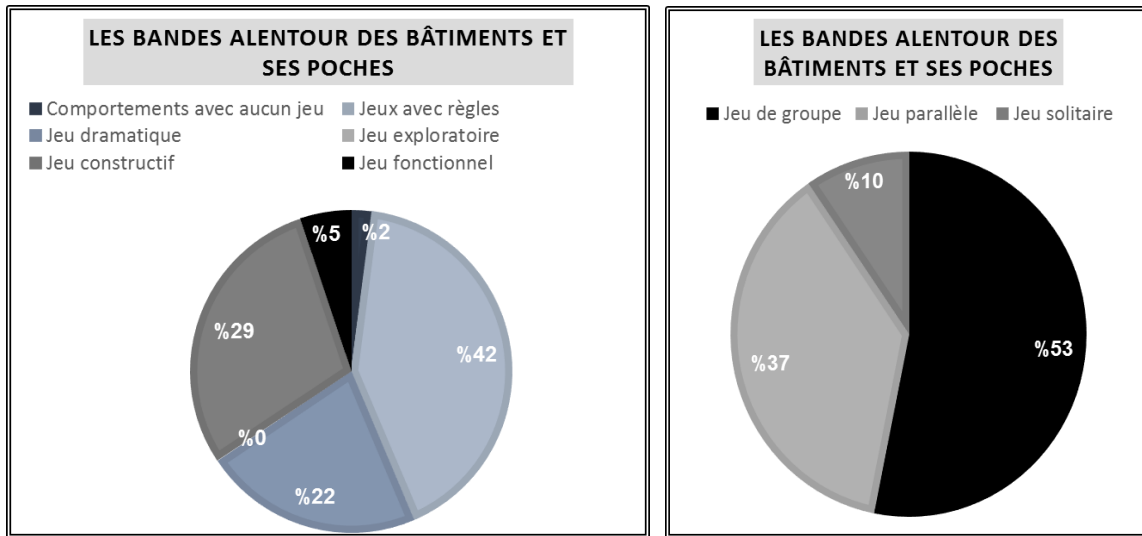


Source : l'auteur

6. Les plates-bandes autour des bâtiments et les caves des bâtiments

Les « jeux à règles », comme l'un des types du jeu cognitif, ainsi que le « jeu en groupe », comme type du jeu social, ont été les prédominants avec des taux de représentation respectifs de 42 % et 53 % (Figures 26). Nous avons remarqué lors de nos terrains que, contrairement aux adultes qui perçoivent les petites caves des bâtiments comme des espaces peu utiles, les enfants semblent y saisir un potentiel dans le sens où une variété d'expériences de jeu peut se produire. Les enfants essaient à remodeler ces espaces selon leur volonté et leur besoin, ceci les aide à développer leur propre créativité et identité. Percy-Smith (2004) a défini ces lieux comme des espaces informels libres, dans ce cadre les enfants les considèrent comme des zones libres et intéressantes. Thwaites et Simkins (2008), ont traité les dimensions cachées des expériences spatiales des enfants dans ces endroits dans le sens où la frontière entre l'imaginaire et le réel est indiscernable.

Figures 26: Répartition des types de comportement de jeu dans Les bandes alentour des bâtiments et ses poches

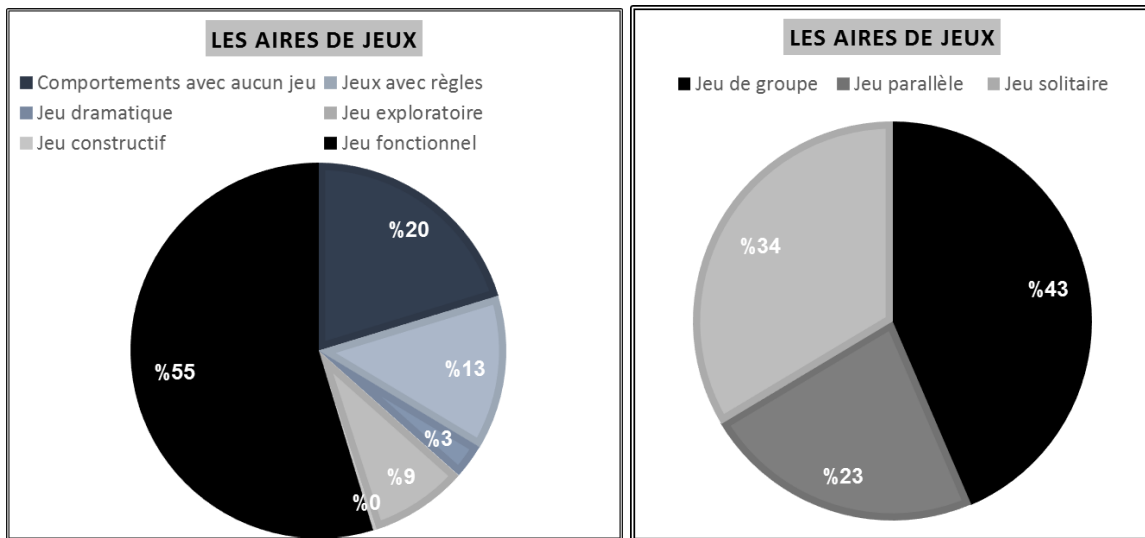


Source : l'auteur

7. Les aires de jeux

Le « jeu fonctionnel », comme type du jeu cognitif, ainsi que le « jeu en groupe », comme type du jeu social, ont été les prédominants avec des taux de représentation respectifs de 55 % et 43 % (Figures 27). Les aires de jeux aident effectivement les enfants à dévoiler leur intelligence dans le sens où la conception spatiale de ces lieux influence le développement cognitif, social, physique, et émotionnel des enfants (C. Hart, 1993). Dans cette perspective, les enfants ont besoin de saisir des vraies opportunités dans les aires de jeux et pas simplement avoir des équipements mises à leur disposition, ces opportunités peuvent leur offrir des enjeux, des risques et des expériences de jeu variées (R. Hart, 2002). Selon nos observations sur le terrain des espaces urbains récréatifs, les aires de jeux semblent favoriser les activités musculaires, puisqu'elles stimulent les capacités physiques des enfants. Il a été remarqué que les aires de jeux sont généralement dotées d'un haut niveau de créativité et d'enthousiasme.

Figures 27: Répartition des types de comportement de jeu dans les aires de jeu



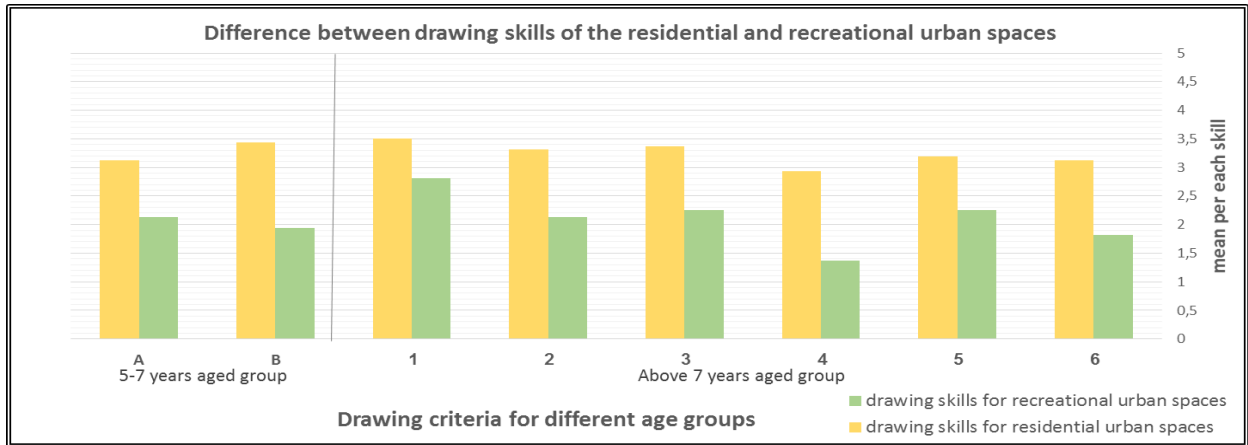
Source : l'auteur

Pour résumer, les variations spatiales mentionnées ci-dessus semblent améliorer les perceptions mentales des enfants de leurs espaces urbains vécus. Ce fait a été nettement traduit dans leurs représentations cognitives et perceptives des espaces via leurs dessins et photographies ainsi que via leurs discours dans les entretiens informels réalisés avec eux.

Pour avoir une interprétation plus approfondie des perceptions et des représentations mentales des enfants, nous nous sommes réappropriés les critères de Piaget (1956) pour évaluer les dessins des enfants. Pour Piaget, l'âge de sept ans amorce un changement d'orientation de l'esprit des enfants. Dans ce contexte, selon Piaget, les propos des petits peuvent être répartis en deux grands groupes : enfants de 5-7 ans et enfants du haut de ses 7 ans. Dans nos terrains d'études, nous avons remarqué que les dessins des enfants dans les zones résidentielles étaient légèrement mieux par rapport à ceux des espaces urbains récréatifs, (Figure 28). Les « Student t-tests » ont montré également que les différentes compétences cognitives des enfants, dans chacune des deux catégories urbaines, sont étroitement liées à l'idée de Piaget considérant l'âge moyen de sept ans comme tournant décisif dans le développement mental des enfants. Ainsi, pour les enfants de 5-7 ans, les compétences cognitives ont été évaluées en fonction de leurs dessins, - inspirée de Piaget - nous nous étions basés sur ces deux critères : (A) la précision des éléments représentés et (B) la quantité de détails dans les éléments représentés. Pour les enfants du haut de ses 7 ans, six critères ont été pris en compte : (1) la précision des éléments représentés, (2) la quantité de détails dans les éléments représentés, (3) la précision de la scène globale, (4) la quantité de détails dans la scène globale, (5) le réalisme visuel [établi via la précision des relations spatiales entre les différentes composantes spatiales], (6) le réalisme visuel [basé sur l'idée de profondeur par la technique de la perspective et des ombres] (Piaget 1956). Il faut noter ici que les dessins des enfants dans

les zones résidentielles, à voir les zones non aménagées pour les enfants, ont illustré que les petits avaient tendance à profiter de la richesse offerte par les environnements pour créer leurs propres espaces de jeu (Figures 29 et 30). Cette richesse a aidé à sculpter l'identité de l'espace, que les enfants ont créée dans leur perception mentale. Ce fait peut-être dû à la prédominance du « jeu constructif » et du « jeu dramatique », en tant que types des jeux cognitifs, au sein des espaces résidentiels (Elnesr, 2018). Ces propos rejoignent effectivement les conclusions de Chawla (2002) dans le sens où elle a précisé que les enfants, dans les zones informelles non planifiées, s'adonnent plus à des activités en plein air (de manière indépendante) et ont la liberté d'explorer leur environnement et de choisir leurs lieux de jeu.

Figure 28: Différence entre les moyennes d'évaluations des dessins des quartiers résidentiels et des espaces urbains récréatifs



Source: l'auteur

Figure 29: Échantillons de dessins des enfants de 5-7 ans (ayant les meilleures évaluations) dans les deux catégories urbaines



Figure 30: Échantillons de dessins des enfants du haut de ses 7 ans (ayant les meilleures évaluations) dans les deux catégories urbaines



4.3 Potentialités spatiales et enveloppe ambiante vécue

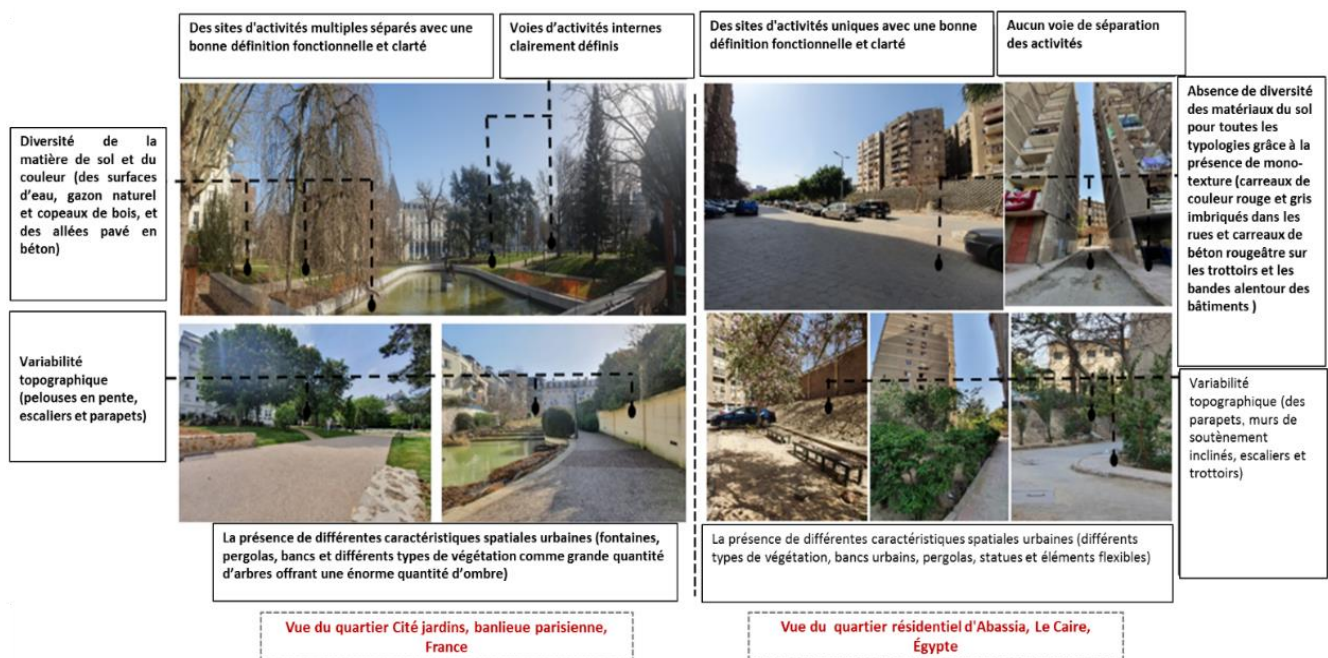
Les différents comportements et perceptions à l'égard de typologies spatiales similaires, dans les quatre sites, reflètent le rôle potentiel de différentes caractéristiques d'aménagement paysager, aspects physiques, et qualités fonctionnelles, dans la formation de différentes configurations spatiales, en termes de potentialités spatiales sur ces sites (Figures 31 et 32).

Ainsi, cette étude se concentre sur les potentialités suivantes :

- Les sites comportementaux,
- Continuité et fluidité du mouvement,
- Diversité des matériaux utilisés,
- Variabilité topographique,
- Présence de différentes aspérités physiques spatiales.

Les opportunités de jeu, le degré de liberté, les gestes tactiles, l'espace vécu, l'ambiance, et les préférences spatiales offerts par chacune de ces potentialités ont été élaborés, tout en les reliant aux résultats d'études précédentes. Autrement dit, une telle association était nécessaire afin de comprendre l'impact du rôle potentiel des cinq potentialités spatiales proposées, indépendamment de la typologie spatiale elle-même.

Figure 31: Différence entre les deux quartiers résidentiels en termes de potentialités spatiales



Source: l'auteur

Figure 32: Différence entre les deux espaces urbains récréatives en termes de potentialités spatiales



Source: l'auteur

1. Les sites comportementaux:

Selon les résultats obtenus, les sites ou les zones permettant la pratique de différentes activités sont liés à la flexibilité dans l'utilisation de leur espace. Autrement dit, ces sites ont la potentialité d'accueillir différents modes de jeu, ce qui est considéré par les enfants comme un atout grâce à la liberté que ces sites offrent. En outre, ces résultats sont compatibles à ceux obtenus par Cohen et al. (1999) qui ont déclaré qu'un espace de jeu doit incorporer une variété de zones différentes pour permettre la pratique de différents types de jeu. Barker, R. (1976) a également décrit les différents sites d'activité comme des espaces limités et identifiables, qui fonctionnent indépendamment des adjacentes. De plus, G. Moore (1986) a constaté qu'une meilleure définition spatiale de multiples sous-zones est associée à avoir plus de comportements exploratoires, à plus d'interactions sociales, et à une plus grande concentration d'activités. Cela est mieux compris à la lumière du fait que l'aménagement de l'espace dans des zones claires, séparées par des limites, permet aux enfants de se concentrer sur les différents matériels de jeu.

En effet, ces études, qu'on vient de mentionner, sont compatibles avec les résultats qu'on a obtenus de nos observations, notamment en ce qui concerne les différences de comportement de jeu entre les exemples de typologies spatiales qui se trouvent dans des quartiers résidentiels de Cité jardins et d'Abassia. Les jeux de types « jeu exploratoire » et

« jeu solo » étaient dominants dans le quartier résidentiel de Cité jardins, et dans les deux sites sous la catégorie d'espace urbain récréatif. En outre, le niveau de concentration chez les enfants était plus élevé en jouant dans le quartier résidentiel de Cité jardins où ils étaient engagés dans la même activité pendant des longues durées. Par contre, dans la zone résidentielle d'Abassia, les durées des activités étaient plus courtes avec des mouvements aléatoires plus impulsifs et des incidences plus agressives prenant la forme des combats. Idem pour l'espace urbain récréatif des HSC, où la nature géographique de l'espace exige le mouvement aléatoire des enfants. En effet, nos résultats obtenus ont révélé l'importance de la présence de multiples sites d'activité, qui sont spatialement bien définis et séparés par plusieurs voies d'activité internes, créant ainsi de multiples zones fonctionnelles.

Il est également intéressant de souligner que, lors d'entretiens informels avec les enfants, ils ont fréquemment déclaré qu'ils préféreraient des sites des activités ayant des limites claires, permettant d'utiliser les notions « dedans » et « dehors ». (Figures 33). En outre, ces préférences étaient claires dans le dessin des enfants et dans leurs descriptions supplémentaires indiquant : « C'est notre ville, où tout est subdivisé en petites zones ». De plus, de nombreux enfants ont souligné l'échelle intime offerte par l'espace multiple, comme une qualité physique importante qui convient à leur taille. Ces conclusions sont conformes avec Christensen et O'Brien (2003), qui a conclu que les enfants interagissent dans des espaces de dimension différente dans une variété de situations.

Cependant, cela ne nie pas le fait que d'autres enfants avaient d'autres opinions, comme certains d'eux souhaitant que les espaces où ils jouent ne soient pas divisés. Par exemple, dans la zone résidentielle d'Abassia, en l'absence de lieux d'activités multiples, les enfants ont déclaré que la cour devant les bâtiments résidentiels est parmi leurs endroits préférés pour y jouer, puisqu'elle a la forme d'un espace clos, large, et bien défini. Ils ont donc déclaré que « vous pouvez faire tout et n'importe quoi dans cette zone ouverte ». La même opinion était partagée parmi les enfants dans les espaces ludiques, qui ont déclaré: « Nous nous sentons libres dans les grands espaces ouverts en raison de la clarté et de la continuité de l'espace ». On trouve également d'autres enfants qui préfèrent les zones de rassemblement non divisées, en mentionnant: « Là, vous pouvez crier, courir, et jeter le ballon fort ». Ceci était cohérent avec Cohen et al. (1999), qui ont mentionné que les grands espaces non divisés et bien définis offrent aux enfants un sentiment de sécurité plus élevé, car le jeu est lié au degré de clôture. Ainsi, certains enfants ont décrit des espaces non divisés et uniques en mentionnant: « L'endroit est clos et nous aimons jouer à distance de passants ».

Figures 33: Exemples de différentes expériences vécues promues par les différentes formes d'entité spatiale



Source : l'auteur

2. Continuité et fluidité du mouvement:

Dans les espaces urbains, les passages où les activités ont lieu sont définis en fonction de matériaux, de la texture, de la couleur, et de la présence de limites physiques. A la lumière de nos observations, il a été remarqué que ces passages ont un impact sur le comportement de jeu choisi dans les espaces urbains résidentiels et récréatifs à la fois (Figures 34). Les passages encadrés ayant des limites physiques incitent les enfants à adopter un comportement de jeu de type « jeux fonctionnels parallèles » ou de « jeux avec des règles en groupe ». A titre d'exemple, les garçons considéraient que les allées sont le meilleur endroit pour y jouer du football, puisqu'ils leur donnent l'espace de jeter le ballon à des altitudes élevées. En outre, ces passages sont considérés comme des espaces multifonctionnels encourageant les interactions sociales. Ils créent des sous-zones de jeu et ils délimitent les sites comportementaux, ainsi ils étaient perçus par les enfants comme des endroits pour le jeu informel. Par conséquent, une bonne circulation dans des sites comportementaux tend à favoriser la créativité et à permettre aux enfants de s'orienter. Les larges allées étaient considérées comme des espaces ludiques; et les allées les plus petites étaient un endroit parfait pour le jeu de cache-cache.

En effet, nos observations sont conformes avec les résultats de Maxwell et al. (2008), Cosco et al. (2010), et Podolska (2014), qui ont suggéré que la présence des passages bien définis tend à organiser la fluidité de jeu, les actions dynamiques, et à réduire les mouvements aléatoires. A cet égard, Cele (2006) a conclu qu'une conception qui

favorise l'action dynamique et augmente le niveau physique des enfants, est considérée comme stimulante.

A la lumière de ces études, on estime que plus de mouvements aléatoires ont été observés à Abassia que dans les typologies spatiales de Cité jardins. Ainsi, les activités de jeu interfèrent les uns avec les autres causant des combats entre les enfants. Par contre, ces combats n'existaient pas dans la zone résidentielle de Cité jardins, où la fluidité de jeu était plus organisée et de rares interférences ont été observées.

Par ailleurs, les enfants adoptent un comportement de jeu qui requiert davantage de concentration dans les passages internes que dans les zones non divisées. Autrement dit, on a remarqué de nombreux dessins et coloriages avec des craies sur des zones pavées en béton qui dure de longues périodes dans les passages internes, dans l'espace récréatif HSC. Par contre, dans les zones non-divisées, ce genre de dessins n'existait pas bien que ces zones soient pavées d'un matériau similaire. Donc, on estime que les enfants se comportent de différentes manières imaginatives en fonction du lieu de jeu. Par exemple, le réseau de circulation au HSC était associé au « jeu dramatique » en imaginant conduire sur un réseau de rues de la ville et imaginer naviguer sur une rivière. Ainsi les enfants ont expérimenté leurs lieux de jeu d'une façon particulièrement imaginative, indépendamment des adultes qui essaient de manipuler l'espace pour satisfaire leurs propres besoins.

En général, les observations ont confirmé que dans les espaces urbains récréatifs comme résidentiels, les passages étaient au centre des lieux de jeux des enfants, puisqu'ils offrent l'opportunité de pratiquer des activités plus dynamiques. De plus, l'appropriation et le réemploi de ces espaces en lieux de jeu était important pour la stimulation du jeu informel et de l'imagination des enfants.

Figures 34: Exemples de différentes expériences vécues et notions résultant de la présence et de l'absence des voies d'activité



Le quartier Cité jardins, banlieue parisienne, France



Le quartier résidentiel d'Abassia, Le Caire, Égypte



Héliopolis Sporting Club (HSC) espace urbain récréatif, Le Caire, Égypte



Châtelet-Les Halles espace urbain récréatif, Paris, France

Source : l'auteur

3. Diversité des matériaux utilisés

Le concept d'affordances permet d'expliquer l'impact de la diversité des matériaux utilisés sur la variabilité des activités des enfants (Gibson, 1979). Barbour (1999), Cosco et al. (2010) et Podolska (2014) ont catégorisé les matériaux du sol qui influencent les différentes formes de jeu et qui créent des limites physiques et visuelles de l'espace. Selon nos observations, une plus grande variété de formes de jeu a été observée dans la zone résidentielle de Cité jardins plutôt que dans la zone résidentielle d'Abassia. Par ailleurs, les typologies spatiales des espaces récréatifs Châtelet- Les Halles et HSC se caractérisent par une plus grande mixité d'activités des enfants. Ces résultats étaient cohérents avec Cohen et al. (1999), Cele (2004), qui ont conclu que « la diversité et la variété » dans l'espace

offrent la possibilité de créer de nouvelles affordances qui stimulent le sens de l'« exploration » et de la « curiosité » auprès des enfants. Ainsi, le jeu des enfants était stimulé par la variation des caractéristiques spatiales, (Figures 35).

La diversité des matériaux du sol semblait créer des territoires identifiables et ils donnaient aux enfants le sentiment de contrôle et de manipulation. Cette déduction convient avec l'approche de G. Moore (1986), qui a interprété les lieux avec des limites identifiables en donnant aux enfants un sentiment de « appropriation » et de « réemploi » de leur espace. De plus, la diversité des matériaux favorise l'imagination et la créativité, puisqu'ils leur donnent la chance d'utiliser des notions telles que « dedans » et de « dehors » dans « le jeu dramatique et constructif ». La variété des matériaux du sol du quartier Cité jardins a incité les enfants à imaginer des territoires pour être à l'intérieur d'un abri imaginaire ou à l'extérieur, les enfants ont également exprimé: « *nous préférons les endroits avec des limites pour les territorialiser* ».

Par contre, certains chercheurs soulignent que les enfants ont besoin d'endroits sans limites tangibles et définies pour attiser leur « imagination » et améliorer leur « curiosité » (Korthals, 2013). A la lumière de cette approche, on remarque que, dans les typologies spatiales du quartier d'Abassia, avec l'absence de diversité des matériaux du sol, les enfants inventent diverses activités de jeu. Ils ont déclaré: « *Nous attendons que les ouvriers et les plombiers viennent réparer le système de drainage, car ils extraient de nouveaux matériaux avec lesquels on peut jouer, comme le sable* ». Bref, la diversité des matériaux du sol peut offrir des opportunités pour le développement social, physique et cognitif en augmentant les niveaux de défi à surmonter. (Samsonsky, 2007)

De plus, l'existence des surfaces dures et lisses a créé une variété de textures et de surfaces ouvrant ainsi la porte à de multiples options de jeu. Par exemple, on constate que les matériaux plus mous observés dans le quartier Cité jardins, comme l'herbe, permettaient p les mouvements acrobatiques et les rassemblements. A cet égard, des enfants ont décrit ces surfaces en tant que « *Un endroit où vous pouvez vous détendre, lire une histoire, et vous éloigner du bruit* ». Par contre, les surfaces dures comme le béton pavé observées dans le quartier Cité jardins ont tendance à favoriser le jeu avec le vélo. De plus, la diversité des matériaux du sol stimulait l'imagination et la créativité dans le jeu, ce qui était plus important pour les thèmes de « jeu constructif et dramatique » plutôt que la diversité moindre.

Ces associations étaient claires dans les deux espaces urbains récréatifs, qui englobent différentes typologies spatiales avec différentes diversités de matériaux du sol. Même la diversité des couleurs aux HSC et aux espaces urbains récréatifs de Châtelet - Les

Halles a favorisé l'imagination des enfants, où un enfant a déclaré qu'il aime la pêche et l'autre aime créer des îles grâce à leur différente perception de la diversité des matériaux

Figures 35: Divers exemples d'expériences vécues favorisées par la différente diversité des matériaux du sol



Un endroit où vous pouvez vous détendre, lire une histoire et vous éloigner du bruit »

Le quartier Cité jardins, banlieue parisienne, France



La diversité des matériaux du sol offre la possibilité de créer de nouvelles opportunités.

Le quartier résidentiel d'Abassia, Le Caire, Égypte



La diversité des couleurs semblait agir comme des réseaux routiers.

Héliopolis Sporting Club (HSC) espace urbain récréatif, Le Caire, Égypte



Dedans

Dehors

La texture, la couleur et la diversité matérielle ont aidé les enfants à intégrer les notions de « dedans » et de « dehors ».

Châtelet-Les Halles espace urbain récréatif, Paris, France

Source: l'auteur

3. Variabilité topographique:

Le concept d'affordances (Gibson, 1979) a approfondi l'impact de la variabilité topographique sur le comportement de jeu. Dans le cadre de ce concept, il était évident que certains types de potentialités offraient différents degrés de liberté et d'opportunités que d'autres. Cela était clairement établi dans les différents recherches, notamment celui de Marc Armitage (2011) qui a précisé qu'en grim pant, par exemple, les enfants peuvent acquérir une « nouvelle perspective ». C'est pourquoi ils favorisent « le jeu fonctionnel » qui développe leur coordination main-jambe-œil. Ensuite, Cele (2004) a conclu que les enfants cherchent des « éléments qui les stimulent physiquement » et qui présentent des opportunités de « risque » et de « complexité » à des niveaux différents. En outre, Cele (2004) a mentionné que les espaces surélevés offrent aux enfants le sentiment de détente et de calme.

En effet, ces constatations établies par les différents chercheurs sont compatibles avec nos observations en termes de comportements de jeu. Autrement dit, la variabilité topographique peut promouvoir des formes fonctionnelles de jeu, comme le fait de sauter, s'asseoir, se détendre et observer les autres d'une place élevée. Ce genre des activités se passait sous forme de « jeu en groupe ».

A cet égard, Cohen et al. (1999) ont également confirmé que les endroits surélevés offrent un environnement favorable aux interactions sociales (Figures 36). Les différences des niveaux d'élévation du sol englobent une grande variété de significations créatives pour les enfants en favorisant l'imagination et le « jeu dramatique ». A titre d'exemple, un enfant dans l'un des quartiers a déclaré : "*C'est l'un de nos endroits préférés dans le quartier, et d'ici, vous pouvez voir le monde entier*". Ceci est aussi évident d'après les observations dans l'espace urbain récréatif du HSC, où un des enfants a glissé sur une pente de gazon artificiel en imaginant être sur un toboggan. Un autre enfant, interrogé dans l'espace urbain récréatif de Châtelet- Les Halles, s'imaginait voler comme un oiseau en disant: « *Je me sens comme l'oiseau qui vole et le sol sous moi* ».

En outre, il a été remarqué que les enfants avaient tendance à défier leurs capacités. Par exemple, dans le quartier Abassia, un enfant escaladait le mur de soutènement à l'envers et un garçon déclarait « *C'est difficile de le grimper, mais mes amis et moi, le faisons toujours* ». Cela indique que surmonter un défi donne aux enfants le sentiment de la fierté. A cet égard, Tovey (2007) a affirmé que les enfants sont attirés par les activités aventureuses qui impliquent des lieux élevés de niveau du sol. De plus, dans les différents sites d'observation, les enfants ont montré une préférence pour occuper des lieux élevés leur donnant le sentiment de propriété. En outre, la variabilité topographique tend à territorialiser les zones de jeu des enfants, leur permettant de développer des notions telles que « en haut » et « en bas », et d'acquérir de la confiance. Ainsi, le fait de grimper les structures et de jouer au-dessus des ponts tend à faire apprendre aux enfants des principes scientifiques et mathématiques qui leur permettent de comprendre la complexité du monde réel.

Ces résultats ont été confirmés par les dessins des enfants et lors des discours avec eux. A titre d'exemple, un des enfants a déclaré « *Ici, je me sens le prince du monde* » et « *J'ai une vue sur tout quartier, au-dessus de tout*. En effet, Ces mots « *au-dessus de tout* » ont été répétés par plusieurs enfants dans les deux quartiers résidentielles soulignant que le monde est sous leur contrôle. Bref, les enfants des deux catégories urbaines utilisaient des mots indiquant les hauteurs, les niveaux, et la topographie, plus spécifiquement lorsqu'ils cherchaient des endroits solitaires pour leur intimité et pour s'éloigner de la distraction. Ceci est évident dans leurs dessins montrant des parapets, des ponts et des marchés.

Figure 36: Exemples des opportunités de jeux libres et variés offerts par la variabilité topographique



Source: l'auteur

5. La présence de différentes aspérités physiques spatiales urbaines :

Les quatre cas d'études englobent diverses caractéristiques spatiales urbaines offrant une variété d'opportunités de jeu (Figures 37). Cependant, le point commun est que les résultats obtenus après l'observation de ces quatre cas ressemblent avec les conclusions de (Fjortoft, 2001) et (R. Moore & Wong, 1997). Ces derniers ont étudié les avantages de la présence des éléments végétaux pour le jeu des enfants. Leurs études ont souligné que la présence de telles caractéristiques naturelles favorise la motricité et le développement physique général des enfants. Les caractéristiques naturelles permettent aux enfants d'avoir de nombreuses expériences qui ne pourraient pas être remplacées par des environnements artificiels. En outre, Wike (2006) a expliqué que jouer avec les particules fines entourant ces éléments végétaux, comme la boue et le sable, favorise la coordination des mains et des doigts.

Les quatre espaces urbains englobent une grande quantité de végétation qui a été associée à différentes formes de jeu, particulièrement les « jeux fonctionnels ». La présence d'arbustes et d'arbres semble augmenter la complexité de l'espace urbain. D'après les observations, ces éléments végétaux étaient souvent utilisés par les enfants pour s'abriter et se cacher les uns des autres. De plus, la présence de végétation tendait à favoriser l'imagination. Par exemple, un groupe d'enfants a été observé en train d'utiliser des feuilles d'arbres pour préparer le déjeuner. D'autres mélangeaient de l'eau et de la boue pour préparer des expériences chimiques. Par conséquent, il était clair que la présence de végétation tendait à promouvoir des thèmes de jeu dramatiques et constructifs. Par ailleurs, en s'appuyant sur la différence culturelle entre la France et l'Égypte, les éléments végétaux étaient les éléments les plus populaires mentionnés dans les entretiens à Châtelet -Les Halles, espace récréatif urbain, qui était même plus que le jeu de boue et d'eau. Certains enfants ont mentionné l'arrosage des plantes et l'odeur des fleurs, pendant lequel tous ces éléments semblaient avoir une incidence puissante sur le monde du jeu des enfants. Contrairement à certains enfants interrogés en HSC espace récréatif urbain, ils ne montrent pas de préférence pour les éléments naturels et déclarent que c'est salissant, par exemple quatre enfants mentionnent « tachant et sale », en relation avec les éléments naturels. Néanmoins, durant les entretiens, les enfants en général ont eu des réponses positives envers les arbres, qu'ils aimaient pour leur ombre et ils avaient des préférences pour eux. Un arbre peut engager longtemps un enfant dans différentes formes d'activités, comme décrit l'un des enfants de l'espace urbain récréatif Châtelet - Les Halles, « on y grimpe, on se cache derrière, et on s'assoit à l'ombre ». De plus, précisément la présence d'une grande quantité d'arbres semblait créer des zones ombragées qui apparaissent être importantes dans les zones à climat chaud. Ainsi, dans le quartier Abassia, où il y a moins d'ombre, très peu d'enfants ont été observés y jouer pendant la journée en été, contrairement à l'espace urbain récréatif HSC avec son intense quantité de grands arbres, plus d'enfants ont été observés y jouer pendant la journée en été.

Concernant les endroits ombragés et les recoins, selon Christidou et al. (2013), ils favorisent la relaxation ainsi que le « jeu de groupe » et favorisent une plus grande concentration de jeu. Lors d'observations dans le quartier Abassia, il a été remarqué que les recoins du bâtiment pochettes sont utilisés comme des espaces multifonctionnels, où les enfants l'utilisent pour se cacher ou pour observer les autres sans être observés. Certains enfants ont décrit ces recoins comme "Un endroit où personne ne peut nous voir", d'autres ont révélé que "Ce sont nos endroits secrets, ici nous sommes libres de faire ce que nous voulons". Alors que certaines filles déclarent « Dans ces endroits, on s'éloigne du bruit des garçons ».

En ce qui concerne les éléments non fixés, Wardle (2000) a suggéré que la présence d'éléments non fixes tend à promouvoir le « jeu plus constructif ». Il a également décrit que

les pièces détachées et les objets non fixes sont perçus comme les éléments les plus manipulateurs pour un large éventail d'opportunités de jeu.

Ceci est conforme à Cohen et al. (1999), qui ont expliqué les « aires de jeux ambiguës », où le concepteur inclut des objets qui pourraient être librement interprétés par les enfants pour enrichir leur créativité. Cela était cohérent avec les résultats conclus des quatre sites, où les enfants ont également montré des préférences pour des endroits avec divers éléments et objets non fixes qui stimulent leur jeu. Ces éléments étaient perçus comme des éléments multifonctionnels qu'ils utilisaient différemment dans chaque nouvelle situation. Ces éléments étaient au centre du jeu des enfants dans l'espace, car ils favorisent des actions dynamiques, stimulent l'imagination des enfants, et renforcent leur curiosité. Les observations ont indiqué que les enfants préféraient jouer avec des pièces détachées et des objets non fixes tels que des cordes, des pneus, et des boîtes, car ils ont un plus grand contrôle sur leurs propres idées de jeu. Ainsi, dans le quartier Abassia, où il y avait une grande quantité de matériaux flexibles sans réglementation standard à utiliser, tels que de vieux pneus et des bouteilles en plastique qui encouragent les enfants à créer et à inventer leurs propres objets de jeu, en interagissant physiquement avec eux et en enrichissant leur imagination. Par conséquent, les enfants semblaient percevoir ces aspérités physiques spatiales urbaines comme des éléments flexibles, non pas avec un but fixe, mais modifiables selon leur imagination. Bien entendu, la disponibilité de matériaux flexibles a eu tendance à stimuler l'imagination des enfants et à leur offrir plus d'occasions créatives. Ainsi, les éléments non fixes semblaient favoriser certaines activités et compétences qui favorisent le développement physique des enfants et stimulent leurs muscles.

Contrairement aux éléments spatiaux fixes dans les espaces urbains, qui ont été utilisés de différentes manières. Par exemple, les bancs, qui offrent des occasions de réfléchir ou de socialiser, certains enfants s'assoient et font semblant d'être dans un train. Alors que les sculptures étaient perçues par les enfants comme vivantes et pouvaient permettre les capacités créatives. Cependant les deux éléments, fixes et flexibles, ont eu tendance à enrichir les concepts d'appropriation et de réemploi des espaces en des endroits pour différents thèmes de jeu et stimulations. Selon Capresi & Pampe (2013), ces compétences soutiennent les développements sociaux, le partage et la coopération d'objets.

Figures 37: Exemples de comportements de jeu, de perceptions, d'expériences vécues et de notions différents offerts par différentes aspérités physiques spatiales urbaines



Source : l'auteur

5. Débats et conclusions

De nos jours, les villes ont perdu l'accessibilité et l'intimité, il n'y a plus d'espace permettant aux enfants de créer leur propre zone de jeu (Freeman et Tranter, 2011). Les enfants dans les sociétés modernes sont incapables de déterminer comment profiter des espaces où ils inventent des jeux, vu que leur vie est programmée et contrôlée par les adultes. Ces derniers imposent aux enfants de jouer dans des endroits limités, tandis que les enfants préfèrent explorer et créer leurs propres lieux de jeu. (Titman, 1994).

Les différences conclues de l'analyse des typologies spatiales similaires, dans les quatre sites, avec leurs différentes formes, ont contribué à envisager l'impact sur la perception et les affordances. Le niveau des activités offert est considérablement affecté par certaines caractéristiques telles que la qualité de la surface, les limites de l'espace, et la forme. Cependant, l'observation des enfants, qui visitent régulièrement les sites étudiés, est considérée à la fois comme un potentiel de recherche ainsi qu'une limite. Le fait d'être familier avec le lieu tend à renforcer directement leurs relations d'amitié et leur sentiment

d'appartenance ; ce qui, par conséquent, aspire à améliorer le bien-être des enfants à travers les différents types de jeux proposés.

En effet, le jeu tend à être le seul moyen accessible à l'enfant lui permettant d'explorer les espaces, parce qu'il lui permet de découvrir l'environnement géographique et de distinguer entre les différentes caractéristiques de cet environnement. Les enfants semblent avoir leur propre façon de penser, de ressentir, et de percevoir les espaces, ce qui n'est pas très commun auprès des adultes. Les enfants utilisent leurs sens pour créer des expériences dans leurs endroits, ces sens peuvent être basés sur la couleur, le son, l'odeur, et le mouvement. Autrement dit, les enfants comprennent un lieu ou un espace en y créant des expériences sensibles et des activités leur permettant de bien assimiler ce lieu et pas simplement l'observer. Les enfants préfèrent les endroits qui leur permettent d'explorer et de créer leurs propres espace de jeu, comme les cachettes et les zones urbaines délaissées (*SLOAP* « *Space Left Over After Planning* ») dans les villes (Titman, 1994). Les interprétations ci-dessus ont développé un langage pour étudier les caractéristiques significatives de l'environnement. Selon le travail terrain, les qualités du lieu sont perçues comme des aménagements à vocation multi-usages pour le jeu des enfants. L'interaction corporelle directe avec le lieu conçu résulte de la curiosité et de l'exploration des enfants. Dorénavant, le jeu s'est avéré être au cœur de la perception qu'ont les enfants d'un lieu et de leur expérience vécue. Ainsi, la configuration de l'espace semblait offrir aux enfants le plus grand nombre d'opportunités ; chaque caractéristique de l'espace présentait des influences différentes sur les compétences de développement des enfants, selon ses affordances perçues.

Ainsi, les environnements sont considérés en tant qu'un outil d'exploration sensoriel pour les enfants. Selon Titman (1994), les enfants perçoivent leur environnement à travers une variété de transactions environnementales, comme un reflet de leurs propres besoins de « penser », « exister », et « ressentir ». Ainsi, ils interagissent avec les espaces en fonction de ses potentialités, ils perçoivent également des potentiels dans des espaces qui semblent être inutiles aux adultes.

En effet, les enfants perçoivent l'environnement conçu, non pas dans l'ensemble, mais plutôt en le classant en affordances potentielles, qui sont perçues comme des collections de signifiants basés sur la culture et leurs milieux. Cette contestation est conforme avec Spencer et Blades (2006), qui affirment que « *les environnements des enfants ne sont pas nécessairement les environnements créés pour les enfants* ». Ainsi, le concept d'affordance a développé un langage pour étudier les caractéristiques significatives de l'environnement. Ces caractéristiques sont perçues par les enfants en offrant de multiples usages pour leurs thèmes de jeu.

Par conséquent, l'interaction directe et corporelle, avec le lieu conçu en raison de la curiosité et du jeu des enfants, est au cœur de l'expérience vécue et de la perception de l'endroit par les enfants. Ainsi, la conception et la configuration de l'espace ont tendance à offrir aux enfants des opportunités différentes, vu que chaque détail influence le développement des enfants. Par exemple, les caractéristiques naturelles offrent des opportunités de jeu physiques, sociales, et cognitives. En outre, les activités physiques développent sur le niveau cognitif la créativité et le raisonnement scientifique des enfants.

A la lumière des observations et contestations présentées, on a pu arriver à des recommandations qui peuvent aider à répondre aux besoins des enfants. Ces derniers sont considérés comme les membres les plus importants des espaces urbains quotidiens, qui sont exposés à davantage de contraintes et d'interdictions établies par les adultes. En effet, comme les adultes, les enfants ont également des droits spatiaux dans les espaces urbains quotidiens. En outre, Lynch (1987) a défini cinq dimensions fondamentales de ces droits spatiaux: vitalité, sens, adéquation, accès, et contrôle. Ces droits spatiaux sont basés sur l'image de la ville que Lynch a classée en cinq éléments: les voies, les limites, les quartiers, les nœuds, et les points de repère. Les droits et les éléments ci-dessus doivent permettre la création de cartes cognitives de l'espace plus claires et l'amélioration du contrôle perceptif (Lynch 1960). Par conséquent, l'étude tend à introduire une approche de conception amie aux enfants pour des espaces urbains quotidiens dans les grandes villes.

Cette étude est distinguée par le fait d'estimer l'importance de la présence de potentialités spatiales spécifiques, qui sont 1) Entité de sites comportementaux, (2) Continuité et fluidité du mouvement, (3) Diversité des matériaux utilisés, (4) Variabilité topographique, et (5) Présence de différentes aspérités physiques spatiales. D'un point de vue critique, classer les potentialités spatiales proposées dans les catégories ci-dessus pourrait être remise en question, car parfois au cours des observations ethnographiques, elles sont en conflit les unes avec les autres. Bien qu'au contraire, d'autres fois, ces potentialités ont tendance à construire des qualités spatiales qui peuvent aider à promouvoir des thèmes comportementaux principaux, élaboré comme « présence et identité communautaires », « Défi », « Territoire » et « Exploration et manipulation », qui semblent encourager différents aspects du développement des enfants et répondre à leurs besoins de droits spatiaux. (Figure 38).

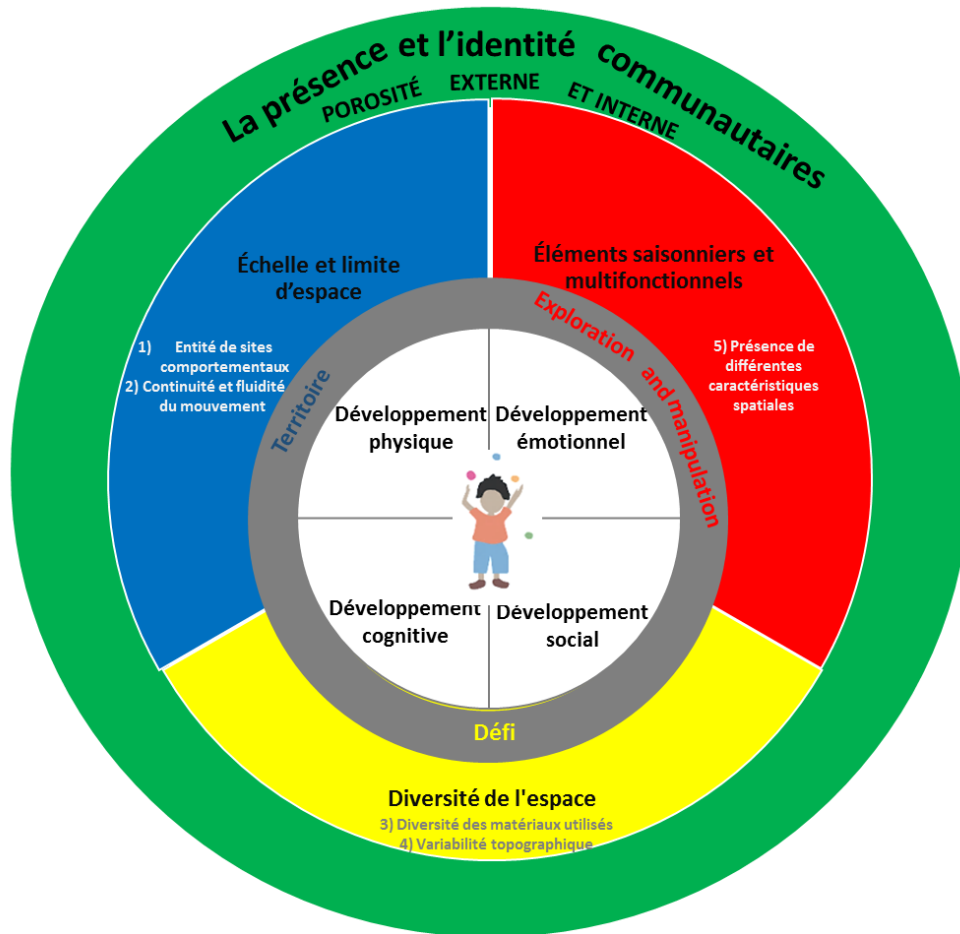
En conclusion, à la lumière de notre étude, ainsi que les données de la littérature et les études de cas analysées ; il est recommandé d'accorder plus d'attention à la conception architecturale et l'aménagement des lieux des enfants en formulant les questions suivantes:

Comment concevoir les espaces urbains de sorte que la question de l'enfance soit mieux intégrée et prise en considération ?

Comment appréhender la qualité environnementale à travers la perception des enfants ?

Et enfin, comment la présence des enfants permet-elle de penser les villes du point de vue de l'architecture et de l'urbanisme ?

Figure 38: Les thèmes comportementaux principaux reposant sur les différents aspects du développement, présentés en termes de milieux engageants basés sur des priorités d'enfants



Source: l'auteur

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THÈSE

Pour obtenir le grade de

DOCTEUR DE L'UNIVERSITÉ GRENOBLE ALPES

École doctorale : SHPT - Sciences de l'homme, du Politique et du Territoire

Spécialité : Urbanisme - Mention Architecture

Unité de recherche : CRESSON

La conception des espaces urbains résidentiels et récréatifs à travers le jeu des enfants

The impact of residential and recreational urban spaces design on children play behavior

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Abstract

Play is a freely chosen process that is important for the overall children development. A relatively large amount of research efforts have investigated the impact of play, particularly outdoor play in natural environments, on children's play behavior and the consequent impact on their development. However, in the recent decades, modern societies have noticed an intense declination of play opportunities in outdoor spaces especially in the local everyday community urban spaces, as living streets, neighborhoods, and recreational public spaces, due to the imposed structured activities, adult supervision, and poor playing environments such as enclosed playgrounds.

To date, relatively few studies have investigated children's lived experiences in their daily urban spaces, where they can play freely. Although they have their own way of perceiving, experiencing, and living the daily urban spaces, different from adults that results in creating a gap. Thus, in order to fill in the resulted gap, this study aims to investigate the potential impact of the urban transformation of daily urban spaces on children presence and their play behavioral patterns. The second objective is to explore the associations between specific spatial physical characteristics as well as functional qualities, or “spatial potentialities” that form different configurations, and children play opportunities (Breviglieri, 2014).

The study relies on a “causal comparative survey research approach” and an “intrinsic case study” (Groat & Wang, 2013). It involves the investigation of four selected urban spaces, with different spatial configuration, (recreational and residential urban functional categories), in Paris, France and Cairo, Egypt. Fieldwork is conducted through three phases, with randomly selected “middle-aged” children, between 5 to 12 years. It included structured child-centered behavioral observations complemented with behavioral qualitative observations, perceptual cognitive skill activities as drawings as well as photography, and informal interviews associated occasionally with child- led walks.

Collected data is analyzed within the shadow of both “Trialectic of Space Theory” (Lefebvre, 1992) and “Affordances theories”, (Gibson, 1979, Norman 1988, Bohme, 2017), to fill in the problematic gap. This created gap is situated between the designed spaces by adult so as designers, children perceptions depending on their capabilities,

cultural, social background, as well as their previous experience, and the resulted lived space with its specific ambiance adopting children's needs and behaviors.

The study strongly suggests that spatial porosity of daily urban spaces, influence children's presence and the occurrence of different play behavior types. In addition, different spatial typologies seemed to promote different play patterns that may enhance different children's spatial perceptions and preferences. Moreover, the study identified and outlined a set of specific spatial potentialities aspects, forming different spatial configurations, which appeared to be associated to children's sensory experiences, play opportunities, and the resulted lived ambient envelop.

This study tended to enable urban planners and landscape architects to extract the essential characteristics that help creating child-friendly spaces. In order to encompass children with diversity of cultures and origins from all over the world. Hereafter, it will open a new perspective in the design, by proposing a design approach and guidelines to articulate children's spaces in the city; it is not a question of thinking of these spaces, as closed islands, but rather as child-friendly environments within intergenerational cities.

“A city where the child would be the prince and the father of Man” (Aillaud, 1972).

Key words: Cross reading- Daily residential and recreational urban spaces- Spatial porosity- Spatial typologies- Spatial potentialities- Affordances theory- Trialectic space theory- Play behavior patterns- Children's place preferences- Children's Perceptions- Everyday sensory experiences- “Child-friendly” design- Ambient envelop .

Résumé

Cette thèse déploie son analyse à partir de la présence de l'enfant dans les configurations variées de l'espace public urbain. Elle privilégie une lecture des ambiances pour appréhender la manière dont le corps des enfants est mobilisé par son environnement. L'étude s'attache ainsi à adopter une analyse dynamique de la façon dont l'enfant s'insère, s'émeut et s'adapte au sein de l'espace public. Le concept d'affordance établi par le psychologue James J. Gibson occupe une place centrale dans cette étude (Gibson, 1979). Il permet de déployer une lecture des propriétés du bâti en ce qu'elles stimulent, offrent ou « appellent » certaines activités. Parmi celles-ci, le jeu, librement choisi, contribue au développement global de l'enfant.

Notre approche se confronte à une littérature scientifique dense et variée qui a examiné l'impact du jeu en extérieur sur le comportement et le développement de l'enfant. Au tournant des années 1970, il semble que la libre présence des enfants dans l'espace public urbain tende à se restreindre et à poser la question de l'émergence de systèmes de surveillance corrélée à l'idée d'une vulnérabilité de l'enfant dans la ville. Non sans liens, les infrastructures et environnements de jeu, qui apparaissent d'abord insuffisants, se développent pour configurer dans l'espace urbain des îlots séparés formant des aires de jeu créées par les adultes. Cette thèse envisage de repartir du corps en mouvement de l'enfant pour envisager son champ de perception et, plus loin, son rapport à la ville (Breviglieri, 2014). L'approche écologique et sensible aux ambiances permettra de poser un regard expérimental et évaluatif sur les espaces urbains présents dans le quotidien des enfants.

La thèse interroge une variété de designs d'espaces (résidentiels ou proprement ludiques) de la ville dans son lien aux comportements de jeu des enfants. Pour cela, elle propose d'investiguer quatre environnements urbains hétérogènes en Égypte et en France. L'étude des dimensions récréatives et résidentielles prend alors appui sur une « approche de recherche par enquête comparative causale » et des « études de cas intrinsèque » (Groat & Wang, 2013).

Cette enquête de terrain est menée en trois phases, avec des enfants « d'âge moyen » choisis au hasard, entre cinq et douze ans. Elle comprend des observations comportementales structurées centrées sur le comportement de l'enfant. Ces observations

sont complétées par une étude des activités cognitives perceptuelles engagée dans l'effectuation de dessins et de photographies, et par la réalisation d'entretiens informels associés occasionnellement à des parcours commentés. Les données recueillies ont été analysées dans le cadre de la « théorie du triptyque de l'espace » et de la « théorie des affordances ». Ce cadre a pour objet de clarifier les écarts de perception et de représentation entre celles qui appartiennent au concepteur de l'environnement urbain et celles qui appartiennent à l'enfant dans son expérience physique et culturelle de l'espace. Il est possible d'extraire de cette étude des thèmes capables de renouveler certaines orientations de la fabrique de la ville. Ces thèmes convergent pour repenser à la fois la place de l'enfant dans la ville, et la manière dont celle-ci peut générer des environnements intergénérationnels favorisant le bien-être des citoyens.

« Une ville où l'enfant serait le prince et le père de l'homme » (Aillaud, 1972).

Mots-clés: Lecture sensible croisée - Espaces urbains résidentiels et récréatifs
- Porosité spatiale - Patterns comportementaux de jeu - Affordances - Analogie spatiale - Perceptions - Potentialités - Ambiance expériences sensibles - Aménagement des espaces amis des enfants.

ملخص البحث

نظرا لأهمية اللعب الأيجابي الحر للنمو العام للأطفال، حيث نظر قدر كبير نسبياً من الأبحاث في توضيح علاقات بين أنواع سلوك لعب الأطفال المختلفة ونواحي النمو المختلفة، وقد ركزت هذه الدراسات السابقة على تأثير اللعب في الهواء الطلق في البيئات الطبيعية، على سلوك لعب الأطفال والتأثير الناتج على نموهم. ومع ذلك، في العقود الأخيرة، لاحظت المجتمعات الحديثة انخفاضاً شديداً في فرص اللعب في الأماكن الخارجية خاصة في الفراغات العمرانية المجتمعية اليومية، كالشوارع والأحياء والأماكن العامة الترفيهية، وذلك بسبب الأنشطة المنظمة المفروضة على الأطفال، وإشراف الكبار عليهم، وأماكن اللعب كحدائق الأطفال المغلقة. الي جانب على ذلك، حتى الآن، قام عدد قليل نسبياً من الدراسات بدراسة التجارب التي يعايشوها. للأطفال في الفراغات العمرانية المجتمعية اليومية، حيث يمكنهم اللعب بحرية.

يختلف الأطفال عن البالغين، حيث لديهم طريقتهم الخاصة في إدراك الفراغات العمرانية المجتمعية اليومية وتجربتها والعيش فيها، مما يخلق فجوة. وبالتالي، فإن الهدف الرئيسي لهذه الدراسة هو التحقيق في التأثير المحتمل لالتحول الحضري الفراغات العمرانية المجتمعية اليومية على نسبة وجود الأطفال وأنماط سلوكهم في اللعب. و يعد الهدف الثانوي هو استكشاف الروابط بين بعض العناصر المحددة في الفراغ و وظائفهم، التي تشكل تصميمات مختلفة في الفراغات العمرانية، وفرص لعب الأطفال «الإمكانات الفراغية المحتملة» (Breviglieri, 2014).

حيث تعتمد هذه الدراسة على «نهج المقارنة السببية» و «دراسة الحالة الجوهرية» (Groat & Wang, 2013). ويتضمن البحث دراسة أربع فراغات عمرانية و مجتمعية، ذات تصميم و تخطيط عمراني مختلف، وتتكون من الفئات العمرانية الترفيهية والسكنية، في باريس، فرنسا، والقاهرة، مصر. يتم إجراء العمل الميداني على ثلاث مراحل، مع أطفال «متوسطي العمر» تم اختيارهم عشوائياً، بين 5 إلى 12 عاماً. تضمنت ملاحظات سلوكية منظمة تركز على الطفل مكتملة بالملاحظات النوعية السلوكية، وأنشطة المهارة الإدراكية كالرسم بالإضافة إلى التصوير الفوتوغرافي، ولاستيبيانات علي صورة النقاش الغير موجه، المصاحبة أحياناً بمسارات مشي مصيرة بقيادة الأطفال.

يتم تحليل البيانات التي تم جمعها في ظل كل من «نظرية الفراغ الثلاثية» (Lefebvre, 1992) و «نظرية إمكانات الفعل» (Gibson, 1979, Norman 1988, Bohme, 2017)، لملء الفجوة الإشكالية بين المساحات المصممة من قبل البالغين وكذلك المصممين، وتصورات الأطفال اعتماداً على قدراتهم، وخلفيتهم الثقافية والاجتماعية، بالإضافة إلى تجربتهم السابقة، وروح المكان بأجواءه الخاصة، الناتجة التي تتبنى احتياجات الأطفال و سلوكيتهم.

و لذلك تشير هذه الدراسة بقوة إلى أن مسامية الفراغات للفراغ العمراني، قد تؤثر على نسبة وجود الأطفال و حدوث أنواع مختلفة من سلوك اللعب. بالإضافة إلى ذلك، يبدو أن الأنماط الفراغية المختلفة قد تعزز أنماط مختلفة من اللعب، التي تعزز ادراكات الأطفال المختلفة للفراغ العمراني وكذلك التفضيلاتهم. علاوة على ذلك، غرقت الدراسة وحددت مجموعة من جوانب العناصر المحددة في الفراغ التي تشجع بعض السلوكيات لدي الاطفال، و تشجع من حدوث فرص محددة من اللعب، و تعزز من التجارب التي يعايشوها الاطفال لتخلق روح المكان المحيط بأجواءه الخاصة به.

ايضا، تميل هذه الدراسة إلى تمكين المخططين العمرانيين من استخراج الخطط الأساسية لإنشاء فراغات عمرانية في مجتمعاتنا صديقة للأطفال، تشمل الأطفال ذوي الثقافات والأصول المتنوعة من جميع أنحاء العالم. ولذلك، فإن هذه

الدراسة تفتح منظورا جديدا في المفهوم، باقتراح نهج تصميمي ومبادئ توجيهية لتوفير مساحات للأطفال في المدينة؛ حيث إنها ليست مسألة تفكير في هذه الأماكن، كجزر مغلقة، بل باعتبارها بيئات صديقة للأطفال داخل المدن المشتركة بين الأجيال.

«مدينة يكون فيها الطفل هو سيد البشرية» (Aillaud, 1972).

مفاتيح البحث: الفراغات العمرانية المجتمعية - مسامية الفراغات للفراغ العمراني- الأنماط الفراغية المختلفة - نظرية الفراغ الثلاثية - نظرية إمكانات الفعل - - سلوك اللعب - إدراك الأطفال - التجارب الحسية اليومية - الأجواء «الصديقة للأطفال»

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Chapter 1

Introduction

Chapter 1: Introduction

This chapter discusses the research problem, research objectives, and research questions. It additionally, details the research design as well as strategy, and goes through the thesis outline.

1.1. Research problem

Play is a continuous process that occurs within time and space (Harker, 2005). As Ward (1978) stated, “Children will play everywhere and with anything. The provision that is made for their needs operate on one plane, but children operate on another”. Children play in every possible spot. They play in playgrounds, parks, building sites, busy streets, neighborhoods, waste lands and left over spaces in the urban fabric. Therefore, any place that attracts the child’s attention by its qualities is considered a “children place”.

Children explore, discover, and understand the world around them primarily through play. Free play among children has no intrinsic goals, voluntary, fun, pleasurable and promotes mixing fantasy and reality (Glenn, et al. 2013). Children create their own rules, their own themes and even their own settings through free play (Miller & Kuhaneck, 2008; Brown, 2009; Lanza, 2012). Active free play is also recognized to be important to the proper development of children (Moore & Wong, 1997; Frost et al., 2001; Blinkert, 2004). It is important for the physical, social, emotional, and cognitive development of children (Metin, 2003). In terms of the importance of children as a nucleus of the community, a major consideration is done for their development. Furthermore, the literature distinguishes between two types of play behavior, cognitive and social play types (Garvey 1990, Santrock 1994, Rubin 2001, Hughes 2010). Cognitive play is classified into various patterns including functional play, constructive play, exploratory play, dramatic play, games-with-rules, and no play. From a social interaction perspective, the literature also distinguishes between solitary, parallel, and group play (Hughes, 2010; Rubin, 2001). Research has linked different types of play to specific aspects of development. For example, functional play promotes physical development (Weilbacher, 1981; Barbour, 1999), while constructive play and dramatic play promote cognitive development (Susa & Benedict, 1994; Petrakos & Howe, 1996; Wardle, 2000; Bergen, 2002; Zamani, 2013; for recent review see Lillard et al., 2013) and group play and games-with-rules promote social development (Reifel & Yeatman, 1993; Coplan et al., 2015). However, children’s play

behavior at each development level, vary across cultural context, conditions, and situations. But still there are some features that characterize each age group. This research focuses on "middle childhood" age group, children between 5 to 12 years, where the surrounding environment starts to be their main concern (Chawla 1992).

Generally, free play is an essential part of developing transactions with place. It is a tool for experiencing and exploring children's daily outdoor play spaces. Moreover, environmental psychologists and geographers reported that the quality of children's experience during play depends on the intrinsic qualities of the environment (Hart, 1979; Moore, R., 1986; Moore, 1989; Matthews, 1992). Today, many researches highlighted the impact of play, particularly outdoor play, for increasing levels of physical activity, on children's well-being through enhancing their opportunities to understand and respect the local community urban spaces and natural world (Wardle, 2000; Fjortoft & Sageie, 2000; Fjortoft, 2001). However, children seem to be getting fewer opportunities to outdoor play. Children's presence in local community spaces, as living streets, neighborhoods, and public spaces, seems to have declined dramatically in recent decades (Lester and Russell 2008; Hillman, Adams and Whitelegg 1990). Despite the evidence documenting the beneficial value of playing in local communities and in natural environments, unwelcoming attitudes towards children, coupled with fears of the public realm have restricted outdoor community play (Worpole and Knox 2007). It is a result of combination of poor play environments as standardized playground islands with their different types, busy school schedules, adult supervision, and an increase in the imposed structured activities, meant that this beneficial and basic children's right has sidelined, often perceived as an 'unaffordable luxury' (Elkind 2008). As a result, children are usually surrounded in places that are specified to them and created by adults (Pilkington, 2000). Kim Rasmussen (2004), drew attention to the relation between places adults create for children and places that are significant so as meaningful to children and stimulate their play. Children experience places in their own way and they view it differently from adults. Accordingly, Rasmussen (2004) emphasized that "Children and their bodies tactically point out that they need different places than those adults create for them"

In this optic, this thesis addresses the presence of the children in the everyday community urban spaces in order to read the way children perceive, live, and experience their spaces. Children mostly play in all possible formal as well as informal spaces.

From a historical perspective concerning the presence of the child in the city and their place preferences, the residential streets and neighborhoods are the original spaces encompassing free self-directed play (Lacey, 2007). Many qualitative studies showed that residential streets are attractive for children because of their variety, diversity and complexity (Moore 1987; Matthews 2003; Lacey 2007). After the passage to modern town planning, and in particular functionalism favorable to all cars, the increase in road traffic and the rise of environmental issues, created a strong desire to put the pedestrian at the center of development projects (Pilkington, 2000; Cele 2004; Valentine, 2004). Thus, in modern cities, the play environment for children has changed from previous generations, and public recreational space is cited as second important play arena that advocate traffic calming measures to help opening up to children (Gill, 2007a, Worpole and Knox 2007; Zigler and Bishop-Josef 2009). Despite the fact that children's presence in the modern city urban configuration dominated by the cars, is threatened due to many factors, they are considered vulnerable users. Safety in outdoor spaces is one of the major parental concern that deprives children from taking their opportunity to play outdoors. This results that nowadays, children spend more time indoors. They play in virtual spaces seated behind the screens. The opportunity to experience joyful, sensory rich, adventurous play getting dirty and intimately involved with nature climbing trees or building a den in bushes is severely limited for many children growing up today in cities (Elnesr and Gamal Said, 2023).

Accordingly, children have unique and direct way of interacting with their environment. They are likely to develop a different attitude to the place. Therefore, adults have to respect their own vision in perceiving their places (Hart, 1979). Accordingly, researchers should not underestimate the concept of children's places in analyzing children's play experiences (Percy-Smith 2004). Understanding, which places attract children for play in their entire everyday environment and what are the intrinsic qualities of those places, is important for us as adults and designers to assure fulfilling the needs and priorities of children (Moore, R., 1986, Moore 1987). In order to understand the children's space in the city, it is important to appeal to the sensory ecological approach that allows to associate the ambiance, the

spatial configurations, children’s body in space, their movements, and their perceptions to physical properties of the surrounding environment (Breviglieri, 2014). Consequently, there is an increasing interest in children’s experience of places and place preferences (Moore 1987, Cele 2006, Breviglieri 2015). Furthermore, there is an increasing attention in presenting a perspective to understand children’s own views of play places and identifying the reasons of the preferred places within cities (Moore, R., 1986, Matthews 1992, Percy-Smith 2004).

The above interest highlights the gap created between the produced space by the adults as well as the designers to the children, the children perceptions depending on their capabilities, cultural, social, previous experience as well as background, and the resulted lived space with its specific ambiance adopting their needs and behaviors. To date, there are relatively few studies that have inspected children's lived experiences in their daily urban spaces with different spatial configurations, where they can freely play. Hence, this study focuses on understanding how and where children actually play and what parts of the surrounding environments they use and why. This is expected to assist designers in fulfilling children’s needs according to recent research that disputes six priorities for children's well-being and development, (Figure1) (El-Husseiny, 2016).

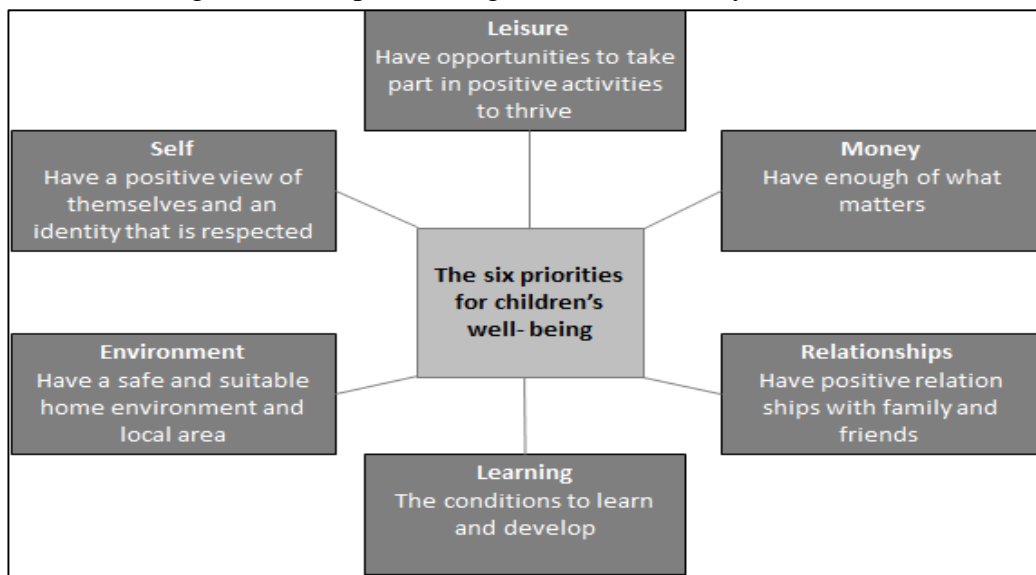


Figure 1: The six priorities for children's well-being and development

1.2. Research objectives

This research is launched with the aim to explore the impact of different design of varied daily community urban spaces, on middle childhood experience of their surrounding

physical environments in terms of children's free play. In addition, the study aims to investigate what sort of environments children find most engaging within cities of different country contexts. Accordingly, children play behavior, perception, and ambiance are considered through a cross-reading between different urban spaces within the city that are characterized by different designs relying on three aspects.

First, investigate the impact of spatial porosity, elaborated as the outer boundaries degree of closure and openness of different urban spaces' territory and inner spatial permeability between different included spatial typologies, on the children's presence and their play behaviors, in more particularly, the occurrence of play types promoting physical, social and cognitive development. Second, the study examines how different included spatial typologies (assembly zones and open spaces; playgrounds including traditional, contemporary, and adventure types; pathway and alley networks; gardens and green belts; residential block buffers and pockets; back streets and parking zones; and courtyards) promote different patterns of play behavior that enhance different children spatial perceptions and preferences.

Third, explore the potential role of specific spatial physical aspects and functional qualities forming different configurations, independently from the spatial typology itself, on affording different play opportunities for children. In consequence, this affordance might offer variant degree of potentiality, presence, freedom, pliability, sensible, experiences and ambiance of children's lived spaces (Gibson, 1979). The above association is defined by Marc Breviglieri (2015) as "spatial potentialities". In particular, the study proposed a set of spatial potentialities that focuses on: (1) Entity of activity setting, (2) Flow continuity and fluidity, (3) Diversity of ground materials, (4) Topographic Variability, and (5) presence of different urban spatial features. Therefore, this study aims to further understand how these potentialities act as spatial-ludic elements.

Hence, the following research questions children's well-being in terms of both play behavior and cities' urban designing, in addition to how they impact each other simultaneously.

1.3. Research questions

To achieve these objectives the following research questions are formulated:

A. 1. How the urban transformation of the city influence children's presences in our daily urban spaces and their play behavior?

What is the impact of the spatial porosity, elaborated as the outer boundaries degree of closure and openness of different daily urban spaces' territory and inner spatial permeability between different included spatial typologies, on the child's presence and play behavior in the daily urban spaces?

2. Does different included spatial typologies promote different patterns of play behavior that influence children's place preferences and spatial perceptions?

Does different urban functional categories stimulate different amount of children's play behaviors that the literature associates with physical, cognitive and social development?

B. 3. What is the potential role of specific spatial potentialities, independently from the spatial typology itself, in offering a greater degree of freedom and a variety of play opportunities than others?

How do these specific spatial physical aspects and functional qualities, forming different configurations, are associated to certain ambiance that enhance children's sensory experiences, their movements, gestures' tactile, and motor skills during use? What landscape elements of the environment do children use and why?

4. How could the city transformation be inspired by the children to extract behavioral themes and design guidelines that might improve the quality of life and development of children through child-friendly urban spaces?

1.4. Research design

In order to achieve the above objectives and to answer the research questions, first, the thesis relied on a literature review to identify the different types of play behavior and particularly identify the types of play that have been shown to promote children's social, emotional, physical, and cognitive development. Free play in this thesis is considered the children's implement in perceiving, experiencing, and exploring their environment, since play controls children's interaction with the world. The review of the literature also helped to outline the development of children age and their play behavior, specifying the middle childhood, on which the study focuses. During Middle childhood years and as the child develops, his/her needs changes and so his/her preference for play places changes. This age

is special, described as ‘the sense of exploration’, where children have a natural curiosity and playfulness in discovering the new world. Children in this age are always in search of new experiences and they relate to their environments through senses (Day, 2007). Children are capable of seeing their world independently and they begin to construct a personal image of the environment based on their own perspectives (Piaget and Inhelder, 1947 cited in Matthews 1992). During Middle childhood years, children start to develop deep awareness of place. The concept of place becomes more specific and geographical and they start building new experiences on the old ones (Tuan, 1977). They are the heaviest users of the outdoor environments and their physical environment becomes a main concern in their experiences (Chawla, 1992; Chatterjee, 2005). For those reasons, it is not possible to restrict middle childhood play to enclosed segregated settings (Matthews, 1992; Titman, 1994). Finally, the literature review looked at the previous research that has investigated the impact of the natural and outdoor environments on the children’s play behavior. Moving to the declination of outdoor play, especially the community play behavior in the modern societies, due to the imposed structured activities, adult supervision, and poor playing environments as the standardized playgrounds with their different types. This review shows that most of the previous research has tended to focus on the impact of playgrounds’ design and play equipment design on children’s development. To date, there are relatively few studies that have looked at children's lived sensible experiences in their daily urban spaces, where they can play freely.

In fact, the children's experience in the city is considered to be complex and has many facets. Therefore, the approach proposed to tackle this problem, is multidisciplinary and crosses several fields, such as: geography, anthropology, psychology of child development and environmental psychology. In this thesis, a children place is considered the engaging setting. It is a place within a space. The concept of children’s places is related to the idea of children as co-creators of their own lives (Christensen and James, 2000). Therefore, in order to provide an insight to what sort of environments children find most engaging, the study views children as the primary experts of their play places and the co-creators of their own lives. Therefore, the thesis adopted a qualitative ethnographic approach with middle childhood in their outdoor daily play spaces through their free play.

Ethnography is a methodology interested in individual's experiences through understanding how this world looks to them from their point of view (Christensen, 2004). It gives a direct voice for children to lead research, "children become instructors and we as researchers, become the pupils," (Emond, 2005). This approach allows for new meanings to emerge instead of imposing the existing ones (Flewitt, 2005). Ethnography allows for understanding the ways in which children perceive the setting around them, while they are engaged in it. Thus, the researcher gets deeply engaged into the children's world and understand their opinions and visions.

1.5. Research strategy

This opens the scope to the **research strategy** of the thesis, which relies on a "*causal comparative survey research approach*" and an "*intrinsic case study*" (Groat & Wang, 2013). This strategy helps to construct a cross reading between different urban spaces in terms of the occurrence of the different types of cognitive and social play behaviors and to offer a better understanding of the "*Ambient envelop*" of these spaces. The ambient envelope is defined as the result of the dynamic use of social spaces, in terms of spatial practices, perceptions and lived experiences of users that creates a dominate sensory transition, visual, sound, odor,... etc. (Monnet, 2014 ; Monnet, 2018, Monnet, 2020, Thibaud, 2007, Gamal Said, 2010). Moreover, to provide an understanding of where do children play, what places, and which spatial configuration children find most satisfying and encouraging, as these often are different from what adult believe children seemed to enjoy.

In order to listen to children's voices, the study works directly with young children to give them the opportunity to identify their preferred places for play and to understand the way they use, interact with, and experience their surrounding built environment. A total number of 184 children, aged five to twelve years, were fully engaged in the study. The children are from middle socio-cultural categories in different societies, in France and Egypt. This helped in understanding children's play experiences in a variety of outdoor settings, with different scales such as social clubs, intergenerational public spaces, open spaces in front of residential units, and the neighborhood.

The study is conducted in two different urban functional categories, **recreational** and **residential urban spaces**, in France and Egypt. Regarding the two case studies in Cairo,

Egypt, the **residential zone in Abassia**, located in the middle of Cairo, which represents the typical Egyptian urban residential street, and **Heliopolis Sporting Club (H.S.C)**, located in the district of Heliopolis, middle north east of Cairo, which is an intergenerational recreational urban space category in the terms of gated urban private space. While the case studies in France, are the residential neighborhood of **Cité jardins**, Paris suburbs (92), and **Châtelet–Les Halles**, 1st district of Paris, which resembles the public intergenerational recreational urban space category.

The sites of each urban functional category are similar in terms of the content of spatial typologies. However, they are different in terms of the spatial potentialities forming different spatial configuration of these typologies. Moreover, they differ in the levels of spatial porosity, which is elaborated as the spatial permeability between these spatial typologies, and the degrees of openness and closure of the outer spatial boundaries of the space territory. Additionally, the four case studies are clearly different in terms of “*Ambient envelop*”, (Gamal Said, 2010).

The study assesses differences between the four urban spaces in terms of the spatial porosity, in relation to children’s presence and play behavior, in order to investigate the occurrence of different play types, enhancing physical, social, emotional, and cognitive development, promoted by different spatial typologies. The study explores the associations between the variety of play opportunities and the suggested spatial potentialities. These spatial potentialities form different spatial configuration of the spatial typologies.

According to literature, the approach of collecting data in revealing children’s experiences of their everyday places can be categorized into qualitative and quantitative, or a mixture of both (Barker & Weller, 2003; Punch, 2002; depeau et al., 2010). Thus, from a methodological point of view, the study intends to rely on an **ethnographic approach**, adopting multiple data gathering methods described as **mosaic method**, it is applied through the combination of **quantitative and qualitative techniques**. Multiple data gathering methods recognize the diversity of children and respect each child as a unique subject in experiencing his/her built environment. Fieldwork is conducted through **three phases** on several successive site visits. For each urban space a sample of two groups were engaged in the field work with a total number of 46 randomly selected children. This research focuses on equal gender distribution in all groups. Children of the "middle

childhood" age group, between 5 to 12 years, are considered as active participants to clarify how they perceive and live their own place.

Initially, the first phase included **children behavioral observations**, held with 30 randomly selected children, **Group A**. It is classified to **child-centered structured observations**, to measure the occurrence of different free play types without parental interference, in the four urban spaces. These structured observations are complemented with **behavioral qualitative observations** through descriptive field notes and clarifying sketches to observe the movements of children's bodies, their presence pattern in space, and their motor gesture tactile during the use of the different spatial configurations. **The second and third phases** are held with another group of 16 randomly selected children, **Group B**. In phase two, children were asked to participate in a perceptual cognitive skill activities, as **drawings and photography**, to comprehend their spatial preferences and spatial perceptions through perceptual cognitive development evaluations. Drawing is a direct method for showing how children view their existing and imaginary world of play (Simkins & Thwaites, 2008). While, photography was used with walks as it is an easy and interesting for children to express themselves. It does not depend on the child's ability or talent (Rasmussen, 2004; Burke, 2005). The drawings and photos is a starting point for a conversation in the informal interviews, as a third phase. They are held for discussing further details of the drawings and for knowing some basic information about the participants and their secret play settings that required an occasional child- led walk, to overcome the constraint of taking the children for walks in their daily play spaces. This interactive process promotes the opportunity to observe the children while they are encountering and experiencing their daily play spaces, where conversations¹ took place as a direct response to the place representing their own experiences details of the everyday play spaces. (Hart, 1979; Moore, R., 1986; Cele, 2006).

The above combination of the North American quantitative method, which relies on child-centered observations (Moore, G., 1986; Cosco et al. 2010), and the qualitative research methods, which rely on techniques inspired by the work of CRESSON (Research Center

¹ Conversations with children were mainly in Arabic and French languages and an intercrossing language table (Arabic- English- French) with translated children's own words trying to give a very close meaning to what they have mentioned (Chapter 5).

on Sound Space and Urban Environment) has attracted less attention in previous French studies on children's spaces. Hence, through a multi-sensory socio-ethnographic approach, the research relied on both quantitative and qualitative techniques that complement each other to help children express themselves in a way that adults can understand. This combination gives a clear image of children's play experience in different space designs. Consequently, this study opens up stimulating empirical perspectives in the theoretical and operational fields by approaching these two urban functional categories as experimental laboratories in order to understand how children perceive the daily environment around them, while they are using it through free play in the context of Egypt and France.

This ends up with **analyzing** the above collected data using different tactics within the shadow of theoretical framework based on both "*Trialectic of Space Theory*" (Lefebvre, 1992) and "*Affordances theories*", (Gibson, 1979, Norman 1988, Böhme, 2017), to fill in the problematic gap between the view of adult as well as designers in conceiving spaces, and the children's perception to their lived surrounding environments. **Statistical and qualitative analysis** are used to assess and comprehend the differences between the four urban spaces in terms of the different outcome variable. Moreover, this analytical structure helps to elaborate children's everyday sensory experiences, their perception of their environment, the ambience of children's preferred places, of their preferences, events, or activities that constitute the everyday life.

The study, then, strongly suggests that spatial porosity influence child's percentage of presence in the daily urban spaces and the occurrence of different types of play behavior. Moreover, different spatial typologies promote different play patterns that have been linked to social, physical and cognitive development of children, which seemed to enhance children's perception of their environment and their preferences for spaces, through refining their perceptual cognitive skills. The study also identifies and outlines a set of specific spatial potentialities aspects forming different configurations, independently from the spatial typology itself that are possibly associated to children's sensory experiences, degree of freedom, play opportunities, creating certain ambience for the lived spaces by the children.

The findings of the field work are analyzed to conduct a classification and grouping task in search of the recurring ideas, reasons, physical features, and qualities that attracted

children during their play experiences. Therefore, the study suggests the extraction of key ideas, qualities and behavioral themes that explain the reasons behind children's place preferences and accordingly discuss what sort of environments children find most engaging, which helps in setting a preliminary outlines for child-friendly environments within the cities.

1.6. Thesis structure

Following this introductory chapter, **Chapter 2 “Literature Review”** presents a review of the relevant literature. It is divided into three parts. Part I addresses the meaning of play through a chronological brief of different theorist of play behavior. It then classifies different types of play behavior, cognitive and social types, in association with different aspects of children's development. The first section also reviews the different groups of children age and their play behavior. Then it discusses previous research that has investigated the relation, as well as the effect of the environmental attributes on the children's play behavior. Moving to the declination of outdoor play behavior in the modern societies and cities. The sequence of part I leads to part II, which presents a review on the presence of the child in the city and their place preferences, through different decades. Moreover, a literature survey introduces children's places through the perspectives and views of the child and not through the lens of developmental psychology. Children's experience of place, children's place preferences and children's agency in creating their play spaces is reviewed and discussed through the survey of previous qualitative ethnographic and phenomenological studies. Part III presents theoretical viewpoints in order to better understand children preferred play places, and the spatial configurations children find most interesting. It discusses children environment relationship explaining the concept of affordances introduced by James Gibson (1979) and his followers, in order to understand children's perception and their experience of designed spaces through the “Trialectic of Space Theory” (Lefebvre, 1992), as a theoretical bases for this thesis.

Chapter 3 “Research Methodology” addresses the research design adopted, giving a clear explanation on how the study is conducted. It starts with discussing the ethnography as a qualitative approach in research with children and some issues the thesis took into consideration to conduct the study with children. In addition, it discusses the participants' criteria and give a clear description of the settings that participating children pointed out as

their daily outdoor play spaces. It describes four urban spaces of residential and recreational urban functional categories, selected with different design, in terms of both urban fabric and spatial configuration. The chapter also presents the methods of data collection representing three phases and data analysis used, accompanied with a previous review extracted from literature of different data gathering methods, which allow performing an effective engagement with children. These methods proved to be appropriate and compatible with the capabilities of middle childhood, who are the focus of this thesis. The conduction of the fieldwork documentation and the results of the empirical study are presented in **Chapter 4 “Field-work Documentation and Results Analysis”**. The chapter presents a thorough documentation of the fieldwork and moves to the analysis of the data gathered through observations, children’s drawings, interviews, and child-led walks are discussed in order to extract the qualities related to children’s experience of their play spaces. It presents results related to differences in children’s presence and their play behavior in the four urban spaces and different spatial typologies. Then, the chapter presents the results that help clarify linkages between the different aspects of spatial potentialities and children's play opportunities.

Furthermore, a cross reading analysis of the results of the data documented from fieldwork sessions in the four urban spaces of the case studies, is presented in **Chapter 5 “Cross-reading Analysis and Design Approach”**. This chapter is based on debates and the confrontation of arguments in the literature that helped in representing various interpretations. Finally, the chapter suggests a grouping and classification of the data in search of the recurring ideas, reasons, physical features and qualities that attracted children during play.

To conclude, **chapter 6 “Discussion and Suggestions for Future Research”** discusses the results in relation to the objectives of the study and conclusions are presented. It discusses general observations and reflections related to the field work. Then it represents a detailed account of the findings, the extracted themes as well as qualities, and how they are tied and related. The chapter also outlines directions for future research. In addition, it proposes implications for the design of child's space in an intergenerational city. This final chapter, ends with a conclusion that presents a child-friendly design approach for the design of the daily urban spaces within big metropolitan cities.

Chapter 2

Literature Review

Chapter 2: Literature Review

This chapter reviews previous literature through three successive parts, **part I** addresses the definition of play through a historical brief of different theorist of play behavior. It then discusses the different types of play behavior, cognitive and social types, and the relationship between these types of play behavior and different aspects of children's development. The first section also reviews the progress of children age and their play behavior, specifying the middle childhood as the main chosen age group for the study, where the environment becomes increasingly important to them. It then discusses the relation, as well as the effect, of the natural environment on the children's play behavior. It moves to the declination of outdoor play especially the community play behavior in the modern societies due to the imposed structured activities, adult supervision, and poor playing environments as the standardized playgrounds with their different types.

This sequence leads to **part II**, which presents a historical perspective on the presence of the child in the city and their place preferences for free play, especially the residential streets and neighborhoods play, as well as, the recreational public spaces play. It then highlights the associations between specific spatial configurations of different space typologies (assembly zones, playgrounds, pathway networks, gardens, green belts, and courtyards) in the urban spaces within cities and children play behavior. Relying on previous literature, this study proposes a set of spatial physical aspects and functional qualities forming different configurations that are discussed in details in the following chapters: (1) Entity of activity setting, (2) Flow continuity and fluidity, (3) Diversity of ground materials, (4) Topographic Variability, (5) The presence of different urban spatial features. It further discusses the research literature that has investigated the impact of these spatial configurations on children's play behavior, defined as the potentiality of play environments.

Part III relies on theoretical studies to provide deeper interpretation of understanding where children play, what places, and which spatial configuration children find most satisfying and encouraging. Thus, this section describes the key ideas of the first theory of “**Affordances**” and its development which lies at the heart of perceptual psychology, explained by the perceptual psychologist **James J. Gibson** in Chapter 8 of his famous book “**The Ecological Approach to Visual Perception**” (Gibson, 1979). Then it was further

interpreted through the book “**The Design of Everyday Things**” by **Don Norman** (Norman, 1988). This concept can further introduce the term of « **ambience** » supported by the German philosopher **Gernot Böhme** in his work “**Aesthetic Theory of Atmosphere**”, which is less dictator than the theory proposed by Gibson (Böhme, 2017). This pointed out to the problematic gap between the view of adult as well as designers, and the children’s perception to the surrounding lived environments. Thus, as a final point, the study later relies on a second theory, the “**trialectic of spatiality**” of Lefebvre (1991) to decrease the gap between conceived (designed by adults and designers), perceived and lived spaces (experienced by children).

This chapter ends up with introducing a multi-sensory ethnographic approach to combine the above theories (the trialectic theory of space and the affordances theory), for better elaborating the ambience of children’s preferred places, everyday sensory experiences of their preferences, events, or activities that constitute their everyday life. In consequence, this study opens a new perspective in the conception of the children's space in the city, where it is not about creating as closed islets, but about thinking of child-friendly environments that could encompass all generations.

The cross-reading in different fields as planning, sociology, physiology, and geography offers a comprehensive analysis of different terminologies and allows to trace the various conceptual issues through a theoretical framework that is considered as the main pillar that this thesis relies on.

Part I

2.1. The essence of play

“**Play**”, play is a freely chosen process, personally directed, and basically motivated. The children are the ones who determine the content of their play, by following their **own** ideas and interests, in their **own** way for their **own** reasons (Mussen, 1983; Garvey, 1990), (Figure 2).

The literature offers several definitions of play that started in the late 18th Century. Definitions of evolutionary biologists and psychologists, can be briefly presented as play involves children doing as they wish in their own time and in their own way. Children’s definition of ‘doing what they want and when they want to’, ‘getting what they want’, or ‘something unexpected, out of the ordinary happening’ is strongly associated with

‘happiness’. It is therefore seen as a temporary state, children choice, and independence and control, which they want to repeat and develop, but this state is also vital as children’s right and to childhood (Metin, 2003; Counterpoint 2008).

In general, play is a basic right for all children and is sensible for the enjoyment of children and their families in the moment. In addition, play, in early childhood ages, allows children to give voice to their experiences; and to express safely their confusing and painful feelings; and to overcome their emotional traumas (Hirschland 2009). Thus, the essence of play is not only primarily viewed as intrinsically motivated behavior, something children do in their own time, following their own ideas, in their own way, and for their own reasons but also as means to achieve long-term physical, psychological and social benefits (Cole-Hamilton 2011). Moreover, play has been linked to overcoming fears in everyday situations. It helps in decision making, discovering interests, brain development and enhancing academic learning (Lester and Russell 2008; Jenkinson 2001). BTHA (2011) maintains that children, who have the freedom and opportunities to play, have stronger friendships, are more joyful, secure and cooperative than those who do not.

Play is an irreplaceable part of family and community life, regardless to age, gender, culture, social class, or disability. It is responsible for the emotional, cognitive, social and physical developments of children (Eriksen, 1985, Moore, R., 1986, Moore & Wong, 1997, Frost et al, 2001, Blinkert, 2004).



Figure 2: The essence of play as a freely chosen process

2.2. Theories of Play behavior and children's development

The importance of play in the social and psychological construction of the child is stressed from the beginning of 20th century, which was led first by the psychological as well as school pedagogy, and by sociology (Caillois, 1958), (Table 1). Childhood theorists admit the critical value of play for overall children development, (Figure 3). As Foley (2008) stated, 'It is widely understood that play is crucial to children's healthy development and quality of life'. Early play theorists tended to focus mainly on the physical benefits of play. For example, Spencer (1973) suggested that play is necessary to allow children to discharge excess energy. As for Patrick (1916), he proposed a somewhat different view and explained the purpose of play as a mode of dispelling the inhibitions built up from-fatigue due to tasks that are relatively new to the child. (Mussen, 1983). While G.S. Hall (1883) linked genetic psychology and education together. His theory explained that each person goes through changes in both the psychic and logic senses, which follow the evolution scale of the mind and body. Thus, he defined play as a typical natural and instinctive activity for children (Hughes, 1995). Also according to a psychoanalytic theorist, Sigmund Freud (1967), play is an attempt to manage the overwhelming anxiety-provoking situations. Play is defensive as well as adaptive in dealing with anxiety (Hughes, 1995).

However, today, in accordance to the works of such theorists as Piaget (1962), Erikson (1985), and Ellis (1973), there is recognition that play is important to the general development of children, including physical, cognitive, emotional, and social development (Moore & Wong, 1997, Metin, 2003). They considered play as a necessary and integral part of childhood (Hart, 1993). Erikson (1985), who developed Freud's theories, identified play importance to learning and development. He focused on the ego-building aspect of play. He was also interested in the link between imaginative play and the emotions. As Piaget (1962), proposed that play is derived from the child's working out of assimilation and accommodation, defined as the two fundamental characteristics of his mode of experience and development. It is the attempt to integrate new experiences into the relatively limited number of motor and cognitive skills available at each age group of childhood.

With arousal modulation theory, Berlyne (1955) stated that there is some optimal level of central nervous system arousal that a human being tries to maintain. Similar views of play

were offered by Ellis (1973) and Fein (1981), who suggested that children's play provides a variety of forms of stimulation to an organism that the child is in need of, such as physical stimulation, perceptual stimulation, and intellectual stimulation.

Accordingly, Weininger and Fitzgerald (1988) explained that play is related to the two sides of the brain. Each side is responsible for different intellectual functions. The left side processes perceptual, physical, and structural modes of information, while the right side processes abstract, conceptual, and functional modes of information. In that sense, play is important to the overall maturation of the human brain.

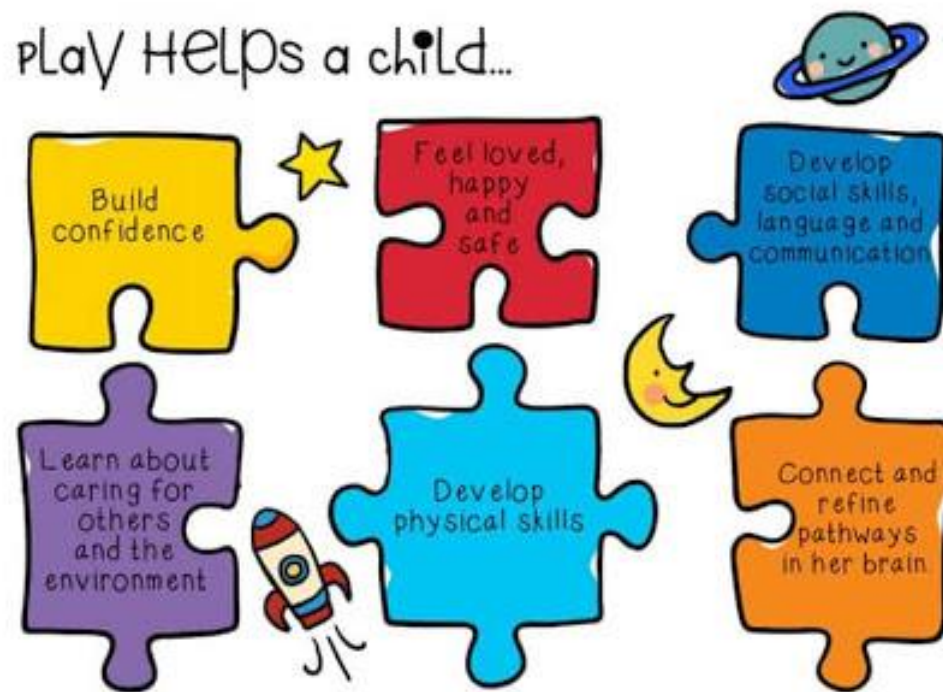


Figure 3: The importance of play for the overall children development

Table 1: Theories of Play

THEORIES	REASONS FOR PLAY	GREATEST BENEFITS
Surplus Energy H. Spencer	To discharge the natural energy of the body	Physical
Renewal of Energy G.T.W. Patrick	To avoid boredom while the natural motor functions of the body are restored	Physical
Recapitulation G.S. Hall	To relive periods in the evolutionary history of the human species	Physical
Practice for Adulthood K. Groos	To develop skills and knowledge necessary for functioning as an adult	Physical, intellectual
Psychoanalytic S. Freud, A. Freud , E. Erikson	To reduce anxiety by giving a child a sense of control over the world and an acceptable way to express forbidden impulses	Emotional, social
Cognitive – Developmental J. Bruner, J. Piaget B. Sutton-Smith	To facilitate general cognitive development and to consolidate learning that has already taken place while allowing for the possibility of new learning in a relaxed atmosphere	Intellectual, social
Arousal Modulation D.E. Berlyne, G. Fein H. Ellis	To keep the body at an optimal state of arousal, to relieve boredom, and to reduce uncertainty	Emotional, physical
Neuropsychological O. Weininger, D. Fitzgerald	To integrate the functioning of the right and left brain	Biological, intellectual

Source: HUGHES, Fergus P. Children, Play, and Development. USA; Allyn & Bacon, 1995. p. 15

2.2.1. Physical benefits of play

Active play is the most common type of physical activity that children participate in, additionally to unstructured play may be one of the best forms of physical activity for children (BHF 2009). Several studies have shown that unstructured physical activity and free play are good for developing motor functioning and fundamental movement skills. Accordingly, Singer (1994) stated: ‘Playful children are more physically active, creative, humorous, imaginative, emotionally expressive, curious, and communicative’ (Singer 1994 cited in BTHA 2011). As for children, who lack proficient motor skills, often choose not to participate in physical activities as they get older, (Graham and others 2005 cited in

Low Deiner and Qiu 2007). For example, play involving arts, craft, and design gives children the opportunity to develop the fine motor skills of hand and finger control, required for handwriting (Lindon 2007). Moreover, in early childhood physical exercises help build strong bones, muscle strength and lung capacity (Lindon 2007).

It may also increase cognitive function, improve academic achievement and accelerate neurocognitive processing.

2.2.2. Cognitive benefits of play

Piaget and Vygotsky, two of the most influential 20th century theorists of children's play behavior and cognitive development, both emphasized the essential role of play for cognitive development. According to Piaget (1951), play provides children with extensive opportunities to construct their own knowledge of the world through interacting with the surrounding environment materials (Zigler and Bishop-Josef, 2004). Piaget's theories about learning emphasized the need for children to explore and experiment for themselves. For Piaget, play was a mean by which children could develop and refine concepts before they had the ability to think in the abstract. For Vygotsky (1978), play was also important for an individual's cognitive development, but his view was somewhat different from that of Piaget. Where Piaget presented the child as a 'lone scientist', Vygotsky emphasized the social and cultural aspects of play. He argued that during play children were able to think in more complex ways than in their everyday life, and could make up rules, use symbols and create narratives. As such, Vygotsky was convinced that play help in learning through interactions with others in our communities: peers, adults, teachers, and other mentors. Vygotsky sought to understand how people learn in a social environment and created a unique theory on social learning. He encouraged more interactive activities to promote cognitive growth, such as productive discussions, constructive feedback, and collaboration with others. To conclude, according to Elkind (2007) reflection, 'Play is our need to adapt the world to ourselves and create new learning experiences'.

Others claim that playing contributes to children's developing vocabulary, their understanding of different concepts, their ability to solve problems, their self-confidence, and motivation (Zigler and Bishop-Josef, 2004). Through creativity developed in play, the use of imagination, and finding one's own solutions to problems, both real and imagined, play helps children to develop ways of reacting to a wide range of situations. Lester and

Russell (2008) suggested that children must develop these adaptive systems so that they acquire an ‘open disposition to the unexpected’. Children’s ability to cope with difficult situations and to recover from, or adapt to, can help them to develop strategies for reacting to real situations (Lester and Russell 2008). Since through play, children imagine themselves in different situations that they might benefit from being able to take risks and challenge themselves (Gill 2007b). Also, some commentators argue that if children are not allowed to take risks, they may grow up over-cautious in many everyday situations, or be unable to judge potentially dangerous situations (Gleave 2008). Sandseter, et al., (2011) provide compelling evidence that taking risks in play is a natural coping mechanism, which helps to reduce fears and tackle phobias. In this sense, risk-taking in play mirrors many aspects of cognitive behavioral therapy.

2.2.3. Social benefits of play

Playing with others affects how children relate to each other, the formation of groups, and the feeling of being a part of the whole or of the groups, enhance their awareness of their need to others and the sense of their local community. Playing freely with peers develop skills of seeing things through another person’s point-of-view, cooperating, helping, sharing, and respecting others (Open University 2011). Play allows physical contact and social negotiation that permits children to form ‘highly sophisticated attachment systems’ at a time in their lives when friendships are becoming important (Lester and Russell 2008). Accordingly, Fanny Delaunay (2018a) further elaborated that play is a co-production, it is the result of an exchange between individuals and the social rules they represent. Play is an individual activity (I play my game), while being imbued with specific values and codes of a given society (I play with the learned sociocultural rules). However, during this time of play, the child adapts the rules to his own needs. As such, play contributes to the collective construction of cultures. Since when children play, they use their own language, rules, and values that help them to develop their own identities (Casey, 2010). In addition, the act of playing can overcome cultural and disability difference as boundaries. Thus, children, who are disposed to social isolation, play could be an important way of creating bonds with other children (Dunn, 2004).

2.2.4. Emotional benefits of play

According to Fogel and Melson (1988), children of early childhood begin to see themselves and others in terms of age categories, gender differences, and other characteristics. Free play fosters children's emotional development in three dimensions: building self-confidence, self-esteem through increased performance abilities, and experimenting with various emotions. Another important factor in emotional growth is to develop a sense of compassion, empathy, and caring for others. Through play children experience all basic emotions; enjoyment, interest, excitement, fear, sadness, shame, and anger (Fogel & Melson, 1988). For example, while playing children examine their limits as well as challenge, their success leads to the feelings of happiness, accomplishment, and positive self-esteem.

2.3. Types of play behavior and children's development

Research has linked specific aspect of children's development to specific types of play. In general, play is varied and flexible; there is no 'right' or 'wrong' way to play; it is encompassing an endless range of play types, which could be active or subdued, imaginative or exploratory, and involve others or carried out alone. The literature distinguished two types of play behavior, cognitive and social play types, (Table 2) (Piaget, 1962; Gravey, 1990; Santrock, 1994; Rubin, 2001; Hughes 2010). Kenneth Rubin (2001), gave different definitions for play types (cognitive and social), in order to act, in this study as a medium of observation that allows play classification during the fieldwork accomplishment (Rubin, 2001). In a socio-cognitive approach, play allows the construction and development of the child by discovery of others and the surroundings.

2.3.1. Cognitive play types

In terms of cognitive types of play behavior, the literature distinguishes between (1) functional play, (2) constructive play, (3) exploratory play (4) dramatic play, (5) games-with-rules, (6) and no play (Rubin, 2001; Hughes, 2010). Cognitive play helps children improve their role playing, problem solving, constructing, and abilities. Based on the definitions provided by Rubin (2001) the different cognitive types of play were operationalized as follows:

i. Functional play

Functional play that is also referred to as sensorimotor play, involves play behavior that includes simple repetition of muscle movement, with or without objects, such as running, climbing, jumping, swinging, sliding, lifting, balancing, throwing objects, pushing a toy back or forth, and riding a bike (Rubin & Cheyne, 1983; Papalia & Olds, 1993), (Figures 4).

Functional play has been linked to physical development. Through functional play children get to understand their own physical capabilities. Functional play also aides children develop their gross and fine motor skills (Weibacher, 1981; Barbour, 1999; Metin, 2003). If this repetitive behavior is non-directed and shifts rapidly from one setting or object to another, as hyperactive, impulsive, fast moving, and ineffective, and incomplete actions, according to literature, it is classified as “*Random behavior*” (Moore, G., 1986).



Figures 4: Examples of functional play

ii. Constructive play:

In constructive play, the child links previous experience of functional play to manipulate objects towards a direct goal which can be construction or creation (Cornett, 1998; Rubin, 2001). Constructive play includes, for example, playing with blocks to build a house, a tower, or a bridge, playing in the sand to build a sand-castle, or using chalk to draw a picture on sidewalk, (Figures 5).

Constructive play has been particularly linked to cognitive development. Through constructive play, children develop their imagination, creativity, problem-solving skills, persistence, and adaptability (Wardle, 2001; Zamani, 2013).



Figures 5: Examples of constructive play

iii. Exploratory play:

Exploratory behavior is the behavior that is directed toward investigating, examining, studying, or searching an object, activity, person, setting, or other points of focus, including inspection, asking questions, manipulation, and producing effects, etc., (Figures 6). It is defined as focused examination of an object for the purpose of obtaining visual information about its specific physical properties. The child may be examining an object in his/her hand or may be looking at something across the setting. Also, if a child is listening to a noise or listening for something in the aim of obtaining audial information, it is considered as exploratory. Moreover, according to Rubin (2001), reading is considered as an exploratory behavior, when a child is reading or leafing through a book, or is being read to by a teacher or other person. Reading, or being read to, is considered as receiving cognitive information from a book or a record.

The goal of this kind of play is to expose curiosity and motivate children to learn more. This could be achieved through an interesting and challenging environment filled with materials and objects that attract children and inspire their explorations.

Exploratory play has been particularly linked to cognitive development, since it is essential for sensory development, fine movements, and hand-eye coordination of children. This type of play helps children to explore their environment through the five senses such as sight, sound, smell, touch, and taste. (Wardle, 2000; Zamani, 2013).



Figures 6: Examples of exploratory play

iv. Dramatic play:

Dramatic play is also referred to as symbolic, pretend, fantasy, make-believe, or imaginary play. It involves an imitative activity, in which a child imagines and acts out various internal and social roles or situations. Dramatic play is characterized by an "as-if" stance (Garvey, 1990).

Dramatic play can involve the acting of familiar activities, without the necessary materials or out of their normal social or physical context, such as pretending to swim in the sand-box. It can involve role playing by acting roles typically performed by other people or even animals or objects, such as pretending to be a school teacher, a doctor, a pirate, a robot, an elephant, or a space-ship, (Figures 7).

In dramatic play, children often imagine that the objects they use are something else. A pine cone can become an apple, a stick can become a sword, a bottle can become a microphone, and a bike can become a horse. In dramatic play, children can also imagine persons or things that are not present such as teaching to an imaginary group of pupils, running from an imaginary lion, or holding an imaginary umbrella.

Dramatic play has been particularly linked to cognitive, emotional, and social development (Lillard et al., 2013), since it has been linked to the development of problem-solving abilities (Fisher, 1992). Moreover, it has been associated with greater levels of creativity and divergent thinking (Susa & Benedict, 1994). It has been also tied to improved linguistic

competence (Sawyer, 1997). As Smilansky (1968) contends that fantasy play aids speech and language skills as a child ‘acts out’ a role, often using particular symbolic objects, which allows children to construct meaningful and perfect speech. Additionally, according to Bergen (2002), it has also been associated with academic skill development. Role play has been also shown to help acquire a sense of belonging for many children to specific culture, community, and society, which improves their social skills and help foster adult–child relationships (Ginsburg 2007).



Figure 7: Examples of dramatic play

v. Games with rules:

The play type games-with-rules is a level of play behavior that imposes rules that must be followed by the players. Rules also determine how the game is to be played. Accordingly, game behavior is more restricted and formalized than other play behavior (Mussen, 1983; Hughes, 1995). Games-with-rules are often characterized by logic and order, while, as children grow older, they can begin to develop strategy and planning in their game playing. According to Piaget (1962), games-with-rules correspond to the final stage in the development of play. Such games include: hopscotch, tag, hide and seek, soccer, other competitive sport games, and games invented by children that require cooperative learning as well as negotiation, (Figures 8). Game rules define what players can or cannot do within their specific roles.

Games-with-rules have been particularly linked to social and emotional development (Reifel & Yeatman, 1993; Coplan et al., 2015). Games-with-rules help children understand limits, and learn to control their behavior to conform to rules. Through this type of play, children become more socialized and logical which enable them to play games together. They learn to share activities, to strategize, and to work together towards common goals. Through games-with-rules, children learn such concepts as fairness, winning, and losing. Games-with-rules help in the development of interaction, communication skills,

leadership, and teamwork skills (Piaget, 1962). This type of play helps children concentrate, understand limits, and control their emotions through the control of sense of happiness in the possibility of winning, or the sadness in the case of losing, respecting others' feelings, and the awareness as well as the acceptance of their capabilities in comparison to others.



Figures 8: Examples of games-with-rules

vi. Non-Play behaviors

There are some types of cognitive play behaviors that are not considered as play **but as** Non-Play Behaviors, (Figures 9). According to Rubin (2001) and Hughes (2010), these behaviors are explained as follows:

- a) **Unoccupied Behavior:** unoccupied play behavior marks the absence of focus or intent of children. Generally, the child is either staring blankly into space; or the child is wandering with no specific purpose.

- b) **Onlooker Behavior:** the child watches the activities of others without involving. S/he may also offer comments, or laugh with the other children, but does not become involved in the actual activity.
- c) **Transition:** Transition is when a child is setting up a movement from one activity to another. For example, walking across the activity settings, getting a drink of water, setting up a game, tidying up an activity, or searching for a desired object.
- d) **Active Conversation:** Conversation involves the verbal transfer of information to another child, where conversation with a teacher or adult, is different. Conversation takes place when a child is being spoken to by another child and is actively listening in order to respond or follow directions. It also takes place when more than one child shares laughter. However, a child who is listening to someone else's conversation but is not specifically being spoken to, is engaging in onlooker behavior instead of conversation.
- e) **Aggression:** Aggression refers to non-playful physical contacts with another child, including hitting, kicking, grabbing, threatening, etc. According to literature, this is interpreted as "Negative interaction". Play fighting, although often discouraged by adults, has been shown as behavior where children learn about self-control and restraint, preparing children for situations that they may have to deal with in later life (Power 2000; Galyer and Evans 2001). However, aggression might be nested with social behavior to be non-play negative social behavior. But if it occupies longer time as a dominate behavior, it will be classified as negative - nonsocial behavior, (Moore, G., 1986; Rubin, 2001). Rubin (2001) further explained a negative interaction as an agonistic or anti-social act which make the playmate feel unhappy, bothered, frustrated, etc. Examples are overt noncompliance, disapproval, rejection, teasing, insults, quarreling, yelling, ignoring, taking or damaging property, physical attack, and threats.
- f) **Rough-and-Tumble:** This is a specialized type of play that involves playful physical contact, including tickling and mock fighting.

- g) **Anxious Behaviors:** Behaviors indicating anxiety including auto-manipulative behaviors such as, crying, complaining, hair twisting, foot shaking, and nail biting, etc. For example, anxious behaviors would be considered if a child refuses to let his/her mother leave him/her in the activity setting.



Figures 9: Examples of No play behaviors

2.3.2. Social play

Since play not only allows physical contact, but also social negotiation that permits children to form contributions to the collective construction of cultures (Casey, 2010). From a social interaction perspective the literature also classifies play behavior into (1) solitary play, (2) parallel play, and (3) group play (Rubin, 2001), (Figures 10). Moreover, Rubin (2001) elaborated that the social play categories (solitary, parallel and group) could be nested within the cognitive play categories. Thus, there are 18 possible nested behaviors (solitary-functional, solitary-constructive etc.). This type of play involves social interaction in a group with a sense of group identity and organized activity behavior. Sociology views play from a different perspective than psychology or educational sciences. According to literature, play also has a social dimension, and is seen as an important aspect in the development of children's social skills. Play is considered as sociability principle and a social mechanism illustrating, interpreting, and explaining the social processes. It is regarded as a way of being together in the particular forms of socialization.

i. Solitary play

In solitary play, the child plays alone or independently, makes no references to others, and makes no effort to include other children in his/ her play. The child plays apart from other children at a distance greater than three feet (one meter). S/he is usually playing with toys

that are different from those other children are using. The child is centered on his/her own activity and pays no attention to any children in the area.

ii. Parallel play

In parallel play, the child engages in the same play activity as another child but plays independently beside, but not with, the other child. The child does not try to influence others in their play. S/he is often playing in behaviors that are similar to those that the children around him/her are having. The child usually seems to be somewhat aware of, and attentive to, his/her playmates, and frequently engages in “parallel speech” (i.e., verbalizing his/her own thoughts for the benefit of the other children). In short, the child plays beside, or in the company of, other children but does not play **with** his/her companions.

iii. Group play

In group play, the child plays with others in mutual acknowledgement. The children's actions are complementary and typically involve communication about a common activity. They may be following one another in a functional activity, or they may be organized for making some material product, striving to attain some competitive goal, dramatizing situations of adult or group life, or playing formal games. Whatever the activity, the goals are definitely group-centered.

In contrast with solitary play and parallel play, group play is associated in the literature with social and emotional development as it contributes to the development of positive social interaction, social relationships, and communication skills. Social play provides unique opportunities to develop collaboration and leadership skills (Reifel & Yeatman, 1993; Coplan et al., 2015). Children's bodies, minds, and emotions become integrated through play. This type of social play involves social interaction in a group with a sense of group identity and organized activities that help them get acquainted to social, community, and cultural rules.



Figures 10: Play behavior and social interaction: (i) solitary play, (ii) parallel play, and (iii) group play

Table 2: Cognitive and social play types

Play type		Definition	
Cognitive play	Functional play	to experience sensory stimulation through simple, repetitive muscular movements	
	Constructive play	to create or construct something	
	Dramatic play	to dramatize life situations or bring life to an inanimate object	
	Exploratory play	to obtain visual or auditory information from an object	
	Games-with-rules	to engage in a competitive game-type activity following pre-established rules and limits	
	No-play	Unoccupied	There is complete lack of goal or focus during this behavior.
		Onlooker	to watch (or to listen to) the behaviors and activities of other children
		Transition	to prepare for, set out activity, or to move from one activity to another
		Conversation	to communicate verbally with other children
		Aggression	to express displeasure, anger, disapproval through hostile means
Rough-and-Tumble		Playful physical activity	
	Anxious Behaviors	Display of wary/fearful behaviors	

Social play	Solitary play	to engage in an activity entirely alone, usually more than three feet (one meter) away from other children
	Parallel play	to engage in activity beside (but not with other children), usually at a distance of three feet or less
	Group play	to engage in an activity with another child or children, in which cognitive goal or purpose is shared amongst all group members

2.4. Children age group and play behavior

Children functioning and play behavior at each level of development is varying across different domains and cultural context, as well as across different conditions and situations (Bourdieu, 1980; Percy-Smith, 2004; Valentine, 2004). However, there are still some features that characterize each age group (Piaget 1956, Hoff 2003). Development can briefly be defined as the change and continuity over time (Piaget, 1962; Vygotsky, 1978). The play behavior theories of Piaget’s and Vygotsky’s dominate the notion of children development till today. For Piaget (1962), the development of play proceeds in coloration with the development of thought, from functional play through dramatic play to end up with games with rules. In early play, assimilation dominates over accommodation (opposite to imitation), and play is characterized by “ludic” or enjoyable qualities, which are characterized by laughter. Piaget believed that development initially occurs through child’s actions on the environment. “Sensorimotor play” is a major forum for such actions. Repetition of sensorimotor acts has a consolidating function, making sensorimotor play very important for development. Piaget did not believe that “symbolic play” help with children’s primary developmental task of adaptation to reality. Yet he viewed the highest form of play helping with development is the “games with rules”, because children need to develop equilibrium in the face of different perspectives on how games should be played. Vygotsky is the other major theorist frequently referred to in contemporary research. Whereas Piaget discussed three types of play behaviors corresponding to different stages of mental development, while Vygotsky focused on just one type, symbolic play. Also in contrast to Piaget, Vygotsky (1978) believed that symbolic play has a crucial role in development. For Vygotsky, pretend play is the activity setting, where children first understand that actions (and the objects on which the child acts) can be separated from reality, and that those actions might be based on the meaning of the imagined situation instead of the physical properties of the objects (Vygotsky, 1967). In addition, Vygotsky

emphasized that these changes with age are linked to norms, values, expectations, and cultural context of the society, in which children evolves. Play goes beyond cultures, which allows learning the rules of life in society, to understand the stress and develop strategies.

For example, a child can pretend a stick as a horse. In treating the stick as a horse, the child ignores or inhibits some of the stick's properties like its un-horse-like shape. Through such acts, children develop abstract thought (Vygotsky, 1967). Play also helps children develop by taking the roles of others especially the elder people. By pretending to be a parent or a teacher, children learn to take the perspectives corresponding to those roles, and to behave according to their norms (Rakoczy, Warneken, & Tomasello, 2008).

Even solitary play, to Vygotsky, is bound by rules. Pretend play thus prepares children for adult life, pulling them up into their zones of proximal development. Vygotsky (1978, 1990) continued to be very influential in discussions of pretend play and its possible role in development. His theory is actually more prominently discussed in the recent research literature than that of Piaget.

Historians, as Aries (1960), demonstrated that the concept of childhood is a social construction relatively recent by the west in the eighteenth century, which is associated with the moralists will, represented by the Church. According to Piaget (1962), further identifies four periods of development. Piaget identifies four periods of cognitive development: The sensorimotor stage, the pre-operational stage, the concrete operational stage and the formal operation stage. Santrock (1994), in his book "Child Development", explained development as follows: "Development is the pattern of movement or change that begins at conception and continues through the life cycle. Most development involves growth, although it includes decay (as in death and dying). The pattern of movement is complex because it is the product of several processes – biological, cognitive, and social." (Santrock, 1994).

There are many aspects of child development and many theories that center around the stages in which encompass a child's maturity, (Table 3) (Papalia & Olds, 1993). During the earliest stage the "Toddlerhood", from birth till about three years old, he explained that children learn about the world through basic actions, such as sucking, grasping, looking, and listening (Piaget 1956, Santrock 1994). As for the "early childhood", it encompasses children between three and five/six years old. Children begin to think symbolically and

learn to use words and pictures to represent objects. At this stage, they tend to be egocentric and struggle to see things from the perspective of others. While they are getting better with language and thinking, although they still tend to think about things in very concrete terms. Family is still the focus of life, although other children become more important, too. Fine, gross motor skills, and strength improve. In addition to, independence, self-control, and self-care increase. Play, creativity, and imagination that become more elaborate. Cognitive immaturity leads to many “illogical” ideas about the world (Piaget 1956, Santrock 1994). Regarding the “middle childhood”, which is termed as the concrete operational period stage, the child’s thought become more logical and organized (Piaget, 1962). Middle childhood is a period which signifies children between five/six and twelve years old (Hoff, 2003). This age range at which children develop the sense of peers and begin to favor complex play types, in group forms, keeping the surrounding environment into consideration (Chawla, 1992). While for the “Adolescence stage”, it is concerned with children of 12 years and above, the egocentrism of the previous stage begins to disappear as kids become better at thinking about how other people might view a situation (Piaget 1956, Santrock 1994).

As previously mentioned, the focus age group of this study is between five/six and twelve years old, children of the middle childhood age group, as they are the most appropriate age group to conduct a research study, due to the following interpretation. Since starting five years, in diverse cultures, this period is regarded as the beginning of the "age of reason" (Rogoff et al. 1975). This age is characterized by the sense of exploration of the surrounding environment. The child’s attachment to the family is less, having more opportunity to integrate within wider social contexts that strongly influence the developmental process (Chawla, 1992; Erikson, 1994). According to Erikson this period is marked with tensions between the increasing expectations of children and the adult authorities in controlling and supervising their children, which either support or delay the development of self- confidence (Erikson, 1994). Children’s cognition of space becomes richer as they could sense different space dimensions such as harmony, volume, and lines. During middle childhood period, the child begins to build a personal image of the environment and is expected to build new experiences on the old ones (Tuan, 1977; Matthews 1992). At this age, children can give clear directions, start to perform mental

rotations, and can get from one place to another by identifying left and right even if they don't occupy the space (Matthews, 1992). Thus, representations, such as aerial photographs, maps, and drawings could be easily related to real places, by middle childhood children (Plester, Blades and Spencer, 2006). Cobb (1969, p.124 cited in Chawla, 1992) described the middle childhood years by a special age, when children have the greatest chance to “explore an ever-expanding repertoire of reachable places, in search of new experiences”.

Table 3: Main developmental characteristics in each childhood age group

Age group	Characteristics
<p style="text-align: center;">Toddlerhood (birth to age 3)</p>	<ul style="list-style-type: none"> ▪ Physical growth and development of motor skills are rapid ▪ Ability to learn and remember is present, even in early weeks of life. ▪ High attachments to parents ▪ Self –awareness develops in second year. ▪ Comprehension and speech develop rapidly. ▪ Interest in other children increases by time.
<p style="text-align: center;">Early childhood (3 to 5/6 years)</p>	<ul style="list-style-type: none"> ▪ Family is still the focus of life, although the surrounding children draws the attention. ▪ Fine and gross motor skills improve. ▪ Independence, self-control, and self-care increase. ▪ Play, creativity, and imagination become more elaborated. ▪ Cognitive immaturity leads to many “illogical” ideas about the world. ▪ Behavior is largely egocentric, but understanding of other people’s perspective grows.

Middle childhood (5/6 to 12 years)	<ul style="list-style-type: none"> ▪ Peers are the central importance. ▪ Egocentrism diminishes. ▪ Children begin to think logically. ▪ Memory and language skills increase. ▪ Cognitive ability improves. ▪ Self-concept develops and affecting self-esteem. ▪ Physical growth slows down. ▪ Strength and athletic skills improve.
Adolescence (12 to about 20 years)	<ul style="list-style-type: none"> ▪ Physical changes are profound. ▪ Search for identity becomes central. ▪ Peer groups help to develop and test self-concept. ▪ Ability to think abstractly and use scientific reasoning develop rapidly. ▪ Relationships with parents are good.

Source: PAPALIA & OLDS, A Child's World. United States of America; Mc Graw-Hill, 1993. p. 13

2.5. Play behavior and outdoor natural environment

As previously introduced, play is fundamental to children's happiness, well-being, and also influential in their health as well as their future life chances. And, because of the recognized essentiality of play behavior for the development of children, much research has highlighted the impact of play, particularly outdoor play, for increasing levels of physical activity, on children's well-being through enhancing their opportunities to understand and respect the natural world (Wardle, 2000; Fjortoft & Sageie, 2000; Fjortoft, 2001).

In addition, play that involves contact with nature, through the presence of natural elements in children's play areas (Moore & Wong, 1997; Burke, 2005; Kuh et al., 2013), appears to have a positive effect on recovery from stress, fatigue, bad mood, concentration, self-discipline, and physiological stress (HC Netherlands 2004). Moreover, several studies have found that playing in natural environments has a positive impact on children's social play, their sense of well-being, and their motor ability (Bird 2007b; Lester and Russell 2008). Therefore, children who do not play outside can have fewer social networks, can be less confident, and be less involved in their local community (Gleave 2010). Unlike children who play outside more, they learn to navigate their immediate environments and build their self-confidence (Open University 2011). Consequently, spending time in the natural outdoor environment is important in creating a sense of belonging and identity, which in turn improves mental health (Bird 2007b).

Relying on previous literature, Fjortoft (2001), for example, showed that play in the natural environment tends to help the improvement of motor skills, balance, coordination, and is beneficial to the general physical development of children. In addition to, Wardle (2000), who suggested that the natural environment as a play setting tends to promote more constructive play that enhances children's cognitive development. As for Moore and Wong (1997), they investigated the transformation of a yard from an asphalt square into an environmental garden with naturalized settings. They conducted interviews several years after the transformation with persons, who used to play there. The interviews revealed memories of fascination with the yard and the complexity of its plants as well as animals. Participants tended to recall the landscape features that afforded play themes, such as the little clearings, the bridge over the stream, the stepping stones in the pond, all the bushes, and the trees to climb. The interviews suggested that play in the environmental yard promoted innovative as well as creative forms of play and tended to lead to greater levels of environmental awareness.

Similarly, Marjanovic-Umek and Lesnik-Musek (2001) compared children from three age groups in preschool settings to investigate the links between symbolic play and cognitive as well as language development, and natural play materials. Their findings suggested that materials and context were very influential in terms of the level and complexity, in which children play. It was found that children play differently in different settings and situations, where some situations encourage higher levels of symbolic play. The authors argued that preschool teachers should provide age-appropriate natural play materials.

Correspondingly, Pretty and others (2009) cited a number of researchers, which have demonstrated that outdoor play, especially in more natural environments that give children a sense of freedom, healthier personal development, increased cognitive functioning, emotional resilience, and opportunities for self-discovery. Thus, when young children play freely in natural environments, they are more likely to enjoy nature as they grow up (Pretty, et al., 2009; HC Netherlands 2004).

2.6. Declination of outdoor community play behavior and modern societies

This part aims to discuss previous qualitative studies to understand more about children place preferences and their presence patterns. Such studies explained the world as

perceived and lived spaces by children, in addition to the way children create a continuous play experiences within formal and informal places that pursue their own interest, presence, and identities. However, children seem to be getting fewer opportunities to play. As a consequence, the adverse effects of poor play environments, busy school schedules, adult supervision, and an increase in structured activities have resulted in the marginalization of this essential and fundamental right for children. Moreover, it is often perceived as a luxury that is unaffordable (Elkind 2008). In recent years, even self-directed play during school break times, which has been linked to improving concentration and behavior during lesson times (Madsen and others 2011), as well as offering children a unique opportunity to advance their interacting skills, have been significantly cut (Blatchford and others 2002). Moreover, following the UNICEF report of a comparative study, carried out by Nairn and IPSOS MORI (2011), it compared the lives of children in UK with those in Sweden and Spain, to uncover why the UK was ranked so poorly in relation to children's well-being. Using subjective indicators, the study found that children perceived spending time with their friends and family, as well as having fun and engaging things to do, as fundamental to their well-being. The research indicates that children in the UK had fewer opportunities for fun outdoor activities compared to other two countries and that was a significant contributor towards poor well-being in the UK. Decisions to cut funding for local play spaces, they argue, is detrimental for children's well-being, particularly for children from low socio-economic groups, whose parents struggle to find affordable play provision on their area. The study also found that UK parents had less free time to spend with their children, due to work as well as other commitments, and calls for policy makers to consider how UK policies impinge on family time. The authors concluded that children must be prioritized in UK government public spending. This is persuasive evidence of the role in playing to children's overall happiness and well-being.

In accordance to the results of previous studies, throughout the completion of this research during epidemic lockdown 2020, interesting observational remarks were documented. It was evident that when the rate of life had slowed down, and children were not deprived from spending time with their parents, many children were observed with their families who allowed them to play freely due to the absence of the daily life constraints of the environment such as traffic crowds, tight school as well as work schedules. Consequently,

children were observed replacing cars on the streets by playing freely with soccer, bicycles, scooters and running, or taking long time exploring the texture of mud, the properties of water, the smell of tree leaves, and the sound of nature. Once more, the sound of children playing has been integrated, into the daily environment. The children had more time to discover their daily environment within the city. The daily environment allowed them to experience their five senses and skills. Thus illustrates how lack of time as well as spaces for play, and hostile attitudes towards children playing outdoors, could have damaging implications for children's health and happiness. This was consistent with what Lester and Russell (2010) had concluded by stating: "*Children's play belongs to children; adults should tread lightly, when considering their responsibilities in this regard, **being careful not to colonize** or destroy children's own places for play through insensitive planning or the pursuit of other adult agendas, or through creating places and programs that segregate children and their play.*"

2.6.1. Poor playing environments and standardized playgrounds

As narrated in the film "Aujourd'hui l'enfant et la ville" Valey (1971) described "*I have an idea, it will be a game, and we will play in the city! What would it be? Ben there, there will be a bunch of really tall buildings and you get a small house behind, you see nothing. So when you are very old you would not be happy. I'd like a very powerful man... So you'd come to me and I would demolish all the houses and instead I would build a garden, with trees and grass. And the cars they would not have the right to come. Let's play it?*" Excerpt from the film Children in the city.

In modern societies, the landscape of the cities has lost accessibility, security and intimacy, where there is no room for children to create their play spaces (Chawla, 1992; Punch, 2000; Freeman and Tranter, 2011). Children in these decades have no control to determine their access and use of their play spaces, since their lives are scheduled, supervised, and controlled in different institutionalized settings (Freeman and Tranter, 2011). Therefore, places for children became scattered like islands on the map of the city (Zeihner, 2003).

As in the nineteenth century, rapid growth of urbanization introduced the development of playground concept in urban public spaces. Until that time, children were not thought of as individuals in the community. The children spaces are the subject of interventions which lead to the standardization of the sites. It is then hypothesized that the industrialization of

urban spaces underpins a standardization of both practices and forms of space in order to minimize possible dangers. Coherent to this Delaunay (2018a) interrogated the question by stating *“Faced with these policies to keep children and spaces safe, what remains for children in these spaces dedicated to their play desire”*. Adults think there is a form of proper play, therefore they are limiting children’s play into designated settings as playgrounds. If children use these settings differently than what it is designed for then adults perceive that as chaotic and random behavior (Burke, 2015). In addition, qualitative studies that recorded accidents in playgrounds, since during the 1980s, encouraged these standardized settings established by, for example, AFNOR (French Association for Standardization), which is responsible for the implementation, compliance, and consistency of standards with those developed by CEN (European Committee for Standardization, established in 1961), and the International Organization for Standardization, established in 1947. The reported cases indicate a variety of situations: scarves that get stuck in games of bolts, children whose head is retained in the security gates, and falls, etc. All have in common to emphasize the low maintenance play areas. This gives rise to different legal procedures leading governments to put implement standardized and controlled maintenance devices. In parallel to these actions, the general direction local French authorities addressed public managers in 1988 cautioned against the diverted use by the child to make playgrounds furniture (Ministry of Interior and the Ministry the Equipment, 1988). These authorities emphasized that the child "will play leapfrog on the bollard"(CERTU, 2002 p. 17 cited in Delaunay, 2018a). It is proposed to frame the confrontation danger by developing playgrounds that hold the "adventurous" aspect of any activity ensuring anticipation of accidents and repositioning the responsibility of everyone. Even though, these standardizations are designed to provide services for adults rather than stimulating children’s play (Mc Kendrick et al., 2000).

In Europe, the development of first playgrounds were revealed in the end of the nineteenth century as in United States. As it was stated in -1st Decree No. 96-1136 of 18 December 1996- article that described the requirements for collective playgrounds as "the term collective playground entire area, including that set in a water park or amusement park, specially equipped to be used collectively by children for playing purposes. Likewise are subject to this order in collective playgrounds located within the grounds of childcare

institutions and whose equipment is likely to be used by them for playing purposes. Excluded from the scope of this Decree carnivals, theaters and sports fields. "

The characteristics of the equipment showed similarity with its hard gravel surfaces and standardized playground structures such as swings and seesaws. Rather than considering play as a serious activity, amusement was the main purpose in the design of the play equipment.

Sequentially, in the middle of the 20th century, Denmark has been considered as the leader in the development of playgrounds. In order to control the development of playgrounds, Denmark began legislation of requiring more playgrounds than ever before. (Eriksen, 1985). At that point, research had typically distinguished between three types of playgrounds, (i) traditional playgrounds, (ii) contemporary playgrounds, and (iii) adventure playgrounds (Hayward et al., 1974; Campbell & Frost, 1985; Eriksen, 1985; Heseltine and Holborn, 1987; Susa & Benedict, 1994; Metin, 2003).

i. Traditional playgrounds

Traditional playgrounds are characterized by presence of large metal unconnected play equipment such as slides, swings, seesaws, and climbers (Susan, 1985; Susa & Benedict, 1994; Metin, 2003), (Figures 11). The design of traditional type play structures developed early in the 20th century and they are still used on playgrounds today. Such standardized equipment quickly become popular because it allowed more children to play in a smaller place. The desire was often for inexpensive and easily maintained apparatus that could be used by the children without much supervision. (Eriksen, 1985).

Changing way of life styles changed children's expectations from a piece of equipment on a playground. In accordance, La Farge (1988) discussed the inadequate form of traditional playgrounds from two points of view: safety concept and deficiency of play value. He stated that, today's playgrounds are still reflecting the same goals with the first playgrounds in the late nineteenth century. The desire to build healthier, better exercised children who were growing up in crowded city conditions. The same goals are still important today, and the same equipment is still fun, but 50 years of research concerning the significance of play for the child's cognitive and social development has revealed the limitations of traditional playground equipment (La Farge, 1988).

As to Heseltine and Holborn (1987), traditional type of play structures are especially useful for physical development. While children are looking for challenge in complex manipulative environment, traditional playground structures such as swings and slides have been linked with only solitary and parallel physical play.





Figures 11: Examples of traditional playgrounds

ii. Contemporary playgrounds

In contemporary playgrounds, the different pieces of play equipment are typically connected together to form multi-purpose continuous structures with multiple entry and exit points. These continuous structures are usually aesthetically pleasing by its sculptural forms which are called “play sculptures” (Susa & Benedict, 1994; Metin, 2003), (Figures 12).

Contemporary playgrounds are generally planned by architects or landscape architects. In general, they are not commonly used and they are expensive because of their large moldings of concrete and stone used in order to provide durability as well as easy maintenance, moreover, sometimes equipment are decorated with bright colors.

Nevertheless, play structures without moving parts do not support children’s learning and developmental needs. Although they are aesthetically pleasing, they do not let children to recreate their environment. Usually these places are used for social play like; retreat, quiet play, educationally worthwhile forms of play, and talking but not for physical activities. As explained by Eriksen (1985), these purely abstract sculptural forms may be attractive but may not suggest any uses to the children, or be comfortable, or easy to climb, or sit on.

He also suggested to enhance the interest in contemporary playgrounds, special features can be added like water jets, climbing hills, and tunnels. Vegetation can also attractive to children, (Eriksen, 1985; Susan, 1985; Susa & Benedict, 1994; Metin, 2003).



Figure 12: Examples of contemporary playgrounds

iii. Adventure playgrounds

Adventure playgrounds incorporate various types of loose materials (such as old tires, large building blocks, wagons, ropes, logs and various pieces of wood, buckets and water containers, sand and sand toys, clay, play dough, and a variety of natural materials) that allow children to create their own environment or play equipment (Wardle, 2000), (Figures 13). In fact, what is so nice about a box is that one time it can be a jail, the next time a palace, and later a rocket ship or inside of a whale. The design team should design nonobjective spaces – round, square, irregular, regular, bright, dark, big, or little. (Weinstein & Thomas, 1987). Adventure playgrounds also referred to as junk playgrounds. The concept of adventure playground first appear in Denmark in 1943, at the end of World War II, where children are free to shape their environment in their own way (Heseltine & Holborn, 1987). While in France, it first appeared in the 1970s (Mantes la Jolie, Paris XX, Paris fifteenth arrondissement). From Eriksen's point of view, adventure playgrounds represent a real change from traditional playground concept in the last sixty years. In this type of playgrounds, children are involved in planning, creating, and building. From this point of view, adventure type playgrounds enable creativity in terms of play with its 'loose materials'. Weinstein and Thomas (1987) emphasized the importance of loose parts that support fantasy play.

Wardle (2000) stated that, adventure playgrounds help to develop a variety of cognitive skills, in addition they enable children to continually be stimulated and challenged. The critical point about this type of playground is that the child engages in specific skills, which differ from purely motor play.

Research has shown that playgrounds can be attractive to children and important for their social life. Though traditional playgrounds may promote muscle activity and functional play (Heseltine & Holborn, 1987), they are often not stimulating and challenging enough for children. Moreover, they tend to encourage solo play rather than group play (Metin, 2003). Although, traditional type playgrounds are common in public places, children's choice of playground type is exactly different from what adult and designers intended for them (Cohen et. al, 1999). Children usually prefer to play on contemporary playgrounds than on traditional playgrounds (Brown & Burger, 1984). It has been shown that contemporary playgrounds are more conducive to dramatic play than traditional

playgrounds (Weinstein & Pinciotti, 1988) and are associated with greater levels of creativity (Susa & Benedict, 1994). A number of studies suggest that while adventure playgrounds also promote dramatic play, they tend to be associated with greater levels of stimulation and greater amounts of constructive play than the two other types of playgrounds (Eriksen, 1985; Heseltine & Holborn, 1987; Weinstein & Thomas, 1987; Wardle, 2000; Maxwell et al., 2008).

Nevertheless, it is clear, in all types of playgrounds that the presence of children is limited to spaces generally controlled and supervised by adults (Breviglieri, 2015). According to Rasmussen (2004), these places are considered, as "places for children" that are created by adults and not as "children's places" that are meaningful and stimulate their play experiences. Coherent to Rasmussen (2004), Matthews (1995) pointed out that restricting children's play in separate islands created by adults "playgrounds" can lead to a feeling of isolation. Spencer and Blades (2006, p.1) further confirmed by stating "*environments of children are not necessarily the environments for children*". Many research believed that places specifically designed for play can limit children to certain activities, by often doing the same things every day. Thus, children's choice of their playing places is different from adults' intentions. Likewise, Worpole and Knox (2007) argued that children must have opportunities for outdoor play that stretch beyond fixed playground equipment and zones in order to offer them a full participation in the community and develop a sense of belonging.

Consequently, over the past few years, children environmental studies had recognized the importance of the surrounding physical environment's characteristics and qualities, in shaping children's experiences. Research on children's geographies was considered as a massive development to the study of children's places, since it pulled play out of its isolated children's settings. Moreover, environmental psychologists and geographers further found that children, to a certain extent, value the same sorts of places they did, decades ago," (Elsely, 2004, p.158).



Figures 13: Examples of adventure playgrounds

2.6.2. Structured activities

The American writer David Elkind claimed that restricting children's opportunities for playing, defined as the replacement of free and self-directed play, with structured or educational activities, has been 'overlooked' in many areas. He stated that: "*School administrators and teachers mentioned that if kids must play, they should at least learn something while they are doing it*" (Elkind 2008: 1).

Although evidence suggested that extracurricular activities can enhance academic achievement, where play experts have expressed concern that children's free time has become associated only with learning, rather than enjoyment of play itself. This is by no means a new concept, as Elkind stated in the 1980s: "*Our traditional conception of play was that of free, spontaneous, and self-initiated activity that reflected the abundant energy of healthy child development. However, today, that conception of play has been relegated to the early childhood years. For school aged children, play is now identified with learning and with the preparation for adult life*" (Elkind, 2008).

Elkind claimed that because of the above elaboration, play had become too luxurious to afford by the modern society, pushed aside to make way for organized activities that are seen as more educational, or television and gaming technology that had taken over from more traditional forms of play. He pointed to a research from the USA in 2007 suggesting that young children of preschool age are watching around two hours of television a day (Elkind 2008). Emergence of technology-based play has led to further confusion over the nature and meaning of play (Lester and Russell 2008). Today, with the increasing time, children spend watching television and playing on computers, there is a decrease of active playing in favor of more sedentary and passive forms of leisure. Passive activities probably do not have the same benefits as active play for the overall development of children (Moore, R., 1986; Blinkert, 2004). Since fun and enjoyment are the greatest motivators for physical activity and at the same time as children see health reasons as important, they are more attracted by 'unhealthy' activities as well as passive play if they are more fun than 'healthier' activities (Hemmings 2007). Though, the literature suggested that it is not enough to merely provide excellent play opportunities for children. Adults must adopt a culture of tolerance towards children playing, and children must be given the time they need to engage in free play. By understanding play only, as a tool for achieving other

outcomes, such as learning or fitness, threatens the losing sight of the essence of play itself, with the result that ‘play’ becomes transformed into structured activities with clear goals and aims rather than something that is self-directed, enjoyable, and instinctive. It is only by following their own rules, in their own time, when children can fully reap the benefits of playing.

2.6.3. Adult supervision

Children will always play, as they are distinctively active, but this natural tendency is easily overridden by external constraints, including adult supervision (Jebb 2007). As Lester and Russell (2010) stated that “*We must exercise caution and not make it too much an object of adult gaze*”.

In early childhood, it is important to support and encourage self-directed play activities even if these appear meaningless to adults. Allowing a child time and freedom to complete their chosen activities to their own satisfaction supports the child’s ability to concentrate (Elkind 2007). According to the 2006 Children’s Society research, parents no longer believe that playing outdoors is safe for their children. In fact, according 43 percent of adults felt that children should not be allowed out unsupervised under the age of 14. These research results were contradictory to what Armitage (2004) who emphasized, where playing away from adult supervision is equally important to allowing children to acquire independent mobility, explore the world on their own terms, and create their own identities. If children’s opportunities for free play are restricted, there are likely to be profound effects on their life experience in general and more specifically on their physical as well as mental health. For example, obesity, rickets, and attention deficit disorder are just some of the growing problems experienced by children that health experts have recently linked to a lack of free non-directed play (Play England 2011). Therefore, adults must provide children with free opportunities, time to themselves and spaces for play, if they are to get the full benefits.

Meanwhile, over-protection can cause children to become more anxious and develop behaviors associated with anxiety throughout their lives, which can be overwhelmed by risk taking in play that reduce anxiety problems in children. Adults should be aware of the importance of play and take action to promote as well as protect the conditions that support it.

Part II

2.7. Historical view on the presence of the child in the city and their place preferences

Despite evidence documenting the beneficial value of playing in local community spaces as well as in natural environments, unwelcoming attitudes towards children, coupled with fears of the public realm have restricted community play, (Figures 14). Thus, children's presence in local community spaces, as living streets, neighborhoods, and public spaces, seems to have been declined dramatically in recent decades (Lester and Russell 2008; Hillman, Adams and Whitelegg 1990). This issue was further discussed by Moore, R., (1986), in 'Childhood's Domain: Play and Place in Child Development', which is one of the descriptive accounts of children's preferred places and typologies in a 'big city', a 'new city', and an 'old city' in England. Moore interviewed 96 children, aged between nine and twelve years old, a subset of this group lead him on a 'field trip' around their play places. His aim was to find out the children's preferred spaces and places that they go to after school as well as in weekends to observe how they use their surrounding environments. He categorized the city into school yards, playgrounds, streets, free unplanned spaces, abandoned lands, hiding spots, public spaces, and public squares. He concluded that **recreational public spaces**, squares, and playgrounds were preferred, but the most frequently mentioned elements from a total of 60 elements were residential **streets and neighborhoods**.

For many years, research findings had demonstrated the value as well as importance of community play to children's well-being. Concerning **residential streets**, they are the children's immediate environment and the first interactive social space through history (Lacey, 2007). In the 1960s, Mead (1966) pointed out that **neighborhoods** provide vital opportunities for children to explore their environments, while playing without adult direction and learn life lessons about the 'familiar' and the 'strange'. While as for public spaces, Mathews (2003, cited in Spilsbury, 2005a) investigated **public space**, in relation to children's play. He suggested that they act as a 'liminal' or 'in-between' settings, in the rite of passage from childhood to adulthood. In fact, evidence suggested that limiting children's freedom in the local area can restrict their opportunities to create social networks and hinder their ability to build strong trusting relationships in local communities (Groves,

1997 cited in Spilsbury, 2005a). It was demonstrated by Beunderman (2010), who found evidence of children acquiring life skills through playing outside in their communities, such as sharing, looking out for one another, and asking for help.



Figures 14: Presence of children in the city

2.7.1. Residential streets and neighborhoods play (space category 1)

Having a historical look at the presence of the child in the city shows that the residential streets and neighborhoods are the original spaces encompassing free self-directed play (Lacey, 2007). Even relaying on cinema and film ontology of the past, it showed that the streets, in the Western world, or the concept of narrow alleys “Al hara”, in Arabian communities, is the oldest space preference for play and safest place used to accommodate children’s free play (Lamorisse, 1956 and Rafla, 1967), (Figures 15 and 16). In addition, children do not perceive, as adults do, the streets as transition lines but as potential elements and qualities that adapt to their needs and play rules, (Figures 17). Moreover, many qualitative studies showed that residential streets are attractive for children because of their offered variety, diversity, and complexity. Robin Moore illustrated that the street is an extremely important spatial site for children’s play. He described streets as endless sequences of exploration: they are the child’s immediate environments, full of movements, and interactive social spaces. They are not perceived as paths like adults. Moore (1987) concluded that “all children like to be where the action is, and where the life of the community takes place” (Moore, 1987). Moore also emphasized that the special attraction offered by the streets is not duplicated elsewhere in other spatial sites.

However, a large number of studies have found that parents adopt a variety of strategies to protect their children from the perceived danger of violence in street and neighborhood play. This includes enforcing curfews, accompanying children around the neighborhood, or restricting their free play as well as mobility in the local area. This lack of trust drove

children away from street and neighborhood play because adults chose indoor activities for their children rather than outdoor play.

These views were mirrored in the children's perspectives by expressing their anxiety about their safety in the local community neighborhoods and streets, where this anxiety prevented them from playing outside. In a research conducted by Lacey (2007), it was found that 51 percent of children had been told, by adults, to stop playing in the streets, neighborhoods, or areas near their homes. Furthermore, Lacey documented a decline in street play showing that, only 12 percent of people over 65 years never played out as children, whereas almost half of today's children never play out in streets (Lacey 2007). While 71 percent of adults reportedly played outside every day as children, only 21 percent of today's children claim to do so. 22 percent thought children's parents do not risk out alone until they are 16 years old (cited in Living Streets 2009). This was further interpreted by a study conducted by Canada, Irwin and others (2007), which found that the majority of parents described their neighborhood as unsafe and felt that their local neighbors could not be trusted to look after their children.

Thus, community development initiatives should be employed to increase children's feelings of inclusion, building social relationships, and establishing trust (Breviglieri, 2015). Since children lack of the sense of belonging to their neighborhood might be associated with 'undesirable' behaviors (Churchman, 2003; Chawla and Malone, 2003). For example, Brockman and others (2010) argued that more safe places to play are required to reduce children's and parents' fears, which can prevent children from being active in their neighborhoods. The study also found that children, who owned mobile phones had more independence to play actively around their neighborhood, as parents felt happier letting them play outside unsupervised, if they could reach them by phone.

In accordance to previous literature concerning street and neighborhood play, Beunderman (2010) concluded that playing within the neighborhoods enhance the feeling of gaining trust, feeling welcomed and knowing others in the community. It seemed that having a place to go, where children are listened to and respected gives them a positive perception of their local area. Through their engagement in the local environments and with others in the community, children not only had better relations with adults, but had more respect for

the public arena allowing them to make a positive contribution to their local neighborhoods.



Figures 15: Excerpted photos from Egyptian film: *Mabodat El Gamaher* - 1967





Figures 16: Excerpted photos from French film: Le ballon rouge - 1956





Figures 17: Street and neighborhood play

2.7.2. Recreational public spaces play (space category 2)

After the passage of modern town planning, in particular the functionalism movement, which was favorable to all cars, the increase in road traffic, and the rise of environmental issues, a strong desire to put the pedestrian at the center of development projects, has arose. Public spaces became at the heart of social and urban renewal of the city (Lacey, 2007; Curnier, 2015; Clark and Uzzell, 2002). Historically, the public squares were originally considered as private gardens for the nobility, the aristocracy, and the bourgeoisie. In the eighteenth century, the gardens served political objectives, so for example, during the French Revolution, in the perspective of equal treatment between individuals, claims opened squares to the public. Among the variety of public spaces, recreational public space had taken, increasingly, a special place in the urban projects. It was under the Second Empire (1852-1870), when Haussmann developed squares similar to current developments, each district must have its green urban public space, with planted walks of interconnect. However, these gardens were not still the subject of leisure activities, until the interwar period, where green spaces acquired their playgrounds qualities. Then a new

type of gardens have appeared, where sports and games were integrated, for example, Kellermann Park in the XIX arrondissement of Paris and the Red Butte Park in XIX arrondissement of Paris (Delaunay, 2018a). As among the French work, the period between the years 1960-1970, it was considered as reflection on the role of space in the children development (Chombart de Lauwe, 1976; Bonnin, 1977 Perrot, 1977) and in play learning approaches (Caillois 1992 1st ed, 1958. Henriot, 1969). However, in the 1980s, large criticism was against repositioning recreational areas within green spaces. They were then designed by landscapers who paid more attention to environmental planning as educational meanings productions. In 1990s, the industrial standards that met the prefabrication of standardized objects was obviously marked. In the late 2000s to early 2010s, the playgrounds were renewed. For the designers, these projects had the opportunity to demonstrate the combination between industrial spaces, aesthetic objects, and development of children's skills were possible, such as the following examples named in Ile de France: Park Cormailles Ivry 2003 40; Square Marin Paris 41 Docks the park of Saint-Ouen 42, 2013; 2014; and Garden Nelson Mandela in Paris 43, 2018. For owners, these operations constituted a power of communication and a new form of attention towards users. In general, these projects are considered as the new categories of spaces, within the subject of recreational city (Paquot, 2015).

In modern cities, the play environment for children has changed from previous generations. Public spaces had been also cited as an important play arena, due to their advocating traffic calming measures and their welcoming to children, once more, (Figures 18) (Hillman, Adams and Whitelegg 1990; Worpole and Knox 2007; Lester and Russell 2008). Nevertheless, negative attitudes towards children are noticed in these public spaces, which have led to the banning of activities that appeal to them, such as ball games and skateboarding in community spaces. Moreover, children are usually surrounded in places peculiar to them even within the developed recreational spaces (Worpole and Knox 2007). Moreover, a certain form of standardization of public spaces was observed, thus the same types of layout of public places could be found in Budapest, or Copenhagen as in Montreal, New York, or Lyon, with the same territorial spatial definition, set between recreational urban spaces and the surrounding urban context, permeability fabricated between the sub-spaces, equipment placed in confined playgrounds, the same material used for pedestrian

pathways, and the same urban public elements as benches "designated" to interfere with the naps of the homeless and the thus push back to the periphery (Bruand, 2019). Similarly, these recreational urban spaces were having a real common desire to control childish practices in order to anticipate forms of danger by encircling children in play areas within these public spaces, where a form of generalization and safety control discourse, were observed to arouse in communities, (Lacey, 2007).

Consequently, Spilsbury (2005b) argued that public spaces have come to be recognized as adult spaces. Therefore, Beunderman and others (2007) argued in "Seen and Heard" that children should be more valued in public spaces and that they should be allowed to have safe and informal areas, where they could hang out freely without restricted or directed adult supervision. In addition, they emphasized on the importance of the everyday public realm, as a valid site for children's informal recreation and a dimension of wellbeing. This should expand across all aspects of public space, beyond playgrounds and include all community members, regardless of age. It is now widely believed that playing in public spaces, is important for children to maintain a sense of community and as for adults too, children's play can help to build good social networks, as it provides them with opportunities to interact with one another at places (Curnier, 2015). Coherent to the previous literature, Worpole and Knox (2007) found that public spaces are highly valued for socializing opportunities and developing community ties. For children specifically, public spaces allow them to build friendships and learn rules concerning social life.

Therefore, there is an increasing interest in understanding children's experience of their places and place preferences. Furthermore, there is an increasing desire in presenting a perspective to understand children's own views of their preferred play places and identifying the reasons of their preferences of different spatial sites within cities. Hence, these investigate bearings point to supply an understanding of where do children play, what places, which spatial setup or settings children discover most fulfilling and empowering, that are regularly distinctive from what grown up consent children appeared to appreciate.



Figures 18: Public squares and recreational urban spaces play

2.8. Children’s place preferences and spatial configurations

Roger Hart (1979) and Robin Moore (1986) pioneered in real world work with children. Their accounts focused on children’s experience of their spaces, children’s place preferences, and children’s use of their surrounding environments. These accounts aimed to capture children preferred place sites for play and to understand children’s experience of their external physical environments. They emphasized that children mainly prefer to play in home sites, streets, sidewalks, public squares, and spaces of different designs (Curnier, 2015). They further showed that children play preferences vary across different range of spatial sites and typologies, for example, they explained that playgrounds were preferred but for a short period of time, as there are less opportunities for exploration, unlike gardens and open spaces. Moreover, children are in need to strategies that increase play opportunities to be safe and active in these different typologies and local transport planning that encourages active travel between play environments. Accordingly, NICE (2008) recommended to involve the local community and to prioritize children, particularly, when planning as well as developing roads by providing safe routes plans and guidance; ensuring public open spaces that are accessible by bike or foot; and designing playgrounds to encourage high levels of active play. Whereas, children’s places should allow children to develop their own ideas and activities at their own pace (Gummer 2010).

Children need sufficient space and age-appropriate equipment, and features to allow them to move around fast and slowly, change direction and manipulate their environment (Thigpen 2007).

Studies pointed out for further interpretive layer that children's places preferences of specific typologies rely on certain physical aspects, forms, and functional qualities creating different spatial configurations that accommodate to their play behaviors related more to the functional meaning of places including walls, trees, garage roofs, and bushes (Hart, 1979 and Moore, R., 1986). Accordingly, Brady and others (2008) linked the physical activity by a number of aspects, including the layout of the space typology, play staff, encouragement from staff, opportunities for free flow of behavior play, and access to outdoor space. Moreover, aggressive behaviors had been linked to a lack of interesting and engaging environments, while destructive behaviors are most common in boring spaces without trees, bushes or other natural boundaries. Bland environments such as these, mean that peer groups can feel that it is difficult to have their own space or get away from each other (Bird 2007a; Bird 2007b).

This was coherent to the study conducted by Moore and Wong (1997), where they investigated, through interviews, the effect of adding naturalized settings to an asphalt square. The interviews revealed that participants tended to show preferences to the landscape features that afforded different innovative and creative forms of play.

Consequently, in order to understand the child's space in the city and the community, it is important to have a sensory approach allowing to associate the spatial configurations of different spatial typologies, the body of the child, his movement, in order to interpret at the same time the perceptions, preferences, and the physical characteristics. As, for example, the same space typology (e.g. playground) with different configuration, such as circular versus straight pathways, and open areas with different ground surfaces, such as asphalt, compacted soil, woodchips, and sand, attracted different levels of physical activity and play behavior.

Therefore, literature had further focused on certain physical aspects, functional qualities, and functional forms of play environments by analyzing multiple descriptive accounts of children's outdoor play experiences, such as: *One Boy's Day* (Barker & Wright, 1951), *Children Experience of Place* (Roger Hart, 1979) and *Childhood Domain: Play and Play*

Space in Child Development (Moore, R., 1986). These physical aspects, functional qualities, and functional forms resulted in different spatial configurations offering different degrees of freedom and variety of play opportunities (Heft, 1988). This was further confirmed by what Singer (1994) stated that “*Children play longer when a wide variety of opportunities are available*”. This granted maneuvering margin that corresponds to Marc Breviglieri (2014) theorizes "**Potentiality**". This was consistent to Heft (1988), who stated that “*Functional description of an environment is more meaningful psychologically than one focusing on the form, because a given form-based category may mask a variety of functional types*” (Heft, p.58). Whereas, Heft (1988) further summarized the results of analyzing the above mentioned descriptive accounts in terms of the potentiality of the physical features in the environment that stimulates children’s play, (Table 4).

Heft paradigm focused only on physical aspects, for example: slopes offer sliding down, rolling down, and rolling objects down. He further suggested that potentials, defined as the qualities of the environment, offer opportunities, which have to be distinguished from the actualized potentials that were intended by the designer. Heft also concluded that these offered opportunities by the environment, are the same to all children, but it differs by age group, cultural background, and community. He explained that different recognized opportunities and potentialities emerged with the development of the child, as different needs and physical abilities develop. Thus, according to Heft (1988) and Breviglieri (2015) elaborations, potentiality helps to decode how children experience their environment not as a configured parameter, but as places that offer a diversity of experiences, different types of play opportunities, and patterns.

For further elaboration, Fjørtoft (2004) applied the concept of “potentiality” to interpret the ability of landscape and natural places to provide stimulating play environments for children. Fjørtoft explained that the different topographies and densities of vegetation allow different types of play; trees to climb, slopes to slide, fields to run, and shrubs to hide (Fjørtoft, 2004). In addition, Thibaud (2012) recently explained that even different sound environments provide different support for actions and act as potential roles social practices.

Table 4: Environmental Qualities and potentiality through a functional taxonomy of affordances, Heft (1988).

A functional taxonomy	Offered Opportunities
Flat, relatively smooth surfaces	<ul style="list-style-type: none"> ▪ cycling ▪ running ▪ skipping ▪ skating ▪ playing hopscotch ▪ skiing ▪ playing (football, ice-hockey, tennis or badminton)
Relatively smooth slopes	<ul style="list-style-type: none"> ▪ coasting down ▪ skateboarding
Graspable/detached objects	<ul style="list-style-type: none"> ▪ throwing ▪ digging ▪ building of structures ▪ playing with animals ▪ using plants in play
Attached objects	<ul style="list-style-type: none"> ▪ jumping-over ▪ Jumping-down-from
Non-rigid, attached object	<ul style="list-style-type: none"> ▪ swinging on ▪ hanging
Climbable feature	<ul style="list-style-type: none"> ▪ climbing ▪ looking out from
Shelter	<ul style="list-style-type: none"> ▪ hiding ▪ being in peace and quiet
Moldable material (dirt, sand, snow)	<ul style="list-style-type: none"> ▪ molding something ▪ building/constructing of snow
Water	<ul style="list-style-type: none"> ▪ swimming ▪ fishing ▪ Playing with water

2.9. Spatial potentialities and of play opportunities

“With the rise of the “ludic city”, the work of Roger Caillois and Marc Breviglieri allows us to question the paradoxical character of planning and programming playfulness into city, which should allow room for maneuver and encourage improvisation on the part of users” (Curnier, 2015).

To date, fewer studies have looked more specifically at the impact of the spatial potentialities on children's play behavior, as users. Although still limited, according to literature, there is an associations between some specific landscape attributes and children's place preference as well as their play behavior in different space typologies (assembly

zones, playgrounds, boulevards, circulation pathways network, gardens, green belts, and courtyards).

Relying on previous literature, and more specifically on Heft, (1988) and Breviglieri (2015), this study extracted, refined, and proposed a set of aspects of spatial potentialities creating different configurations, that could have an impact on play behavior as well as play opportunities, independently from the spatial typology itself (Barbour, 1999; Cosco et al., 2010; Christidou et al., 2013; Zamani, 2013; Podolska, 2014; Alaa, 2015), (Table 5). These suggested spatial potentialities are: (1) Entity of activity settings, (2) Flow continuity and fluidity, (3) Diversity of ground materials, (4) Topographic Variability, (5) The presence of different urban spatial features.

2.9.1. Entity of Activity setting:

According to Podolska (2014), the entity of activity settings is achieved through the presence of multi-spatial experience settings with good functional definition. The entity of activity settings is measured in terms of the separation from activity routes and good functional definition of the display space to the activity in the setting. Behavior settings are ecological units where the physical environment and the behavior are indissolubly connected (Cosco et al., 2010). These eco-behavioral units have clearly identifiable spatial and temporal boundaries with components that function independently of adjacent eco-behavioral units. Behavior settings are composed of people, physical components, and behavior. The concept is applied in design research by disaggregating the functional parts of the outdoor environment (i.e., climbing area, sand pit, water play setting, tricycle path, vegetable garden, etc.) as opposed to treating the play area as a generalized context for behavior. Linking setting type and level of physical activity are essential for understanding the impact of design on children's behavior, for guiding design interventions, for informing childcare licensing policy, and accrediting regulations that may support active childhoods (Cosco et al., 2010).

Independent defined functional sub-areas have been associated with greater levels of activity concentration and better flow of play (Barbour, 1999; Podolska, 2014). It has also been associated with more exploratory behavior, with more sociability and social interaction, and with increased dramatic play (Barbour, 1999; Maxwell et al., 2008; Podolska, 2014).

2.9.2. Flow continuity and fluidity:

Continuity and fluidity of flow are achieved by the presence of clear definition of activity loops or routes that had been suggested to encourage smooth flow of play and high chance of playability (Podolska, 2014). According to Cosco et al. (2010), flow continuity and fluidity might promote various forms of functional play such as running and biking. Furthermore, Cosco et al. explained loop shaped routes have been suggested to be more enjoyable for children and to offer greater perceptual complexity because of visual blocking, while linear routes are less comfortable for children and tend to be perceived as dead-end spaces (Maxwell et al., 2008, Cosco et al., 2010; Podolska, 2014).

In addition to a study that investigated the indoor play areas of day-care centers, Moore, G., (1986) found that better spatial setting definition of play sub-areas and the clear definition of activity routes were associated with greater concentration in play activities, and less random movements. He defined random movement as hyperactive, impulsive, fast moving, and actions with rapid shifts from one setting or object to another.

2.9.3. Diversity of ground materials:

As for, diversity of ground material, Christidou et al., (2013) elaborated that it could be achieved by diversity in texture, color and materials. This diversity might promote various forms of play, whereas hard ground surfaces have been associated with running and wheeled toy play and are thus suggested to promote functional as well as motor play (Barbour, 1999; Fjortoft, 2004; Cosco et al., 2010). Moreover, hard ground surfaces have also been suggested to promote games-with-rules but to offer less opportunities for creative activities (Barbour, 1999; Christidou et al., 2013). On the other hand, soft ground surfaces have been suggested to be more appropriate for relaxation, group gatherings, and social interaction among children (Fjortoft, 2004; Zamani, 2013; Christidou et al., 2013).

2.9.4. Topographic variability

According to Fjortoft (2004), variability in ground levels is achieved by offering places to play above or below the ground that offer safe-risk, many heights, or levels, such as sitting steps, stairs, parapet, slopes, cliffs, ramps, and bridges. Relying on previous literature, topographic variability has been particularly associated with visual completion points (Alaa, 2015; Curnier, 2015; El-Husseiny, 2016). Moreover, it offers challenging and

rewards that increase possibilities for functional as well as gross motor play such as jumping, tumbling, sliding, and climbing (Fjortoft, 2004; Zamani, 2013; Podolska, 2014).

2.9.5. The presence of different urban spatial features

Podolska (2014) explained the urban spatial features as elements or equipment that can be changed, modified, or manipulated. They were described as interactive features with diversity in scale offering dynamic in place that continuously changing or can be modified, place that can be rearranged, such as plants, animals, flexible materials, and elements stimulating senses.

Podolska further gave examples as thematic elements, unique landmarks, sculptures, animal features, fantasy shapes, over-scaled or under-scaled elements e.g., boat or fire truck miniature or child-sized, different types of vegetation and plants offering presence of shaded areas, water jets, natural loose materials e.g., sand and mud, urban seats and pergola.

Moreover, according to literature, trees with their different branching patterns, diameter, and installation technics, in addition to stems and plants, are suggested to be attractive elements for children (Christidou et al., 2013; Alaa, 2015; Podolska, 2014; El-Husseiny, 2016; Elnesr, 2018). The presence of vegetation in playgrounds has been associated with increased possibilities for functional and gross and fine motor play, exploratory play, imaginative, dramatic, and constructive play (Fjortoft, 2004; Zamani, 2013; Christidou et al., 2013). The presence of trees also offer shaded areas that has been suggested to be particularly important in hot and sunny weather. And, shaded areas are suggested to be preferred areas for relaxation and social interaction (Christidou et al., 2013; Alaa, 2015; Elnesr, 2018).

While Sand and water are perhaps the prototypical examples of manipulative play that offers opportunities to mold, reconfigure, and change the environment. They are an important ingredients of more sophisticated play behavior (Heft, 1988; Wan & Zulkiflee, 2010; El-Husseiny, 2016; Podolska, 2014).

Table 5: Landscape aspects mentioned in previous literature review influencing children’s behavior in playgrounds that will undergo the study

Spatial potentialities	Spatial configurations Attributes	Attributes and play opportunities	Reference
1. Entity of spatial Activity setting	<ul style="list-style-type: none"> - Functional definition <ul style="list-style-type: none"> ▪ Multi-spatial experience settings ▪ Smooth linkage between settings 	<ul style="list-style-type: none"> - greater levels of activity concentration - better flow of play - more exploratory behavior - more sociability and social interaction - increased dramatic play 	<ul style="list-style-type: none"> - Podolska, (2014). - Cosco et al., (2010).
2. Flow continuity and fluidity	<ul style="list-style-type: none"> - The presence of clear defined activity loops and routes <ul style="list-style-type: none"> ▪ Curved/ linear/looped ▪ Hard/soft ▪ Wide/ narrow 	<ul style="list-style-type: none"> - encourage various forms of functional play such as running and biking - loop shaped pathways <ul style="list-style-type: none"> ▪ are more enjoyable by children ▪ offer greater perceptual complexity ▪ offer visual blocking - linear pathways <ul style="list-style-type: none"> ▪ are less comfortable for children ▪ tend to be perceived as dead-end spaces 	<ul style="list-style-type: none"> - Cosco et al., (2010). - Wan & Zulkiflee, (2010). - Zamani, (2013).
3. Diversity of ground materials	<ul style="list-style-type: none"> - Diversity in texture, color and materials <ul style="list-style-type: none"> ▪ Hard : asphalt/compacted soil /concrete / artificial grass ▪ Intermediate : rubber tiles woodchips ▪ Soft: sand / water/ grass 	<ul style="list-style-type: none"> - Hard ground surfaces <ul style="list-style-type: none"> ▪ Afford running and wheeled toy play ▪ promote functional and motor play ▪ promote games-with-rules ▪ offer less opportunities for creative activities - soft ground surfaces <ul style="list-style-type: none"> ▪ promote relaxation, group gatherings, and social interaction among children 	<ul style="list-style-type: none"> - Cosco et al., (2010). - Zamani, (2013). - Barbour, (1999). - Podolska, (2014).
4. Topographic variability	<ul style="list-style-type: none"> - Variability in ground level through places to play above or below the ground <ul style="list-style-type: none"> ▪ Slope/ flat/ cliffs/ steps 	<ul style="list-style-type: none"> ▪ Afford functional and gross motor play - jumping, tumbling, sliding, and climbing 	<ul style="list-style-type: none"> - Podolska, (2014). - Wan and Zulkiflee, (2010). - Zamani, (2013).

			- Fjørtoft, (2004). - Curnier, (2015).
5. The presence of different urban spatial features	<ul style="list-style-type: none"> ▪ Thematic elements, unique landmarks, sculptures, animal features, fantasy shapes, over-scaled or under-scaled elements. ▪ Tree/flower/ shrubs ▪ Sheds (artificial-natural) ▪ Sand and water 	<ul style="list-style-type: none"> ▪ are attractive elements ▪ increase possibilities for functional and gross and fine motor play ▪ increase possibilities for exploratory, imaginative, dramatic, and constructive play ▪ offered shaded areas that are preferred areas for relaxation and social interaction 	<ul style="list-style-type: none"> - Christidou et al., (2013). - Wan & Zulkiflee, (2010). - Zamani, (2013). - Fjørtoft, (2004). - Curnier, (2015).

These above suggested spatial potentialities by the study, contribute to space materiality referred the position of geographical accessibility through the achieved spatial porosity that can consequently contribute in other ways to the children's presences by promoting opening up to them, free play behavioral activities, and different body gestures (Curnier, 2015; Delaunay, 2018a).

Based on previous literature, “**spatial porosity**” is interpreted in this study as *the degree of openness and closure of a defined outer spatial boundaries of space territory and the inner spatial permeability in between defined spatial typologies*. The degree of closure and openness is represented through the enclosure and encapsulation degree of the whole, functional clarity, separation, and definition by visual as well as tangible boundaries. While the inner spatial permeability is represented through connectivity and integration between different spatial typologies that make all the practices visible and welcomed to implement social interaction. The degree of permeability between different subspace typologies could be built by zoning of internal different functional typologies through their different sizes and shapes, different circulation pathway networks, and linkages between zones. (Moore, G., 1986; Delaunay, 2018b).

According to literature, “**The spatial degree of closure and openness**” of urban spaces could encourage the consideration of different levels of security that promotes children presence and their high sense of security (Breviglieri, 2013a; Podolska, 2014, Cosco et al, 2010). In addition, Podolska (2014) and El-Husseiny (2016) noticed that well-defined encapsulated spaces act as intimate spaces that impact a sense of privacy, security, and

ownership that increase children's curiosity, sense of security, and belonging by allowing them to mark their boundaries and limits. Children value places, but also they value 'belonging'. Children showed preference, through several studies, to places that evoke their feelings by giving them the sense of belonging and well-being (Hart, 1979; Moore, G., 1986; Rasmussen, 2004; Burke, 2005; Kytta, 2002).

According to literature, “**degree of inner spatial permeability**”, is referred to as the degree of separation of the functional zone from circulation pathways network, good interaction within adjacent zones, ability to move smoothly between zones and with neighboring zones, and the presence of inviting access for each zone, (Podolska, 2014, Cosco et al., 2010; Delaunay, 2018b). In addition, Delaunay (2018b) assumed that high degree of permeability could ensure children's proper function and use of the subspaces because of the feeling of being observed, so they seemed to be more careful to comply the rules of use (age groups, respect for sites, etc.). This bias is part of a more general process of transferring the supervision of practices to users through offering users quality spaces that make them rather participators in social control. This principle has been developed since the 1960s in France. This movement took off through urban renewal operations (Delaunay, 2018a). As Podolska, (2014) interpreted the importance of high spatial permeability in the increase of activity concentration and the better flow of play; as well as the social control between all age groups.

On the other hand, Gamal Said (2013), highlighted the emergence of specific isolated ambiances due to low degree of spatial permeability, where the whole ambience of the urban public space is composed of differentiated micro-ambiences forming inner sensory islands. She is referring to these micro-ambience islands as “Mosaic Ambience”, which might enhance series sensory breaks or sensory-spatial segregation, confinement, and isolation by age and function.

A Mosaic Ambience is defined by Gamal Said (2010), when the main urban space is divided internally into neighboring unmixed micro-ambiences. The mosaic ambience is achieved through the diversity of micro-ambiences, and the separation between them due to zoning of differentiated functional islands. On the sensory level, strong sensory break is felt whether between the outside and the inside or while moving from a zone to another.

Accordingly, the physical detachment played a major role in composing a sensory structure of isolation.

Consequently, there has been a recent proliferation of interest in the concept of “**Intergenerationality**” defined as the growing interest in the **new approach of intergenerational cities**. Recently this is a topic becoming more important in the context of the designing cities: instead of paying attention to one group to design, creating spaces that accommodate ages from 0-80 years old. This approach addresses the mode of different kinds of spaces and spatial arrangements (e.g. cities, neighborhoods, institutions, and leisure sites) in facilitating or limiting intergenerational contact and encounters. Moreover, it overviews the processes of influencing the intergenerational negotiation and contestation of values, beliefs, and social memory, through producing patterns of continuity and change, in order to avoid generational separation and segregation as social problems across different contexts. Thus, the rise in use of notions of intergenerationality had been influenced by recent calls within the geographies of children and young people to (1) adopt a more relational approach to understanding age, (2) to bring into conversation areas of research (e.g., on childhood and old age) that have traditionally been compartmentalized from one another, and (3) to explore more robustly the nature of child/adult interdependencies (Vanderbeck and Worth, 2015; karsten, 2005).

The above might introduce the reason behind marking a current return to the presence of children in cities, especially in the new forms of urbanism such as gated urban spaces and eco-districts or eco neighborhoods (Gamal Said, 2013). These two new urban forms can be recently added to the children’s place preferences in cities, pre-mention above by Moore, R., (1986). It has been associated with the feeling of identifiable territories, and belonging, which reinforces certain social behaviors and social interactions (Breviglieri, 2013a; Podolska, 2014). According to literature, “**Gated urban spaces or gated communities**” are considered as a new urban vocabulary. It can be defined as a closed urban territory, internally fragmented by functions into islands (Degoutin, 2006). In this emerging landscape, the two main features defining this contemporary landscape are walls and zoning, as being expressed by Gamal Said, (2013) with the expression “**Wallification**”. It is mainly characterized by the sense of enclosure, as a part from the whole city. It enhances the sense of “the outside and the inside”. Generally, the ambience in this gated community

appears to be frozen, rigid, and well controlled, with strict regulations governing the city. Thus, result in sense of isolationism (Gamal Said, 2013).

Likewise, with the same concept of isolation and wallification, an “**eco-district or eco-neighborhoods**” is a neologism associating the terms "district" and "eco" as an abbreviation of ecological. It designates an urban planning aiming to respect the principles of sustainable development and ecological urban planning, which seeks to take into account the social, economic, environmental, and cultural challenges of a confined neighborhood, urban unit of urban planning, or region that is isolated from the surrounding context. This notion insists on the consideration of the whole environmental issues by way of a collaborative process. They are often eco-cities or eco-neighborhoods seeking to reduce their ecological footprint by compensating for their impacts and tending to repay their "ecological debt" (Mathieu, N., & Guermond, Y., 2011, p 109).

Thus, Elsley (2004) contended that three issues must be addressed to understand children preferences according to their play behavior within urban spaces in our cities. Firstly, children should be considered as active participants in everyday life. Secondly, planning and urban development should aim to improve the public realm for children, by noting how children wish to use public space. This should take into consideration children's age-related needs, different cultural background, and the diversity of children's experiences. Finally, policy makers should ensure that public policy is influenced by children's perceptions, so it accurately represents children's views, rather than making assumptions about these. Moreover, Lia Karsten (2005) identified the key features of successful urban planning for families. The challenge, she said, is to embed children as principles within the planning process, moreover, to ensure that children are recognized and supported as full stakeholders. She ensured that urban planning should aim to promote such encounters; residents of all ages, and backgrounds sharing time as well as space with each other, including the intergenerational housing and public spaces.

Furthermore, the environmental psychologist Marketta Kyttä, who summed between the environmental design literature and children's behaviors as users, discussed that children are experts at play and that each child has significance in perceiving, utilizing, and/or reshaping their environment that fit with his/her character (Kyttä, 2003). Kyttä (2002, 2003) continued on Heft's (1988) as well as Breviglieri's (2015) work by exploring the

actualization of potentiality in various forms of play environment and discussing the various degrees of usability between the child and the environment, in terms of “affordances”. Moreover, she categorized the various degrees in the actualization of affordance into: affordances that have been perceived, affordances that have been utilized, and affordances that have been shaped, (Figure 19). Furthermore Kytta stressed on how the designer should make affordances perceptible and distinguishable to be perceived, utilized, and shaped (Kytta, 2006). Moreover, Kytta extended the concept of affordances to the emotional, social, and cultural opportunities that a child can perceive in the environment (Kaevi, Kytta and Harting, 2002).

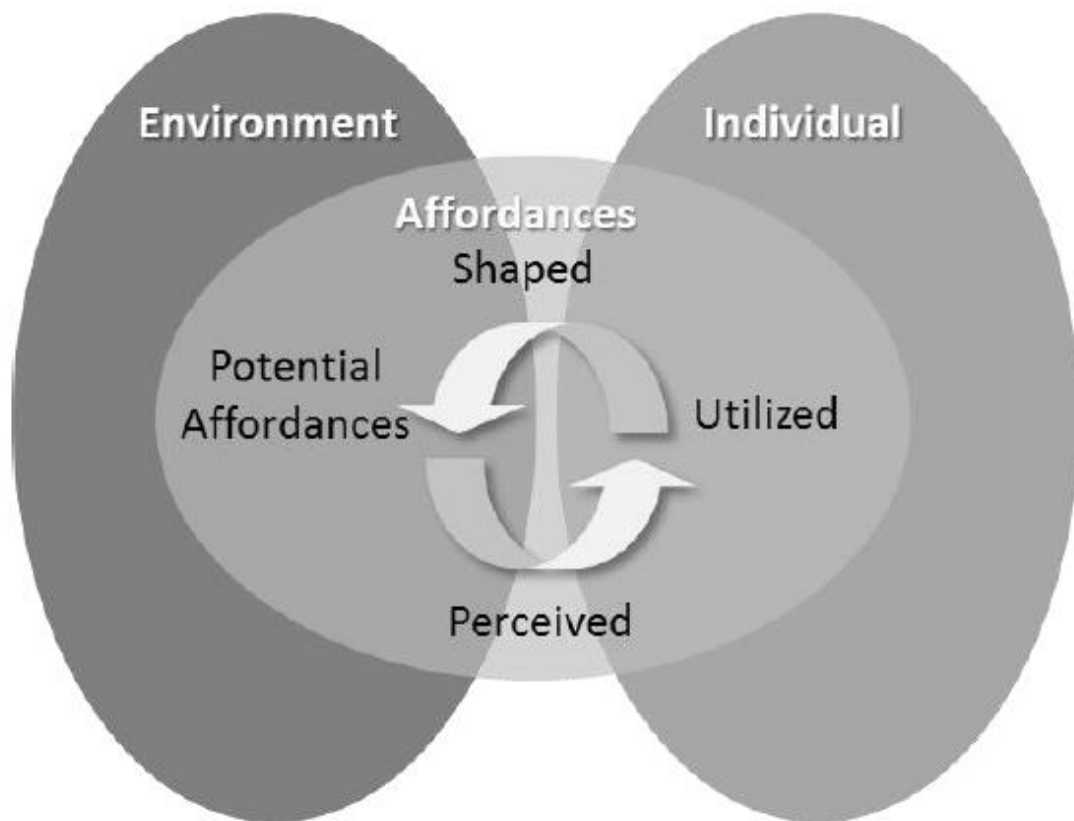


Figure 19: The different levels of affordances, Kytta, (2002)

PART III

2.10. The concept of affordances

As previously mentioned, developmental and environmental psychologists introduced several theories of children’s perception and environmental cognition, such as, Piaget’s theory of “Cognitive Development”, Werner’s theory of “Children Cognitive Structures”, and Gibson’s theory of “Functionally Oriented Ecological Approach to Perceiving” which

was extended to “Children’s perception” by Harry Heft (1988) and Marketta Kytta (2002, 2003). Those theories were a start of an increase interest in developmental and environmental psychology that highlighted the relation between the physical environment and the child. In Piaget’s and Werner’s theories, too much attention had been focused on the perceiver and not enough consideration has been given to the form of the environment. Unlike Gibson’s theory, which represented the possibility for an individual to perceive place in terms of its functional significance, Gibson gave consideration for both the perceiver and the environment. Then he developed his work to introduce the concept of “**Affordances**” in his book the ‘**Ecological Approach to Visual Perception**’.

In order to enhance the idea of the presence of the child in the city, their perceptions of the physical characteristics of the surrounding environment by associating the spatial configurations, the body of the child, and the movements, through a sensory approach, the theory of “**Affordances**” is considered as a theoretical base for this thesis. Where, this section describes the key ideas of this theory and its development which lies at the heart of perceptual psychology, knowing that the verb “afford” is found in the dictionary, but the noun “affordance” is not.

The theory of affordances is originally explained by the perceptual psychologist **James J. Gibson** in Chapter 8 of his famous book “**The Ecological Approach to Visual Perception**”. **James J. Gibson**, who was interested in how people see the world, had developed his research over 70 years on the developmental and environmental psychology. He highlighted the relation between the physical environment and infants, children, adults, as well as a wide range of nonhuman species. As cited in McGrenere and Ho (2000), Gibson defined the affordance concept as:

“Offering or action possibilities in the environment in relation to the action capabilities of an actor; independent of the actor’s experience, knowledge, culture, or ability to perceive. Existence is binary – an affordance exists or it does not exist.”

Here affordance points both ways, to the environment and to the observer (Gibson, 1979). Gibson’s affordances introduced the idea of the actor-environment mutuality, where the actor and the environment make an inseparable pair. He focused his work on direct perception, where a direct perception is possible when there is an affordance and there is information in the environment that uniquely specifies that affordance. For example, one

will perceive that one can walk forward when one sees a solid, opaque surface that extends under one's feet. The affordance, in this example, is walkability and the information that specifies walkability is a perceived invariant combination of a solid opaque surface of a certain size relative to oneself. Therefore, direct perception depends on the actor's "picking up" the information that specifies the affordance. While, if this surface of support with the above properties is also knee-high above the ground, it might afford sitting on, and in this case, it could be named as a seat in general, a stool, bench, or chair. This type of seat might be natural like a ledge or artificial like a couch. It might have various shapes, as long as its functional layout is that of a seat. The color and texture of the surface are irrelevant.

Moreover, he further illustrated that a knee-high surface for a child is not the same as knee-high for an adult, therefore, the affordance is relative to the capabilities of the user. The information to specify the utilities of the environment is accompanied by information to specify the observer himself, his body, legs, hands, and mouth. Consequently, the affordance is perceived visually relative to the body and have meaning. Thus, to an infant, different surfaces "afford" opportunities for walking, sitting, crawling, and grasping, etc. As children gain more motor skills, they discover new opportunities for movement and thus new affordances. The more chances they are given to perceive and interact with their environment, the more affordances they discover, and the more accurate their perceptions become. In other words, affordances could be recognized via information.

Gibson (1979) also precised that perception is important because it allows humans to adapt to their environment. In this way learning can be seen as a process of discriminating patterns in the world, rather than one of supplementing sensory information with past experience. The existence of the affordance is independent of the actor's experiences and culture. Thus, an actor may need to learn to distinguish the information in order to perceive directly. Therefore, Gibson's academic career centered on the field of visual perception, which is deviated from the classical theories of perception that were based on physical optics, because he felt that physics provided an inappropriate frame of reference for visual perception.

Gibson made it his life's work to describe an appropriate ecological frame of reference. He believed that studying the human beings' visual perception in isolation from the environment that is perceived resulted in false understandings. Thus, Gibson claimed that

we perceive at the level of mediums, surfaces, and substances rather than at the level of particles and atoms, in particular, we tend to perceive what the combination of mediums, surfaces, and substances offer us. Consequently, he concluded, (1979, p. 127), that "...the affordances of the environment are what it offers the human beings, and what it provides or furnishes, either for good or ill."

Gibson (1979, p. 139) also claimed that the affordance of something does not change as the need of the observer changes. The observer may or may not perceive or attend to the affordance, according to his needs, but the affordance, being invariant, is always there to be perceived. The notion of 'affordance' is central to Gibson's view, since, according to him, what we perceive is what things afford. To prove this, he further explained that the environment still offers the affordance of food even if the animal is not hungry on the particular occasion; but if the animal does not need to eat on any occasion, it would not be able to say that the environment offers food to animals.

In addition, there are two properties of affordances that Gibson implied but never directly stated. The first is that affordances are binary; they either exist or they do not exist. For example, a stair is climbable by a particular individual or it isn't. Gibson did not address the grey area where an action possibility exists but it can only be undertaken with great difficulty. For example, a stair that is climbable but only with great difficulty. Second, Gibson implied that affordances can be nested when an action possibility is composed of one or more action possibilities. For instance, an apple affords eating, but eating is composed of biting, chewing, and swallowing, all of which are afforded by the apple. Gibson described the environment as being composed of nested objects and he described the nesting of information that specifies affordances but he never specifically used the term of "*nested affordances*".

Finally, he suggested that what we perceive when we look at objects, are their affordances, not their qualities, and yet we do not have to classify and label things in order to perceive what they afford. The basic affordances of the environment are perceivable and are usually perceived directly, without an excessive amount of learning.

To sum up, according to Gibson (1979), these are the three fundamental properties of an affordance, (Figure 20):

1. An affordance exists relative to the action capabilities of a particular actor.

2. The existence of an affordance is independent of the actor's ability to perceive it.
3. An affordance does not change as the needs and goals of the actor change.

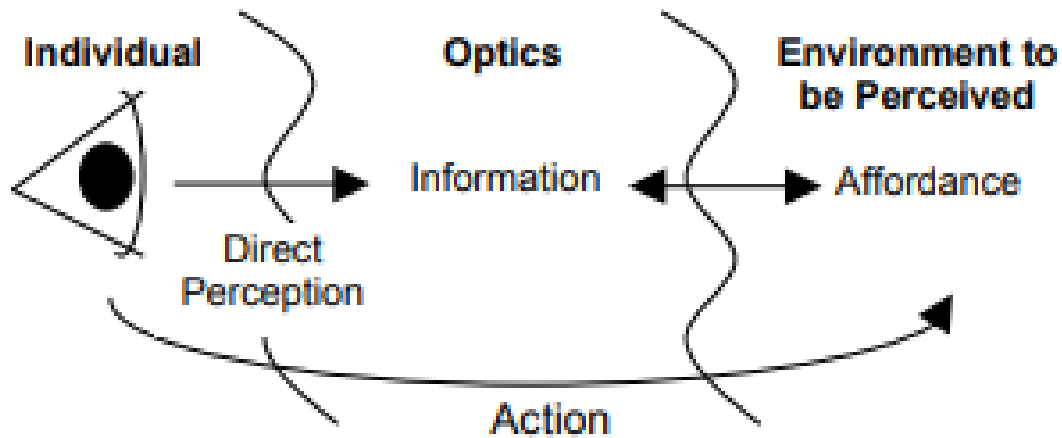


Figure 20: Direct perception is the act of picking up information to guide action

The concept of affordance was further interpreted by **Don Norman** (1988), through the book “**The Design of Everyday Things**” that opens with an excellent a simple message:

“We have to accept human behavior the way it is, not the way we wish it to be”.

Donald Norman appropriated the concept of affordances from James J. Gibson for the design of common objects. Gibson and Norman appear at first glance to have similar definitions of the concept. However, Gibson intended an affordance to mean an action possibility available in the environment to an individual, independent of the individual's ability to perceive this possibility. This can be contrasted with what Norman introduced concerning affordances in his book. Norman (1988, p.9) described affordances as follows:

“...the term affordance refers to the perceived and actual properties of the thing, primarily those fundamental properties that determine just how the thing could possibly be used. A chair affords (‘is for’) support and, therefore, affords sitting. A chair can also be carried”.

This quotation pointed to some apparent differences between Norman's affordances and Gibson's affordances. Norman talked on both perceived and actual properties. He implied that a perceived property may or may not be an actual property, but regardless, it is an affordance. Thus, he deviated from Gibson in that perception by an individual may be involved in characterizing the existence of the affordance. Further, Norman indicated that an affordance refers primarily to the fundamental properties of an object.

He also believed that affordances result from the mental interpretation of things, based on our past knowledge and experience that applied to our perception of the things. This view is somewhat in conflict with the views of many Gibsonian psychologists that identifies another difference between Gibson and Norman [p. 219]. Gibson claimed that the existence of affordances is independent of an actor's experience and culture. On the other hand, Norman, tightly coupled affordances with past knowledge and experience. The frame of reference for Norman is the mental and perceptual capabilities of the actor, whereas for Gibson is the action capabilities of the actor. Therefore, Norman's point view concerning affordance is further explained by McGrenere and Ho (2000, p.3), who interpreted that: *Perceived properties may or not may actually exist. Suggestions or clues to how to use the properties, can be dependent on the experience, knowledge, or culture of the actor, which can make an action difficult or easy.*

Moreover, Norman (1988, p.39) emphasized on usability as he stated that: *"The designer cares more about what actions the user perceives to be possible than what is true"*. He also suggested that a designer must also be concerned with creating the useful actions of the design while for Gibson the usefulness of a design is determined by what the design affords (that is the possibilities for action in the design).

To conclude, according to Norman (1988), these are the three fundamental properties of an affordance, (Figure 21):

1. An affordance exists relative to the mental and perceptual capabilities of the actor.
2. The existence of an affordance is dependent on the actor's mental interpretation of things, based on the past experiences.
3. An individual may be involved in characterizing the existence of the affordance.

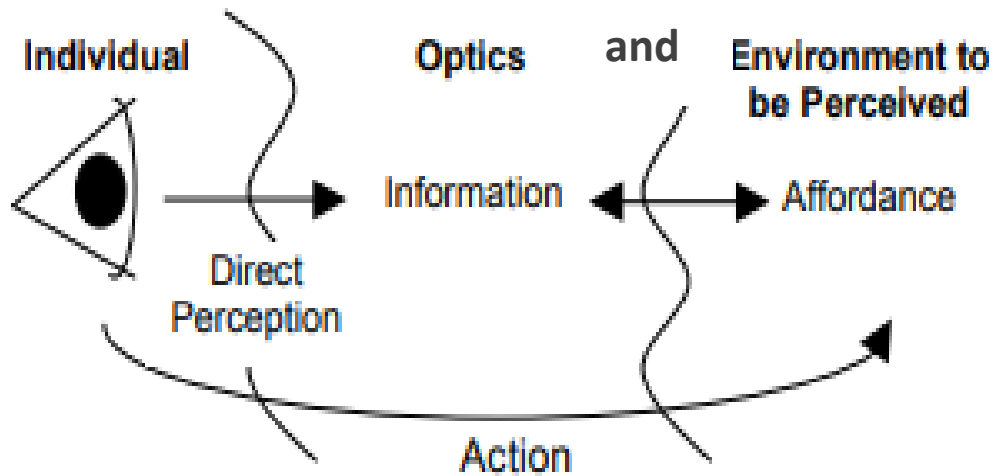


Figure 21: Affordance according to Norman interpretation

Figure 21 is modified to differ from Figure 20 and to illustrate Norman's vision, where optics and the Environment to be perceived and collapsed into a single section.

In conclusion, to highlight and interpret the differences between Norman and Gibson who gave different meanings of the concept of affordance are further highlighted and interpreted by McGrenere and Ho (2000), who have compared Gibson's and Norman's perceptions of affordance, (Table 6). For Gibson, affordance is an expression for significant and important actions in the environment seen by the individual (Gibson 1979). While according to Norman (1988), affordance refers to the perceived and actual properties of an object, those properties that decide how it can possibly be used.

Table 6: Differences between Gibson's and Norman's perceptions of affordance

Gibson's Affordances	Norman's Affordances
<ul style="list-style-type: none"> • Offerings or action possibilities in the environment in relation to the action capabilities of an actor • Independent of the actor's experience, knowledge, culture, or ability to perceive • Existence is binary – an affordance exists or it does not exist 	<ul style="list-style-type: none"> • Perceived properties may or may not actually exist • Suggestions or clues in the way of using the properties <ul style="list-style-type: none"> - Can be dependent on the experience, knowledge, or culture of the actor - Can make an action difficult or easy

McGrenere and Ho (2000) further illustrated an example to elucidate the differences between Gibson's and Norman's original use of the concept. Consider a door with no handle, according to Norman, without prior knowledge of how the door operated, an actor would find it difficult to know the direction of opening. While following Gibson's definition, the fact that the door can be opened by a given actor is sufficient to determine that it has an affordance, perhaps the door can be pushed and it will swing away from the actor or the actor can grasp the door edges and pull. For Gibson, there is no need for any visual information specifying the correct direction to the actor for there to be an affordance. Unlike Norman's use, which confirmed the affordance would only exist if there was information to specify the possibility for action and the actor had learned how to interpret the information. In this case, Norman suggested that there would be a need to a door handle that signaled the direction of opening to the actor.

In conclusion, it is important to note that Norman and Gibson had two related yet different goals. Gibson was primarily interested in how we perceive the environment. He acknowledged that both people and animals manipulate the design of their environment to change what it affords them, but the manner of manipulation was not his focus. On the other hand, Norman is specifically interested in manipulating or designing the environment so that utility can be perceived easily. Given Gibson's focus, he made the simplifying assumption that affordances are binary. By recalling the example of a stair being climbable or non-climbable by a particular individual. Reality obviously isn't this black and white; a grey area exists that is meaningful to the stair climber. For a particular individual one stair may be climbable with great difficulty whereas a different stair may be climbable with ease. Gibson doesn't address this range; they are both climbable and thus they both qualify as affordances. From a design perspective, an affordance that is extremely difficult to undertake versus one that is undertaken with ease can hardly be put in the same category. In "The design of everyday things", the goal should be to design information that uniquely specifies an affordance and also to design useful affordances that can be undertaken with ease.

As illustrated above, Gibson perception means awareness gained by actively seeing, hearing, smelling, touching, and moving around. Gibson also emphasized that perception of oneself in the environment, highlights relational aspect. So that the environment is not

the same for everyone, as the abilities to perceive it can vary. Therefore, affordances are the possibilities or opportunities the environment offers. For instance, solid ground affords us to stand upright, supports balance, and thus makes it possible to move in various ways. While windows afford see the views, flowers afford smelling scent, musical instrument affords hearing sound, and so on. But also beyond these affordances, there are further values and meanings. For instance, balance can make us feel secure and free, music can provide a positive distraction that can make us relaxed. Gibson pointed out that affordances do exist everywhere all the time, but they are not given – they have to be perceived in order to be utilized. In other words, if someone is visually impaired, the window does not afford seeing through, or if the scent of the flower is not noticed there is no affordance, but the possibility objectively is still there.

Accordingly, Thibaud (2013) elaborated that since environmental and urban issues are key challenges in the contemporary world, affordance theory helps to create a basis for understanding relationships with the environment. To cope with these issues effectively, new conceptual tools and methodological frameworks have been developed which foster original ways of dealing with day-to-day situations. From this standpoint, the sensory, affective, practical, and material dimensions of the built environment implies a particular conception of situated perception that helps us to introduce the notion of “**ambience**” (or atmosphere)

This view can be further supported by the thoughts of the German philosopher **Gernot Böhme** who proposed a new relational aesthetics in terms of a perception theory for the surrounding environment. Böhme stated (2017, p.72): “*The primary “object” of perception is the ambiances not the separate things or their shapes and colors*”. The concept of affordances is further expanded by the **Aesthetic Theory of Atmospheres**, which is less dictator than the theory proposed by Gibson. Böhme’s relational aesthetics is extremely similar to the Affordance Theory by Gibson, which states that we perceive in a direct manner, through our bodies. Gibson (1979) and Böhme (2017) proposed the meanings, values, and atmospheres are perceived before the details. Therefore, Böhme pointed out that the perception of the atmosphere is also direct. He went on to explain that atmospheres are not the qualities of the things but are transmitted through the qualities of things, the ecstasies of the thing (2017, p.54). Furthermore, he explained that the design

determines the properties of bodily space experience, in short, of our feeling inside the space (2017, p.430). Unlike Norman, Böhme meant that atmospheres have not necessarily been the primary concern of the design, but rather more or less an unplanned product. Böhme's concept of the ecstasies of the thing, which consists of the qualities of things, such as color, smell, form, and volume, defined the way things are present, is here seen as a medium that transmits aesthetic affordances.

Although, the aesthetics of atmosphere, or ambiances, are now pervading all realms of life, *ambience* is missing in an English translation. Atmospheres can be translated into Arabic by "*Al Ja'w*" - "الجو" (Al-Ba'libaki, 2005), which basically refers to climatic characteristics, but *ambience* can be expressed more in the informal Egyptian dialect by a common expression used as "*Roh al makan*" - "روح المكان", referring to a place qualities, its raised impressions, sensations, perceptions, and experiences, indicating the richness of place characteristics in relation to the user's sensory experiences.

Now a days, the term « **ambience** », extracted from the French language, is introduced in the domain of architecture and urban design as a new concept aiming to re-establish the balance between the senses and their importance in constituting our daily experiences as well as the user's relation with the surrounding environment. From this perspective, Gamal Said (2010, 2013) concluded that ambiances play on both sensing and knowing. Since the renaissance time, the architecture had been under the major influence of vision sensory. The eye became the noble sense or the logic of the senses dominating the process of design. However, in the realm of perception in this multi-sensory approach, researches on the architectural and urban ambiances collected sensorial signs and sensate having all the same equal rights (Augoyard, 2004, P.21).

Furthermore, this term had become scientifically introduced in the field of architecture by CNRS mixed research unit 1563 that regroups the two research laboratories, CRESSON Laboratory "*Centre de recherche sur l'espace sonore et l'environnement urbain*", founded in 1979 at Grenoble School of Architecture and CERMA Laboratory "*Centre de recherche méthodologique d'architecture*", at Nantes School of Architecture. Thibaud (2007, P. 22) defined the term "*ambience*" by indicating the ordinary sensory experience felt when practicing places. These words helped us to change our way of thinking about the ordinary experience of urban environment. The most well-known definition of the word "*ambience*"

is that stated by Augoyard (2004, P.18), where it is described as “*the material and moral atmosphere which surrounds a place and a person*”.

In these definitions, both the physical dimension referred to as the construction as well as the environment, and the human one referred to as sensitivity, practice, and cultures, are articulated in a multidisciplinary approach used in architecture and urban design. Ambience, then, arose between people and things; it is neither objective nor subjective but it is ‘the shared reality of the perceiver and the perceived’. In turn, conception of reality impacts perception and spatial practices. Yet, architecture is not a visual art but rather a spatial art, which is best experienced in bodily sensing, through which the spatial design enters directly into one’s disposition, (Böhme, 2017).

Marc Breviglieri (2013b), perfectly described it as the «spark of feeling», translated from the French expression “*étincelle du sentir*”, which is the experience through the question of how the atmosphere spreads, reaches the context, undoing the insensible, and bringing the sensitive to the foreground. Accordingly, there is fast-growing awareness of the role of ambience in architecture, where “*Atmospheric Architectures*” means: The Aesthetics of Felt Spaces.

For illustration, when we enter a room, i.e., material environment, we can get a feeling of its character, i.e., immaterial environment, we might get a feeling of discomfort and leave the space. This is the kind of direct perception Gibson and Böhme are referring to when they note that holistic perception of the meaning or atmosphere comes first, and the separate qualities of the things are secondary or not even noticed at all. In other words; we do not need to analyze the space, its substances, and surfaces first in order to understand that the space gives us an uncomfortable feeling. Afterward, we might want to ask ourselves what made us leave and notice certain things or feelings. Maybe we realize that the color of the walls reminded us of the time when we were sick. Or that the low ceiling height made us anxious. According to this explanation, the perception and the experience are not necessarily the same for different individuals due to previous experiences. Additionally, the ability and interest to reflect on separate qualities can vary from an individual to another. Moreover, some material atmospheric aspects are conventional and depend on culture specific values as well as judgments. Therefore,

according to Norman (1988), it is important to note that as a designer, one should be able to reflect upon and be aware of the possible affordances the design might contain, in order to ensure the most appropriate user experience (Norman, 1988).

The above concepts and interpretations are the heart of this study to further explain the perceived properties of the physical environment that underlie the actions of children in a designed space. In addition, to understand how the characteristics of built environments stimulate, attract, or "provide" certain activities, because as Hughes (2009) emphasized that childhood has its own way of seeing, thinking, and feeling, and nothing is more foolish than to try to substitute ours, as adults, for them (Rousseau in 'Emile', 1979, p.63, a classic work on education, cited in Hughes, 2009). Children experience spaces in their own way which is diverse from adults. Their perception of a space is not common to adults, as they use all their senses in experiencing their places, according to their capabilities, previous experiences, and cultural background (Hughes, 2009). This experience is based upon color, sound, odor, texture, scale, movement, form, and eyelevel (Day, 2007). For children the world is one big sensory Exploratorium (Day, 2007). They don't respond to place by standing and looking at it, they interact with place through action; by using it, moving around it, observing it, and reshaping it (Matthews, 1992; Day, 2007). Children perceive their environments through a variety of environmental transactions, as a reflection of their own needs for 'being', 'doing', 'thinking', and 'feeling' simultaneously (Titman, 1994). They see places as full of meanings and are concerned with the experience and opportunities for things to do and thus they respond to places according to their potentiality (Breviglieri, 2015). They might see potential in corners that may seem useless to adults but have intrinsic qualities for them (Titman, 1994; Tovey, 2007; Chatterjee, 2005). They read the external environments as a "loosely connected collections of signifiers" (Titman, 1994). In fact, children comprehend space as a segmented place (Moore, R., 1986, Moore & Wong, 1997) and do not perceive the places as a whole, but classify them into elements, to which they could adapt their different play experiences (Titman, 1994).

This interpretation was consistent to the example illustrated by Moore, R., (1986), where he explained that the streets in the city are a space of infinite exploration. Children perceive and experience the streets through several devices, such as lampposts, fences, electrical wires, trees, retaining walls, letter boxes, bus stops, notice boards, and benches. Marc

Breviglieri (2015) in his work on children further described how impressive is the street for them, with its slopes and descents, its slippery and shiny surfaces, its unfamiliar faces and “the pasture of the strange”, the rumbling traffic flow, and the magnificent buildings huddled together. He explained that these elements are valuable for children because of the diversity of their potential activities, they offer (Breviglieri, 2015). In short, the streets create a continuous play experience for children and act as a “hub or social center” (Danic, David, Depeau, 2010).

In conclusion, this sensitive reading of the child presence in the urban spaces allows the understanding of two specific aspects of the child perception. The first, is how the child perceives the urban space as a place of play and the second, is the content of this perception, which is rather segmented and deconstructed into elements and not as a whole (Titman, 1994, p.37). Thus, Play has been interpreted with a wide range of disciplines including psychology, education, philosophy, and anthropology. In addition, these disciplines include the urban ecology, which is considered as a center of varied ambiances and a support for children’s play, as well as their body expressions. Ecological studies enhanced this understanding of how children interact with different types of environment and how the environment influences their experiences. Consequently, Moore and Young (1978) explained the importance of using the sensitive ecological approach to understand the child's space in the city, which makes it possible to associate spatial configurations, the movement of the child's body, and the perception of physical characteristics of the surrounding ambience.

For example, Moore and Young (1978, p.83) set up a ‘behavior-environment ecological framework’, to explain how children encounter everyday environments. They classified their model into three interdependent realms of experience: physiographic landscape of spaces (objects, persons, natural and built elements), the social space (human relationships and cultural values) and the inner space (physiological and psychological life of the individual). The child lives simultaneously in these three realms and the interaction between them influences the children use as well as their perception of the environment. Thus, the children's environment is generally defined as their social, cultural, and physical context (Danic, David, Depeau, 2010). In addition, free play is recognized as the product of a visual perception of the physical environment translated into children body

movements, gestures and sensory responses (Barker & Wright, 1951; Roger Hart, 1979; Robin Moore, 1986; Harry Heft, 1988; and Marketta Kytta 2002, 2003).

Therefore, children maintain a specific relationship with their environment that influences their perceptions or their actions. They operate in a world largely built by and for adults, but are able to multiply their activities and bring into play the range of their sensitive perceptions (Tuan, 1977; Moore, R., 1986; Titman, 1994). In accordance to Gibson's (1979) quote that stated "*We must perceive in order to move, but we must also move in order to perceive*".

2.11. Trialectic spatial modes and space production

The above concepts of "affordances" highlights the created gap between the produced space for children by the adults as well as the designers, the children's perceptions depending on their capabilities, cultural, experience, as well as social background, and the resulted lived space with its specific ambience adopting their needs and behaviors.

The determination of the created gap, lead to the recall of the "Space" verses "Place" explanations. According to literature, *Space* is the physical setting, in which everything occurs, while *place* is the outcome of the sensory experience and meanings that values space. Accordingly, space is the raw material for creating places. The design introduces a character to the space. When this character adheres to the minds of people, the space transcends into a 'Place'. Place is a global term which is full of meanings. Consistent to the above definitions, Agnew (1987) argued that theoretical studies on place described it differently from space, where it is the setting for social relations and linked to human capability to produce the sense of place (*ambience*) (as cited in Stout, 2008). Therefore, spaces are not only materials, volumes, colors, and heights, but also they are constructed through uses, flows, perceptions, mental associations, and systems of representation whose significance changes with time, cultures, as well as social groups (Lynch, 1960). In addition to users, who are constantly adapting to their environment, and appropriating space for one purpose either challenging or supplementing a determined function. Thus, many group of researchers whether from sociology (Goffman, 2012; Joseph, 1984), environmental psychology (Moser, 2003), geography (Bertrand, 1978), or urban planning and architecture (Lynch, 1960) highlighted possible associations between the physical environment, behavior of the users, representations of places, and social relations that take place in space.

In particular, Lynch (1960) further elaborated that "images of the environment are a result of a relation between the user and the environment. This constitutes a two-way process between the user and the environment (Lynch, 1960), where lived experiences inform the everyday practices. In accordance to previous literatures, **Heneri Lefebvre (1991)** introduced theoretical studies, based on critiques of structuralism, phenomenology, and existentialism that led to the construction of the three modes of space, which had been described as a "**trialectic of spatiality**" (Lefebvre, 1991), (1) conceived, (2) perceived, and (3) lived. These different levels of space (i.e. from very abstract to more complex) help to apprehend the space significance.

2.11. a. Conceived space

According to Lefebvre, the conceived space is the first space level, which is defined as the representations of space by conceptualizing it according to planners, architects and designers (Lefebvre, 1991). It is the space as a "mental construct or imagined space" (Elden, 2004). For Lefebvre (1991), it is described as "*tied to the relations of production and to the 'order' which those relations impose, and hence to knowledge, to signs, to codes and to frontal relations*". Furthermore Zhang (2006) explained that this level of the space, it is the abstract and the mental space, which scientists, planners, urban designers, technocratic sub dividers, and social engineers create. It is the space represented in maps, designs, institutional rules, and symbols (as cited in Harrison and Sumsion, 2014). Therefore, it is the representation of the space where the designer and the authorities identify and determine how to be used.

2.11. b. Perceived space

According to Lefebvre, the perceived space is the second space level, which is the concrete physical thing which embraces the particular locations and spatial set characteristics of each formation (Lefebvre, 1991). In addition, this level is observable and can be empirically measured, where it is the space generated and used. As Lefebvre further clarified that perceived space is the dialectical interaction between material spatial practices and the day to day interpreting of space as an accumulated form of knowledge (as cited in Dugan, 2009). More simply, perceived space is the physical/material space that is produced and reproduced through embodied routines and through the use of space. In

other word, it is the spatial practice where it is produced and reproduced through daily use of space.

In this level, it is important to highlight that the perception of the space is totally different from the perception of the designer, which gives the space its identity to the users. According to Lefebvre (1991), identity is created through the complex process of appropriation, where people create and recreate it through their interaction with space. The perception of space falls for its sensory-motor experiences, but also images that the user builds. This depends on different variables, such as emotion, availability, and meteorology, etc. (Bailly, 1981). This was coherent to Lynch (1960), who defined spatial identity as a person's ability to identify and remember a place distinctive from other places. It is also a component in forming the image of a space, where also that image promotes the identity of space (Lynch, 1960). Consequently, the perceptions or the representations then form a collectively constructed imaginary fueled by signs and inherited from culture as well as society that punctuate the everyday spaces (Bourdieu, 1986, Norman 1988, Lefebvre, 1991, Heidegger 1996).

2.11. c. Lived space

It is the third level of space pioneering the development of the trialectic of spatiality and the production of space. It is directly produced and experienced as images as well as symbols formed by everyday life of users (Lefebvre, 1991). Accordingly, Zhang (2006) explained that lived spaces emerge as a result of people using the space to perform the necessities of daily life; therefore, it is subjective. In addition, it is a directly experienced social space which involves "more or less coherent systems of non-verbal symbols and signs". Therefore, it is the result of the relation between conceived and perceived space levels and results in adding a specific ambience as well as sense to the space (as cited in Harrison and Sumsion, 2014). Based on the users' different perceptions, they unintentionally undergo activities different from the planned. The users, unconsciously, modify or adapt space according to their needs and their background understandings. As further clarified by Heidegger (1996), in the theory of "**Phenomenology**", consciousness is not separate from the world view but is a formation of historically lived experience (as cited in Laverty, 2003). Theoretically, a person's background includes what a culture provides from birth and is handed down, presenting ways of understanding the world

(Heidegger, 1996; Norman 1988). Through this understanding, Heidegger believed that people and the world are intimately related in cultural, social, and historical contexts (Bourdieu, 1986, Norman 1988, Lefebvre, 1991, Heidegger 1996). Moreover, Heidegger claimed that nothing can be encountered without reference to a person's background understanding (Norman 1988).

This was consistent with Bourdieu (1986), who introduced the term “**Habitus**” for describing the way to express the norms and the common social ideas that generate practices (Bourdieu, 1986). Bourdieu also explained the concept of cultural capital that refers to the collection of symbolic elements and are acquired by being part of a specific social class. This concept represents the collection of non-economic forces such as family background, social class, and education, etc. (Bourdieu, 1986). Thus, meanings is found since world existence while reconstructing this world is based on our own background, experiences, social, and cultural factors.

Social and cultural factors influence the experiences of place and determine our activities in it. In addition, people assign meanings to place based on their experiences of social dynamics and they also derive meaning from it based on the intentions of its producers. Consequently, the ambience and the sense of a space changes according to the way of being in it and the way of using it (Lefebvre, 1991, Thibaud, 2007, Bohme, 2017). Hence, the physical environment is influenced by and reflects society and culture (Samareh & Terzidis, 2002). Therefore, Lefebvre concluded that lived space is never empty, it is always embodied with meanings. Lefebvre further highlighted that lived space is a social product, where space does not exist in itself. However, it is produced and reproduced by the individuals who enter into relationships with each other through different practices and activities. It is a result of sets of relations produced and reproduced by individuals and their interests (Lefebvre, 1991, Molotch, 1993). In other words, the physical space becomes a lived space with a specific ambience due to practices (affordances) and imaging of space identity (perception) through social as well as cultural relations taking place in that specific space. In consequence, it is the linkage between geographic forms, built environment, symbolic meanings, and routines of life (Molotch, 1993; Ségaud, 2012). In conclusion, not all spaces can be defined as lived space that is characterized by a specific ambience, only the ones that stimulate the sensory experiences.

In the light of these theoretical studies, this produced gap, between the conceived, perceived, and lived, is the feature that makes the children differs from that expected and assigned to them (Goffman 1975 first ed., 1963). However, this gap enhances the feeling experienced by the children that the city does not belong to them and the weakness of the term “ownership”. In sociology, this can be interpreted as “deviation” which is a form of behavior that some disapprove and others like it. Deviance is the result of a transaction between a social group and individuals, that the eyes of the group, has violated the norm (Cusson, 1992 p. 380). Therefore, tensions may exist in the space produced either between who designed the space and those who use the space, or amongst those who use the space. These conflicts relate to the image of space and are associated to cultural capital (Bourdieu, 1986; Ross, 2016). Lefebvre further argued that these tensions may exist in a social space as individuals may fight about the sort of reality the space constitutes (Molotch, 1993). Thus, every society produces its own social places, which is central to the design practice. Nobody agrees to the definition of place making or ambience making. Whereas, Norman illustrated that place/ambience making is a process which is part of the design that makes places livable and meaningful (Norman 1988). Therefore, place making is important to community planning, since it provides a thorough understanding of the contemporary social dynamics of place and the people inhabiting it. Experts focused on understanding the social places as an echo to the community dynamics, where the social production of space is a reflection of the society.

Hence, this study seeks to re-frame the understanding of the levels of space and its social production in order to assist planners in place making or ambience making for children within different communities with different cultures. The spatial triad introduced by Lefebvre (1991) helps in the understanding of the production of the social spaces. It also helps in the analysis of the dynamic use of these social spaces through the afforded spatial practices and the lived experience of the users. Therefore, Lefebvre’s work supports examining the gap between developed and lived space, as he argued that space is a medium of conflict which is reflected in the different uses of space and affordances. Space is not a fixed setting for action, but “*the outcome of past actions, space is what permits fresh actions to occur, while suggesting others and prohibiting yet others*”.

2.12. Research with children and ethnography

In this multi-sensory approach for elaborating the preferred places by children, which depend mainly on the “lived experience” or the “experience in situ”, in which being in site is operational. Whereas, everyday aesthetics defines aesthetic experiences as sensory experiences of objects, events, or activities that constitute our everyday life. Everyone has different experiences with ambiences in everyday life. Yet, such thinking requires to move beyond the practical and functional aspects of everyday life and combine the “Affordance concepts” with “Aesthetic Theory of Ambience” in the sense of the “trialectic theory” of space thorough an “ethnographic approach”.

In its literal translation, the term ‘**ethnography**’ means writing about people, where it is rooted in sociology and anthropology. The anthropologist Clifford Geertz’s (1973) defined doing ‘ethnography’ as being an interpretive act of ‘thick description’. He suggested that ethnographers try to analyze people’s actions (1973: 9–10). This interpretive understanding evolves but slowly; through immersion in the lives of those we seek to understand, over a lengthy period of time and across a range of social contexts, by involving a variety of different kinds as well as levels of engagement between the researcher and his/her informants. As Flewitt (2005) further explained that ethnography allows discovering insights from the participant’s point of view rather than enforcing the researcher’s own view.

Until recently, children rarely had the opportunity to speak for themselves in the field of research and designing. Researchers had to consider children as incompetent and passive, since they had given little thought to work directly with children and, instead, they explored children’s lives through adult voices, such as parents, teachers, and professionals (Barker & Weller, 2003; Hart, 1992). However, in the 1970s, there was a shift in research concerning children. Researchers in the field of the sociology of childhood changed their vision from seeing children as objects, to viewing them as social actors. There had been an increasing interest in developing new methodological approaches for undertaking research with children and for children rather than research on children (Christensen and James, 2000; Barker & Weller, 2003, Depeau, 2010).

As in 1989, the United Nations Convention on the Rights of the Child mentioned that children have a right to participate and influence the decisions that have an effect on their

lives (Hart, 1992; Christensen & James, 2000). Since then, the recognition of children's active participation in research has significantly changed. Researchers started positioning children as experts of their own lives (Langsted, 1994), skillful communicators (Edwards et al., 1998) and meaning-makers (Carr, 2000). Likewise, Oakley (1994) further mentioned that *"the best way to defend the development of children's studies for children is to enroll them fully in the research process"* (Oakley, 1994, p.26).

Ethnography is recommended by Allison James, Chris Jenks and Alan Prout in discovering children's world (James, Jenks and Prout, 1998). As elaborated by Emond (2005) and James et al. (1998), ethnography allows understanding the ways, in which children perceive the setting around them during their engagement in it. Thus, the researcher could investigate deep into the children's world. Furthermore, James (2001) explained that it helps in giving children the ability to become research participants, shifting the focus from 'on' children to 'with' children. It gives voice to the children, in which they become active social actors with their own point of views being considered (Christensen & James, 2000). Consequently, ethnography has been used as a methodology in studies that are interested in exploring children's experience of their places (James & Prout, 1997). According to James and Prout (1990, p.8): *"Ethnography is a particularly useful methodology for the study of childhood. It allows children a more direct voice and participation in the production of sociological data than is usually possible through experimental or survey style of research"*.

Emond (2005) further described it as a methodology that "empowers children in the research process and it relies on researchers granting children their rightful position as experts" (Emond, 2005, p.136). This means that the researcher should allow developing relationships with children and accept their control of the degree, in which he/she is allowed in (Emond, 2005).

Indeed, the experience of children in the city is complicated and multi-faceted. Thus, the proposed approach to address this issue is multidisciplinary and spans several domains: geography, anthropology, psychology of child development, and psychology of the environment. Therefore, in order to fill in this spatial gap between the intended designed spaces by adults and designers for children, and the perceived as well as lived experienced spaces by children, the different perspectives of the affordances theory are to be combined

and embedded within the trialectic theory, keeping in consideration the culture, social, and previous background (Gibson, 1979, Bourdieu, 1986, Norman 1988, Lefebvre, 1991, Heidegger 1996, Bohme, 2017) for better elaborating children preferred everyday places with their spatial ambiences, everyday sensory experiences of their preferences, events, behaviors, or activities that constitute the everyday life. Thus, this study highlights the importance of children having access to play spaces in their local communities, and the importance of adults having positive attitudes towards children playing freely outside, to a wider sense of well-being. As a world that understands and supports children's play is a world that is likely to be healthier, more vital, more alive, and happier than a world without play.

In consequence, this study opens a new viewpoint in the conception of the children's spaces in the city accommodating intergenerational concept. This study is concerned with the prescriptive dimension and planning strategies that transform an ordinary urban territory into an area for play and configure a certain potential for appropriation and misappropriation into design.

Is not it recreation all about re-creating, and more particularly about (mis)appropriating objects and twisting their primary functions? (Curnier, 2015).

Chapter 3

Research Methodology

Chapter 3: Research Methodology

This chapter details the used methodological strategy. It addresses the research design, in addition to the selection and description of the participants in their different daily outdoor play settings such as the recreational social clubs, urban recreational public spaces, in front of residential units and neighborhoods. Moreover, it describes the selected sites as well as it introduces the methodological approach employed in this study, the data collection methods, and it describes the process of data analysis.

In a short brief, this chapter launches with the **research strategy** of the thesis, which relies on a “*causal comparative survey research approach*” and an “*intrinsic case study*” (Groat and Wang, 2013). This strategy helps to cross-read between different urban spaces in terms of the occurrence of children’s play behaviors, in addition to, their presence. Moreover, it aids to better understand children’s sensory experiences, their perception of their environment, and their preferences of spaces by exploring the “*Ambient envelop*” of these spaces through “*Trialictic of Space Theory and Affordances theories*”.

This chapter also describes the four selected urban spaces of the two different functional urban categories; two **residential neighborhoods** and two **recreational urban spaces**. The sites of each urban category are similar in terms of the included spatial typologies, but are very different in terms of the spatial configuration of these typologies, the spatial permeability between these spatial typologies, and the degree of openness and closure of the outer spatial boundaries of the space territory. Consequently, the four case studies are clearly different in terms of “*Ambient envelop*”, (Gamal Said, 2010).

Regarding the two case studies in Cairo, Egypt, the **residential zone in Abassia**, located in the middle of Cairo, which represents the typical Egyptian urban residential street in front of residential buildings, and **Heliopolis Sporting Club (H.S.C)**, located in the district of Heliopolis, middle north east of Cairo, which is an intergenerational private recreational urban space category, in terms of social clubs. While the case studies in Paris, France, are the eco-residential neighborhood of **Cité jardins**, Paris suburbs (92), and **Châtelet–Les Halles**, 1st district of Paris, which resembles a public intergenerational urban recreational space category.

Children are the active participants of this study, in order to clarify how they perceive and live their own place. This research focuses on "middle childhood" age group, with equal

gender distribution in all groups. This age group is concerned with children between 5 to 12 years old.

The chapter's sequence opens the scoop to the data collection which relies on an **ethnographic approach**, adopting multiple data gathering methods described as **mosaic method**, through the combination of **quantitative and qualitative techniques**. Fieldwork is conducted through **three phases** on several successive site visits and children were classified into two groups. Initially, it included **structured child-centered behavioral observations**, held with "**Group A**", to measure the occurrence of different free play types without parental interference, in the four urban spaces. These structured observations were complemented with **behavioral qualitative observations** through descriptive field notes and clarifying sketches to observe the movements of children's bodies, their motor gesture tactile during use of the different spatial configurations, and their presence. **The second and third phases** are held with the other group "**Group B**", where children are asked to participate in a perceptual cognitive skill activities, **drawings and photography**, to understand their perception of their play spaces through evaluating the perceptual cognitive development of children. **As a third phase**, the drawings and photos are a starting point for a conversation preparing for the **informal interviews**. They were held for discussing further details of the drawings, for knowing some basic information about the participants as well as their play settings that required an occasional child- led walks, and for giving a deep description of their sensory experience, degree of freedom, and the offered play opportunities from their point of view.

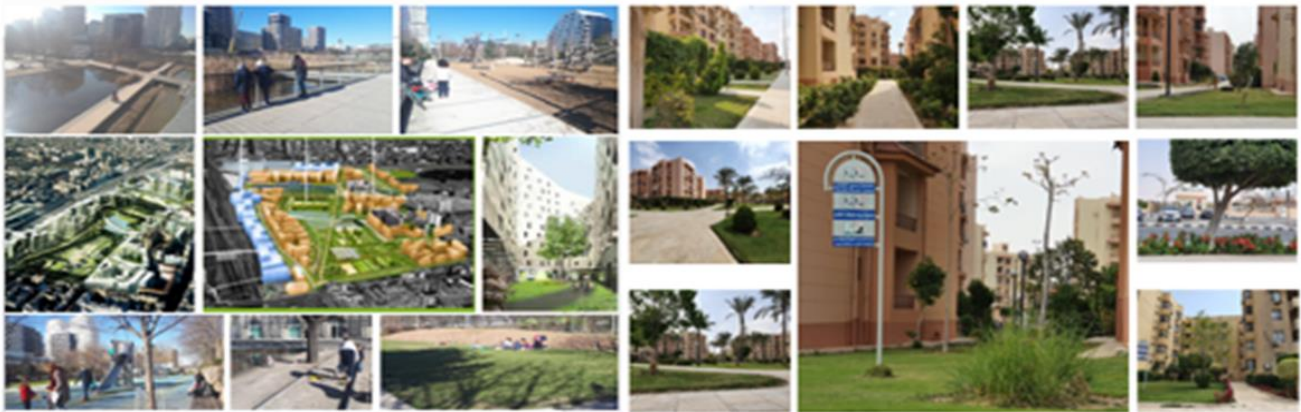
This chapter ends up with introducing the used different tactics for data analyzing of the collected data. **Statistical and qualitative analysis** are used to assess and comprehend the differences between the four urban spaces, in terms of the different outcome variable.

3.1. Research design

To empirically investigate the impact of the design and the transformation of different daily urban spaces on children's presence and their play behaviors, the **research strategy** of the thesis relied first on a "*causal comparative survey research approach*" (Groat and Wang, 2013). This strategy helps to cross-read different urban spaces, in terms of the occurrence of children's different types of cognitive and social play behaviors associated with different aspects of development, their perceptions, and their spatial preferences. In addition, to

achieve all the research objectives, the study peruse an “*intrinsic case study approach*” for better understanding children's sensible experiences, the afforded play opportunities, and their degree of freedom by exploring the different developed “*Ambient envelop*” of the different urban spaces (Gamal Said, 2010; Groat and Wang, 2013). Therefore, this study provides a thorough interpretation of the best places for children to play in, their favorite places, and the spatial arrangements, that they find most satisfying as well as enjoyable, and seems to be mostly far away from adult’s perceptions of children’s interests.

To achieve the above, several attempted field visits to 9 different urban spaces in Cairo, Egypt and Paris, France, (i.e. the eco-district of Clichy-Batignolles, Elrehab residential neighborhood, and Al-Khalifa district), (Figures 22). Four urban spaces are selected for the cross-reading and interpretational studies, in terms of the occurrence of the different types of play behaviors, children presence, and children's sensible experiences. The selected urban spaces are classified into two functional urban categories; **residential street as well as neighborhoods** and **recreational urban spaces**. Every two spaces of the same urban category are similar in terms of the included spatial typologies, but are different in terms of the spatial configuration of these typologies, the spatial porosity, and consequently, the developed “*Ambient envelop*”, (Gamal Said, 2010).



L’éco quartier de Clichy-Batignolles

The site was under construction, it encompasses a public park (Parc Martin Luther), which is surrounded by residential set contouring courts with limited access to residents only. This limits researcher’s observations to the public park only.

Elrehab residential neighborhood

It is a large-scale urban closed space, where children are not allowed to play in certain spaces, as well as most children were accompanied by nannies. According to the literature, this is considered a directed play (Fontaine, 2005). Therefore, this site is excluded, since this research objectives target randomly selected children, who freely play without adult’s directions. In accordance to Marc Breviglieri (2013a) description between a playful cities verses a guarantee city.



El Khalifa residential district According to the new governmental movement of quarter design modifications, this quarter is recently being renewed to be more touristic and zoned to workshops, markets, and bus stops near a police station. This project aims to increase security levels by controlling and excluding illegal activities, abusements, and drugs. Children are not welcoming for strangers neither their parents as they have fears of children abusements, experienced from the police or the media. In addition, the researcher found difficulty in conducting observations freely due to security reasons especially near the old Islamic historical zone.

Figures 22: Samples of different visited urban spaces during the initial field visits with the exclusion reasons

As the research is of interpretive type that seeks to understand the complex world from the point of view of those who live in and use the space (children) by exploring their lived experience of the insiders. Therefore, children are the active participants of this study to clarify how they perceive and live their own places. This research aims to observe and determine the three levels of space, thus, the spatial physical features, which is defined by the adults and the designers as the spatial practices (i.e. conceived space), the children’s mental image, which is defined as the representations of spaces (i.e. perceived space), and the space produced and modified over time by the different afforded, as well as prompted behaviors through its use (i.e. lived space) (Lefebvre, 1992). In addition, the research elaborates the impact of the lived spaces’ characteristics that are related to everyday life reflecting the social, cultural values, beliefs, and backgrounds, on the everyday use, creating specific ambient envelops.

The fact remains that the objective is to fill in the gap between the conceptual view of adult as well as designers, the children’s perception to their surrounding environments, and the produced ambiance through the resulted lived space. Thus, filling the gap may contribute in the reflections on the modalities of urban space production by positioning children and

their daily practices as a social actor of urban development, (Figure 23). This choice is in the extension work held by social geography and urban sociology, which are participating in updating the challenges posed by the relationships between children and urban spaces (Monnet, 2014, Monnet, 2018, Monnet, 2020, Thibaud, 2007, Gamal Said, 2010).

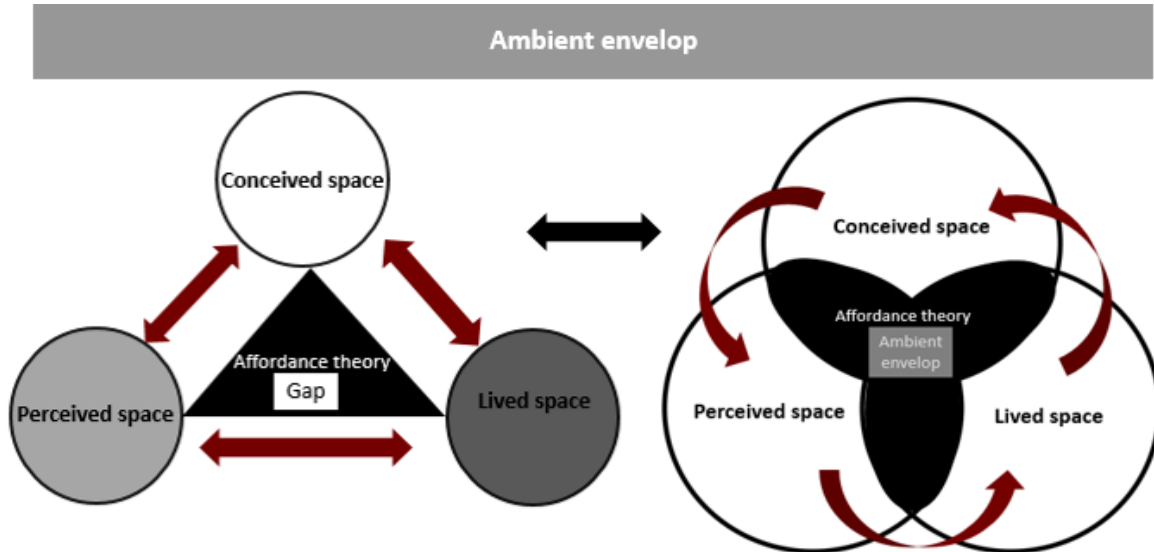


Figure 23: Integration of dialectic theory of space and affordance theory

3.2. Site Description

As previously mentioned, the study was conducted in two different functional urban categories, recreational and residential urban spaces, in Cairo, Egypt and Paris, France. Both cities are two metropolitan ones that encompass great population diversity, either from the Middle East and Arabian world, or the European world, correspondingly. Moreover, these two megacities have been chosen to carry on the fieldwork, because this study adopted “ethnographic approach”, where the researcher has to be very close to the daily life of the participants, and I, as a researcher, am living between the two countries. This part describes the four selected urban spaces of the two different functional urban categories. Regarding the two case studies in Cairo, Egypt, the **residential zone in Abassia**, which resembles a prototype of the Egyptian urban residential streets in front of residential units, and **Heliopolis Sporting Club (H.S.C)**, which resembles an intergenerational private recreational urban space category, in terms of social clubs. While the case studies in Paris, France, are the eco-residential neighborhood of **Cité jardins**, and **Châtelet Les Halles** which, resembles a public intergenerational urban recreational space category.

The study permits to assess the differences between the four urban spaces, in terms of children's play behavior and presence in relation to the spatial porosity; moreover, to investigate the occurrence of different play types, promoting physical, social and cognitive development, associated with the different spatial typologies; in addition, permits exploring associations between variety of offered play opportunities and spatial potentialities forming different spatial configurations. More specifically, the spatial potentialities that the study suggests to be focused on are: (1) Entity of activity setting, (2) Flow continuity and fluidity, (3) Diversity of ground materials, (4) Topographic Variability, (5) Presence of different urban spatial features, (Table 7).

Category I: Residential urban spaces

3.2.1. Abassia residential zone

Abassia residential zone lies in the middle of Cairo, Egypt, (Figure 24). It was designed, in the early 80s, by "Ain-Shams University association" for social housing, to be considered as a residential compound that dedicated to the University staff and their families. This residential project was launched with the aim of enhancing the social solidarity among faculty members. Residents are of middle socio-economic levels context. It offers them and their children a calm as well as secured district that is separated from the outside noises. It also offers security through the presence of a pedestrian street, proposing parking lots, and calm traffic flow that is separated away from the residents' circulation. Additionally, it introduces nature in the neighborhood and landscaping through the presence of a garden, different types of vegetation, and urban spatial features.

The neighborhood encompasses a group of 9 residential units, forming a linear street that resembles a prototype of Egyptian urban residential streets. The area of the neighborhood is about 20,000 m². The architectural style of the buildings are of the functionalist style that refers to the shoebox style of modern architecture. It is characterized by predominantly rectilinear and orthogonal shapes, with regular horizontal rows of windows. Buildings' heights are up to fourteen floors, with flat roofs, and homogeneous facades in soft colors. The neighborhood is purely residential with a concentration of commercial street vendors. It is a vibrant residential neighborhood with a medium population density, in comparison to other residential zones in Cairo. A noticeable amount of the children, belonging to the neighborhood, were observed playing. Thus, the entire residential urban space represents

the participants' territorial range (the children). However, the children's parents limit their territorial range for their children so they are not permitted to play outside the neighborhood gate, (Figure 25).

Regarding the spatial porosity, the whole neighborhood is enclosed, from one side, by a gravel retaining wall to be separated from "Ain Shams University", and from the other side, by a continuous concrete barrier to be separated from a bridge with medium traffic flow. In addition, the whole neighborhood is depressed with a slight ramp below the outer streets' level. This residential zone is designed as a flat large single residential compound zone with a single entry gate. The single gate is connected by a narrow and relatively calm serving road with three meters width which is branched from a secondary street with medium traffic. According to all the mentioned above, Lynch (1960) described these physical characteristics as barriers that are considered as strong edges. Thus, these characteristics help in achieving high spatial definition of the territory through low degree of openness, or in other words, medium degree of closure. Moreover, the residential urban space is distinguished by a good circulation network, implementing smooth flow, good interaction as well as linkages between the included different typological spaces that feature an elevated spatial permeability in between. Accordingly, this high permeability helps in the achievement of adjacent zones, and inviting access to each spatial typology, (Figure 26).

As for the included different typological spaces, the entire neighborhood is subdivided into different space typologies such as, a pedestrian pathway, narrow vital alleys "AL-HARA"- "الحارة", a garden, a depressed courtyard "AL-HOSH"- "الحوش", back axial street with parking zones, block buffers, building pockets, and an open assembly zone, (Figure 27). These spatial typologies surrounded by the buildings that are accessible to residents, with no private access code. Thus, it could be considered as a semi-public/ private urban residential district. Each building is buffered by concrete tiles, considered as semi-private defined territory. Moreover, the semi-public back linear street is well-defined by a distinct interlocking tiles covering, which is branched to the semi-private multiple narrow passages between buildings attached to the main pedestrian path that are all well-defined by their distinct concrete paving to connect between the entry point and different spatial typologies. This back street is attached to the bridge barrier and it is divided by parking island into two

direction lanes with relatively calm traffic, about six meters wide, each. While, the main pedestrian path, is attached to the gravel retaining wall, it is about four meters wide and connected to the multiple narrow passages between buildings which are only for pedestrian's circulation. Forming a transition fabric from the outer public streets to semi-public/private zones in the neighborhood and giving access to the buildings' buffers as well as the rest different typologies.

In general, the design of the neighborhood, as whole, features a variety of ground materials. In addition, there is noticeable topographical variability, as flights of stairs, curbs, climbable gravel retaining wall, ramp, concrete manhole elevated bases, and brick parapets. There is a large amount of vegetation including palm trees, flowery plants, and different types of large shading trees that offer climate moderation, (Figures 28).

While more specifically, each mentioned spatial typologies is characterized by different spatial configurations that are achieved by the set of suggested aspects of spatial potentialities, in terms of landscape design. More precisely, the above mentioned multiple spatial typologies are different in their spatial configuration, in terms of: (1) Entity of activity setting, (2) Flow continuity and fluidity, (3) Diversity of ground materials, (4) Topographic Variability, (5) The presence of different urban spatial features, (Figure 29). Accordingly, each spatial typology, in the residential zone, constitutes of single-spatial experience setting with good functional definition and clarity of single behavioral setting. The single behavioral settings are characterized by the presence of visual and tangible boundaries achieving enclosure and definition. Thus, every spatial typology is considered as a single whole well-defined activity setting with no internal separating activity routes. Therefore, every typology is characterized by random flow and fluidity within each activity setting. However, integration with adjacent zones, linkages and inviting access are present. The included spatial typologies are characterized by poor ground material diversity, where every typology is characterized by the presence of mono- texture, color, and material, such as, concrete paving for the pathways and alleys, interlocking red and grey colored tiles for the street and the courtyard, grass mixed with sand-cover in the garden, pure sand-cover for the elevated open assembly zone, and concrete tiles at the locations building buffers. Moreover, there is a noticeable varying ground levels in every spatial typology. Additionally, these spatial typologies are characterized by high presence of different urban

spatial features, such as, urban seats, pergolas, flexible and loose materials e.g., tires, bricks, ladders, water hoses, unneeded home items, bottles, tanks, as well as wooden boxes left from the commercial street vendors, and different types of vegetation, including shrubs, flowery plants, palm trees, and large shading trees, providing relatively large shaded areas, in addition to the high rise buildings that provide large outdoor shaded areas enhancing moderate climate.

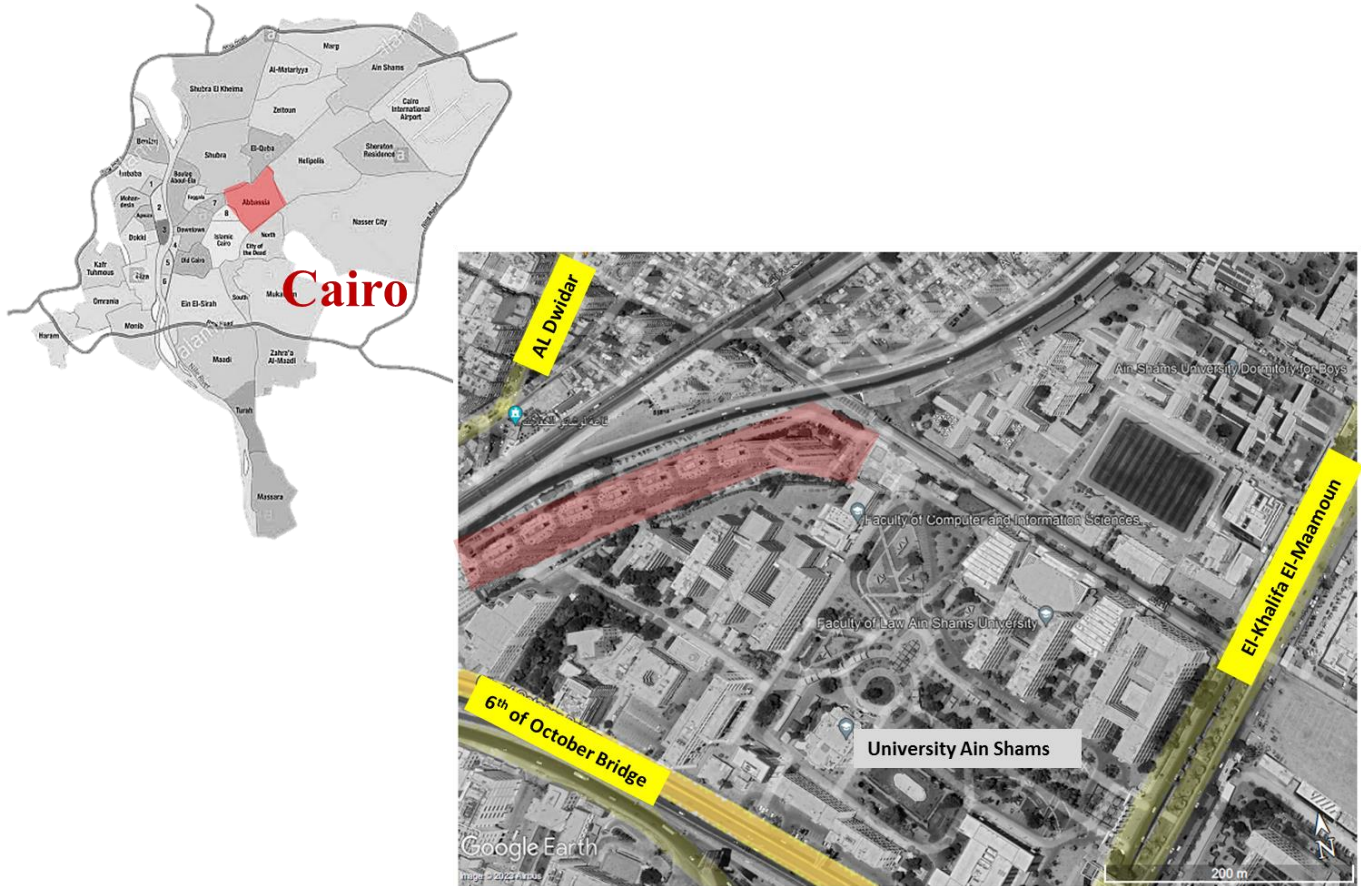


Figure 24: Abassia neighborhood highlighted on Cairo map (macro and micro scales)



Figure 25: General view of Abassia residential urban space, Cairo, Egypt

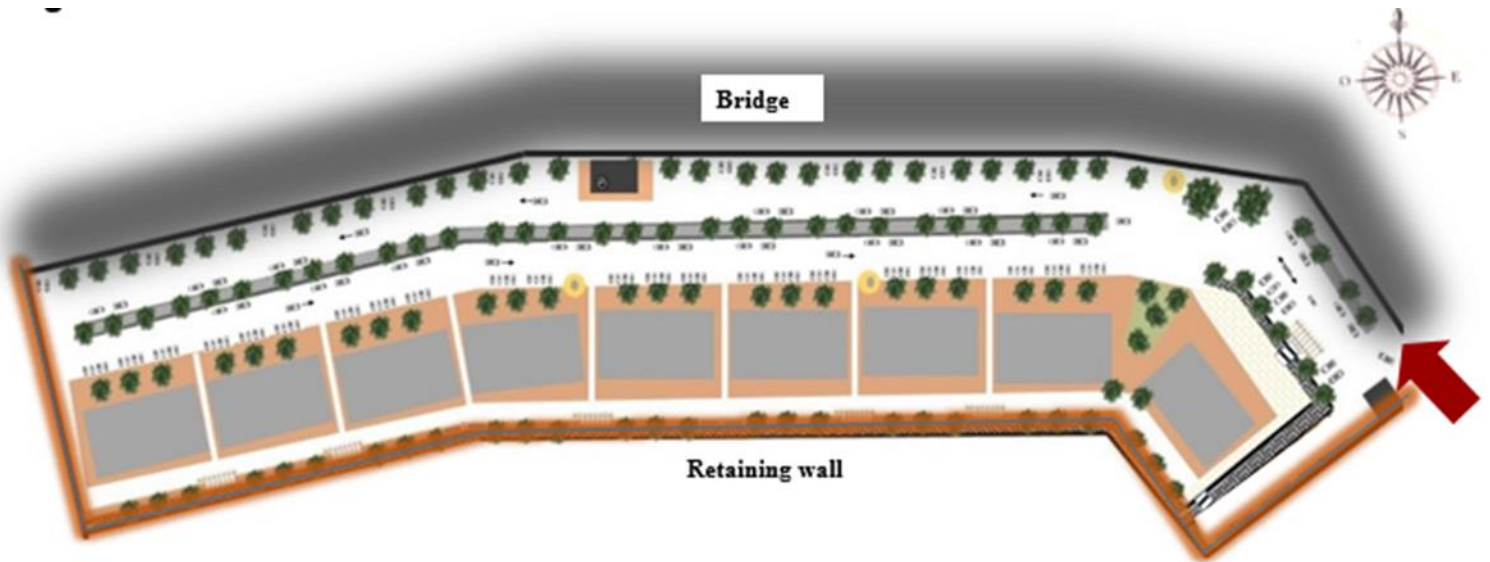


Figure 26: Layout of Abassia residential urban space, Cairo, Egypt

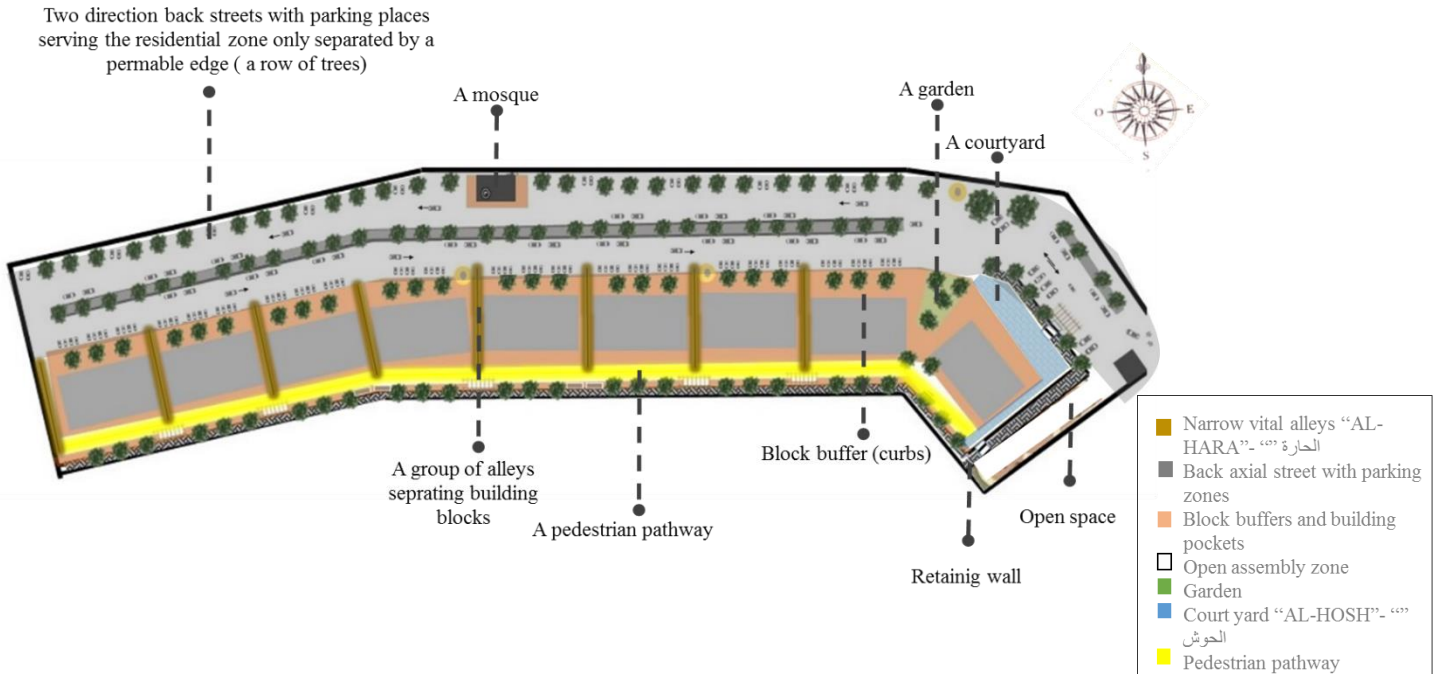


Figure 27: Different spatial typologies encompassed in Abassia residential urban space, Cairo, Egypt



Figure 28: General view of the different typologies encompassed in Abassia residential urban space, Cairo, Egypt

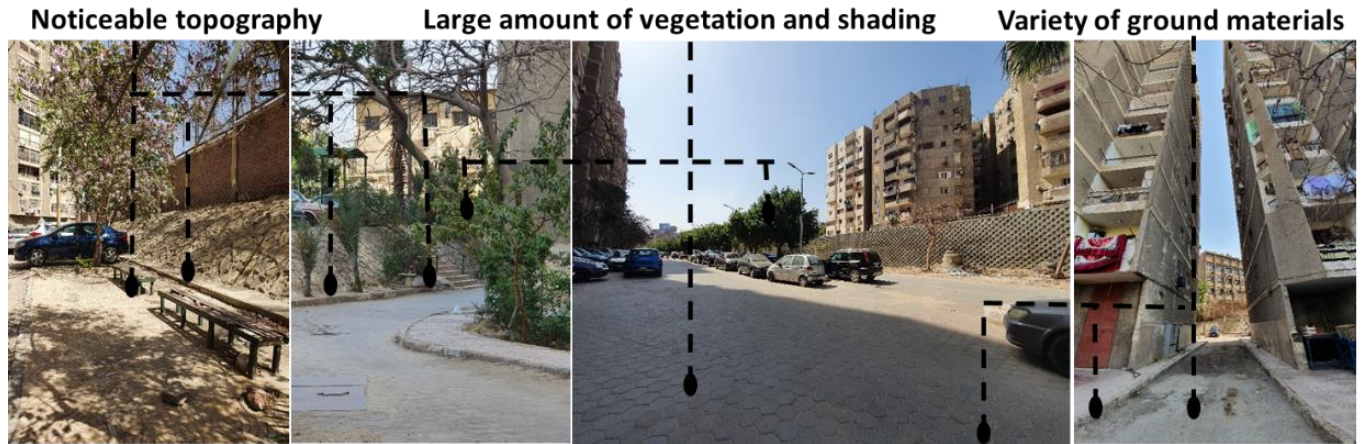


Figure 29: General design features of Abassia neighborhood, Cairo, Egypt

In fact, the spatial morphology of each of the above included spatial typologies vary due to the role of the different physical aspects and the functional qualities that are elaborated in terms of the suggested spatial potentialities. Thus, same spatial typology in different urban spaces may be present, but with different attributes.

In Abassia residential zone, the “**Garden**” is spatial defined visually by its different ground materials cover, grass and sand, and tangibly defined by the surrounded short elevated shrubs that are bounded by reddish tiled covered curbs creating narrow sidewalks from all sides, achieving enclosure as well as spatial definition. The “Garden” is composed of single-spatial experience setting with good functional definition and clarity of single behavior setting. It is characterized by the absence of internal separating activity routes, leading to random flow and fluidity within the undivided setting. In addition, it has poor ground material diversity that is achieved through grass-cover mixed with sand-cover. Moreover, ground levels variety are limited, since it is a flat garden bounded by a curb. The “Garden” encompasses different urban spatial features, such as, an electricity elevated box, wooden pergola, and different types of vegetation as large amount of trees offering huge amount of shade, (Figure 30).

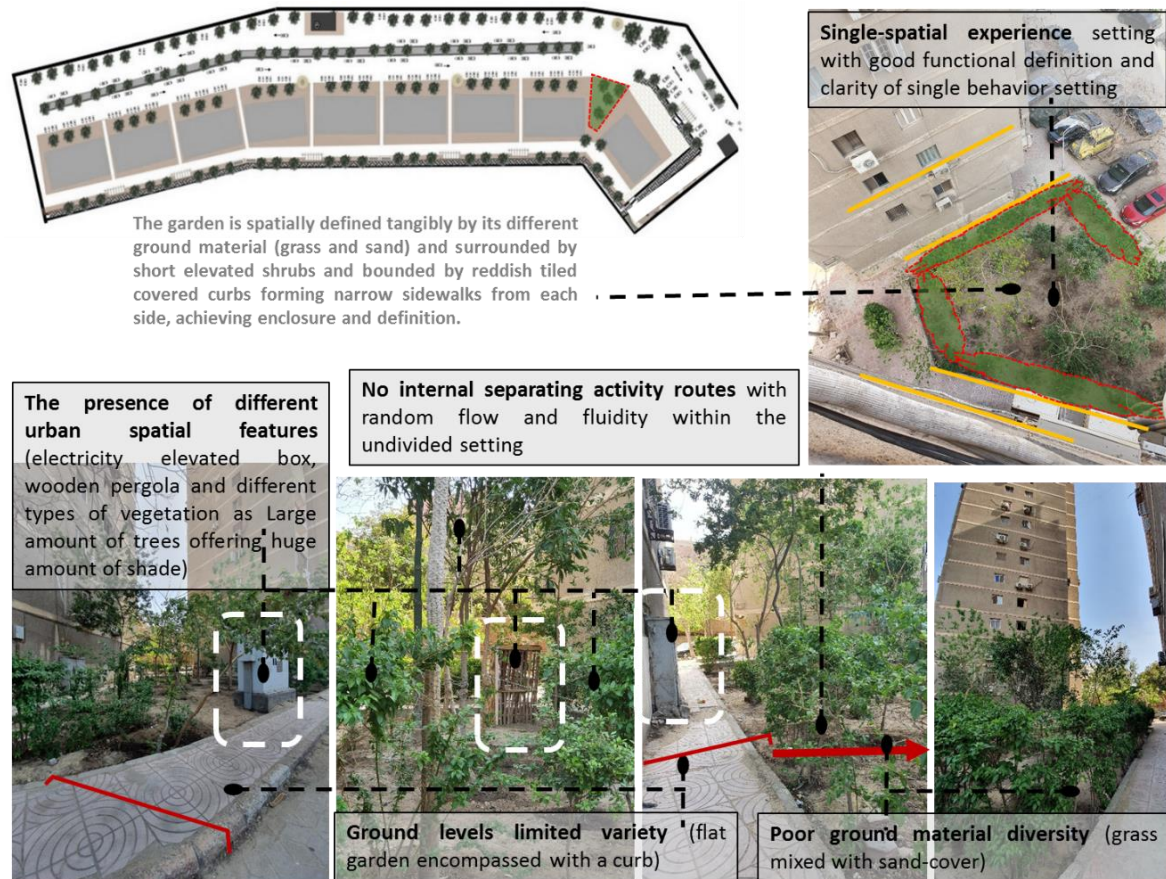


Figure 30: Morphological analysis of “Garden” as a spatial typology in terms of the suggested spatial potentialities

As for the “**Pathways and alleys**”, they encompass a pedestrian pathway that is defined from one side by the retaining wall, which is considered as a tangible continuous edge, and the residential blocks and alleys, from the other side, that are considered as permeable edge (Lynch, 1960). The pedestrian pathway is of a single space setting, with a curved form, defined by elevated retaining wall and building blocks, forked from these blocks the defined narrow single linear spatial alleys with good circulation functional definition and transition clarity. These narrow alleys « AL-Hara, الحارة » separate the residential building blocks. However, there are no internal activity routes observed, but continuity and fluidity are achieved to integrate with adjacent zones by linkages and inviting accesses. “Pathways and alleys” are characterized by poor ground cover diversity that is achieved through the mono-material and color used, e.g. concrete paving for the pathways and alleys and reddish concrete tiles at sidewalks of the building buffers. In general, these transition lines are flat, however, parapets and elevated manholes are noticed. The main pedestrian pathway is

bounded with sloped retaining wall and steps, while the alleys are bounded by curbs defining circulation. Moreover, different urban spatial features are present through different types of vegetation, urban seats, pergolas, and posts, (Figure 31).

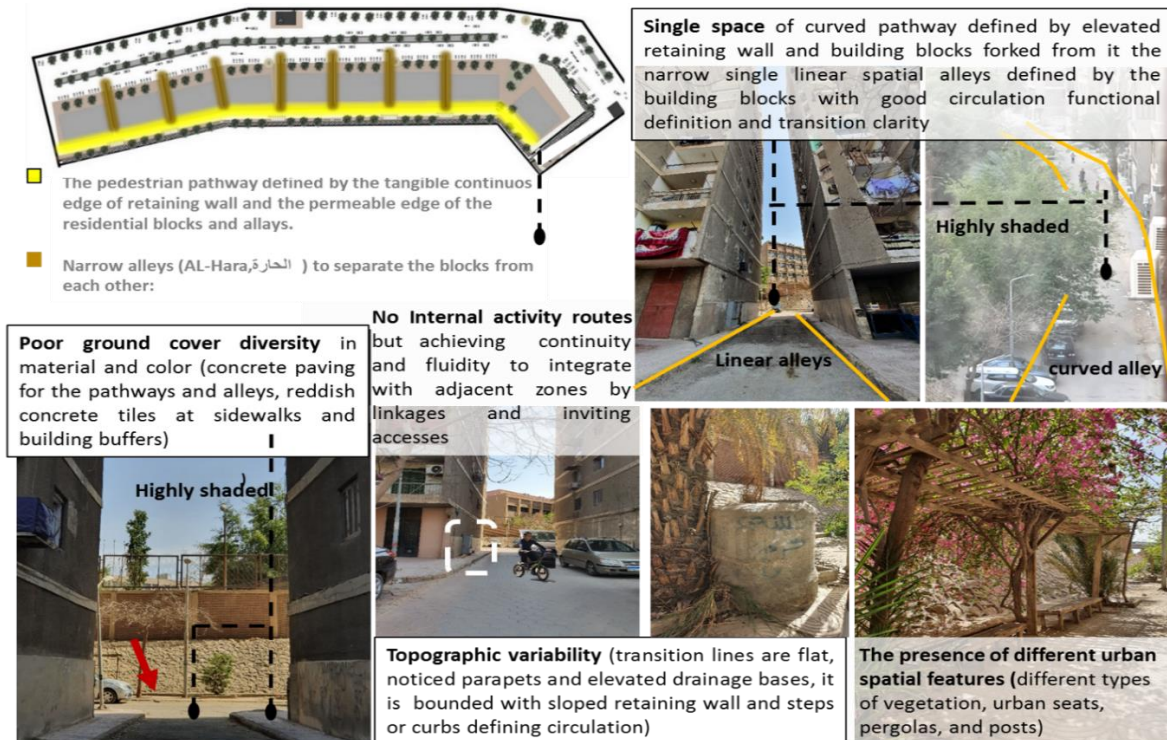


Figure 31: Morphological analysis of “Pathways” as a spatial typology in terms of the suggested spatial potentialities

Concerning the “**Assembly zone**”, it is defined by tangible boundaries such as an elevated parapet, separating the neighborhood from the university, and a security kiosk, on-looking the main entering gate. While it is defined visually by its elevated level achieved by the stair flight and the retaining wall overlooking the courtyard (Lynch, 1960). These visual and tangible boundaries achieve a sense of enclosure and isolation. The “Assembly zone” is composed of single-spatial experience setting with good functional definition and clarity of a single behavior setting. There are no internal separating activity routes are observed, leading to random flow and fluidity in the undivided setting. It is only covered with sand-cover material that achieve poor ground material diversity. It is a flat elevated open space that is characterized by limited ground levels variability. It encompass different urban spatial features, for example, different types of vegetation as shrubs and large trees offering huge amount of shade and moderate climate, (Figure 32).



Figure 32: Morphological analysis of “Assembly zone” as a spatial typology in terms of the suggested spatial potentialities

Regarding the “**Courtyard**”, it is defined by its specific ground material, interlocking tiles, and its depressed level, from the axial back street. It is enclosed with a retaining wall and a building. It is, also, composed of single L-shaped spatial experience setting with good functional definition and clarity of single behavior setting. The “Courtyard”, constitutes of no internal separating activity routes, leading to random flow and fluidity within the undivided setting. It is characterized by poor ground material diversity, where only red and grey colored interlocking tiles are noticed, while the building buffer sidewalk is covered with reddish concrete tiles. Moreover, it is characterized by topographic variability, since it is a depressed courtyard, in addition to the parapets, elevated manholes, sloped retaining wall, stair flights, and curbs are noticed. The “Courtyard” encompasses different urban spatial features, such as different types of vegetation, urban seats, pergolas, post, and flexible loose materials, (Figure 33).

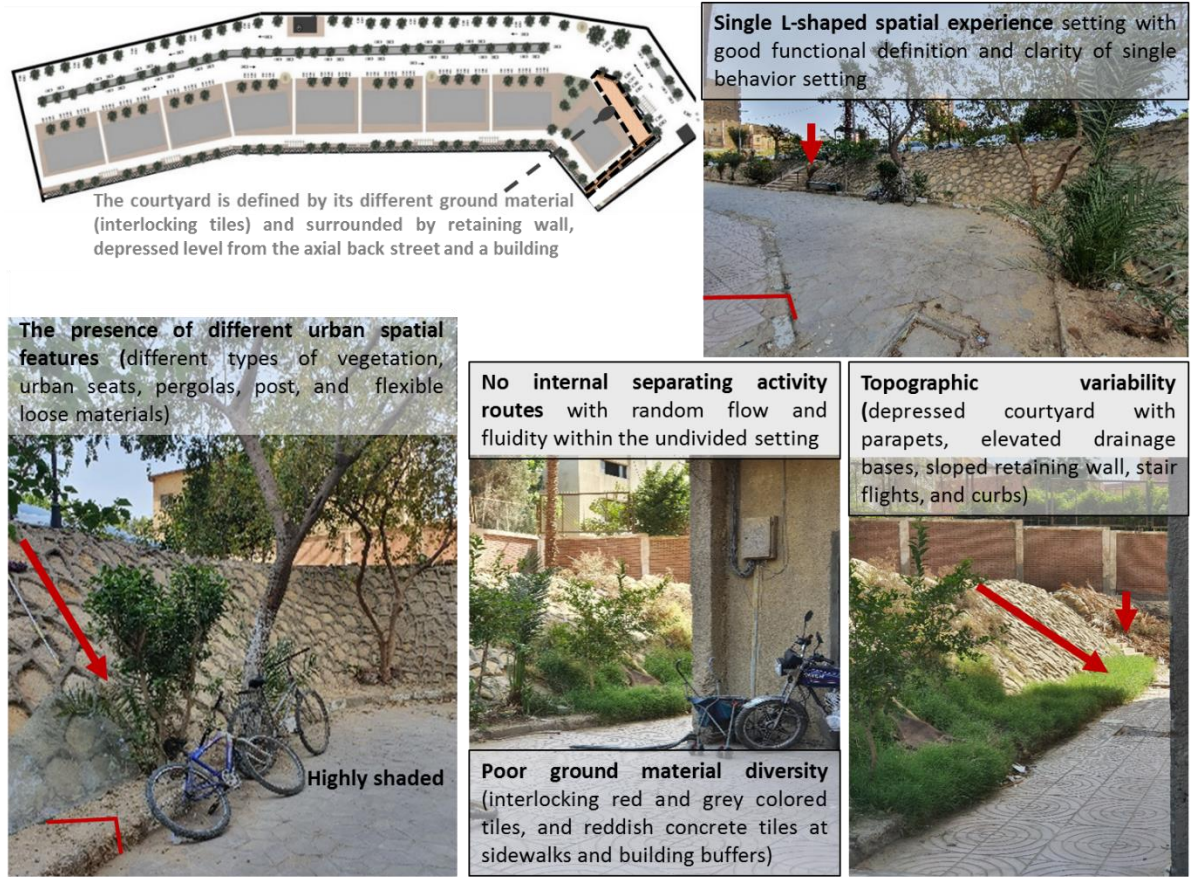


Figure 33: Morphological analysis of “Courtyard” as a spatial typology in terms of the suggested spatial potentialities

The “**Back street and parking zone**” are attached to the bridge barrier. The back street is divided by under-tree parking island with sets of tree rows that are considered as a permeable edge, into two direction lanes about six meters wide each, with relatively calm traffic. The back street and parking zones encompass multiple separated activity settings, composed of two direction lanes, an island, branched parking pockets, side parking lanes, and a mosque square, with good circulation, functional definition, and transition clarity. However, internal activity routes are absent, but continuity and fluidity are achieved through linear as well as parallel separation leading to integration with adjacent zones, linkages, and inviting accesses. They are characterized by poor ground material diversity. They are covered by red and grey colored interlocking tiles that are bounded by the reddish concrete tiles at the sidewalks of building buffers. In addition, topographic variability is achieved through the slope of the street entrance, the mid-island curb, parapets, elevated manholes, and the bridge barrier high parapet bounding the street. The “Back street and

parking zone” encompass different urban spatial features, such as different types of vegetation, urban seats, posts, and flexible loose materials, (Figure 34).



Figure 34: Morphological analysis of “Back street and parking zones” as a spatial typology in terms of the suggested spatial potentialities

In Abassia residential zone, the “**Building block buffers and pockets**” act as looped belts surrounding each building. They are defined by their different material, elevation, and the building over headed cantilevers. The pockets act as recessed shelters, or storage places, or private car parking places. The “Building block buffers and pockets” are composed of single-spatial experience settings with good functional definition and clarity. There are no internal separating activity routes that are observed, leading to random flow and fluidity within the undivided settings. They are characterized by poor ground material diversity where the pockets are cement covered, while building buffers are covered by reddish concrete tiles. Moreover, the ground levels are limited, since the buffers and pockets are having the same flat level that is slightly elevated than the back street level, acting as a platform. They are characterized by the high presence of different urban spatial features, such as, flexible loose materials, e.g., tires, bricks, ladders, water hoses, unneeded home

items, bottles, tanks, as well as wooden boxes left from the commercial street vendors (Figure 35).



Figure 35: Morphological analysis of “Building block buffers and pockets” as a spatial typology in terms of the suggested spatial potentialities

3.2.2. Cité jardins residential neighborhood

Cité jardins residential neighborhood is located in south west of Paris, Le Plessis Robinson (92), France, (Figure 36). The area of the neighborhood is about 60,000 m². It is considered as an eco- residential neighborhood, which encompasses nine sets of residential building clusters. Additionally, it is densely built with good integration and relatively plentiful of green areas, as well as parks. The neighborhood is purely residential with no other land use functions. Residents are of middle to upper middle socio-economical level contexts. The area is as many contemporary inner city areas in Paris rather wealthy and have few immigrants. The architectural style of the neighborhood buildings is inspired from the traditional one of Ile de France, which is known as the Haussmann French style with about

five floor buildings, with inclined roofs, shed dormers, varied as well as rich decorated facades, and homogeneous facades in soft colors.

Back to the year 2000, the old city had become obsolete with low attractive brutalism buildings, only offering social housing, which was characterized by their massive, monolithic as well as 'blocky' appearance with a rigid geometric style, and large-scale use of poured concrete. Cité jardins neighborhood was considered at that time as a forefront project providing residents with a comfortable modern home, hot water, heat, and authorizing residents grow gardens so as to increase their income. Thus in 2001, the town and the SEMPRO decided to renew this district and launch a tender that was won by atelier Xavier Bohl. The urban direction of this atelier, is to develop principles such as, a discernable and hierarchized urbanism and focusing on landscaping through public as well as vegetable gardens that introduce nature in the neighborhood by introducing an ecological residential zone. The above is achieved through the presence of parks, gardens, lakes, rivers offering bridges, and fish, which promote traditional architecture. In addition, the atelier targets to promote security by offering inhabitants quietness through the presence of pedestrian streets, proposing parking lots, and traffic that is directed to the edge of the neighborhood to be separated away from the residents, and to enhance children's safety and their presence, (Figure 37).

With this renewal concepts, public gardens and river of 1 km long walk, are included inside the project of Cité jardins. The landscape of the park and the river is totally integrated to the built zones of this new Cité jardins. The new mixed-use neighborhood offers both social housing, private owner, and public amenities. Thus, it could be considered as a semi-public/private urban residential structure district.

Concerning the spatial porosity, the whole neighborhood of Cité jardins is elevated with few steps or a slight ramp above the outer streets' level. In addition, there are some major roads surrounding the neighborhood with medium traffic, besides, a smaller and a relatively calm serving road with three meters width, passing within the neighborhood to connect the parking lots. Most roads have zebra crossings or are controlled by lights. The entire residential neighborhood is surrounded by a wall with eight successive gates, (Figure 38). All the above mentioned characteristics achieve high spatial definition of the territory through medium degree of openness.

In fact, the design of the neighborhood, generally, features some noticeable topographical variability, such as, flights of stairs, lawns, climbable stones, ramps, bridges, and parapets. There is a large amount of vegetation including shrubs, flowery plants, and large shading trees. These shading trees provide relatively large shaded areas. Furthermore, there is a variety of ground materials, such as, concrete paving for the pathways, grass for assembly zones, and wooden studs for bridges as well as platforms, and concrete tiles at the locations building buffers, (Figure 39). More particularly, the pathway circulation network in the neighborhood is well-defined by a distinct concrete material that connect between the entry points and different sub-spaces, forming a fabric that helps the transition from the public zone to semi-public and giving access to the private buffers. Consequently, there is an elevated spatial permeability between the included different spatial typologies through smooth flow in-between, good interaction, linkage within adjacent zones, and inviting access to each that helps in implementing good circulation network in the whole neighborhood, (Figure 40).

Moreover, most of building clusters encompass different spatial typologies such as, pedestrian pathways, open gardens, courtyards, back axial serving street connecting parking lots, private block buffers, and open public assembly zones, (Figure 41). These spatial typologies, surrounded by the buildings, are accessible by the residents and public, while each building is surrounded by private coded buffer.

The above mentioned spatial typologies are of varying functional qualities and physical aspects creating different spatial configurations. More specifically, the multiple above mentioned spatial typologies differ in terms of spatial potentialities, thus they vary in the following: (1) Entity of activity setting, (2) Flow continuity and fluidity, (3) Diversity of ground materials, (4) Topographic Variability, (5) Presence of different urban spatial features. Each spatial typology is characterized by the presence of multiple-spatial experience settings with good functional definition and separated by multiple internal activity routes. These activity routes promote continuity flow and fluidity between the activity settings, through the presence of clear definition of activity loops as well as routes. The different typologies are characterized by ground material diversity through the variability in texture, color, and materials included in every spatial typology distinctly, for example, concrete pavements for the activity routes, water surfaces, grass as well as

wooden-chips in the greenery areas. In addition each spatial typology is characterized by varying ground levels as steps, slopes, sitting steps, stairs, parapet, cliffs, lawns, ramps, and bridges. Moreover, they encompass different urban spatial features, such as interactive features and landmarks, e.g. sculptures, urban seats, and pergolas; elements stimulating senses, such as different types of vegetation e.g. plants, shrubs, flowery plants, large shading trees providing relatively large shaded areas, waterfalls, and lakes; flexible materials and natural loose materials, e.g., wooden chips and mud. All the above suggested potentialities help in achieving a good functional definition and entity of the multi-spatial experience settings in each of the spatial typologies.

The different mentioned spatial typologies surrounded by residential buildings represent the participants' territorial range of playing. A noticeable amount of the children belonging to the neighborhood consider it as their daily outdoor play space. However, the children's parents limit their territorial range, so they are only allowed to play in the gardens in front of their residential units, but they are not permitted to play out of neighborhood gates and they are not allowed to cross the major streets alone.

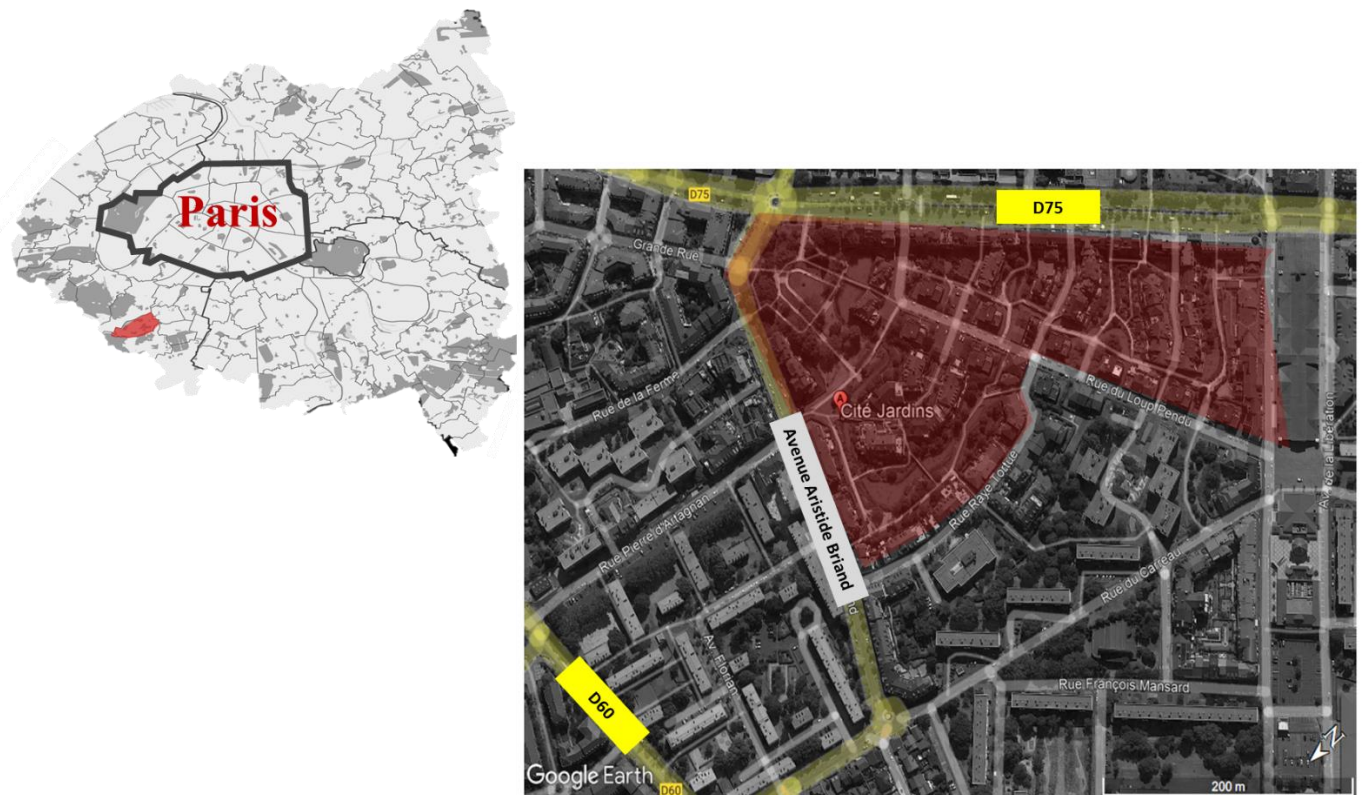


Figure 36: Cité jardins, highlighted on the south west of Paris, Le Plessis Robinson (92), France (macro and micro scales)



Figure 37: General view of Cité jardins urban residential neighborhood, Paris suburbs, France

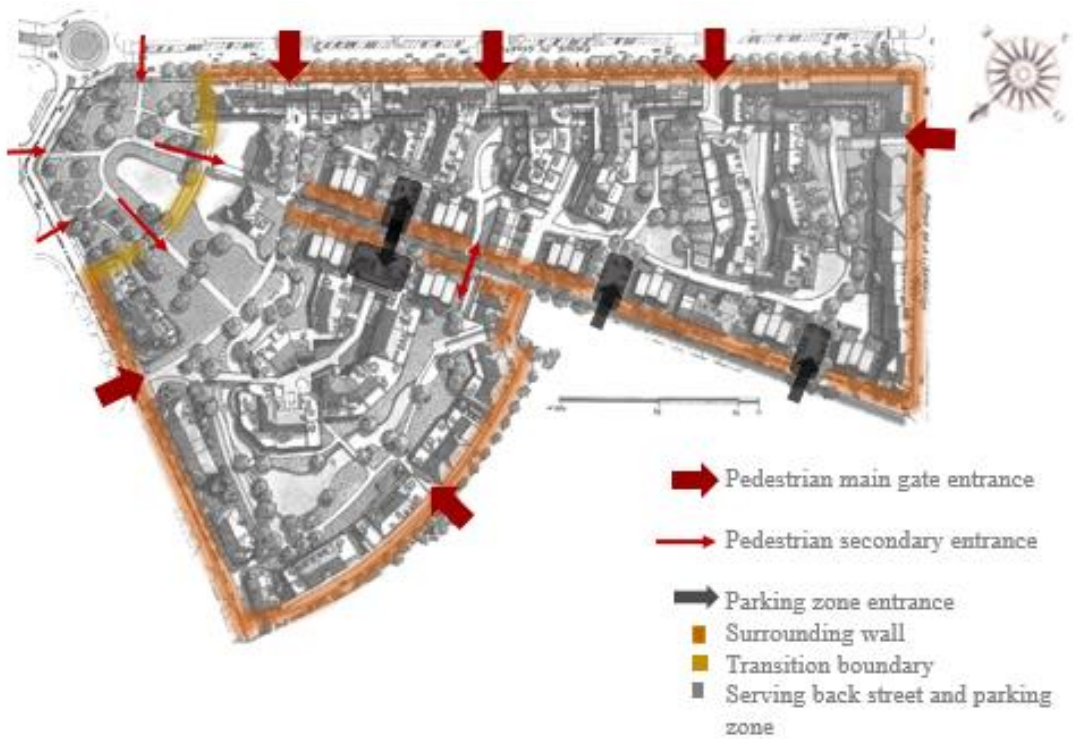


Figure 38: Layout of Cité jardins urban residential neighborhood, Paris suburbs, France

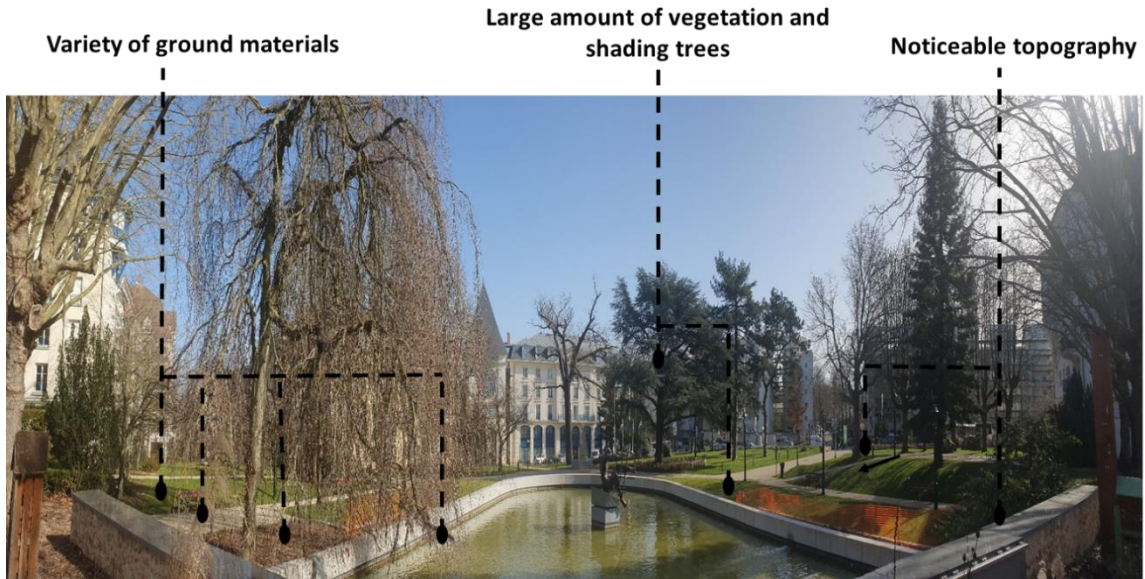


Figure 39: General design features of Cité jardins urban residential neighborhood, Paris suburbs, France



Figure 40: Layout of the different typologies encompassed in Cité jardins urban residential neighborhood, Paris suburbs, France

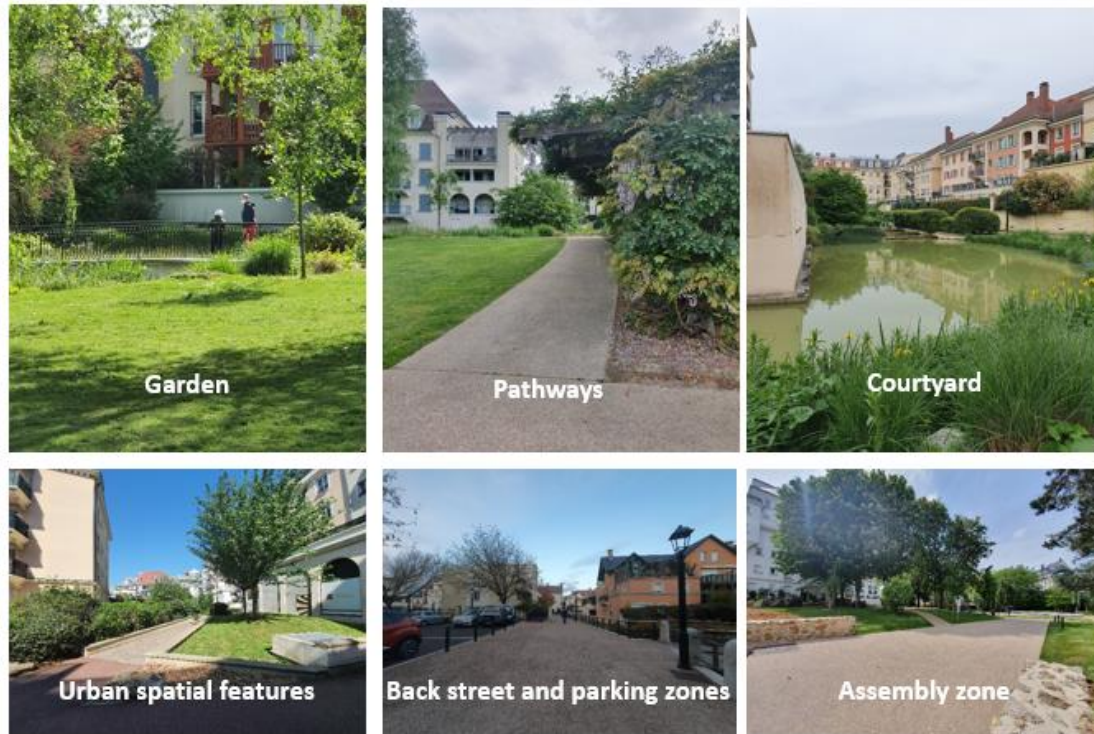


Figure 41: General view of the different typologies encompassed in Cité jardins urban residential neighborhood, Paris suburbs, France

Furthermore, through a morphological analysis of each of the included spatial typology in terms of the suggested spatial potentialities, an explanation of the role of physical aspects and the functional quality in forming different spatial configurations of each of the above spatial typologies is given. Thus, although Cité jardins neighborhood encompasses the same spatial typologies included in Abassia residential neighborhood, however they are characterized by different attributes.

The “**Garden**” is visually defined by the different ground material coverings and its elevation from the public assembly zone. It encompasses multiple separated activity settings and clear defined internal activity routes with good functional definition as well as clarity. In addition, ground cover diversity is achieved through the presence of water surface, natural grass cover, wooden chips cover, and concrete paved pathways. The “Garden” features variability in topography that is achieved through sloped lawns and elevated parapets. Moreover, different urban spatial features are present, in terms of fountains, pergolas, benches, and different types of vegetation including large amount of trees offering huge amount of shade, (Figure 42).

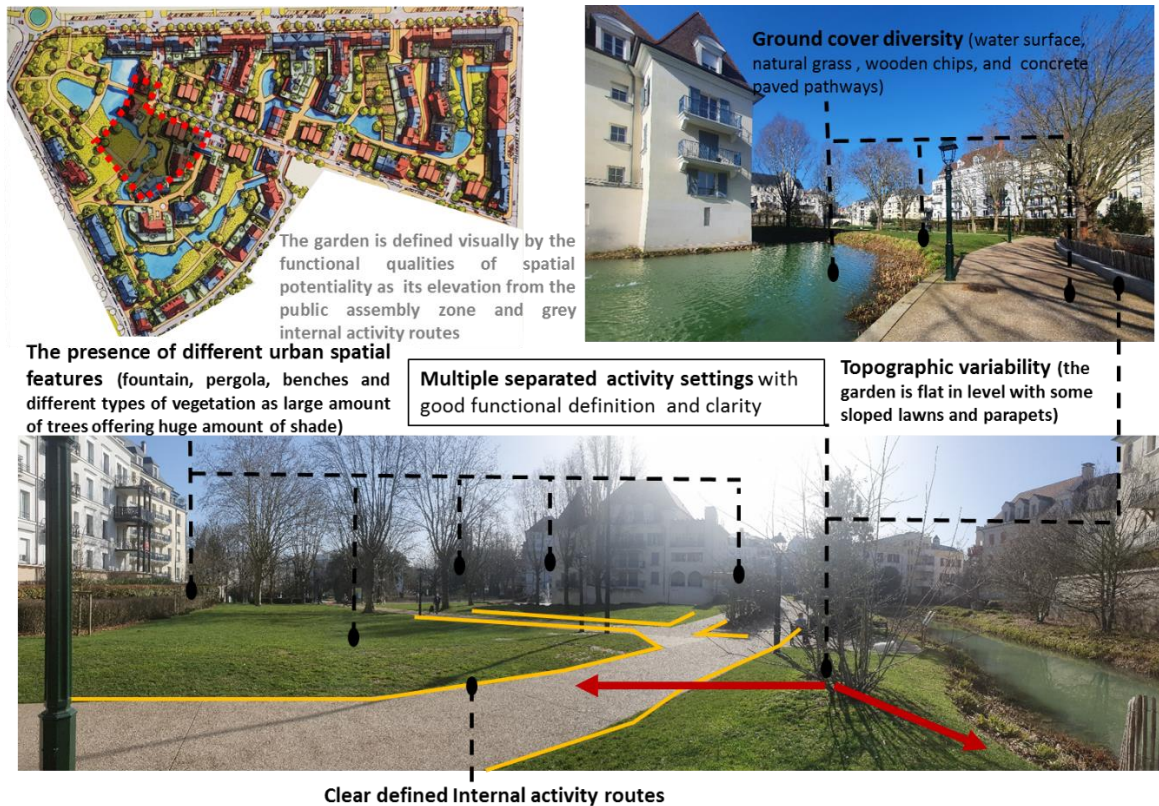


Figure 42: Morphological analysis of “Garden” as a spatial typology in terms of the suggested spatial potentialities

“**Pathways**”, in Cité jardins are pedestrian ones, some of them are visually defined by ground colors, materials, levels, and water stream edges, while other “Pathways” are tangibly defined by physical elements, such as shrubs as well as fences. In addition “Pathways” constitute of multiple parallel separated activity settings, such as, green belts and water features, bounding the transition lines with good circulation, functional definition, and transition clarity. However, there are no internal activity routes although continuity and fluidity are achieved by linear as well as parallel separation of transit lines, with their different forms (linear/curved/looped), from the different activity settings leading to integration with adjacent zones, linkages, and inviting accesses. The “Pathways” are characterized by ground cover diversity, which is achieved through material and color diversity, such as water surface, natural grass, wooden bridges, and concrete paved transit lines, with different color according to zones. Moreover, topographic variability is noticed, where most of the transition lines are flat with sloped or stepped bridges, defined by sloped lawns, studs, curbs, and parapets. These “Pathways” encompass different urban spatial

features through the presence of different types of vegetation, urban seats, pergolas, post, water features, climbable rocks, and statues, (Figure 43).



Figure 43: Morphological analysis of “Pathways” as a spatial typology in terms of the suggested spatial potentialities

As for the “**Assembly zone**” it is defined by physical boundaries such as water fall element and other elevated elements as parapet and stairs flights that identifies a clear separation public and semi-public zones. It encompasses multiple separated activity settings with good functional definition and clarity. Moreover, curved, linear, and looped well defined multi-activity routes are noticed by their different concrete material and color helping in integration with adjacent settings. It is characterized by ground cover diversity that is achieved through the use of natural grass cover, water surface, wooden chips cover, and concrete paved pathways, where these characteristics add sense of contrast to the ambience of the space. In addition to variability that is achieved through topography since the garden is flat in level with some sloped lawns, ramps, stair flights, curbs, sculpture bases, and parapets. There are, also, different urban spatial features that are obvious, such as fountains, water fall elements, posts, statues, benches, and different types of vegetation as large amount of trees offering huge amount of shade, (Figure 44).

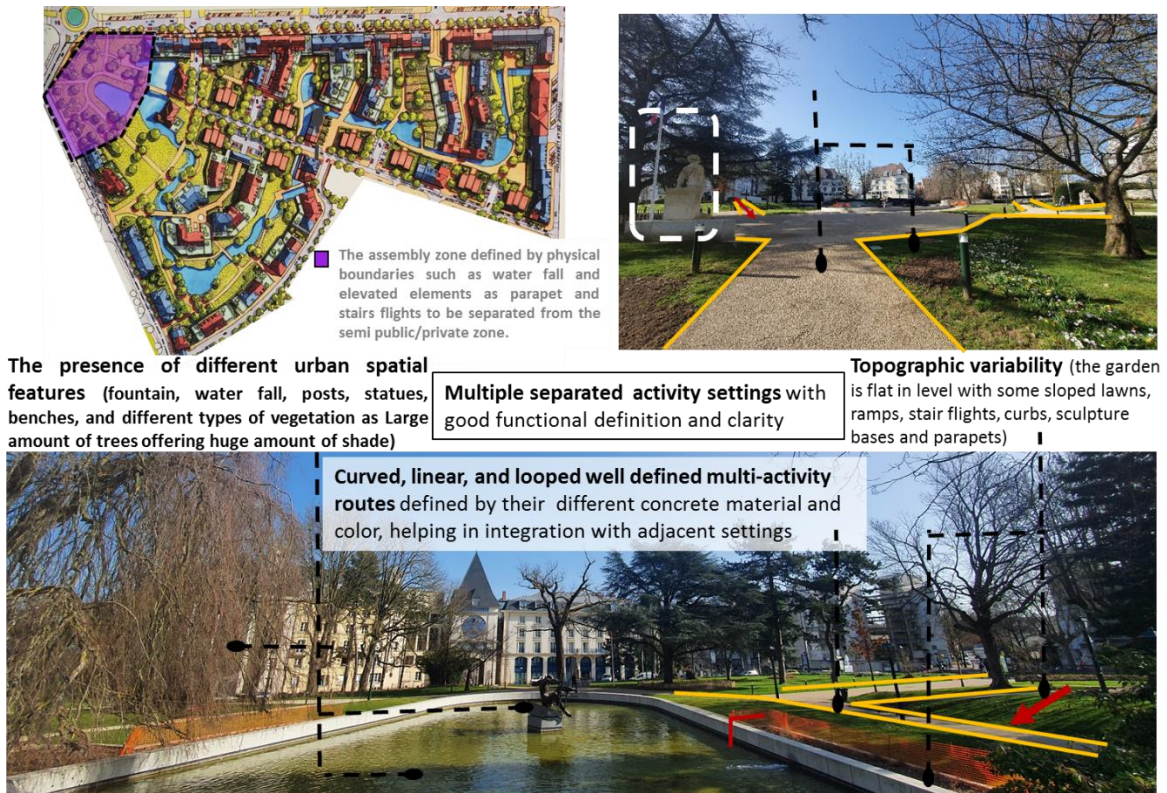


Figure 44: Morphological analysis of “Assembly zone” as a spatial typology in terms of the suggested spatial potentialities

Regarding the “**Courtyards**”, Cité jardins comprises four courtyards that are defined by surrounding building sets that include multiple separated activity settings with good functional definition and clarity, such as ponds, activity routes, green belts, and greenery areas. The activity routes vary in their form, curved, linear, and looped, they are also well defined by their different concrete material and colors helping in integration with adjacent settings achieving flow fluidity and spatial continuity. Moreover the “Courtyards” are characterized by ground cover diversity that is achieved through material and color diversity, such as water surface cover, natural grass cover, wooden stud bridges, and concrete paved activity routes with different colors, or tiled ones. In addition to the sloped or stepped bridges, studs, curbs, elevated or depressed zones as elevated islands, platforms, bases, and parapets, that achieve topographic variability. “Courtyards” are also, characterized by high presence of different urban spatial features, for example, different types of vegetation, urban seats, pergolas, posts, statues, lakes, water falls, water streams, and climbable stones, (Figure 45).



Figure 45: Morphological analysis of “Courtyards” as a spatial typology in terms of the suggested spatial potentialities

Concerning the “**Back serving street and parking zones**”, they are defined by pavement material and metallic posts. They are composed of multiple linear separated activity settings, where the streets are bounded by the pedestrian lanes, and green belts. Moreover, the streets are branched to the parking pockets and side parking lanes, with good circulation, functional definition, and transition clarity. No Internal activity routes are observed, but continuity and fluidity are achieved by linear as well as parallel separation of the street from the pedestrian lanes, the branched parking pockets, and side parking zones, leading to integration with adjacent zones, linkages and inviting access. Moreover, there is no ground material cover diversity is noticed. However, in the “Back serving street and parking zones”, pavement materials differ in colors, for example, there are red, white, and grey that are used to define different functions. The whole streets and parking zones are flat, achieving limited topographic variability. The “Back serving street and parking

zones” include different urban spatial features, such as different types of vegetation, posts, and metal sidewalk deviators, (Figure 46).



Figure 46: Morphological analysis of “Back serving street and parking zones” as a spatial typology in terms of the suggested spatial potentialities

In Cité jardins, the “**Private building buffers**” are specified for residents only and enclosed by fences with private entry code. They are confined by visual and tangible boundaries achieving sense of enclosure. They include multiple-spatial experience settings with good functional definition and clarity of behavior settings. Moreover, defined multi-activity routes are noticed to define the building main entrance. The “Private building buffers” are characterized by ground material diversity that is achieved through concrete tiles for entry passage in the front yards, while grass cover for backyards. However, the ground level variability is limited, since building buffers are flat. In addition, they encompass different urban spatial features that are accomplished through the presence of different types of vegetation as large amount of trees offering huge amount of shade that moderate climate, (Figure 47).

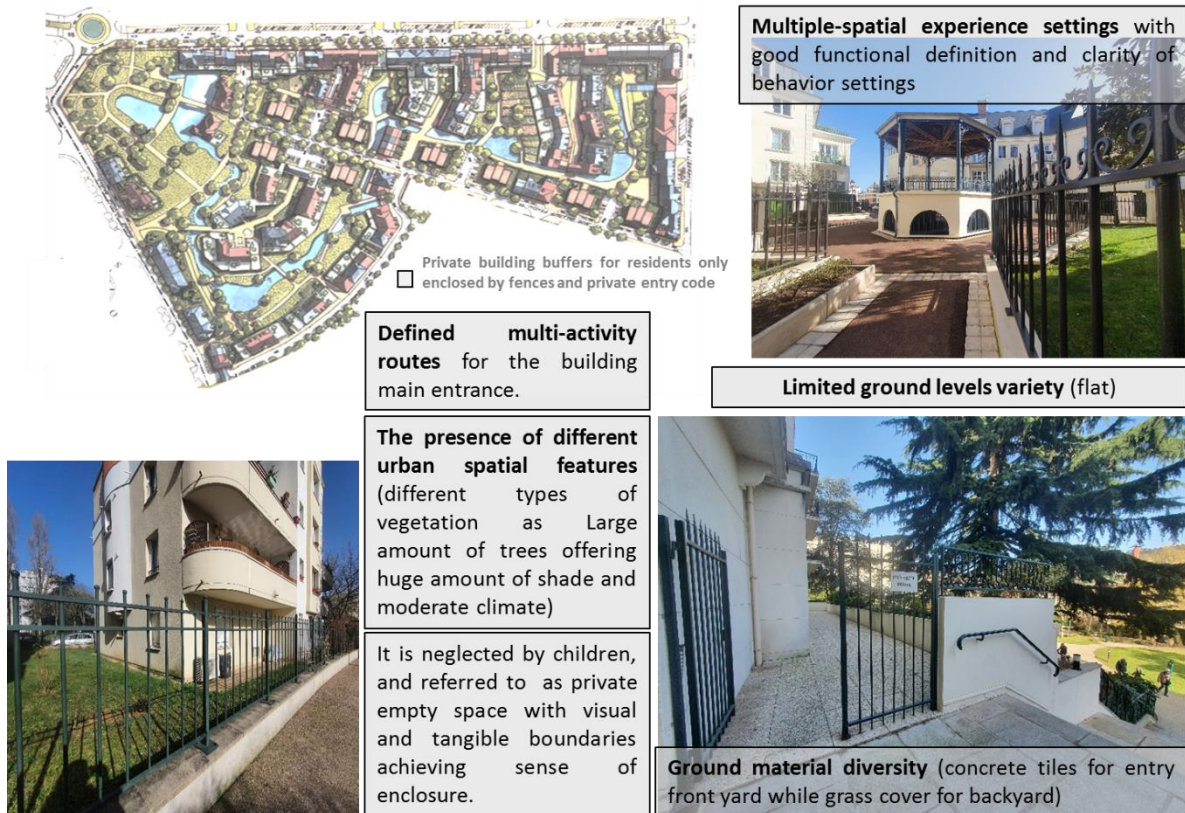


Figure 47: Morphological analysis of “Private building buffers” as a spatial typology in terms of the suggested spatial potentialities

Category II: Recreational urban spaces

3.2.3. Urban recreational private space of Heliopolis Sporting Club (H.S.C)

Recreational urban spaces, classified as one of the functional urban space categories, are considered as another daily outdoor play spaces for children. Heliopolis Sporting Club (H.S.C), a restricted membership sports and social Club, located in the affluent district of Heliopolis, middle north east of Cairo, Egypt, (Figure 48). Within its walls, the creation of a community sharing common culture and identities takes place.

In general, Social Sporting Clubs (SSCs) in Egypt are exclusive social and sporting urban intergenerational spaces that give the chance to their members to meet, play, or simply hangout. These spaces were first introduced to Egypt with the British occupation. In the late eighteenth and early nineteenth centuries, SSCs appeared as a permanent British institution for social interaction and cooperation (Panckridge, 1927; Sinha, 2001). SSC existed almost in all main colonial centers and were very essential to the structure and the

expansion of the British Empire (Mak, 2012; Tignor, 2016). SSCs were spaces to recreate the characteristic social features of their home lives in their settlements and colonies (Panckridge, 1927). They were very crucial leisure and recreational spaces. Not only they gave the British colonizer the feeling of exclusivity, but they acted as a reminder of power and colonialism for the locals (Mak, 2012). SSCs introduced British sports to the Egyptian society: such as polo, golf, cricket, squash, hockey, tennis, and Croquet. They also reflected the British landscape design and gardening as well as the style of architecture of colonial clubs (Beattie, 2005; Mak, 2012; Raafat, 2003). SSCs in British colonies encouraged certain behaviors and manners. Some club regulations were not even written, but no one was allowed to break the unwritten regulations as well as norms of club membership and behavior, as the consequences for breaking the rules were well known to everyone (Mak, 2012).

The British introduced SSC first to India during its occupation. The main members of SSCs were the army officers and senior officials. They acted as a social gathering place where they could relax and talk, in addition, as a sport venue. SSCs at that time were considered colonial islands. Consequently, membership was not allowed neither to Indians nor to Anglo-Indians (Crane, 2011; Forster, 1984). Likewise, it was the same case in Egypt as well. SSC were introduced to Egypt also with the British occupation following the same pattern (Di-Capua, 2004; Jackson, 2013; Tignor, 2016). Since the British excluded Egyptians from their colonial SSCs, they created their own Clubs. In 1907, a group of Egyptians established Al-Ahli Club, in order to be able to participate in sports.

As a result, SSCs developed into two forms in Egypt: first, colonial elite SSCs used by the elites and upper social class society; second, SSCs used by Egyptians. In the colonial SSCs, there were three categories of club members: first, the British residents and their families, who lived permanently in Egypt and were also a part of the colonial apparatus; second, the foreigners who resided in Egypt; third, the Egyptian aristocratic families; who were the smallest and most insignificant of the three types of members (Di-Capua, 2004).

After the First World War (WWI) (1914-1918), Egyptians sought independence and an end to the British occupation of Egypt. In 1952, Egypt gained its real independence and the colonial SSCs were nationalized to serve the Egyptian society. They were developed and transformed to accommodate the Egyptian culture and identity.

This study is concerned with one of the colonial SSCs in Egypt: Heliopolis Sporting Club (H.S.C). In 1905, a French Belgian industrialist: Edouard Louis Empain conceived Heliopolis suburb. Empain's architects designed Heliopolis with the intention of being a "city of luxury and leisure" for the upper-class society. It was a "garden city" isolated 10 km in the desert, north of Cairo, to accommodate the growth of Cairo's population. Heliopolis suburb recreational places were to offer residents and visitors rest and relaxation. It comprised a hotel complex, an amusement center, and other public spaces (Abd-El-Azeez, 2019). Later in 1910, a British specialist designed a racetrack and a social sporting club (H.S.C) with a golf course to increase the land value and attract more European residents (Raymond and Wood, 2007). Furthermore, it faced social and physical transformation after the British evacuation from Egypt. As time passed, the area and the number of SSCs increased, while H.S.C remained a landmark of this suburb (Sole, Telmissany, and Volait, 2005).

As for the spatial porosity, H.S.C Club is bounded by belt of trees and a wall with one main entry gate and five secondary entry gates with security to monitor member's entry only, (Figure 49). The H.S.C's members are of middle to upper middle socio-economic level contexts of nowadays, In order to reach this main entrance, there is a well-defined pathway accessed from the main street beside of the parking zone. In addition, there are some minor roads surrounding the club with dense traffic, with three meters width. All the above mentioned characteristics achieve high spatial definition of the territory through high degree of closure. Thus, it could be considered as a private or gated recreational urban space (Gamal Said, 2013).

The whole site area is approximately 70,000 m², from which 30,000m² considered as urban social spaces, while about 2000 m² is consecrated to a playground for children. The playground is a large fenced area that consists of fixed colorful equipment, composite structures, merry-go-round, climbers, seesaws, slides, and swings. In terms of play equipment design, they can be both characterized as "traditional playgrounds" rather than "contemporary playgrounds" or "adventure playgrounds" (Eriksen, 1985; Heseltine and Holborne, 1987; Susa and Benedict, 1994; Wardle, 2000). The Playground is surrounded by benches for adults to keep an eye on their children.

Moreover, the club encompasses long defined circulation pathways bounded by trees on both sides. The main circulation boulevard considered as a social pathway named by the members as “Champs-Élysées”. The club comprises a variety of social and sport facilities such as, tea garden, different terraces overlooking the club, a football field, tennis courts, multi-purpose courts, a pool complex, croquet fields, and squash courts, (Figure 50). In the center of the Club lies the Clubhouse building with a three-leveled terrace overlooking the main swimming pool with its services, (Figure 51). In addition to the availability of services such as a mosque, a gymnasium, vending booths, a bank, a supermarket, restaurants, car parking, and a light structured exhibition hall, (Figure 52).

In fact, the design of the club, generally, features a variety of ground materials, textures, and colors, such as tiled pathways, tiled social assembly zones that differ by color, water surfaces, and artificial as well as natural grass covered areas. Furthermore, there is some noticeable topographical variability such as the presence of stair flights, ramps, and parapets. Additionally, there is a large amount of vegetation including shrubs, flowery plants, palm trees, and large shading trees. These shading trees provide relatively large shaded areas that moderate climate, especially the summer times, in addition to the artificial shading. All green areas are accessible and can be used, moreover there are large zones covered with artificial grass, (Figure 53).

However, H.S.C is subdivided into a number of segmented functional spaces considered as different spatial typologies encompassing the above mentioned services and facilities that are highly confined with fences and tangible boundaries, promoting the creation of a “Mosaic ambiance” through functional islands, as explained by Gamal Said (2013). In consequence, these closed and limited spatial typologies feature low spatial permeability in-between. In addition to, the pathways are well-defined by a distinct material and colors, connecting between the entry points and the different spatial typology islands through linear flow, linkage within adjacent zones, and inviting access.

Thus, the encompassed spatial typologies are classified into, allays and circulation pathways or boulevards, open gardens, a playground, and open assembly zones, (Figure 54). The above mentioned spatial typologies are of varying characteristics distinctly, spatial configurations, and accordingly spatial potentialities. More specifically, these spatial typologies differ in terms of (1) Entity of activity setting, (2) Flow continuity and

fluidity, (3) Diversity of ground materials, (4) Topographic Variability, (5) The presence of different urban spatial features. For example some of the above mentioned spatial typology such as, the playground, pathways, the fields of croquet, and the squash assembly zones, are characterized by the presence of multiple-spatial experience settings with good functional definition, separated by multiple internal activity routes. These activity routes promote continuity of flow and fluidity between the activity settings, through the presence of clear definition of the activity loops or routes. Unlike other assembly zones, that are characterized by multiple-spatial experience settings with good functional definition, but with no included internal separating activity routes within the visual divided settings. On the contrary, the garden and some assembly zones, are characterized by single-spatial experience setting with good functional definition with no internal separating activity routes within the single undivided setting. However, all the spatial typologies are characterized by ground material diversity through the variability in textures, colors, and materials. They are, also characterized by variability in ground levels through the presence of steps, slopes, sitting steps, parapets, and ramps. Moreover, the presence of different urban spatial features is noticed through the presence of interactive features, elements stimulating senses, different types of vegetation in each of the above typology providing relatively large shaded areas, waterfalls, natural loose materials e.g. mud, urban seats and pergolas.

The presence of children in all mentioned typologies is highly noticed, as the parents do limit their children's territorial range within the club, and they leave their children play freely and move within the different typologies bounded by the club wall, relying on the security and the convergent surrounding community. In addition, according to the club design and regulations, it is an intergeneration recreational space, that is convenient to all ages as well as handicapped. Nevertheless, according to the club's regulations, the club house and the main Croquet field are exclusive social areas, for members above 18 years old only and children are not allowed. Thus, children are deprived from the entry of certain spaces in the club.

Moreover, since, the access to clubs in Cairo such as H.S.C, is strictly restricted to members and their children, it should be noted that these clubs tend to be the main destination for the practice of sports as well as for recreational and social activities. Therefore, they are

visited quite frequently. In fact, it was confirmed by parents of children, as members, that they visit the club from 2 to 3 times a week when school is in session to almost every day during school vacations. Accordingly, the club is considered by the children, the recreational place, where they have most frequent and regular access to, regardless to the playgrounds that may exist in their schools. It appears then reasonable to assume that the selected club for the study have an important role in the lives of the children sampled for data collection, since it acts as daily outdoor play space for them.

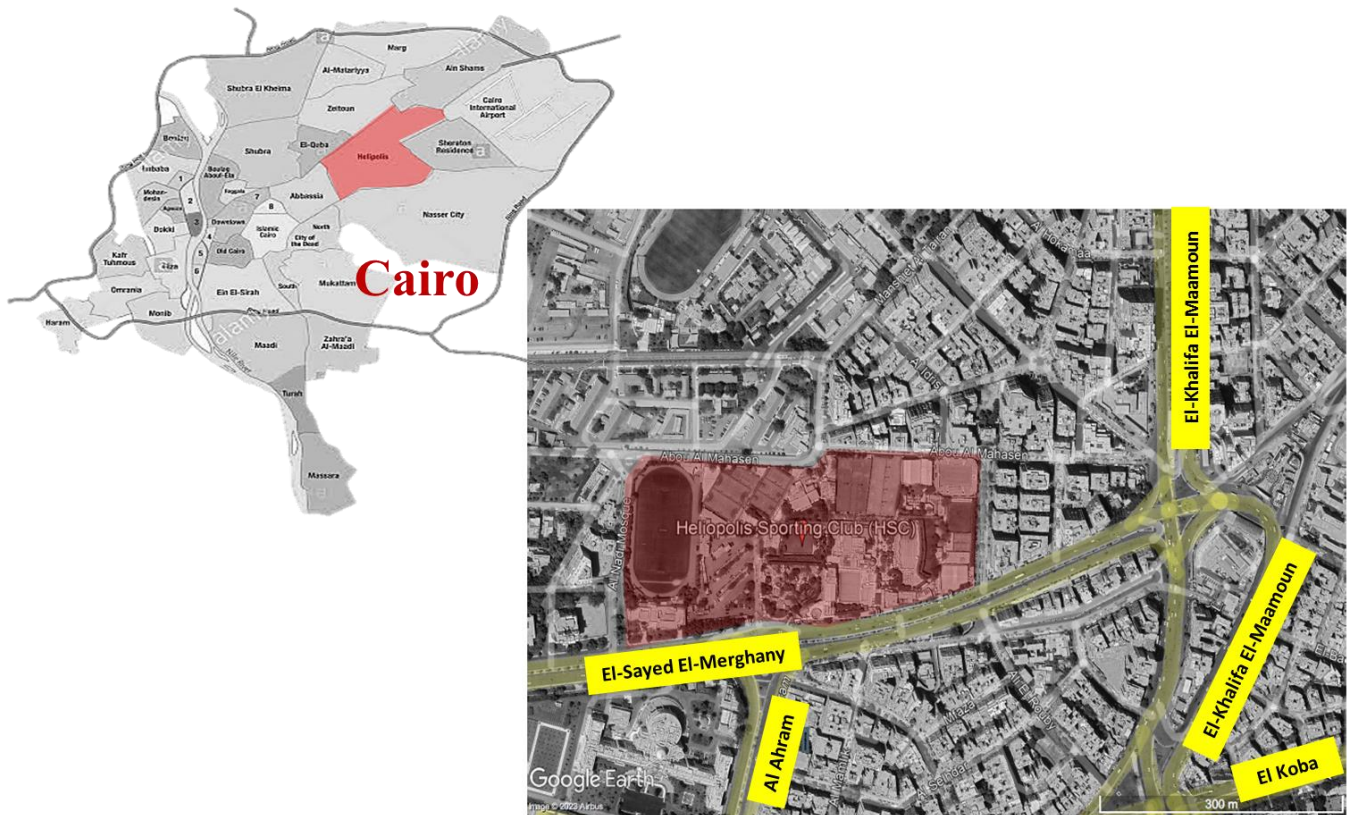


Figure 48: H.S.C, located in the highlighted district of Heliopolis, middle north east of Cairo, Egypt (macro and micro scales)

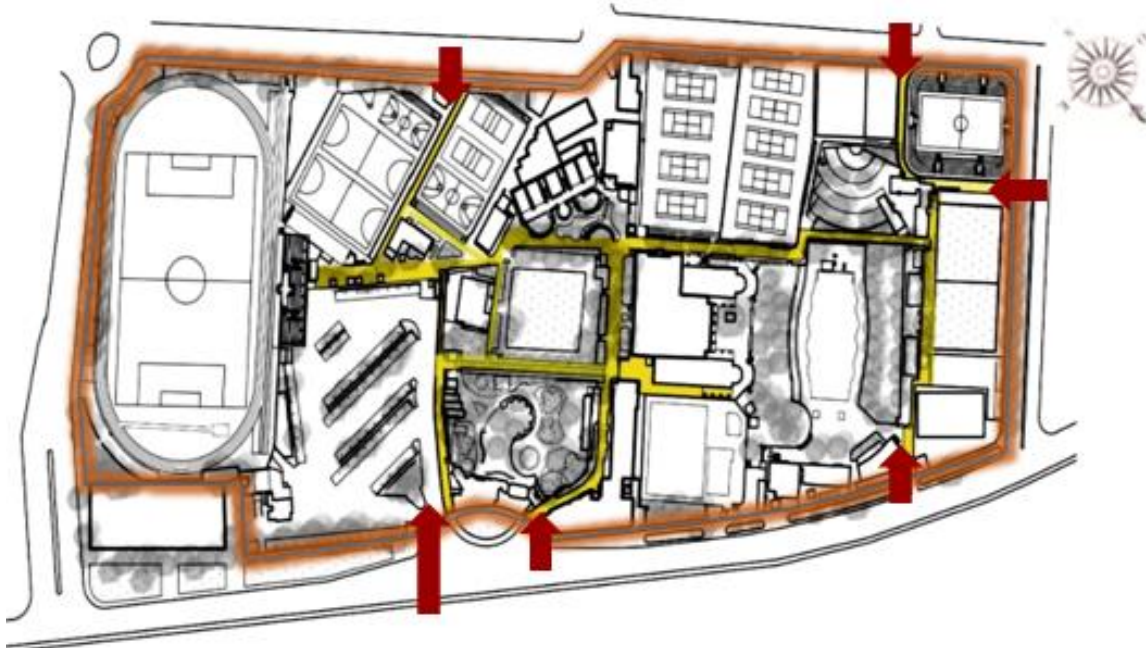


Figure 49: Layout of H.S.C urban recreational intergenerational urban space, Cairo, Egypt



Figure 50: Zoning layout of H.S.C, Cairo, Egypt



Figure 51: General view of H.S.C and the clubhouse building, Cairo, Egypt

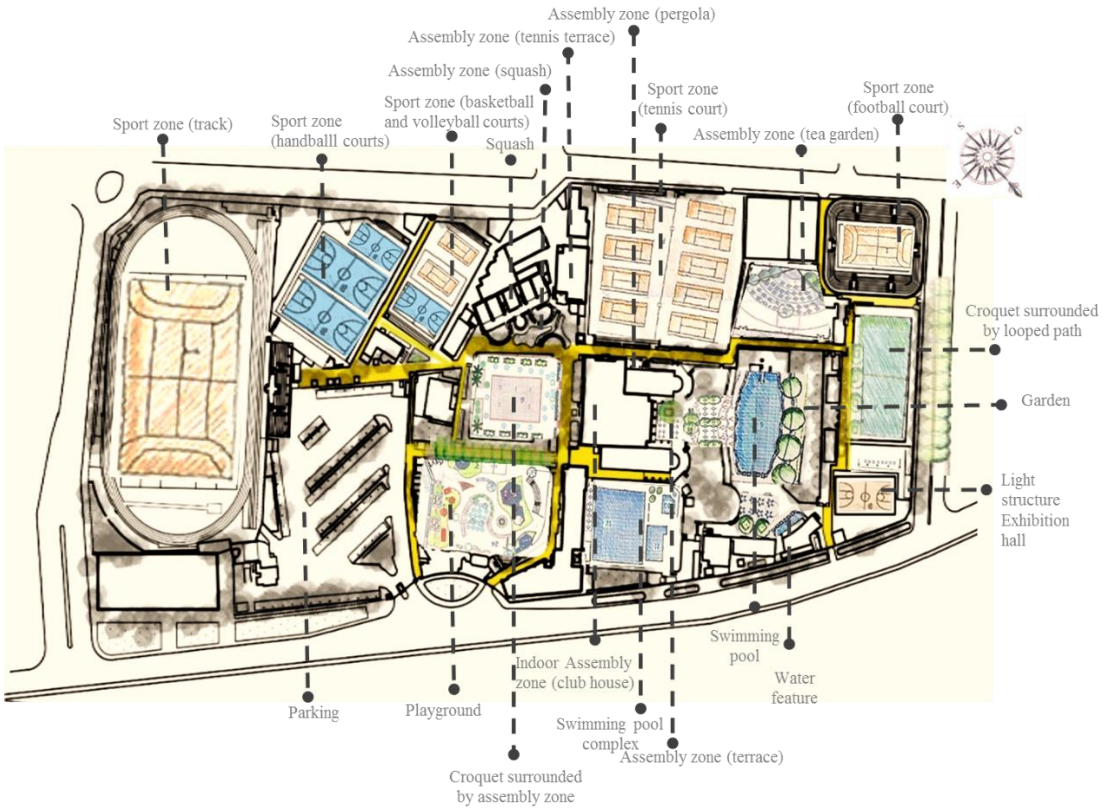


Figure 52: Layout of different typologies encompassed in H.S.C urban recreational urban space, Cairo, Egypt

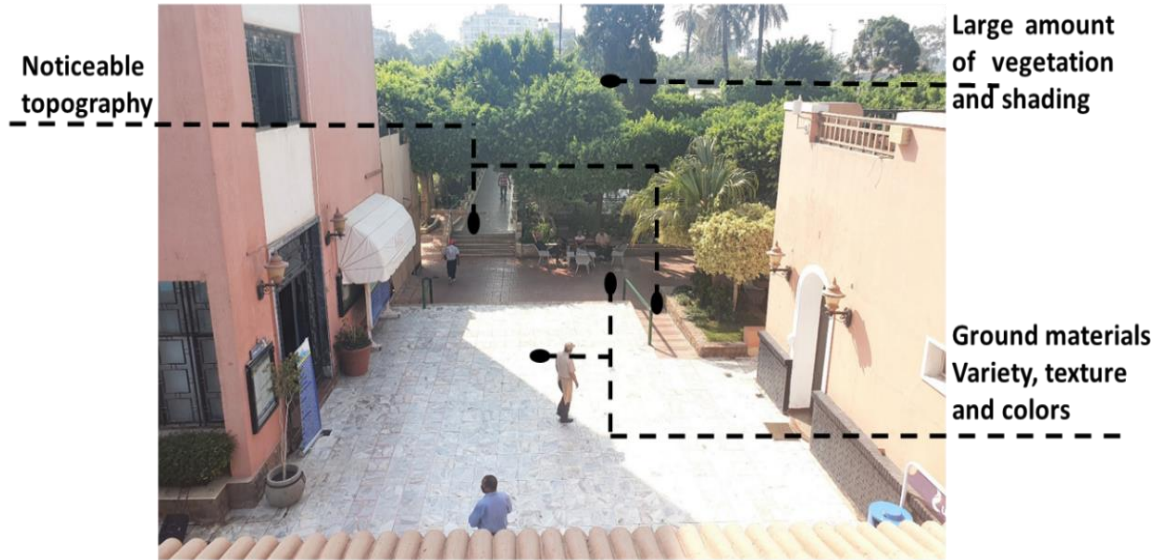


Figure 53: General design features of H.S.C recreational urban space, Cairo, Egypt



Figure 54: General view of the different typologies encompassed in H.S.C urban recreational urban space, Cairo, Egypt

Similar to the residential urban category, the included spatial typologies are analyzed morphologically in terms of the previously suggested spatial potentialities to represent the different configurations formed by the different physical aspects and the functional qualities, resulting in different spatial attributes.

In H.S.C, the “**Garden**” is visually and tangibly defined by its elevated level, grass covering, and surrounding trees, shrubs, fence, as well as gravel parapet, achieving high sense of enclosure. It consists of a single-spatial experience setting with good functional definition and clarity of the single behavior setting. There is no internal separating activity routes accomplishing random flow and fluidity within the undivided setting. The “Garden” is characterized by poor ground material diversity, where it is only covered with natural grass. Regarding the topographic variability, it is elevated from the surrounding spaces with flat ground level inside.

Electricity boxes, and different types of vegetation as large amount of trees and shrubs offering huge amount of shade as well as moderate climate are present, as different urban spatial features, (Figure 55).

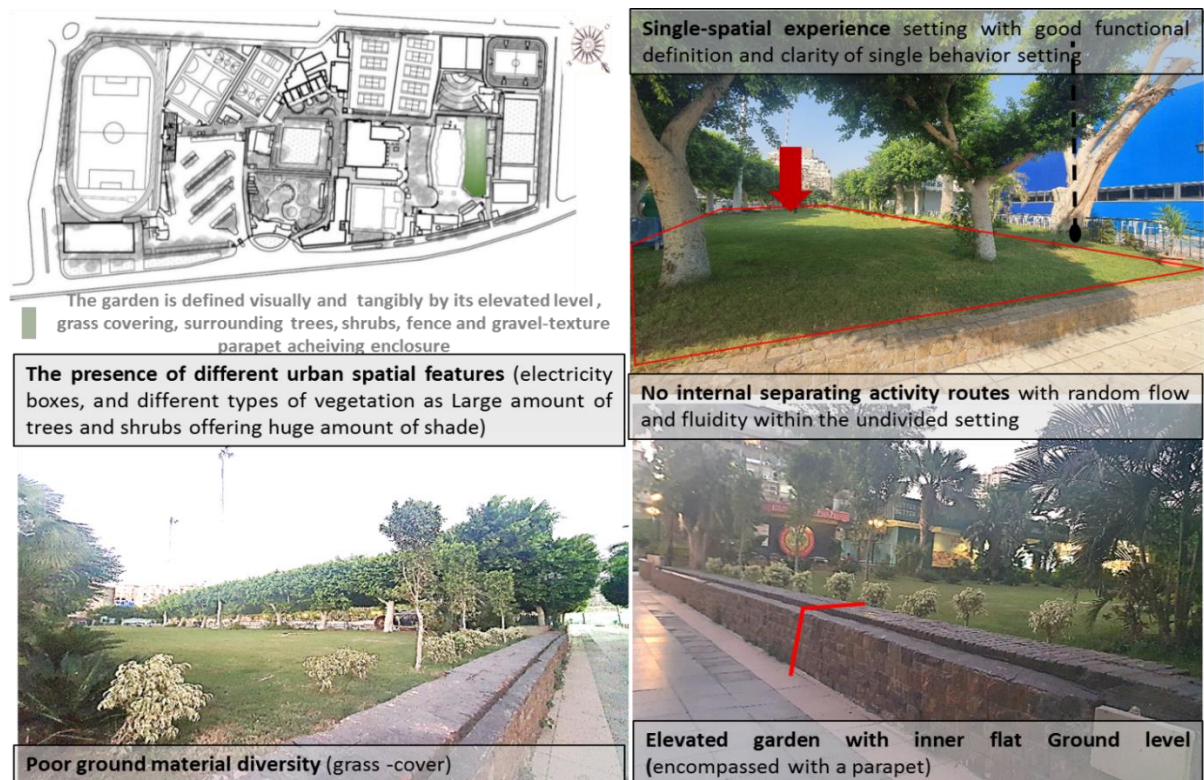


Figure 55: Morphological analysis of “Garden” as a spatial typology in terms of the suggested spatial potentialities

As for the “**Pathways and boulevards**”, they are defined by visual and tangible boundaries, through their different tiling and different edges, such as, activity pockets as well as parapets. “Pathways” constitute of multiple separated activity settings bounding the transition lines as green belts, water features, and activity pockets, additionally, these

“Pathways” achieve good circulation, functional definition, and transition clarity. Moreover, the absence of internal activity routes is noticed. However, continuity and fluidity is achieved by the linear or parallel visual separation of the transit lines from the other different activity settings. These transit lines are of different forms, e.g. linear, curved, and looped, leading to integration with adjacent zones, linkages, and inviting accesses. “Pathways” are characterized by diversity of ground cover, in materials and colors used, such as, water surface, natural as well as artificial grass cover, and tiled transit lines with different color according to zones. Moreover, topographic variability is realized through the presence of slopes, steps, sloped lawns, studs, and curbs. In addition to the different urban spatial features that are highly present, for example, different types of vegetation, urban seats, flexible moving furniture, and posts are present, (Figure 56).

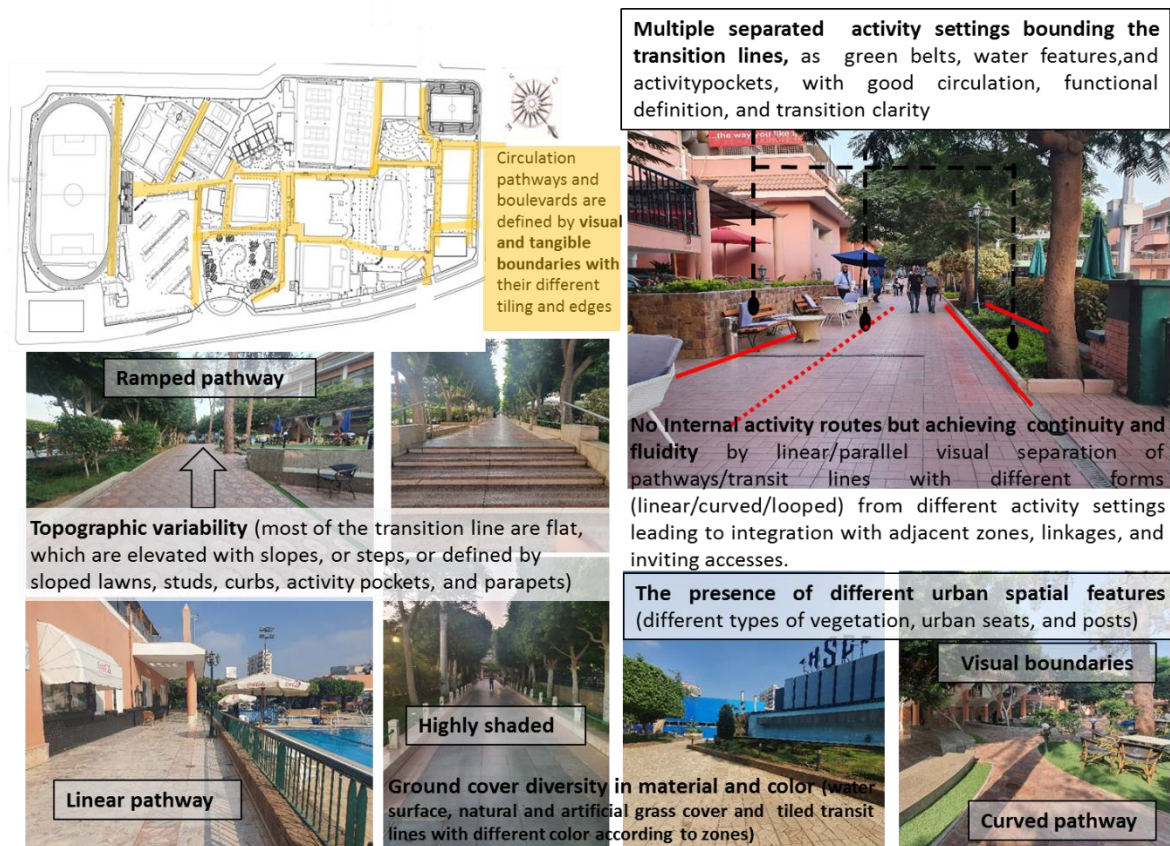


Figure 56: Morphological analysis of “Pathways” as a spatial typology in terms of the suggested spatial potentialities

Concerning the “**Assembly zones and open areas**”, they are defined visually by urban seats, tree pots, different ground materials, or elevated levels, otherwise tangibly by fences

or parapets, in order to be separated from the main circulation networks and to achieve enclosure and definition. Croquet and the squash assembly zones, are characterized by the presence of multi-spatial experience settings with well functional definition of the behavior settings, which are well separated with activity routes. Club house assembly zones are characterized by multiple-spatial experience settings with good functional definition, but no internal separating activity routes within the visual divided settings. On the contrary, the tennis and the tea assembly zones constitute of single-spatial experience settings with good functional definition and clarity of the single behavior setting. Thus, these “Assembly zones” are considered as a single whole well-defined activity setting with no internal separating activity routes. Moreover, ground material diversity is realized through the use of different materials, colors, and textures. “Assembly zones” are flat large areas with noticeable topographic variability, such as, steps, ramps, and elevated parapets. They are characterized by the presence of different urban spatial features, such as, different types of vegetation offering huge amount of shade, shrubs, flowery plants, large shading trees, and plants; urban seats and pergolas; as well as posts and movable furniture, (Figure 57).

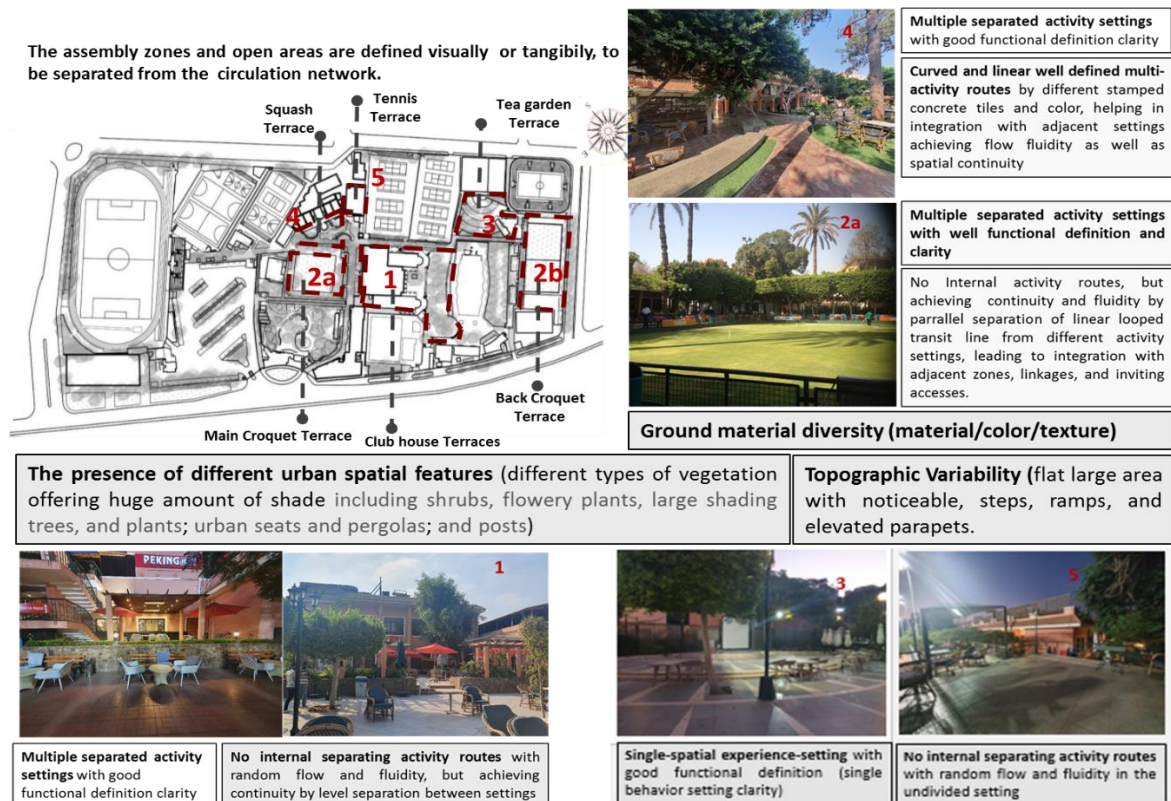


Figure 57: Morphological analysis of “Assembly zone” as a spatial typology in terms of the suggested spatial potentialities

Regarding the “**Playground**”, it comprises multiple separated activity settings, with good functional definition and clarity of each sub-play area. Moreover, it encompasses curved, linear, and looped well defined multi-activity routes that are defined by their different concrete material and color, helping in integration with adjacent settings, and achieving flow fluidity, as well as spatial continuity. The “Playground” is characterized by ground cover diversity by the use of different colors and materials, such as natural as well as artificial grass cover, concrete bridges, rubber cover for play equipment areas, and concrete paved activity routes with different colors. In addition, topographic variability is accomplished through the presence of sloped bridges, stepped bridges, studs, curbs, elevated as well as depressed zones as elevated islands, platforms, bases, and parapets. The “Playground” also comprises different urban spatial features, for example, different types of vegetation, urban seats, pergolas, posts, sculptures, thematic elements, landmarks, and fantasy shapes, (Figure 58).



Figure 58: Morphological analysis of “Playground” as a spatial typology in terms of the suggested spatial potentialities

3.2.4. Urban recreational public space of Châtelet–Les Halles

The open public spaces are considered as one of the daily recreational outdoor urban spaces for children's play, "The Nelson-Mandela Garden, formerly Jardin des Halles" is located in the center of Paris, the 1st arrondissement, France, (Figure 59). The garden is built on a slab covering the underground facilities of the "Forum des Halles" commercial center and the "Châtelet - Les Halles" station, of an approximate area of 30,000m², which implies access and ventilation. A redesign of the garden and the Forum was carried out that began in 2010 and ended in 2018. This redesign project is part of the global rehabilitation of "Les Halles" in the heart of Paris, held by SEURA architects, urban planning Studio, and Philippe Raguin, the landscape designer, who won the international urbanism competition for "Les Halles" renewal in 2004, including the garden's restructuring. The studio takes part in public and private projects that is characterized by an in-depth work in, time, experience, transmission, and experimentation. The main objective of this studio is to enhance the relationship between landscapes; urban forms and architectures; as well as material shapes and plasticity. Seura is interested in different scales and has solid various skills, such as landscape and territory (masterplan); urbanism and public space (urban expansion, urban renewal, infrastructure, and urban design); as well as architecture (new buildings and rehabilitation). According to the designer design, the "Jardin des Halles" is considered as intergenerational recreational space that is convenient to all ages as well as handicapped. It acts as a link or a respiration in the urban tissue by creating a clearly delineated and comprehensible single space that fully expresses the size of the site, in addition to, recreating generous views over Paris, (Figure 60). The park is designed to be an esplanade that combines water features, planted islands, and a bandstand. Moreover, the Park keeper's huts, metalwork, and fibrous concrete benches, that all form part of the street furniture, are specially designed for this park.

As illustrated in the air photograph, the recreational public space is bounded by the church Saint Eustache, the main entrance of the commercial center, and two secondary streets of three meters wide each, with calm traffic namely Rue Berger and Rue du Louver, which is behind the "bourse de commerce", (Figure 61). Most of the surrounding roads have zebra crossings or are controlled by lights. In addition, the entire recreational area is accessible to public and elevated with few steps or a slight ramp above the outer streets' level. The

outdoor recreational area consists of a network of allays with six entry points that are perpendicular on an axial central promenade facing the “bourse de commerce”. All the above mentioned characteristics achieve high spatial definition of the territory through high degree of openness of the urban public recreational space.

The site also comprises basketball as well as football sports fields, a large meadow planted with a mixture of vegetation, chess zone, elevated musical sheltered kiosk as a small amphitheater, outdoor facilities, and circulation network. The network is well defined with the use of a distinct concrete paved material and lined with the elevated concrete bases for sitting. Between the Church and the meadows there are sitting steps leading to the center of the site, in addition to walkers, where one can stop to rest, discuss, and exchange outside the large pedestrian flows of the garden. These areas of lawns and meadows are accessible to the public. On these steps, the famous sculpture of Henri de Miller exists, the "Listening head", well known to the regulars of the place, it naturally retains its place. Furthermore, the site consists of two playgrounds, one for middle childhood-aged children, named the “adventure playground” intended for 7-11 year olds, of an approximate area of 2,500 m² and the other for younger children, reserved for 2-6 year olds, of an approximate area of 1,400 m², (Figure 62). The adventure playground is characterized by giant pebbles, large balls, and mini-canyon, where according to the mayor of Paris description, it encompasses “Beautiful and innovative” equipment. The stated objective, by the designer, of these playgrounds is particularly ambitious. This involves realizing "in the heart of Paris" an original, high-quality layout, accessible to disabled children, with high play value, combining a sensitive, poetic and functional approach, and integrating into a diversified plant environment with innovative play structures in conjunction with the sculptor. Both playgrounds encompass well-defined sub playing settings, containing fixed multi-purpose equipment for children’s play, grass areas, depressed as well as elevated elements, bridges, and colored sprayed concrete structures. In terms of play equipment design, they can be both characterized as "contemporary playgrounds" rather than "traditional playgrounds" or "adventure playgrounds" (see Erikson, 1985; Heseltine and Holborne, 1987; Susa and Benedict, 1994; Wardle, 2000). The Playgrounds are surrounded by secured fences, and parents are not allowed in the middle childhood playground, the “adventure playground”.

In fact, the design, in general, involves a variety of ground material as paved concrete slabs for the pathways, sand covered alleys, grass-paved areas, wooden studs for bridges in playgrounds, rubber flooring for the playgrounds and the sport fields, metal grids, and concrete tiles for the water jets in the assembly zones, as well as musical kiosk. Furthermore, it is designed as a flat large area with noticeable topography such as depressed levels, ramps, bridges, seating steps, and elevated concrete bases for sitting. There is a large amount of vegetation including perennials and grasses whose species cause variation in color and texture, while the different heights of the grasses create a changing carpet. In addition to the chestnut trees and lime trees that dominated the site, they are sometimes accompanied by species with seasonal effects due to their flowering and fruiting. These trees provide relatively large shaded areas, (Figure 63).

The project is of great spatial organizational complexity, due to the flows linked to the operation of the shopping center, parking lots, and public transport passing under. It is subdivided into a number of segmented functional spaces that are considered as different spatial typologies, surrounded by visual and tangible boundaries. So for example, some of these typologies are visually confined by the elevated concrete fragmented bases for sitting, while other typologies are highly confined with tangible fences, such as sport fields and the playgrounds. The above description might enhance the creation of a “Mosaic ambiance” that creates functional islands with a clearly outlined spatial typologies that are fully expressive, Gamal Said (2013). These spatial typologies are classified into, allays and circulation pathways or boulevards, open gardens, playgrounds, and open assembly zones. The main boulevard is branched into a network of circulation that connects between the entry points and leads to the different spatial typology islets. Thus, these semi-closed and limited spatial typologies feature medium spatial permeability in-between, achieving linear flow, linkage within adjacent zones, and inviting access. These spatial typologies differ in terms of spatial potentialities, such as: (1) Entity of activity setting, (2) Flow continuity and fluidity, (3) Diversity of ground materials, (4) Topographic Variability, and (5) The presence of different urban spatial features. Each of these spatial typologies is characterized by the presence of multiple-spatial experience settings with good functional definition and separated by multiple internal activity routes. These activity routes are clearly defined and promote continuity flow and fluidity between the activity settings. The different typologies

are characterized by ground material diversity, through the variability of the used textures, colors, and materials. On the contrary, the assembly zones and open areas, are characterized by delineated and comprehensible single spatial experience setting with good functional definition, no internal separating activity routes, and with poor ground material diversity. Playgrounds feature varying in ground levels through the depressed and elevated levels as well as the presence of steps, slopes, sitting steps, stairs, parapet, and bases, while all other spatial typologies are designed as flat spaces defined with levels, e.g. steps, slopes, and parapets, or encompass noticeable topographic elements. All spatial typologies are characterized by the presence of different urban spatial features, where interactive features, such as sculptures; different types of vegetation e.g. including shrubs, flowery plants, large shading trees, and plants, providing relatively large shaded areas; elements stimulating senses, such as, water jets; natural loose materials e.g., wooden chips and mud; urban seats; and pergolas are present. All the above attributes help achieve a good functional definition and entity of the multi-spatial experience settings in each of the mentioned spatial typologies.

Moreover, a noticeable parental supervision is realized, due to the consideration of the site as a public space connected to public streets and the presence of strangers, homeless people, as well as alcoholics. Thus, the children's parents limit the territorial range for their children, where they are only allowed to freely play alone in the secured closed middle childhood playground, but not permitted to play far away their supervision or to cross the surrounding streets alone.

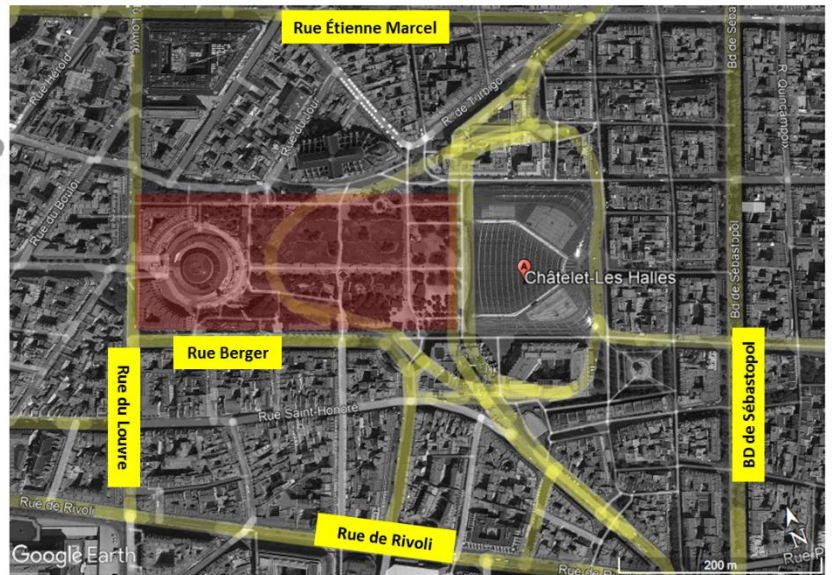


Figure 59: Châtelet - Les Halles recreational urban space, located in the highlighted 1st arrondissement, in the center of Paris, France (macro and micro scales)



Figure 60: General view of Châtelet - Les Halles recreational urban space, Paris, France



Figure 61: Zoning layout of Châtelet - Les Halles recreational urban space



Figure 62: Layout of the different typologies encompassed in Châtelet - Les Halles recreational urban space, Paris, France

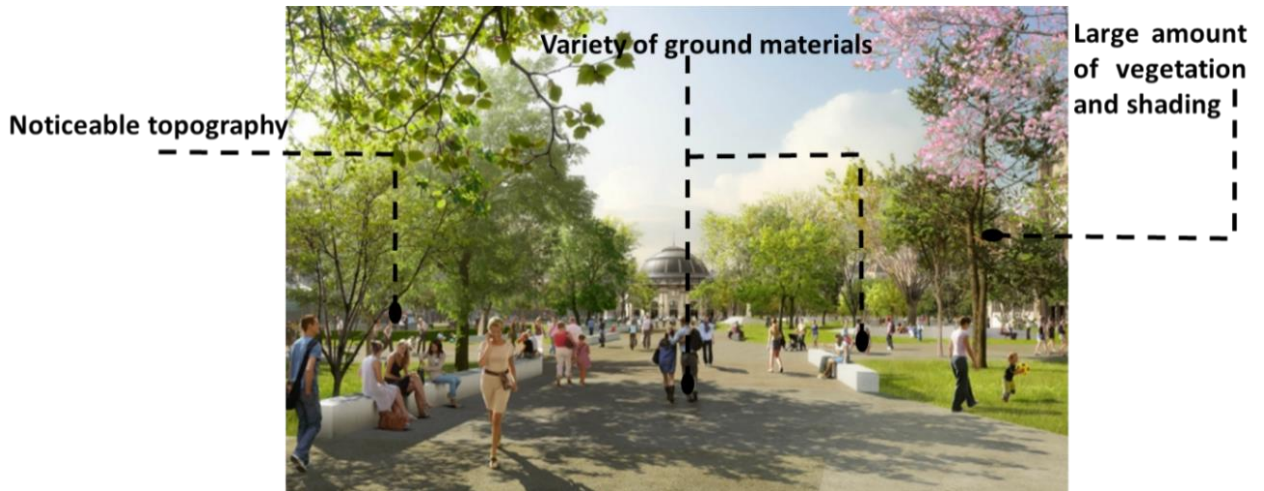


Figure 63: General design features of Châtelet - Les Halles recreational urban space, Paris, France



Figure 64: General view of the different spatial typologies encompassed in Châtelet - Les Halles recreational urban space, Paris, France

Although same included spatial typologies of H.S.C recreational urban space, are present in Châtelet - Les Halles recreational urban space, the design of each typology has a different

configuration due to the different attributes of the physical aspects and the functional qualities that exist. Therefore, analyzing these spatial typologies morphologically in terms of the suggested spatial potentialities, elaborates the different spatial attributes and configurations for same spatial typologies.

In Châtelet - Les Halles recreational urban space, the “**Garden**” is visually defined by its different ground material and the segmented elevated concrete bases for sitting. It consists of multiple separated activity settings with good functional definition and clarity. It encompasses clear defined internal activity routes with organized flow and fluidity. The “Garden” is characterized by diversity of ground material, e.g. natural grass, concrete tiles for pathways, and darker grey concrete tiles defining the trees’ bases. It is flat in level with some elevated concrete bases for sitting and tree bases, achieving topographic variability in the “Garden”. Moreover, different urban spatial features are present through different types and amounts of vegetation offering huge shade amounts, (Figure 65).

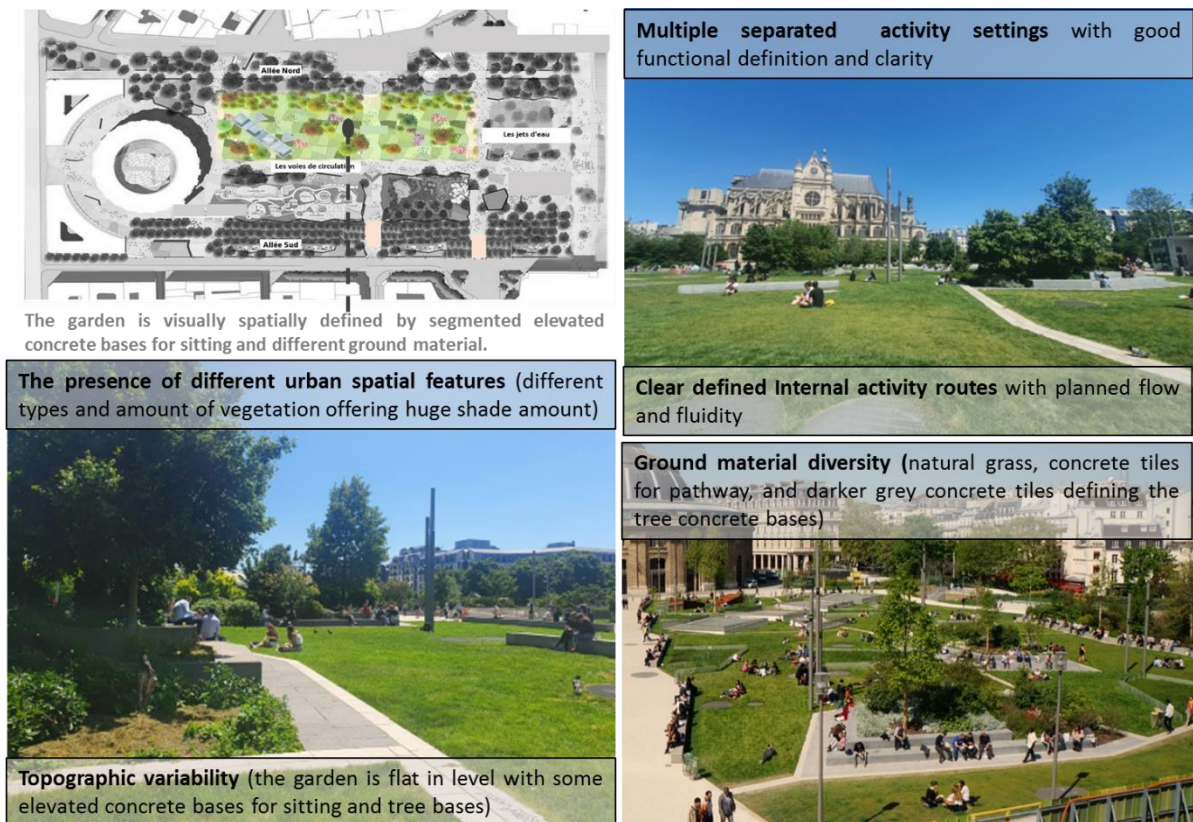


Figure 65: Morphological analysis of “Garden” as a spatial typology in terms of the suggested spatial potentialities

Concerning the “**Pathways alleys and boulevards**”, they embrace multiple parallel separated activity settings bounding the transition lines, such as, green belts and concrete sitting bases. These multiple settings achieve good functional definition and transition clarity. There is no internal activity routes, but continuity and fluidity are achieved through the parallel separation of the linear transit lines from the other different activity settings, leading to integration with adjacent zones, linkages, and inviting accesses. They are characterized by ground cover diversity, which is accomplished through the use of different materials and colors, for example, natural grass cover, colored concrete tiles, colored concrete slabs, or sand cover. Moreover, “Pathways” constitute of flat transition lines with noticeable topographic variability, through the bounding elevated concrete bases or steps for sitting. In addition to the presence of different urban spatial features that are realized through the presences of different types of vegetation, sculptures, posts, and tree pots, (Figure 66).

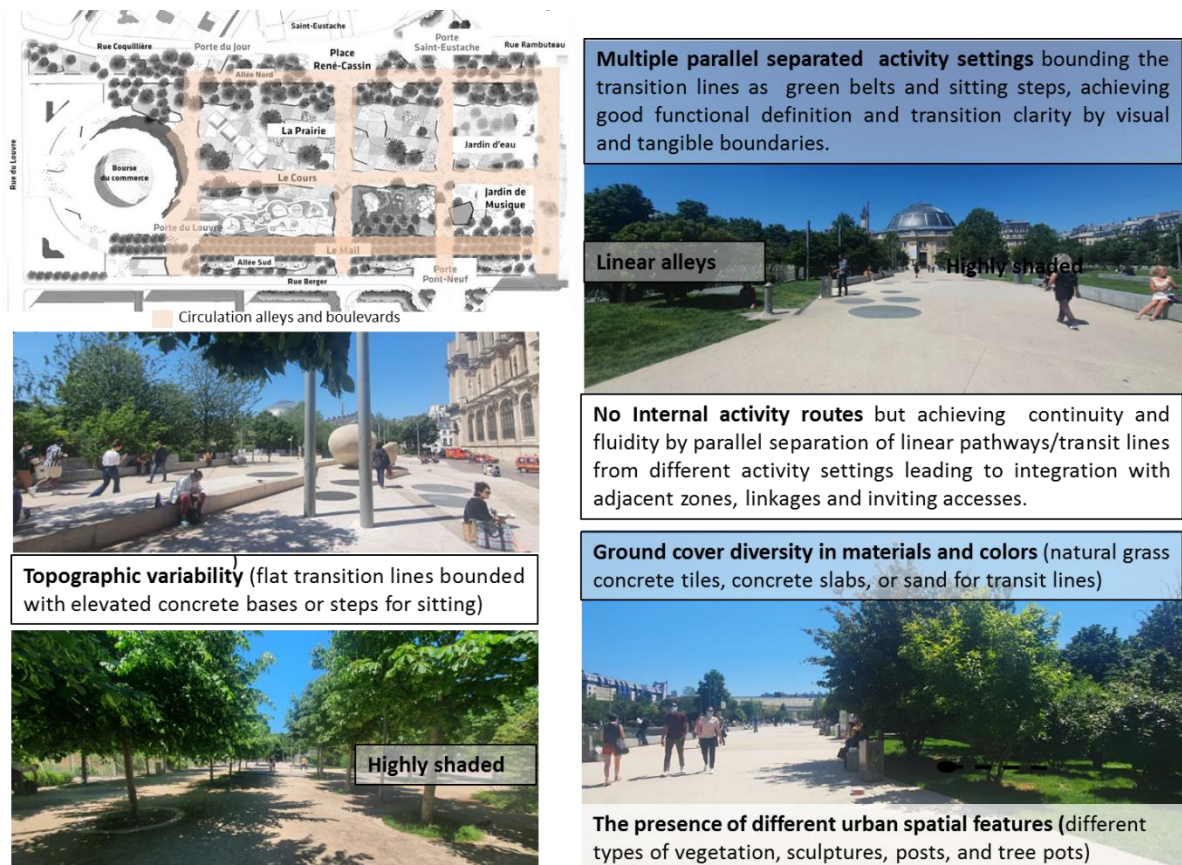


Figure 66: Morphological analysis of “Pathways” as a spatial typology in terms of the suggested spatial potentialities

As for the “**Assembly zones and open areas**”, they are defined visually by urban seats, tree pots, different materials used, or elevated steps, to be separated from the circulation network. “Assembly zones” constitute of single-spatial experience-settings with good functional definition and single behavioral setting clarity. There are no internal separating activity routes noticed, leading to random flow and fluidity in the undivided settings. They are characterized by poor ground material diversity. They are flat large areas with noticeable steps and elevated concrete bases that accomplish limited topographic variability. Moreover, different urban spatial features are present, through the presence of different types of vegetation including shrubs, flowery plants, large shading trees, and plants; in addition to water jets, urban seats, pergolas, sculptures, and landmarks, (Figure 67).

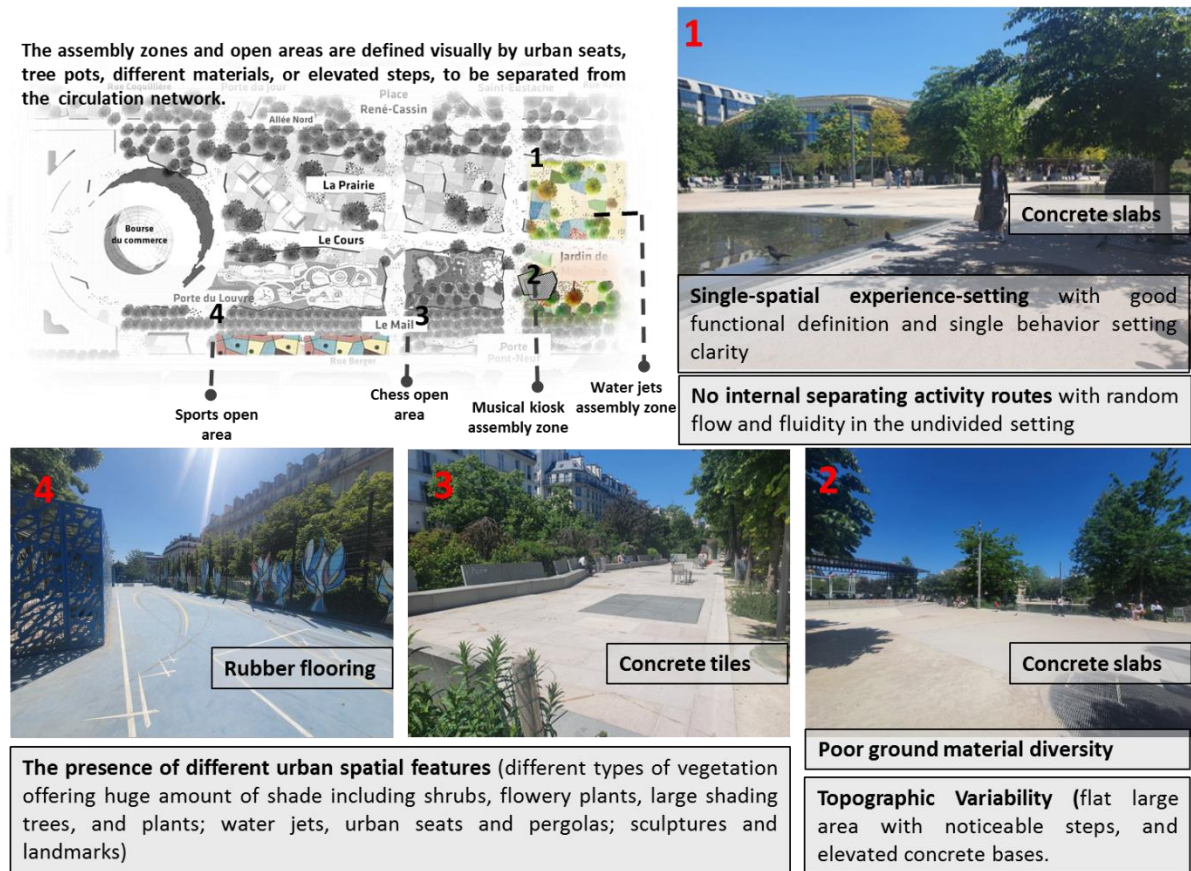
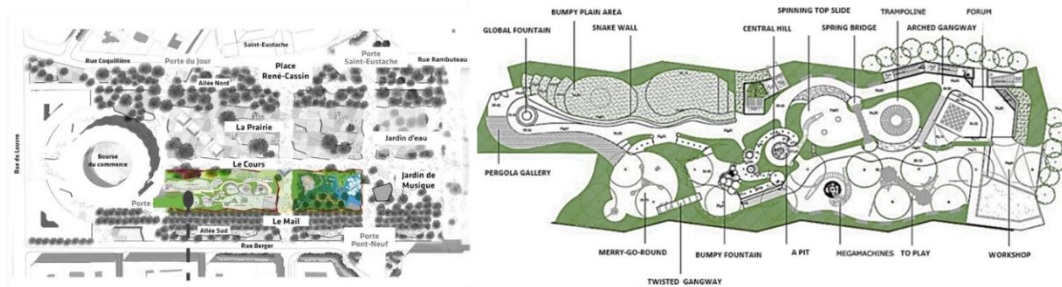


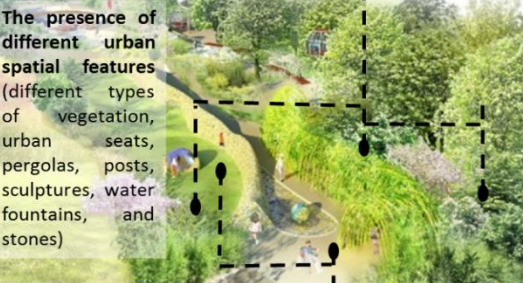
Figure 67: Morphological analysis of “Assembly zones” as a spatial typology in terms of the suggested spatial potentialities

Regarding “**Playgrounds**”, both the adventure and the younger playgrounds are confined by fence to control accessibility and increase security. Both playgrounds include multiple separated activity settings with good functional definition and clarity for the sub-playing areas. They encompass curved, linear, and looped multi-activity routes that are well-defined by their different concrete material and colors, helping in integration with adjacent settings by achieving flow fluidity and spatial continuity. The “Playgrounds” are characterized by ground cover diversity, which is achieved through different materials and used colors, such as, natural as well as artificial grass, wooden stud bridges, rubber cover, concrete paved activity routes with different colors, and colored concrete slabs. Moreover, topographic variability is accomplished by the presence of sloped or stepped bridges, vertical studs, curbs, depressed and elevated zones as elevated islands, platforms, bumps, bases, and parapets. Both “Playgrounds” encompass different urban spatial features, for example, different types of vegetation, urban seats, pergolas, posts, sculptures, stones, water fountains, and water elements, (Figures 68).



Adventure playground confined by fence and parents are not allowed

Multiple separated activity settings (sub-play areas) with good functional definition and clarity



The presence of different urban spatial features (different types of vegetation, urban seats, pergolas, posts, sculptures, water fountains, and stones)

Curved, linear, and looped well defined multi-activity routes by their different concrete material and color helping in integration with adjacent settings by achieving flow fluidity and spatial continuity



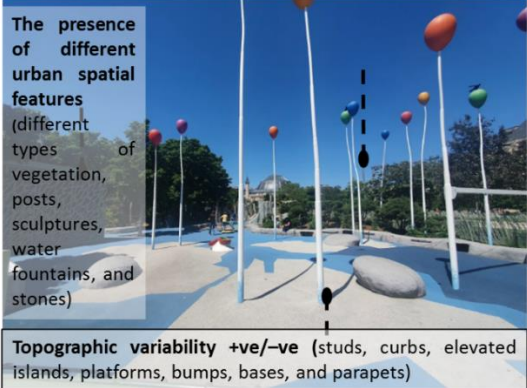
Ground cover diversity in material and color (natural & artificial grass, wooden bridges, rubber cover, and concrete paved activity routes with different colors)

Topographic variability (sloped or stepped bridges, studs, curbs, elevated and depressed zones, elevated islands, platforms, bases, and parapets)



Younger playground confined by a fence to control accessibility

Multiple separated activity settings (sub-play areas) with good functional definition and clarity



The presence of different urban spatial features (different types of vegetation, posts, sculptures, water fountains, and stones)

Topographic variability +ve/-ve (studs, curbs, elevated islands, platforms, bumps, bases, and parapets)

Curved, linear, and looped well defined multi-activity routes by their different concrete material and color, helping in integration with adjacent settings by achieving flow fluidity and spatial continuity



Highly shaded

Ground cover diversity in material and color (natural grass, wooden bridges, rubber cover, and colored concrete slabs)

Figures 68: Morphological analysis of both “Playgrounds” as a spatial typology in terms of the suggested spatial potentialities

Table 7: Differences between the four urban spaces

Urban spatial category		Recreational urban spaces		Residential urban spaces	
Chossen case studies		Châtelet-Les-Halles	Heliopolis Sporting club (H.S.C)	Eco-residential district cité jardins	Abassia residential zone
Spatial porosity	Urban context	Public recreational urban space	Private gated recreational urban space	Semi-public/ private urban residential district	Semi-public/ private urban residential district
	Total area	30,000 m ²	70,000 m ²	60,000 m ²	20,000 m ²
	degree of openness and closure	<ul style="list-style-type: none"> High spatial definition High degree of openness 	<ul style="list-style-type: none"> High spatial definition High degree of closure 	<ul style="list-style-type: none"> High spatial definition Medium degree of openness 	<ul style="list-style-type: none"> High spatial definition Medium degree of closure
	Different included spatial typologies	<ul style="list-style-type: none"> Allays, circulation pathways, or boulevards Gardens Playgrounds Open assembly zones 	<ul style="list-style-type: none"> Allays, circulation pathways, or boulevards Gardens Playground Open assembly zones 	<ul style="list-style-type: none"> Pedestrian pathways Gardens Courtyards Back axial serving street & parking pockets Private block buffers Open assembly zones 	<ul style="list-style-type: none"> Pedestrian pathways Narrow vital alleys "AL-HARA"- "الحارة" A garden A courtyard "AL-HOSH"- "الحوش" Back axial street & parking zones Block buffers & building pockets An open assembly zone.
	Levels of spatial permeability between typologies	<ul style="list-style-type: none"> Medium spatial permeability Visual and tangibile boundaries 	<ul style="list-style-type: none"> low spatial permeability Closed and limited spatial typologies 	<ul style="list-style-type: none"> Elevated spatial permeability 	<ul style="list-style-type: none"> Elevated spatial permeability
	Porosity discription	<ul style="list-style-type: none"> Visual confined typologies by the elevated fragmented concrete bases Tangible highly confined typologies with fences Segmented functional spaces Functional islands (Mosaic ambience) 	<ul style="list-style-type: none"> Highly confined typologies with fences and tangible boundaries Segmented functional spaces Functional islands (Mosaic ambience) 	<ul style="list-style-type: none"> Well defined spatial typologies Smooth flow in-between Good circulation network in the whole neighborhood. Good spatial interaction Linkage within adjacent zones Inviting access 	<ul style="list-style-type: none"> Well defined spatial typologies Smooth flow in-between Good circulation network in the whole neighborhood. Good spatial interaction Linkage within adjacent zones Inviting access
Spatial Potentialities of each spatial typologies	(1) Entity of activity setting	<ul style="list-style-type: none"> Multiple-spatial experience settings Good functional definition Except (assembly zone)	<ul style="list-style-type: none"> Multiple-spatial experience settings Single-spatial experience settings (some of assembly zones) Good functional definition 	<ul style="list-style-type: none"> Multiple-spatial experience settings Good functional definition 	<ul style="list-style-type: none"> Single-spatial experience settings Good functional definition
	(2) Flow continuity and fluidity	<ul style="list-style-type: none"> Separating multiple internal activity routes Clear definition of activity loops/routes. Flow continuity and fluidity between activity settings Except (assembly zone)	<ul style="list-style-type: none"> Separating multiple internal activity routes Clear definition of activity loops/routes. Flow continuity and fluidity between activity settings No internal separating activity routes within the single undivided setting (some of assembly zones) 	<ul style="list-style-type: none"> Separating multiple internal activity routes Clear definition of activity loops/routes. Flow continuity and fluidity between activity settings 	<ul style="list-style-type: none"> No internal separating activity routes within the single undivided settings.
	(3) Diversity of ground materials across different typologies	<ul style="list-style-type: none"> High variability in texture, color, and materials. Except (assembly zone)	<ul style="list-style-type: none"> High variability in texture, color, and materials 	<ul style="list-style-type: none"> High variability in texture, color, and materials 	<ul style="list-style-type: none"> Poor ground material diversity for every typology
	(4) Topographic Variability across different typologies	<ul style="list-style-type: none"> Noticeable varying ground levels (steps, slopes, sitting steps, stairs, parapet., and bases) 	<ul style="list-style-type: none"> Noticeable varying ground levels (slope, sitting steps, parapet, and ramps) 	<ul style="list-style-type: none"> Noticeable varying ground levels (steps, slopes, sitting steps, stairs, parapet, cliffs, lawns, ramps, and bridges) 	<ul style="list-style-type: none"> Noticeable varying ground levels (stair flights, parapets, slopes, elevated manholes, ramps, and retaining walls)
	(5) Presence of different urban spatial features.	<ul style="list-style-type: none"> High presence of different urban spatial features (interactive features, flexible materials, landmarks, sculptures, different types of vegetation, water jets, urban seats, and pergolas)	<ul style="list-style-type: none"> High presence of different urban spatial features (interactive features, different types of vegetation, waterfalls, natural loose materials, mud, urban seats, and pergolas)	<ul style="list-style-type: none"> High presence of different urban spatial features (interactive features, flexible materials, landmarks, sculptures, different types of vegetation, waterfalls, lakes, natural loose materials, wooden chips and mud, urban seats, and pergolas)	<ul style="list-style-type: none"> High presence of different urban spatial features (urban seats, pergolas, looses elements end materials, different types of vegetation)
Parental supervision, children presence, and play opportunities	<ul style="list-style-type: none"> A noticeable parental supervision and children presence Presence of strangers, homeless people, alcoholics, and surrounding public streets Parents limit the territorial range for their children. 	<ul style="list-style-type: none"> The presence of children is highly noticed Parents allow children play freely within the bounded club walls High security and the convergent surrounding community. 	<ul style="list-style-type: none"> noticeable amount of the children playing who belong to the neighborhood. The children's parents limit the territorial range for their children, so they are not permitted to play out of neighborhood gates. 	<ul style="list-style-type: none"> Noticeable amount of the children playing who belong to the neighborhood. The children's parents limit the territorial range for their children so they are not permitted to play out of neighborhood gate. 	

3.3. Children as participants

This research focuses on children of "middle childhood" age group, in the different functional urban space categories, in the two countries, France and Egypt, with different architectural and urban cultures. This approach would make it possible to develop a crossed perspective on how children appropriate space in different socio-cultural contexts, in a form that reflects their lived spaces differently from the adults. Moreover, it is common now to grasp as many children as possible from different ages, backgrounds, and abilities, to help the researcher in capturing a broader range of experiences, in addition to create a full image of the studied phenomena (Barker and Weller, 2003; Punch, 2002; Darbyshire, et al., 2005). Thus, the selected children are of different nationalities and they belong to different socio-cultural social classes of the society that would help understanding children's play in a variety of outdoor settings, with different scales such as a recreational urban spaces, parks, social clubs, open spaces in front of residential units, and neighborhoods.

As previously mentioned, children in the middle period concerns the age between five and twelve years old (Hoff, 2003). These children are among the foremost critical users of open air spaces, making the physical environment a major preoccupation in their understandings (Blatrix 1998; Chawla, 1992). As Piaget (1962) explained that this age range corresponds to the "concrete operational stage" of development, at which children develop the sense of peers, begin to favor play in groups, and diminishes attachment to their families (Chawla, 1992; Blatrix, 1998; Erikson, 1994).

In this study, children were approached in their own daily environment allowing them to be free interacting with it and reflecting on (Punch, 2002). Although, approaching children through schools is a relatively common approach within children's studies, it was excluded from this research. Since this is an approach which can be criticized, as in school the children are used to being led and dominated by adults and there may be a risk that they perceive their participation in a research project as another school task, where their answers will be judged. It is therefore a problem that the children may try to produce answers that they believe the teacher or the researcher want to hear and not what they really experience themselves.

In consequence, according to children's everyday life and normal routine, children who engaged from the residential units and the neighborhoods urban category, mostly play regularly on daily basis or day after the other, while most of those who engaged from social club and the recreational urban category, are not allowed to play in the gardens, streets, alleys, and the vacant land plots between the buildings in their neighborhoods or in front of their residential units. Thus, it appears then reasonable to assume that the recreational urban spaces selected for the study have an important role in the lives of the children sampled for data collection. Since as previously mentioned, they visit these recreational urban spaces on weekly basis, from 2 to 3 times a week when school is in session to almost every day during school vacations.

However, observing children that are visiting the sites on regular basis is considered as both research potential and constrain at the same time. Since being familiar towards the place, seemed to directly enhance their friendship aspects and their sense of belonging, which consequently, tended to improve children's well-being through the different offered types of play.

Thus, for each of the pre-mentioned urban space, a sample of two groups were engaged in the field work with a total number of 46 randomly selected children. The selection of the children in the two groups of each sample insured an equal gender distribution. Furthermore, the four samples were perfectly matched in terms of age, where there was a similar number of children of each particular age in each of the four samples, 5-7 years / 7-10 years / 10-12 years. In addition, consent for participation in the study and ages of the children were obtained from accompanying parents. The field work was carried out in March 2020 in parallel with the four urban spaces, and lasted for approximately eighteen months, and in similar weather conditions (including week days and weekends). Moreover, in this study, children knew that participation is voluntary, and that they are free to change their minds, as well as, to withdraw from the research at any stage (Einarsdottir, 2007; Flewitt, 2005). Since according to Cele (2006), she suggested that children may be unwilling to perform research tasks in their spare time and this has to be respected.

3.4. Data collection

According to literature, the approach of collecting data in revealing children's experiences of their everyday spaces and places, can be categorized into qualitative and quantitative, or

a mixture of both (Barker and Weller, 2003; Punch, 2002; depeau, et al., 2010). Thus, In order to achieve the research objectives and to understand how children perceive the daily environment around them, while they are using it through free play in the context of Egypt and France, an ethnographic approach, adopting multiple data gathering methods described as “Mosaic method”, was applied through the combination of quantitative and qualitative techniques. The quantitative techniques included child-centered structured behavioral observations to investigate children’s presence as well as the occurrence of different play behaviors in the four urban spaces with different spatial porosity, in addition to consider the links between the different included spatial typologies of urban spaces, children’s spatial perceptions, and their patterns of play. Regarding the qualitative techniques, behavioral qualitative observations were complementing the above structured observations, in the form of behavioral maps, descriptive field notes, and clarifying sketches; besides perceptual cognitive skill activities, in the form of drawings and photography; as well as informal interviews and occasional walks. Furthermore these qualitative techniques aimed to explore where the participants actually play and what are their preferred as well as meaningful places in the selected recreational space, social club, and neighborhoods.

The above combination of the North American quantitative method, which relies on child-centered observations (Moore, G., 1986; Cosco et al., 2010), and the qualitative research, method which relies on techniques inspired by the work of CRESSON Laboratory (Research Center on Sound Space and the Urban Environment) has attracted less attention in previous French studies on children's spaces. Hence, through a socio-ethnographic approach, the research relied on both quantitative and qualitative that complement each other to help children express themselves in a way that adults can understand. This combination gives a clear picture of children's play experience in different urban space with different designs. In consequence, this study opened up stimulating empirical perspectives in the theoretical and operational fields by approaching these two functional urban space categories as experimental laboratories.

The process of relying on multiple methods or “Mosaic method” for data collection is, also, referred to as “Triangulation” (Cele, 2005). This approach is becoming increasingly popular within the social sciences and to overlap several different perspectives in an

attempt to maximize the understanding of the research questions. The data gathered from each technique does not necessarily reinforce or validate that produced by the others, but in fact, often reveals contradictory findings. This may result in problems during interpretation, but it also proves that triangulation is often a satisfying way of capturing the complexity of a problem and pointing to the contradictions within human behavior and everyday life. The decision to use triangulation in this study was based on previous research that reveals difficulties in working with children, since as an adult trying to understand children's complex realities, and also because children often have difficulties, due to their psychological development, in expressing their views. Thus relying on previous literature that used several methods to produce the full image of understanding children place experiences, which are multi-dimensional, (Table 8). These types of methods help children to be actively engaged, as most of the data generation depends on them. Children are the ones who decide what to draw, which photo to capture, and which route or place he/she would like to guide the researcher to. These methods give children sense of power and control. For example, the photography and drawings are task-based methods, sometimes they are misleading so they have to be followed by informal interviews for the child interpretations. While walks and participant observations are interactive techniques, which give the child and the researcher the ability to interact with the place simultaneously. Diaries, photographs, photo- elicitation, and focus group discussion help children in representing their own views and experiences of their spaces, without visiting all these spaces with the researcher (El-Husseiny, 2016).

Moreover, the field study focuses on the reasons behind the participant's preferences of specific spatial potentialities that promote a greater range of freedom, sensible experiences, and play opportunities, through offering certain ambiances. Therefore, the choice of an ethnographic approach was to provide insights into children lived experiences. It enabled the researcher to get involved in the settings where children play, to listen, and record their voices.

In accordance, Hammersley and Atkinson (1995, p.6), further explained that socio-ethnography is applied for the exploration of "*what happens in the setting, how the involved people see their own actions, and the actions of others, and the contexts, in which the actions take places*". Within the social sciences, it has become more and more popular to

combine different methods, in order to understand different phenomena, and in particular, to be able to bring together different perspectives on complex issues. This is an approach, which is useful when working with urban space, since so much of the experience of a physical environment is connected to everyday interaction with it. Moreover, according to Cele (2005), this knowledge is at the inner core of how an environment to be used and valued, but since it is knowledge, which is often, unspoken, being so well recognized, and assumed by individuals, that it is rarely reflected upon, it is very difficult to bring it to light. In conclusion, the research with children requires that the researcher moves away from typical adult position and to take the 'least adult role', by engaging as a participant in children's activities (Mandell 1988; Christensen, 2004). In addition the researcher has to show interest in understanding how the world looks from children's perspective but without attempting to be a child (Christensen, 2004). Moreover, one of the main issues, is not to force the researcher point of view and to allow the participants to express their perceptions freely, as sometimes children say what they think the researcher wants to extract from their conversations (Punch, 2002; Barker and Weller, 2003). Additionally, the researcher has to concentrate during all conversations and to not be interrupted by anyone until every child complete what he/she wanted to state and that the interview would stop when the child wants it to stop (Christensen, 2004).

Table 8: Previous studies using multiple data gathering methods

Academic paper				Data collection tactics								
#	Title	Author	Date	Drawings	Photography	Walks	Photo elicitions	Focus groups	Model building	diaries	Cognitive mappings	Behavior mappings
1	Children's experience of place	Roger Hart	1979	x	x	x			x		x	
2	Childhood's domain: play and place in child development	Robin Moore	1986	x		x					x	
3	Children's strategies for creating play spaces: negotiating independence in Rural Bolivia	Samantha Punch	2000	x	x					x		
4	Children in the neighborhood: the neighborhood in the children	Kim Rasmussen & Soren Smidt	2003		x							
5	Neighborhood quality in children's eyes	Louise Chawla & Karen Malone	2003	x	x	x		x				
6	Geographies of environmental learning: an exploration of children's use of school grounds	Paul Tranter & Karen Malone	2004	x		x						x
7	"Play in focus": Children researching their own spaces and places for play	Catherine Burke	200		x			x		x		
8	On foot in the city of children	Sophia Cele	2005	x	x	x						
9	Revealing the hidden spatial dimensions of place-experience .	Ian Simkins & Kevin Thwaites	2008	x				x	x		x	

In accordance to the above literature, data collection and fieldwork in this research were conducted through three phases on several successive site visits and each urban space sample was classified into two groups, (Figure 69). Initially, it included behavioral observations, held with “Group A”, that comprises both child-centered structured behavioral observations and qualitative behavioral observations, to investigate children’s presence and the occurrence of different play behaviors, without parental interferences in children’s activities. However, children were under the visual control of their parents, security staff, or other users, who might interfere to maintain security and safety, in the

four urban spaces. Moreover, these behavioral qualitative observations complemented by the observations structured comprised behavioral mapping, descriptive field notes, and clarifying sketches to further observe the movements of children's bodies, their physical gestures tactile, and their motor skills during the use of the different spatial configurations. This phase made it possible to understand the links between the spatial configuration and the motor skills of the child.

The above first phase of observations were followed by the second and third phases, which are held with another group “Group B”. Children were asked to participate in perceptual cognitive skill activities including drawings and photographic activities to evaluate their perceptual cognitive skills as well as their cognitive development, in addition to better understand how children perceive their daily environments and their spatial preferences. The drawings and photos made it easier to communicate with the children, also, it was a starting point for a conversation of the informal interviews. Informal interviews were held for discussing further details of the drawings and for knowing some basic information about the participants as well as their play settings that required an occasional child- led walks. The third phase helped to reveal the variety of children’s experiences and helped them to express such a sensory experience of a place in a way that is possible for adults to understand, and easy for children to communicate.

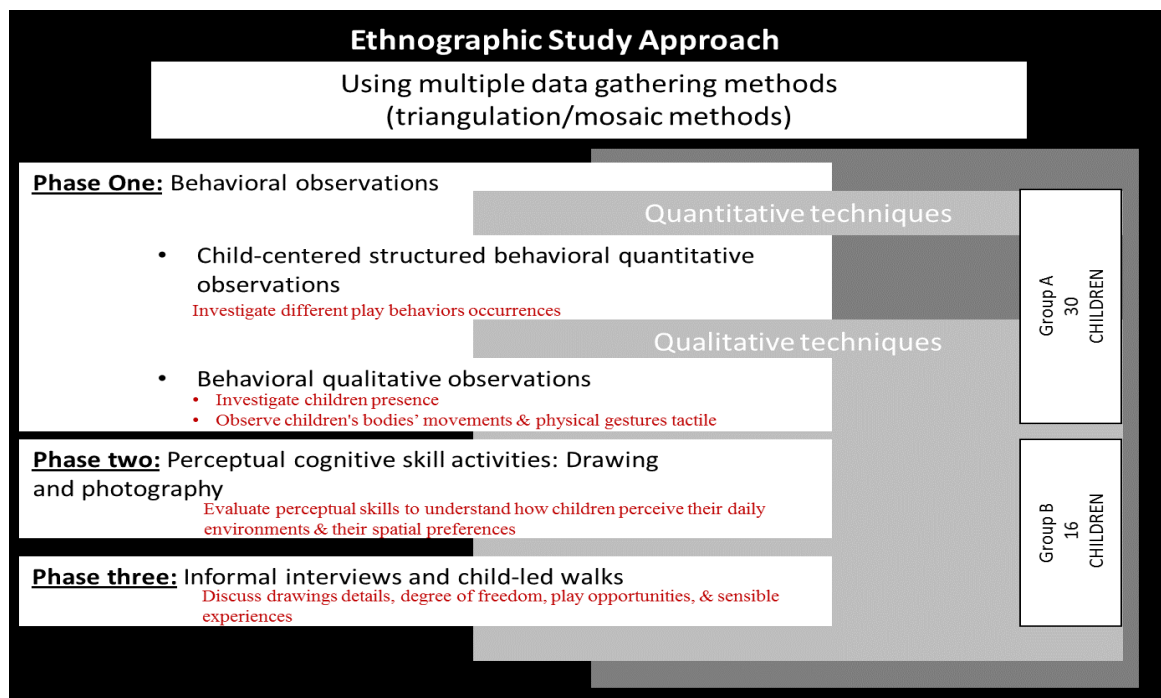


Figure 69: Multiple data gathering through combined methods

3.4.1. Phase One: Behavioral observations

Experience of place can be difficult to communicate both for children and adult, since these experiences are reactions to sensory experiences and memories triggered by the place itself. Once a person is physically present in a place his or her reactions, memories, and thoughts are considered as continuous reactions to objects, people, and place itself. Behavioral Observation method, is a method which allows respondents to interact with an environment including the very personal experiences. According to literature, Paul Gump (1975) discussed the concept of “setting coercively”, where through an observational research study of the behavior of children in different settings, he found that several aspects of child behavior changed as that child moves from one place to another. In addition the behaviors of different children in the same setting were more similar than the behavior of any one in different settings. Thus Gump highlighted that settings are ecological rather than psychological or social and that the child behavior is directly related to the qualities of the physical environment. Gump further suggested that settings provide a context, which by design determines the child behavior (El-Husseiny, 2016).

Accordingly, this phase, included a child-centered structured behavioral quantitative observations and behavioral qualitative observations. In each urban space, thirty (30) randomly selected children of 5 to 12 years of age were observed and referred to as “Group A”. The selection of the children insured an equal gender distribution in each of the four samples (15 girls and 15 boys).

3.4.1. A. Child-centered structured behavioral quantitative observations

Through the child-centered structured behavioral quantitative observations in the four urban spaces, each child was observed for 40 minutes, using as observational table that was adopted from the tables developed by Rubin (2001), Cosco et al. (2010), and Podolska (2014). A prototype table was conducted and specified for every urban space. The table helped to record in one-minute increments the amount of time the child engaged in different types of play: functional play, constructive play, exploratory play, dramatic play, games-with-rules, or no play, as well as, solo play, parallel play, or group play, (Figures 70). The children selected for observation, who left the site before the end of the 40 minutes, were excluded from the samples and replaced by another selection. Also, children that engaged in negative interaction or aggressive behavior were excluded from the samples and

replaced, if it occupied longer time as a dominate behavior during the 40 minutes observation, and it was classified as negative- non social behavior. However it should be mentioned that the negative non social behavior, is not always considered as adversity, but sometimes it is the start of play friendship. Thus, excluding children with dominate aggressive behavior, might be listed as one of the research limitations.

Furthermore, according to Rubin (2001), if a child was observed to engage in two activities simultaneously, the focus of the child's attention should be determined. Rubin (2001) further explained through describing different examples, where a child may be walking toward a group of children (transition behavior) and watching them at the same time (onlooker behavior). Similarly, a child may be drawing a picture (constructive play type) and singing (functional play type) all at once. Rubin clarified that in such a situation, it is important that the observer try to establish where the child's attention is. In the first example the child is probably concentrating on the activity of the child s/he is watching; therefore onlooker is coded. Regarding the second example, it depends more on the contextual cues (i.e., is the child just lightly humming bits of songs while drawing, or is s/he signing loudly and pausing during drawing to sing choruses).

However, although this thorough explanation, one of the study limits, is that this classification permits rethinking about the compatibility and the tension between different types of play, socially and cognitively. Whereas, from a critical point view, this classification might prevent the overlapping and the consolidation between different play types, by creating clear limits between each type that preclude the easy transition between them.

The operationalization of the different types of play was based on the definitions provided by Rubin (2001). Moreover, the observation table was tested through pilot study sessions. For this pilot study, the same observations were conducted independently by two observers, which allowed checking for reliability. Reliability was calculated by dividing the number of minutes agreed on by the total number of minutes of observation and was found to be quite high (0.91).

3.4.1. B. Behavioral qualitative observations

The structured observations were complemented with behavioral qualitative observations, to allow the exploration of associations between various aspects of landscape design as

well as gesture movements, and spatial configurations as well as play behaviors. Moreover, these behavioral observations helped to assess the presence of children percentages that help in understanding their preferences and the impact of the spatial porosity, elaborated as the outer boundaries degree of closure and openness of different daily urban spaces' territory and inner spatial permeability between different included spatial typologies. The used observation tables were designed to feature a base-map of the relevant urban space. For each child, a behavioral mapping was conducted during the 40 minutes of observation, in order to record the location of the different play activities and the movements of the child. Descriptive field notes and clarifying sketches were used to further document the behavior of the child and how it may be related to the specific characteristics of the landscape design. This was tested during the pilot study and was not found to interfere with or affect the accuracy of the structured observations. Samples of filled observation sheets during the sessions of observations at the four sites are included in Appendices A, B, C, and D.

According to Cosco et al. (2010), behavior mapping is an unobtrusive, direct observational method, for recording the location of research participants and measuring their activity levels simultaneously. Its results help researchers understand the behavioral dynamics of the built environment. Early examples of behavior mapping used pencil-and-paper methods to gather data and to hand graphics that spatially represent results at the level of residential neighborhoods, parks, playgrounds, and schoolyards. Later, Van Andel (1985) was the first investigator to digitally code outdoor behavior and its environmental attributes linked to a relational database. The advent of Geographical Information Systems combined with handheld digital coding devices created an almost paperless data gathering protocol that allow many more variables to be coded, including accurate location of physical activity. Therefore, behavior mapping now provides environment behavior researchers with an efficient method for gathering, processing, analyzing, and representing data, where behavior mapping is a method based on the concepts of behavior settings and affordances.

Date: Hour: Age: Gender:

Behavioral setting:



Child number	Minutes (40)	Cognitive play								Social play			Descriptive notes (interaction behavior in the behavioral setting)	
		Functional play	Constructive play	Exploratory play	Dramatic play	Games with rules	No play	Solo play	Parallel play	Group play				
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Date: Hour: Age: Gender:

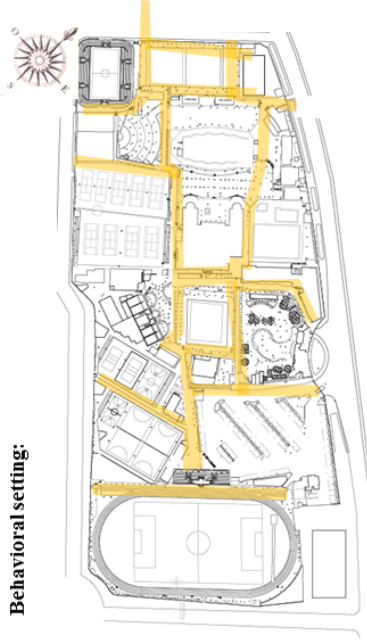
Behavioral setting:



Child number	Minutes (40)	Cognitive play						Social play			Descriptive notes (interaction behavior in the behavioral setting)
		Functional play	Constructive play	Exploratory play	Dramatic play	Games with rules	No play	Solo play	Parallel play	Group play	
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percentage											

Date: Hour: Age: Gender:

Behavioral setting:



Child number	Minutes (40)	Cognitive play							Social play			Descriptive notes (interaction behavior in the behavioral setting)
		Functional play	Constructive play	Exploratory play	Dramatic play	Games with rules	No play	Solo play	Parallel play	Group play		
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percentage												

Date: Hour: Age: Gender:

Behavioral setting:



Child number	Minutes (40)	Cognitive play							Social play			Descriptive notes (interaction behavior in the behavioral setting)
		Functional play	Constructive play	Exploratory play	Dramatic play	Games with rules	No play	Solo play	Parallel play	Group play		
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Figures 70: Behavioral observational tables for the four urban spaces

3.4.2. Phase two: Drawing and photography

This phase required the organization of another group of sixteen (16) children, referred as “Group B”. This group was approached in every selected urban space, to conduct the perceptual cognitive skill activities, including drawings and photography activities, whom their parents insured their quite frequently visits to the four urban spaces, correspondingly. The children’s parents were informed through parental get-togethers and by written communication, to consent for their children’s participation. Theses communications and get-togethers were held either through a community leisure center near Cité jardins residential neighborhood, Paris suburbs (92), France, or through a winter school held near the recreational urban space of Châtelet - Les Halles, or in situ during the observation settings, in the cases of Cairo. Selecting another group was due to several restrictions and limitations including; the length of time duration of the behavioral observation sessions that lasted for 40 minutes per child, where it is more probable that the child might leave after or would feel fatigue to engage and concentrate in a required task. In accordance to James et al. (1998), who emphasized that children have shorter attention span, thus it is important to prevent boredom and increase interest. Moreover, these observations were not revealed to the children, so as not to tear their attention and influence their behavior after feeling judged and monitored. Furthermore, since the fieldwork launched on March 2020, the unrevealed observations were prevailed, due to the sanitary situation “COVID-19” and the parental restrictions to strangers. In addition, triangulating different techniques and crossing check data are essential, since children have rich imaginations and sometimes they cannot distinguish between reality and fantasy which raises reliability concerns (Punch, 2002; Einarsdottir, 2007). Accordingly, Darbyshire et al. (2005) explained that “Triangulation approach” provides free insights and generates more as well as deeper data Children selected, in “Group B”, were 5 to 12 years old, in addition, the four samples were, once more, matched by age and insured equal gender distribution (8 girls and 8 boys).

In this phase, each child was engaged in a brief friendly conversation by the researcher, with experience in working with young children, as a start to break the ice before being asked to take part in the drawing and the research (Christidou et al., 2013),. Then, they were asked to create a drawing on an A4 using pencil and colors, independently, which excluded the idea that some children were influenced by what their colleagues draw,

(Figures 71). They were instructed to draw the urban space as it currently exists and the activities that typically take place there. Moreover, they were asked to mark out their special play places in their daily environment. In addition, there were no time restriction that was put on the children to complete their drawings.

Drawing is a traditional method used to discover young children's views. It was used by Hart (1979), Moore, R., (1986), Chawla and Malone (2003) and Cele (2006) to highlight children's preferred places for play. Drawing is a visual data that gives insight into how children view. In addition, it is a creative, fun method that encourages children to be more actively involved in the research (Punch, 2002; Barker and Weller, 2003). Moreover, it gives children more control as they can edit or add what they like, where it is a non-verbal way of expressing themselves. Accordingly, Simkins and Thwaites (2008), as well as Tranter and Malone (2004) used the idea of the wish picture. They asked the children to draw an imaginary picture of a place that they wish to play in. Consequently, drawings were also used in an exploratory way that showed children's dreams and imaginative images of their play spaces.

Furthermore, a large developmental psychology literature confirmed that drawings can be used to assess children's perception of the surrounding environment and their cognitive development (Luquet, 1927; Piaget, 1956; Kellogg, 1970; Silver, 1983). However, because both the drawing abilities and cognitive skills of the children develop with age, the assessment of perception and cognitive development from drawings needs to be age-related (Luquet, 1927; Matthews, 1984; Cox, 1992). Therefore, the 16 children from each site were divided into two age groups of 8 children each; a group of 5 to 7 years old and a group of children older than 7. For each age group, a different set of criteria was used to evaluate their perceptual cognitive development.

Children from the age of 5 to the age of 7 correspond to a pre-schematic drawing stage. Accordingly, for the younger age group, cognitive skills were evaluated by rating drawings in terms of two criteria: (1) accuracy of represented elements and (2) amount of details in represented elements (Luquet, 1927; Piaget, 1956; Kellogg, 1970; Silver, 1983). On the other hand, children older than 7, enter the schematic drawing stage. Accordingly, for the older age group, cognitive skills were evaluated by rating drawings in terms of six criteria: (1) accuracy of represented elements, (2) amount of details in represented elements, (3)

accuracy of overall urban space scene, (4) amount of detail in overall urban space scene, (5) visual realism in terms of accuracy of spatial relationships, and (6) visual realism in terms of perspective and representation of depth (Luquet, 1927; Piaget, 1956; Kellogg, 1970; Silver, 1983).

For each child's drawing, each of the criteria was independently rated on a five-point Likert scale by three raters: two university faculty with experience in the teaching of visual studies courses for architectural students and a kindergarten as well as primary school art teacher. For each drawing, the measure of each of the criteria was taken as the average of the three independent ratings (Elnesr, et al., 2018).

Although, drawing is a rich visual illustrational method that gives the children freedom in expressing their thoughts, in addition that it is used as an exploratory method, for showing how children view the existing surroundings and their imaginary world of play. Some children were reluctant to participate in drawing at first, where they mentioned that their drawings would look bad as they are not talented. While others refused to give their drawings as they complained about feeling uninspired and that it is difficult to imagine the place. Thus, some drawings were complemented or replaced with captured photographs by the children themselves, if necessary or upon child voluntary request. Consequently, some children asked to represent a picture that describes their best space to play in or the world in which they would like to play. This could be further interpreted by Rasmussen (2004) and Burke (2005), who further explained that taking pictures allows children to express themselves easily and creatively, without relying on any special skills or talents, in addition, it doesn't take time or effort so children don't lose interest. Moreover, Rasmussen and Smidt (2003) as well as Burke (2005) used children's photography to construct photo diaries, in addition, to document the informal and formal play spaces as well as places children's prefer for play. Children's photography is a visual method as well as drawings, incorporated by Hart (1979) in researching and exploring the informal play spaces of children. Children's drawing and photographs also might bring the details of the participants' everyday play spaces, without accompanying them for site visits due to the above mentioned restrictions.



Children drawing during the perceptual cognitive skill activities at Abassia residential zone



Children drawing during the perceptual cognitive skill activities of Cité jardins residential neighborhood



Children drawing during the perceptual cognitive skill activities at H.S.C recreational urban space





Children drawing during the perceptual cognitive skill activities of Châtelet - Les Halles recreational urban space

Figures 71: Children drawing during the perceptual cognitive skill activities

3.4.3. Phase three: informal interviews and child-led walks

Informal interviews were held, for further interpretations, with the children of “Group B”, who participated in the drawing stage. Although drawings and photography methods give children sense of power and control, they are task-based methods that sometimes are misleading (El-Husseiny, 2016). Therefore, the drawings provided a range of data that made it easier to connect with the children and it was a starting point for the informal interviews. Children were grouped into 4 children for interviews that took place either in the community leisure center near Cité jardins residential neighborhood, Paris suburbs (92), France, or during the winter school held near the recreational urban space of Châtelet - Les Halles, or in situ during the observation settings, in the cases of Cairo, on sixteen different days. The group discussion lasted for around 30 to 45 minutes. Moreover, the interviews were noted down, and no tape recording was used.

First, every child was asked to describe his/her drawing and what the drawing meant to him/ her. Most of the children were keen to share in the conversation. Conversations were relaxed and children were willingly answering the questions. However, others were shy and preferred to describe his/her drawing privately, which was scheduled after the group

conversation. It was difficult to understand the meaning of the drawings, until each child described her/his drawing. During the interviews, the positive and negative aspects, as well as their favorite areas settings in the urban spaces were discussed. In addition to their parental concerns and restrictions, regarding their free mobility in the different urban spaces, were argued. Moreover, it was noticed that most of the children categorized and classified spaces. Interviews were efficient in knowing basic facts and information about the participating children and discussing the meanings of their drawings.

Some children in both countries were asked to reveal their special and secret places in the different urban spaces. Therefore, some informal interviews were complemented with child-led walks that were held on 5 separate different days (three children belonging to one group from Abassia residential zone, two children belonging to one group from Cité jardins residential neighborhood, one child from Châtelet - Les Halles recreational urban space, and four children belonging to the two groups from H.S.C recreational urban space). Each walk lasted for 30 to 35 minutes. Conversations and participant's observations during walks were very insightful. In addition, children's facial expressions, their body language, and their tactile gestures, during talking and walking, helped understanding their feelings in certain places. The walks allowed children to remember more details concerning the urban spaces and to highlight their preferred as well as their secret places. In addition, it allowed the researcher to experience the space from the children's view to explore how children live the space, and to interact with the space in the manner performing a specific ambient space. During the walk itself, the surrounding landscape features, physical aspects, and functional qualities, triggered conversations which probably never would occur otherwise. Hence, it could be argued that the experienced landscape features, physical aspects, and functional qualities are constructed not only by seeing, but rather by memories, feelings through narratives, and what is perceived through our senses when interacting with it. During the walks, children were jumping, climbing, balancing, laughing, and exploring every corner while guiding the walk. Furthermore, it was a rich experience to observe their use and appropriation of all elements in the space, by relating parade to gestures. Accordingly, descriptive field notes and clarifying sketches were also used during walks to further document all impressions, children's body language, and their fine tactile gestures in relation to spatial configurations, landscape features, physical aspects,

functional qualities, and most of what they described. Furthermore, no tape recorder was used, in order not to make the walk too formal that might lead children to control their behavior.

This phase, more particularly the child-led walks, was adopted by Moore, R., (1986) and Cele (2006) approach, by allowing the children to guide the walk without any restrictions and show the researcher their secret and preferred places. Several ethnographic studies have used walks as a method of data gathering. It was, also, used by Hart (1979), who provided children with a map and a list of places on a paper, and asked them to find the places and answer the questions regarding each place. Child-led walks method is an interactive method that gives the researcher the opportunity to observe the unique way of children in interacting with their outdoor environments. In addition, it explores children's place knowledge and place feelings due to the direct transaction with the built environment. Moreover, walks include a higher level of details of the environment as conversation takes place as a direct response to the space. Therefore different type of knowledge is received than methods that are conducted indoors (Hart, 1979; Moore, R., 1986; Cele, 2006; El-Husseiny, 2016).

Furthermore, short-semi structured interviews took place with the designers and the managers of the different urban spaces, to gather accurate information on the design, motivations, design concepts, expectations, and the allowed social practices for the designed urban projects. This notably took shape around mental maps, photographs, individual as well as group interviews, and aerial images.

These interviews might help to understand the conceived, managed, and represented spaces from the perspective of the designers as well as the managers. In addition, the interviews approached the designers' considerations in their design to enclose and encourage children's presence in their design. Furthermore, these interviews might help to further highlight the problematic gap achieved between the conceived spaces and the ambient envelop of the lived final produced spaces.

3.5. Data analysis

Meanwhile, using these alternative methods enabled different children's voices to be heard, since they helped in achieving a balance, as some children preferred to draw, others to talk, and others to write, as preferences vary from one child to another (Hart, 1992).

Accordingly, the used data collection methods appeared to be appropriate and compatible with the capabilities of middle childhood, who are the focus of the study (Hart, 1979; Moore, R., 1986; Punch, 2000; Cele, 2006). However, what makes a research ethnographic is not just the set of methodological tools to collect data, but the way in which they are analyzed, since methods are to bound theory (Cerwonka, 2007).

Thus, the study proposed some existing theories as analytical tools; nevertheless very few studies have aligned them with the study of children’s everyday spaces. Consequently, collected data was analyzed within the shadow of both “Trialectic of Space Theory” (Lefebvre, 1992) and “Affordances theories”, (Gibson, 1979, Norman 1988, Bohme, 2017), to fill in the problematic spatial gap between the view of adult as well as designers in conceiving designed spaces, and the children’s perception to their lived experienced surrounding environments, keeping in consideration the culture, social, as well as previous background (Gibson, 1979, Bourdieu, 1986, Norman 1988, Lefebvre, 1992, Heidegger 1996, Bohme, 2017), (Figure 72).

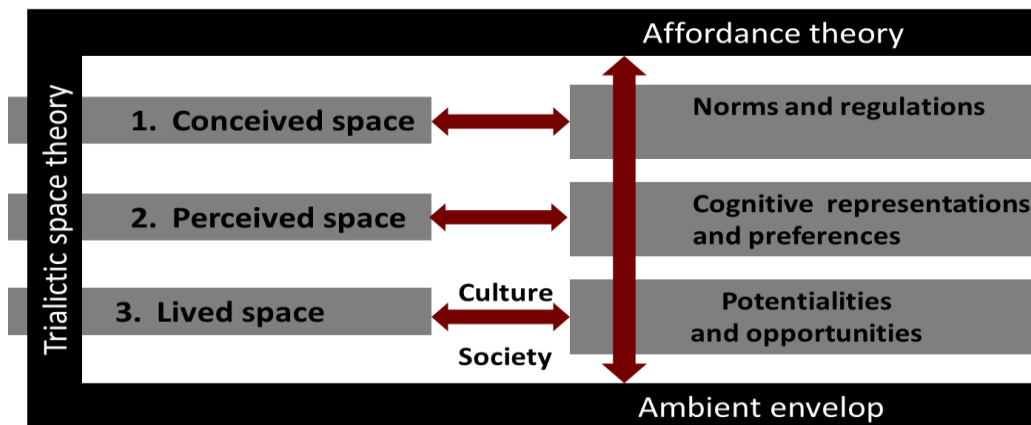


Figure 72: Analyzing the collected data within the shadow of both “Trialectic of Space Theory” and “Affordances theories”

In consequence, the collected data was analyzed within the shadow of the above mentioned theories through different tactics, (Figure 73). Initially, statistical analysis was used to assess the differences between the four urban spaces, in terms of the different outcome variables. This statistical analysis of the data collected included the performance of “Student's t-tests”. Student’s t-test, in statistics, is a method of testing hypotheses about the mean of a small sample drawn from a normally distributed population, when the population standard deviation is unknown. The method indicates the significance of the

differences between groups. In other words, it reveals such differences (measured in means) could have happened by chance (Goulden, 1956).

This test was used in the study to evaluate differences between the four urban spaces, in terms of children’s presence, occurrence of the different types of play behavior, and more specifically, the occurrence of the different patterns of play in different spatial typologies. Moreover, the “Student's t-tests” allowed to evaluate differences between the four urban spaces, in terms of children’s perceptual cognitive development skills through drawing evaluations. Since according to Elnesr, et al. (2018), there might be an association between spatial configuration design and children’s perceived mental map, as well as their spatial preferences, which emphasized their perceptual cognitive development, the relationship between the amount of constructive as well as pretend play, and cognitive skills.

Furthermore, qualitative analysis was used to elaborate children's everyday sensory experiences, their perception of the environment, the ambience of children’s preferred places, events, or activities that constitute their everyday life. The qualitative analysis included comprehending the descriptive notes and sketches recorded during the observational sessions, the content of drawings, the key words utilized in the informal interviews, and the gestures tactile performed during the walks, in order to explore the potential links between the different spatial configuration, landscape features, physical aspects, as well as functional qualities, and play behavior, play opportunities, degree of freedom, gestures tactile, lived space, ambience, spatial perceptions, as well as spatial preferences.

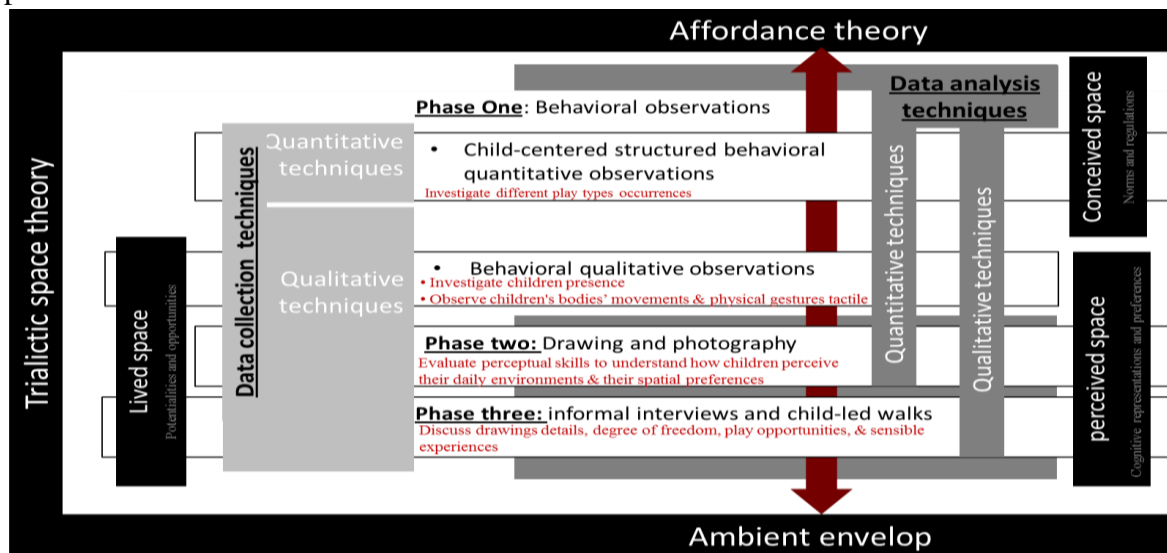


Figure 73: Brief of the research strategy adopted

Chapter 4	Field-work Documentation and Results Analysis
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Chapter 4: Field-work Documentation and Results Analysis

This chapter presents the documentation of the fieldwork, the analysis of the collected data from the four urban spaces, residential as well as recreational, and the results. The collected data during the field-work is stated, discussed, and analyzed through the three spatial levels (i.e. conceived, perceived and lived), which focuses on children's experiences of their everyday settings. Results of the structured observations of play behavior, the qualitative behavioral observations, listening to children's interviews, and their drawings are reviewed and noted. This chapter explains how data gathering has proceeded. It shows a classification and grouping of collected data, from each case study, is carried out, in search for the recurring physical features and functional qualities that attract children during their free play in a variety of outdoor settings. This is followed by the analysis of data to identify the reasons behind children's place preferences, patterns of play, and the attractive physical features of urban spaces. This triangulation of methods helps in creating a full vision of the research problem and tries to answer the research questions. Thus, it might enhance the understanding of children's priorities and needs through comprehending how and where children actually play, in addition to what parts of the surrounding environments they use and why.

4. I. Residential urban spaces category

This section of the chapter is concerned with the fieldwork documentation, the results and the analysis of the first as well as the second case studies of the residential urban category, and the results.

4. I.1. Abassia Residential zone, Cairo, Egypt

The three spatial level analyses (i.e. conceived, perceived, and lived), for the data collected during the field-work held in Abassia residential zone, are presented, as follows:

4. I. 1. a. Conceived space

This first spatial level investigated the impact of the spatial porosity, defined as the degree of openness and closure of the outer spatial boundaries of the territory and the inner spatial permeability between the different sub-spaces and its impact on the children presence in the residential urban space and their play behaviors. As previously mentioned, Abassia residential zone is considered as a semi-private/public residential zone, resembling the

prototype of the traditional Egyptian urban residential streets. It is distinguished medium degree of closure of the urban space. Accordingly, the collected data from Abassia residential zone, in this spatial level, was analyzed on two phases as follows:

On the first phase, the Child-centered structured observations, which were collected by means of observational tables specified for Abassia residential zone, (Appendix A.1), were analyzed to assess occurrence of different play types, (Figures 74 and 75). Concerning the cognitive play behavior types, observations designated that the occurrence of “games with rules”, was a prevailing play type, where 22 children were observed to engage in “games-with-rules” play type for a total of 396 minutes. Children were observed engaging in tag, hide and seek, and other competitive sports, as football games, as well as games invented by children that require cooperative learning and negotiation. In general, “games-with-rules” offer assistance to children to comprehend their limits and learn to control their behavior to comply with rules. Through this sort of play, children become more sociable and consistent, which empower them to play in groups (Piaget, 1962).

Additionally, it was observed that the occurrence of “dramatic play” and “constructive play” were almost similar. The two behavioral types were not found to really differ in terms of occurrence, number of engaged children, and the approximate mean per engaged child calculated as 10.6 minutes. For the “constructive play”, 19 children were observed to engage for a total number of minutes of 319. “Constructive play” in Abassia residential zone included examples of playing with loose bricks to build a house, a tower, or a bridge, playing in the sand to build a sand-castle, or using chalk stones to draw a picture on sidewalks. Similar to “constructive play”, 19 children engaged for a total number of minutes of 318 in “dramatic play”. Children were observed involving in acting familiar activities, without the necessary materials, or out of their normal socio-cultural, or physical context such as pretending to swim in the sand-box, or to sell as the street-vendors. These imitating roles were specifically extracted from the surrounding socio-cultural community. On the contrary, observations revealed that the occurrence of “No play”, was the least prevailing cognitive play types, where only four children were observed to engage in “No play” for a total of 35 minutes, thus the approximate mean per engaged child, was 8.75 minutes. These children were mainly observed to engage in either onlooker behaviors, where they watch the passers-by, or they were engaged in active group conversations.

Regarding the social play, very clear differences between “group play” and “solo play” so as “parallel play” types were observed, since 29 children, which almost the whole group, were observed to engage in “group play” for 862 as a total number of minutes. Thus the approximate mean per engaged child in “group play” was 29.7 minutes. Unlike the “solo play”, where only 16 children were observed to engage in “solo play” for just 84 minutes, thus the approximate mean per engaged child in solo play was only 5.25 minutes.



Figure 74: Examples of different observed cognitive and social play types

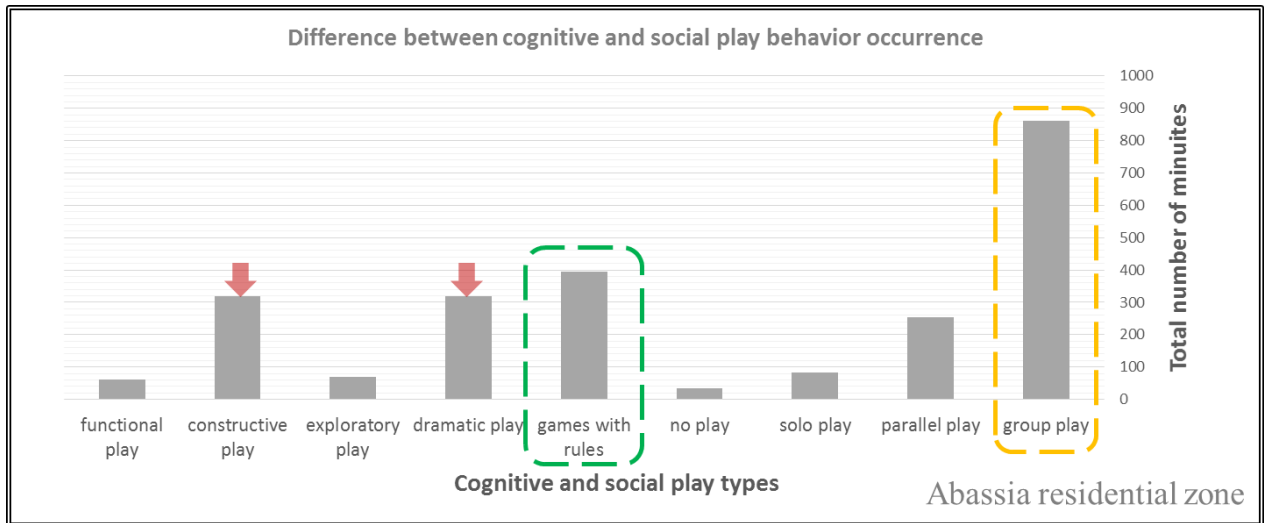


Figure 75: Amount of occurrence of cognitive and social play types in Abassia residential zone

The structured observations were further analyzed with the initiative to assess the difference in the occurrence of play behavior in terms of different genders through applying the statistical “Student t-test” valuation, (Table 9). It was identified that there was a significant difference in terms of “dramatic play” in favor to girls, where p-value was less than 0.01. Since 12 girls were observed to engage in “dramatic play” for a total of 223 minutes, therefore, the average minutes per engaged girl was 18.6. While only 7 boys, which is half of the engaged number of girls, were observed to engage in “dramatic play” for a total of 89 minutes. Therefore, the average minutes per engaged boy was 12.7. This might be related culturally, as girls were always observed to be prevailing in playing with dolls and involving role playing by acting roles typically performed by others as pretending to be a school teacher, cooking, or in other words motherhood duties. Unlike boys, it is not welcomed by the community traditions and the parents to engage in acting roles reflecting female duties. Moreover, boys’ acting roles were always observed to involve and reflect a patriarchal society, where the following quote was repeated frequently from different children “*boys do not play with dolls, it is a girl’s toy*”. This could be linked to the inequality of genders’ roles experienced in the community, since, according to literature, dramatic play involves an imitative activity in which a child imagines and acts out various internal and social roles and situations reflected from the surrounding community and culture (Piaget, 1962).

Concerning “games-with-rules”, it is important to highlight that the engaged number of girls and boys were equal with a slight difference in favor to boys. While, there was no significant difference between genders in relation to the rest of different cognitive and social play types where p-value was greater than 0.01, (Figure 76).

Table 9: Differences in cognitive and social play types between genders in Abassia residential zone

Boys							Girls		
Student t-test (Abassia residential zone)									
Play type	Cognitive play						Social play		
	functional play	constructive play	exploratory play	dramatic play	games with rules	no play	solo play	parallel play	group play
Total of minutes of girls	42	129	18	223	178	10	45	102	453
Mean per girl	2,8	8,6	1,2	14,9	11,9	0,7	3,0	6,8	30,2
No of engaged girls	8	8	2	12	11	4	10	9	15
Mean per engaged girl	5,3	16,1	9,0	18,6	16,2	2,5	4,5	11,3	30,2
Total of minutes of boys	20	190	52	89	215	25	39	152	409
Mean per boy	1,3	12,7	3,5	5,9	14,3	1,7	2,6	10,1	27,3
No of engaged boys	4	11	7	7	11	3	6	12	14
Mean per engaged boy	5,0	17,3	7,4	12,7	19,5	8,3	6,5	12,7	29,2
P-value significance	0,206	0,275	0,106	0,009	0,493	0,335	0,739	0,231	0,343
In favor to	Girls	Boys	Boys	girls	Boys	Boys	girls	Boys	Girls

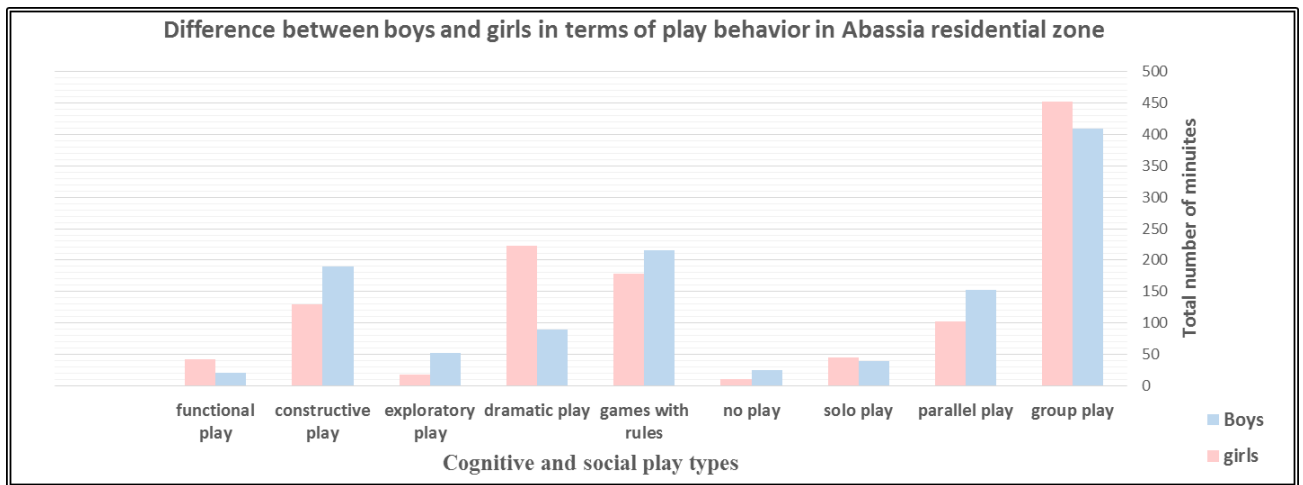


Figure 76: Gender differences in amount of observed cognitive and social play types in Abassia residential zone

As for the second phase, data from the behavioral qualitative observations sessions, complemented to the child-centered structured observations was analyzed through using a collective behavioral mapping to investigate children’s presence within the residential zone and its different included space typologies that are characterized with high permeability in-between, as previously mentioned (Figure 77). On the behavioral map, each red dot represented the observation of an individual child in a specific spatial typology. The none

red dots indicated the same engaged child but playing in different spatial typologies. In this case study, the behavioral map indicated to the multiple presence of other colored dots. Thus, observations at Abassia residential zone revealed that many children tended to engage in different activities in the several spatial typologies with higher degree of freedom and integration. Children seemed to move freely between the different space typologies. This might be associated to the sense of security and enclosure enhanced by the medium degree of closure of the outer spatial boundary. Moreover, the high inside permeability within the included spatial typologies might help in not limiting children movement within the urban space as a whole. Accordingly, a noticeable amount of the children playing, who belong to the neighborhood, considered it as their daily outdoor play space. In addition, the playing areas that represented the participants' territorial range, encompasses different included spatial typologies surrounded by the residential buildings. However, the children's parents limited the territorial play range of their children out of the neighborhood territory.

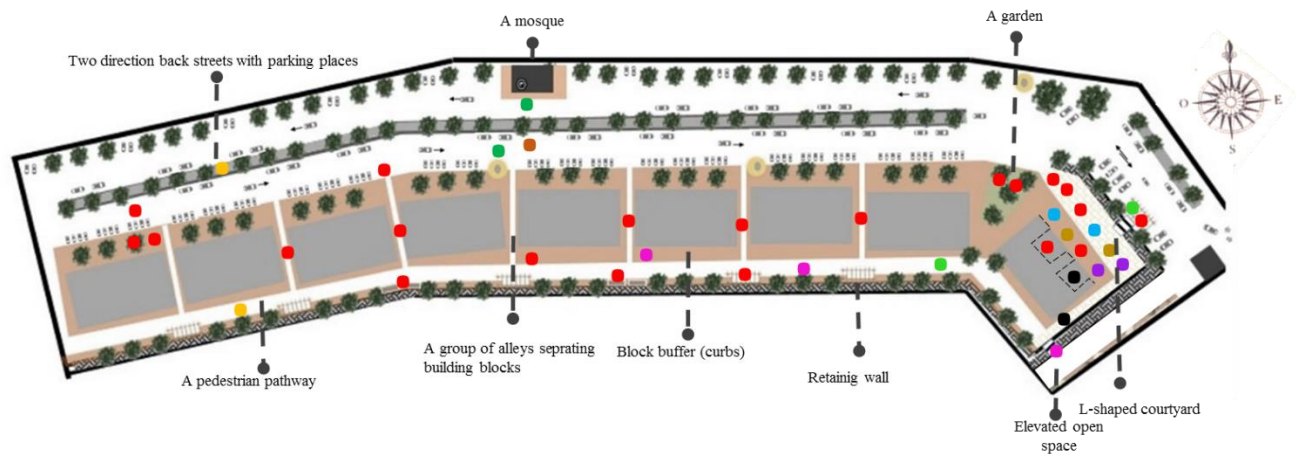


Figure 77: A behavioral map highlighting children's presence in different spatial typologies at Abassia residential zone

4. I. 1. b. Perceived space

This second spatial level examined the included spatial typologies (garden, pathways, assembly zone, a courtyard, back axial street with parking zones, block buffers, and building pockets) in enhancing different space preferences; promoting different play patterns associated with different cognitive perceptions. Accordingly, the collected data from different included spatial typologies was analyzed as follows:

First, data from the above behavioral mapping was further analyzed to assess children's different spatial preferences of these spatial typologies through percentage analysis of their presence in different spatial typologies (Figure 78). Accordingly, pathways and alleys, followed by courtyards, and block buffers as well as buildings' pockets, in their different forms and configuration, were observed to highly encourage children's presence. The analysis revealed that pathways encompassed almost one-third of the sample, while both courtyards and block buffers as well as buildings' pockets together encompass approximately half of the sample. The reason behind the high presence percentage of the above typologies might be due to the well spatial definition of these spaces enhancing activities occupied on long times with high concentration.

The least children's attention and presence percentage was observed in the garden, which encompassed only 5% of the observed sample followed by the open assembly zone. Regarding the low presence percentage of the garden might refer to children's anxiety from their parents. Since according to the children's interviews, their parents usually pre-notified them not to spoil their clothes while playing with mud in the garden and referring to it as an unclean place full of insects. Where according to traditions, nature is not integrated and interfered with in the daily life, but "nature is to watch only".

Similarly, elevated open assembly space in the neighborhood was almost neglected by the children in this case study. Children referred to it in the interviews rarely and they were only interested in the stairs and the retaining wall attached to the assembly zone, but they had fears of the dogs which are constantly there and even children referred to this assembly zone as "*dogs' territory place*". It was noticed that children's fears had transformed the "dogs' space" to "a place", which indicated the real comprehended and highlighted territory, where their fears were perceived and developed. Moreover, children described it as "*uncovered space*" like the "*desert*" and "*not suitable for children's play*", they mentioned that "*in this space there is a lot of sun and hot weather*". These descriptions might refer to the sun and shadow direction, since buildings do not offer shade to this zone. Additionally, the assembly zone is not artificially shaded, and with the sand ground cover that highly absorb heat, which might be perceived and give the sense of the desert. In addition, their perception appeared to point to their awareness of the climatic conditions, exposure to the sun. Consequently, the above interpretations highlighted how children

perceive and are aware that some spaces in the city are not convenient nor dedicated to them.

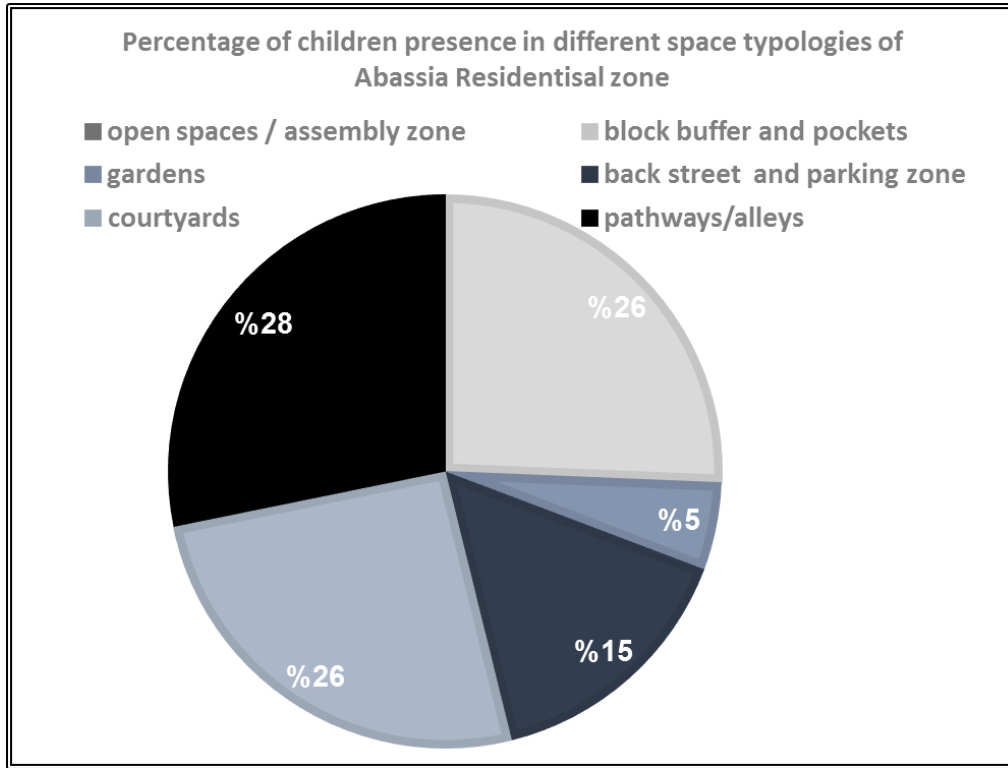


Figure 78: Percentage of children’s presence in the different spatial typologies according to their preferences at Abassia residential zone

Second, beside the elaboration of the children’s preferences and presence, a further layer of overlapping data from both, the child-centered structured observations of play behavior and the behavioral mapping, was analyzed to investigate the differences between the above spatial typologies in the occurrence of different amounts of cognitive and social play types (Figures 79). Where pathways, courtyards, back streets, and parking zones, were observed mainly to promote “games-with-rules” in the form of “group social play”.

In particular, 28% of the children’s sample that were observed in the pathways and alleys, where to engage in different play activities. Pathways and narrow alleys, “AL-HARA”, “الحارة”, with their branched linear as well as their looped forms connecting the axial back street to the pedestrian curved pathway, and their shade offered by the high rise buildings provided them with high sense of enclosure and bounding that seemed to afford children long term concentration activities as sport competitive games as “games with rules” followed by “dramatic and role playing”. These affordances might be linked, as well, to the

moderate shaded climate of these narrow alleys that promoted children with sense of intimate scale allowing the creation of “identifiable territories” and affording the children’s sense of “ownership” as well as “control” over their space, which seemed to increase their social interactions, competition, and challenging their abilities. Where ten children out of 11 marked in the pathways, were observed engaging in “games with rules” for 167 minutes, while six children out of the 11 were observed engaging in “group dramatic play” for 78 minutes. However, “no play” was remarked as the least prevailing behavior in neighborhood’s pathways for a total of 8 minutes.

As for the social play affordances, pathways and alleys were observed to promote “parallel play” and “group play” with slight difference. Five out of the total 11 children, were observed in the pathways and alleys to engage in “parallel play” with total 298 minutes (mean minutes per engaged child was 59.6). While ten children, the double of children engaged in “parallel play”, were observed to engage in “group play” with total 288 minutes, (mean minutes per engaged child is 28.8). This might be linked to the nature of the above mentioned prevailing cognitive play type “games with rules”, since it might require the parallel self-capability challenge in reference to their colleagues and the agreement between the group on the rules of the game, as running speed, jumping capability, wheel toys speed, and balance capability.

For the courtyard, “AL-HOSH”- “الحوش”, with its high sense of enclosure, 26% of children’s sample were observed, engaged in different play activities with more “dramatic play” types for a total 114 of minutes. In the courtyard, activities that required higher level of concentration and time were slightly observed more than “games with rules”. The inclusion of the courtyard is achieved by the spatial definition through its depressed level, the building encompassing it, and its unique interlocking tiles. In addition, it is considered as a secure and safe space due to the presence of the axial street with the elongated sloped retaining wall, and the high presence of vegetation offering high shade, shadow, and moderate climate that create the sense of cozy owned place. These spatial functional qualities seemed to allow the creation of territory but also give the sense of enclosure and security that tended for longer time spans of activity promoting children imagination and invention. However, “exploratory play” was noticed to be the least prevailing. Moreover, the courtyard was observed to promote less “solo social play”, where only two of total ten

marked children in the courtyard, were observed to engage in “solo play” with total 6 minutes, (mean minutes per engaged child is 3), while children were observed to engage in "group play" for a total of 244 minutes.

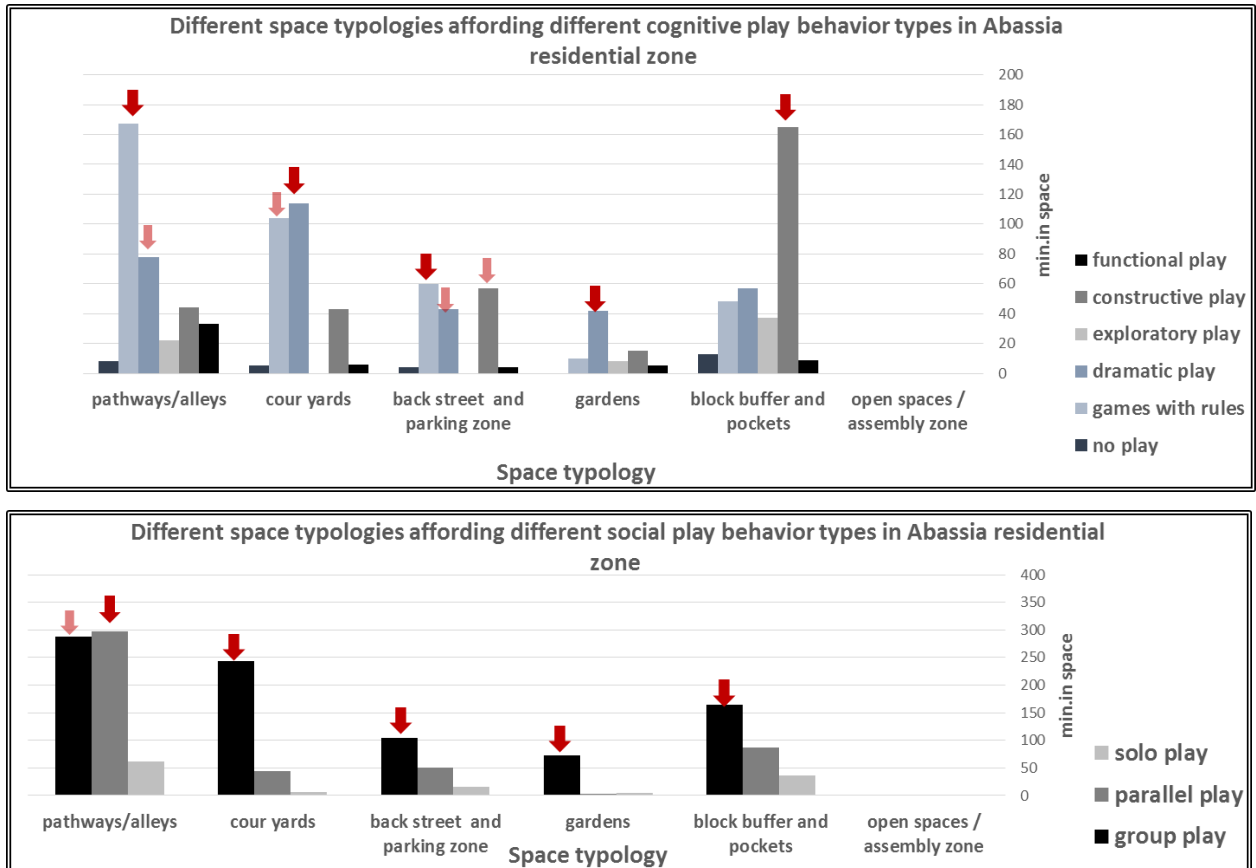
Similarly, 26 % of the children’s sample were observed to engage in different play activities in the enclosed pockets or the well-defined buffers that offer opportunities provoking imaginative and inventive activities that spans long time and requires high concentration. This might be linked to the clear created territory of the space giving the sense of boundary identification, enclosure, and security. Thus, children engaged in “constructive play“, for a total of 164 minutes is considered the highest amount of occurrence time of “constructive play” among all spatial typologies. While “functional play” was considered the least prevailing behavior in the block buffers and pockets that might be associated to the absence of elements, which stimulate children physically with a challenging way and present opportunity for “risk” and “complexity”. The occurrence amount of time of this type of play was only 9 minutes. Moreover, children were observed to engage more in "group play" for a total of 164 minutes.

In the street and parking zones, 15% of the children’s sample were observed, where "games-with-rules" play behavior was the prevailing type, for a total amount of occurrence of 60 minutes. While “constructive play” was considered as the second prevailing behavior for a total of 57 minutes, in the form of “group play” for a total of 104 minutes. Accordingly, block buffers, pockets, back streets, and parking zones supported “constructive play” due to being away from any supervision and the high presence of loose materials that stimulated children construction of their own ideas, such as tires, bricks, ladders, water hoses, unneeded home items, bottles, tanks, and wooden boxes left from street vendors.

Concerning the garden, only 5% of children’s sample were observed to be engaged in different play activities in the garden with the prevalence of “dramatic play” with an occurrence amount of time of 42 minutes. This prevalence might be associated to the presence of flexible natural elements that promoted children imagination and creativity. While “functional play” was observed to occur with a very low amount of time, 5 minutes, which might be interpreted by the absence of hard ground covering surface, since it is sand covered as well as its limited level variability that limited children’s high physical

activities. Children were mainly observed to engage in the form "group play" and social interactions, for a total amount of occurrence of 72 minutes.

Unlike the assembly zone, it was neglected by the children that might be associated to children's anxiety where they perceived it as a non-designed space, and they considered it as non-shaded open space that do not accommodate their play ideas.



Figures 79: Variant afforded cognitive and social play types by different spatial typologies Abassia residential zone

These spatial typologies' preferences, relying on presence percentages, and affordances of different play patterns appeared to affect children's perceptions and their mental maps of the neighborhood, (Appendix A.2). In addition, they tended to implement different learned and experienced notions that are enhanced by children's mental perceptions. Accordingly, these preferences appeared in their drawings, photographs, so as informal interviews.

The children’s drawings were analyzed to assess their cognitive and mental perceptions through perceptual cognitive skills assessment following Piaget’s criteria, (1956). As previously mentioned, regarding the age between 5 and 7, cognitive skills were assessed by evaluating drawings in terms of two criteria: (1) accuracy of represented elements and (2) amount of details in represented elements, (Table 10).

It was noticed that most of the children had high accuracy of represented elements and high perception of large amount of details in the represented elements. Children were aware of the presence of natural elements such as trees, grass, flowers, birds, sun, and sky, in addition, they presented the different types of vegetation, especially the trees offering high amount of shade and moderate climate. Furthermore, different typologies with its distinguished characteristics seemed to be clear in children’s drawings. Additionally, they were aware of the different typologies, in the neighborhood, and their entity of single experience settings, (Figure 80). For example, the garden was presented in many drawings, and was described as a place that offer secret and mysterious spaces, (Appendix A.2.I).

Table 10: Perceptual cognitive skills assessment for drawings of 5 to 7 aged children group, at Abassia residential zone

Child no.	Abassia Residential zone (below 7 years)		mean per child
	1. Accuracy of elements represented	2. Amount of detail in elements represented	
1.	2	3	3,00
2.	4	5	4,50
3.	4	3	3,50
4.	3	4	3,50
5.	4	3	3,50
6.	3	4	3,50
7.	4	3	3,50
8.	3	4	3,50
mean per criteria	3,25	3,75	

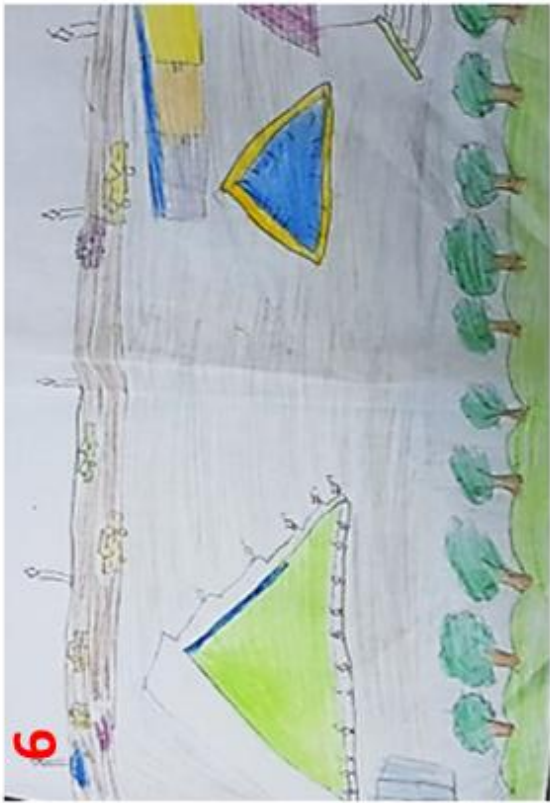


Figures 80: Sample of drawings of children below 7 age group, representing different perceptual mean rating categories, at Abassia residential zone

As for the age above 7, as previously mentioned, six criteria were considered: (1) accuracy of represented elements, (2) amount of details in the represented elements, (3) accuracy of overall scene, (4) amount of details in overall scene, (5) visual realism in terms of accuracy of spatial relationships, (6) visual realism in terms of perspective and representation of depth (Piaget 1956), (Table 11). Likewise, it was noticed that most of the children have high perception so as accuracy of the represented elements with high amount of details and aware of the overall scene, which appeared in the representation of the surrounding buildings, the different typologies that offer them secret places as well as mysterious spaces, and the different urban spatial features that offer them multiple play opportunities. In addition, they were aware of the spatial entity of single experience settings of the typologies in the neighborhood and the presence of topographic variability, as for example, the stairs, the ramps, and the surrounding retaining wall that provided them with the sense of enclosure. Moreover, their drawings tended to explain their perception of different material using different colors, (Figures 81) and (Appendix A.2.II).

Table 11: Perceptual cognitive skills assessment for drawings of children above 7 aged group, at Abassia residential zone

Child no.	Abassia Residential zone (above 7 years)						mean per child
	1. Accuracy of elements represented	2. Amount of detail in elements represented	3. Accuracy of overall scene	4. Amount of detail in overall scene	5. Visual realism in terms of accuracy of spatial relationships	6. Visual Realism in terms of perspective and representation of depth	
1.	4	5	5	5	5	5	4,83
2.	4	4	4	4	3	4	3,83
3.	5	5	4	5	4	5	4,67
4.	4	3	4	2	4	2	3,17
5.	4	4	4	3	3	3	3,50
6.	4	4	4	5	2	3	3,67
7.	3	2	3	2	4	2	2,67
8.	3	2	2	1	3	3	2,33
mean per criteria	3,875	3,625	3,75	3,375	3,5	3,375	



Figures 81: Sample of drawings of children above 7 age group, representing different perceptual mean rating categories, at Abassia residential zone

In general, most of the drawings consisted of various perceived settings, characters, as best friends or family members, and spatial elements, which are meaningful to children. In addition, it was common that the drawings indicated natural features like sun, sand hills, trees, flowers, and water features. Furthermore, some drawings represented the existing physical spaces with some of its included objects that they interact with, on daily basis. For both age groups (5 to 7 and older than 7), drawings of the children tended to be of slight complexity, including a good number of represented elements with a good amount of details. Furthermore, the drawings tended to use a good variety of colors; featured natural elements (such as grass, flowers, as well as trees), and presented good spatial representations with the presence of different spatial experience settings (garden, courtyard, back street) highlighting some physical features and functional qualities, as levels, materials, and vegetation, (Figure 82). For further details, Student t-test denoted that there was no significant difference between genders in terms of cognitive skills' criteria, where p-value was greater than 0.01, (Table 12) and (Figure 83).

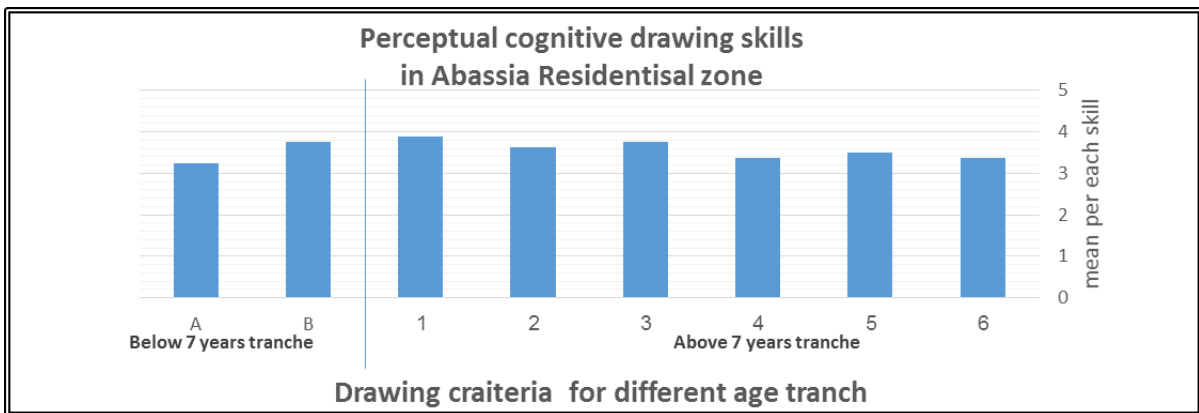


Figure 82: Mean rating of the perceptual cognitive skills evaluation for both age groups at Abassia residential zone

Table 12: Statistical analysis presenting gender differences in terms of perceptual cognitive skills evaluation, at Abassia residential zone

Boys					Girls			
Student t-test (Abassia Residential Zone)								
Criteria	(above 7 years)						(5-7)	
	1. Accuracy of elements represented	2. Amount of detail in elements represented	3. Accuracy of overall scene	4. Amount of detail in overall scene	5. Visual realism in terms of accuracy of spatial relationships	6. Visual Realism in terms of perspective and representation of depth	1. Accuracy of elements represented	2. Amount of detail in elements represented
Mean per criteria for girls	4,3	4,3	4,3	4,0	4,0	4,0	3,0	4,0
Mean per criteria for boys	3,5	3,0	3,3	2,8	3,0	2,8	3,5	3,5
P-value significance	0,097	0,147	0,114	0,303	0,134	0,147	0,468	0,356
In favor to	Girls	Girls	Girls	Girls	Girls	Girls	Boys	Girls

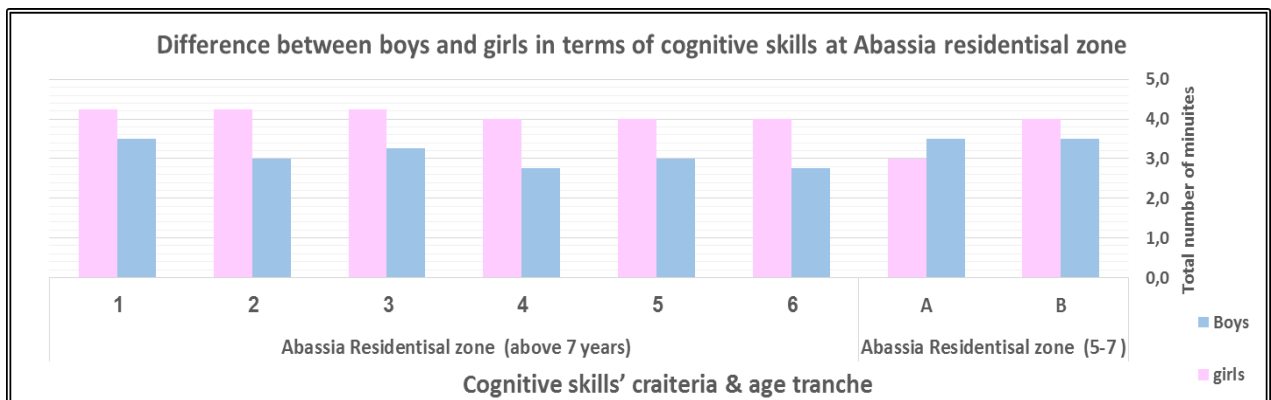

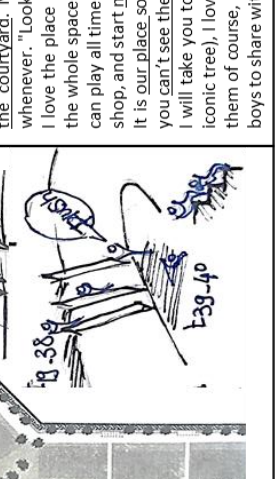
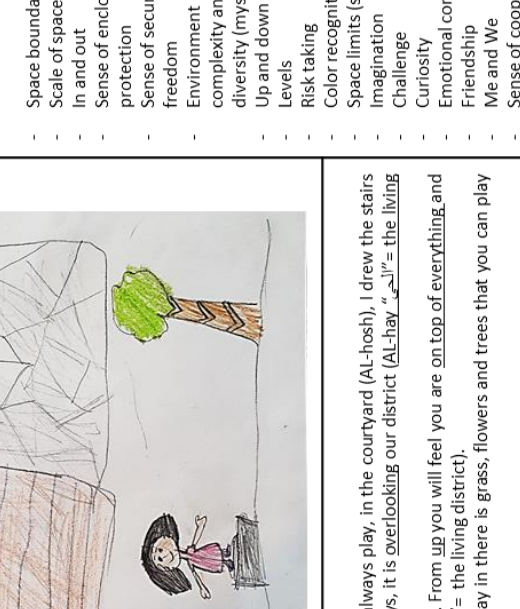


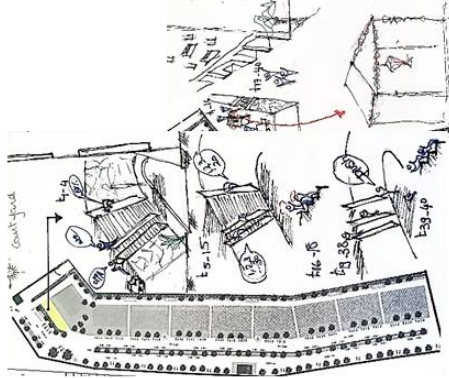



Figure 83: Gender differences in terms of perceptual cognitive skills evaluation at Abassia residential zone

After drawings and informal interviews, a clustering task was conducted to determine the common recurring ideas, physical features, and qualities that attracted children during their play. This process of classification and analysis was held through creating a matrix for participants, whose drawings achieved the highest mean ratings in the cognitive skills evaluations for each age group. The matrix denoted basic information of each participant such as his/her age, gender, child's territorial range, and daily outdoor play settings. In addition, it documented drawings, child's description of the drawing, reflections on pictures of the daily play settings, his/her reactions, responses, and feelings during the interviews that were occasionally complemented by child led-walks, showing preference to certain features that attracted children during their free play in a variety of outdoor settings. The participants highlighted keywords as well as adjectives that described their

mental perceived characteristics of space and the frequent attractive physical features to them, through implementing different learned as well as experienced notions that accordingly were analyzed in relation to research terminologies, such as: sense of enclosure and protection; challenge; curiosity; emotional control; sense of cooperation; sense of distinguishing; and space belonging (Figures 84).

<p>Child basic information</p> <ul style="list-style-type: none"> • Participation in research stages: Engaged in drawing, interview complemented by a child-led walk and photogramphical tasks • Mobility: Free • Age: 6 years • Gender: girl • Play spaces: courtyard and building buffer 	 	<p>Drawing description during interviews that might complemented by a child-led walk</p> 	<p>Drawing description This is my home and this is the place we always play, in the courtyard (AL-hosh), I drew the stairs and the pergola posts that we climb always, it is overlooking our district (AL-hay "الحي" = the living neighborhood). We are near the sky and without a ceiling. From up you will feel you are on top of everything and we even can see our district (AL-hay "الحي" = the living district). The courtyard it is my favorite space to play in there is grass, flowers and trees that you can play anytime, you feel refreshed with the air.</p> <p>Interview and walks: I always play with my friends from AL-hay ("الحي" = the living neighborhood) on the stairs, and in the courtyard. My mother do not allow me to be far so she can see me from the balcony whenever. "Look", here is our balcony in the 1,2,3,4,5, 5 the 5th floor. I love the place here it is a huge space closed so you feel safe here, there are walls surrounding the whole space. The weather here is nice too in summer and winter, a lot of shaded areas, so we can play all time. "Sometimes we took all the flowers here and pretend as if we are doing a flower shop, and start matching the flowers' colors with each other", said by her sister. It is our place so we never get afraid, this space gives us the chance to have many hiding spaces, you can't see the end of the street. I will take you to our mysterious place, here you are (the courtyard ends with garden with a big iconic tree), I love this tree, you know why? The big children hang ropes in the branches, we help them of course, and we make the most wonderful swing, but it is a secret because we do not like boys to share with us this game, they take the whole time swinging.</p>	<p>Mental perceived characteristics of space that implement and different learned and experienced notions</p> <ul style="list-style-type: none"> - Space boundaries - Scale of space - In and out - Sense of enclosure and protection - Sense of security and freedom - Environment complexity and diversity (mysterious). Up and down - Levels - Risk taking - Color recognition - Space limits (sky) - Imagination - Challenge - Curiosity - Emotional control - Friendship - Me and We - Sense of cooperation - Sense of distinguishing (this tree) - Appropriation - Ownership - Space belonging 	<p>Extracted attractive physical features of the neighborhood in relation to research terminologies</p> <p>Spatial porosity</p> <ul style="list-style-type: none"> - Degree of permeability <p>Spatial potentialities</p> <ul style="list-style-type: none"> - Entity of space - Topographic variability - Urban spatial features (pergola/vegetation) <p>Experiences under-going applied theories:</p> <ul style="list-style-type: none"> - Affordances - Trialectic theory - "lived space"
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<p>Child basic information</p> <ul style="list-style-type: none"> • Participation in research stages: Engaged in drawing, photographic tasks and interview • Mobility: Semi-restricted. • Age: 9 and 1/2 years • Gender: girl • Play spaces: back axial street, courtyard, and retaining wall.   	<p>Drawing description during interviews that might complemented by a child-led walk</p>  <p>Drawing description I drew the place, where I play in, we always climb this retaining wall and slide on the ramp beside the stairs. I added also the handrail in the drawing, as we, I and my friends, like to do some physical gymnastics on it or we use it to slide on. Look, I drew the lantern "Fanoos/الفاونوس" as we are very close to Ramadan, me and my friends from "AL-hay" (الحى) = the living neighborhood get together to decorate the streets. Here are also some palm trees and other types of plants that we always water them so as not to be dry from the hot weather.</p> <p>Interview: This place is overlooking the whole district; it is high, huge and empty. The district is safe and cars are slow, unlike outside. We like playing up here in the street and overlooking the courtyard. It is windy and the weather is nice up there. A lot of ramps to play on, (slopped street, retaining wall, and the stairs' ramp). When I am upset with my mother, I love sitting here on the steps, they are a bit cold as they are granite, you can see the whole district so you feel you are on top of things, and if my friends are there we can relax and have a conversation. There are a lot of things to do. Look! This is still my best place. My favorite activity is to climb up. We sometimes connect a rope in this palm tree or to fixed cement and grab the rope to climb up on the yellow rough stones of the slopped retaining wall to be up and then slide down in the courtyard, this makes us imagine being soldiers, like some films or series we are watching. Its seems that we are crazy as we use the stairs differently. My friends and I, created these games using old tires, a thick rope and grey cement to fix it, as the one fixing in between the yellow stones, can you see it. Also, we put tires on the stair ramps and let them go through. We are happy with these places we play in. I took you these photos for the decoration of Ramadan this year, we make a competition between the 9 buildings, to see whose building is better, what do you think about ours?</p>	<p>Mental perceived characteristics of space that implement different learned and experienced notions</p> <ul style="list-style-type: none"> - Ownership - Space limits - Space boundaries - Scale of space - Friendship - Space belonging - Environment - complexity and diversity - Up and down - Observe and control from heights - Levels - In and out - Physical properties of surrounding environment - ME not WE - Sense of security - Texture sensation - Texture and color recognition - Activities variation - Me and We - Sense of cooperation - Sense of distinguishing - Appropriation - Color recognition - Culture awareness - Risk taking - Imagination - Curiosity - Emotional control (overlooking) 	<p>Extracted attractive physical features of the neighborhood in relation to research terminologies</p> <p>Spatial porosity</p> <ul style="list-style-type: none"> - Degree of closure of outer boundaries - Degree of permeability <p>Spatial potentialities</p> <ul style="list-style-type: none"> - Spatial experience defined single settings - Transition in between settings - Topographic variability (stairs, slopes, and ramps) - Ground material - diversity - Urban spatial features (vegetation/ pergola/ handrail) <p>Experiences under-going applied theories:</p> <ul style="list-style-type: none"> - Affordances - Trialectic theory - "personal lived space and ambient envelop"
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Figures 84: Sample of matrixes, including drawing description documentation and informal interviews' script for each age group, at Abassia residential zone

4. I. 1. c. Lived space

This third spatial level explored the potential associations between the included various landscape aspects, physical features, and functional qualities, independently from the spatial typology itself, and children's play opportunities, tactile gestures, lived spaces, ambiance, and spatial sensory experiences. Accordingly, sketches as well as descriptive notes were recorded during behavioral qualitative observations sessions, informal interviews, and occasional child-led walks that were interpreted to explore the potential links between the different aspects of spatial configurations, landscape aspects, and play behavior. The five spatial potentialities that were suggested for analysis: (1) Entity of activity setting, (2) Flow continuity and fluidity, (3) Diversity of ground materials, (4) Topographic Variability, and (5) Presence of different urban spatial features. They are elaborated, as follows:

1. Entity of activity settings: Every included spatial typology, in this residential zone, constitutes of single spatial experience setting or single behavior setting with good functional definition and clarity through the presence of visual boundaries such as variations in ground materials, ground levels, or vegetation elements that achieve enclosure. Thus every spatial typology is considered as a single whole well-defined activity setting with no internal separating activity routes within the single undivided setting, (Figure 85).

These single spatial experience settings were observed to be associated with long time activities and social interactions (Barbour, 1999; Maxwell et al., 2008; Podolska, 2014). Children tended to engage in the same activity for longer time spans with less frequent shifts from one activity to another. According to this study, single spatial experience settings might provide a flexible variety of play experiences, where children can shape the setting according to their will (Smith, 2004; Jones, 2000). Observations noted that single activity settings appeared to encourage types of play that requires protection from the interference and movements of others, as the residents and passers -by. These types of play included "games with rules", "group constructive play", and "group dramatic play", (Figures 86).



Figure 85: Sketches presenting single behavior settings of different spatial typologies at Abassia residential zone



Figures 86: Examples of different lived experiences promoted by space entity of single settings.

2. Flow and fluidity: Random flow and fluidity was observed in spatial typologies due to the absence of internal separating activity route networks, leading to children random movements, (Figure 87). Observations documented that absence of activity routes (allays or pathways) might encourage impulsive play flow, high chance of fights, and aggression, due to children's random movements as well as interference with the play activities of others (Maxwell et al., 2008; Cosco et al., 2010; Podolska, 2014). Moreover, absence of internal activity routes might promote various forms of repetitive random

behavior, shifts rapidly from one setting or object to another, ineffective, and incomplete actions, (Figures 88).

However, the circulation network of the whole neighborhood is well-defined by its distinct materials or forms, offering integration, linkages, and inviting accesses with adjacent spatial typologies. As previously mentioned, this network encompasses the back linear axial back-street, which is covered with hard interlocking tiles and the branched multiple concrete paved linear narrow passages between the buildings, which are attached to the curve-shaped pedestrian path that is well-defined by its distinct concrete paving.

Hard ground material surface used for the circulation network, was observed to afford biking, playing with wheeled toys, and physical activities of high levels. In addition, observations revealed that curved-form pathway seemed to be more attractive for children than the straight linear ones. Since linear pathways might force children to travel back and forth, and make the maneuvering of wheeled toys difficult, which might result in conflicts between children (Cosco et al., 2010).

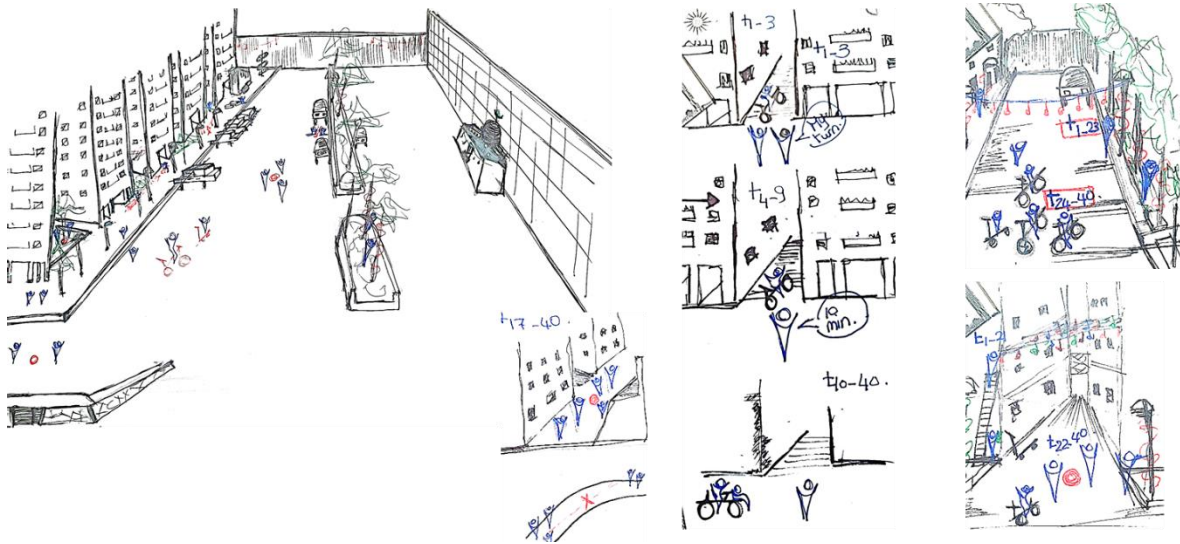


Figure 87: Sketches presenting the main circulation network of the neighborhood with the absence of internal activity routes in the different spatial typologies at Abassia residential zone



Figures 88: Examples of different lived experiences promoted by random flow and fluidity

3. Ground material diversity: Although the design of the neighborhood, as whole, features a variety of ground materials, including: concrete paving for the pathways and alleys; interlocking colored tiles for the street and the courtyard (red, yellow, and grey); sand as well as grass-cover for the garden and the elevated open assembly zone; and reddish concrete tiles at the locations of the building buffers. However, every spatial typology, separately, is characterized by poor ground material diversity through the presence of mono- texture, color, and material, (Figure 89). Most of the above mentioned materials are considered as hard ground surface covers with a lack of soft ground surfaces that had been noticed in the neighborhood. Where hard ground surfaces had been suggested to

promote functional and motor play (Cosco et al., 2010; Christidou et al., 2013; Zamani, 2013; Barbour, 1999; Fjørtoft, 2004). Observations documented that children played differently on different materials, where physical activities were observed as running, biking, and wheeled toy play, to take place on hard surfaces. They had also been suggested to offer possible opportunities for creative activities and “games with rules”. Although absence of soft surfaces, appeared to cause lack of acrobatic movements, tumbling, and relaxation, however, the presence of sand cover as a soft ground material promoted other play opportunities as “constructive play” and “exploratory play”.

In general, diversity of ground materials or color appeared to promote the imagination and creativity in play that were important to “constructive play” and “dramatic play”. On the other hand, long span activities on same material was observed to provide children with boring environment, losing place identity, and attachment, (Figures 90).

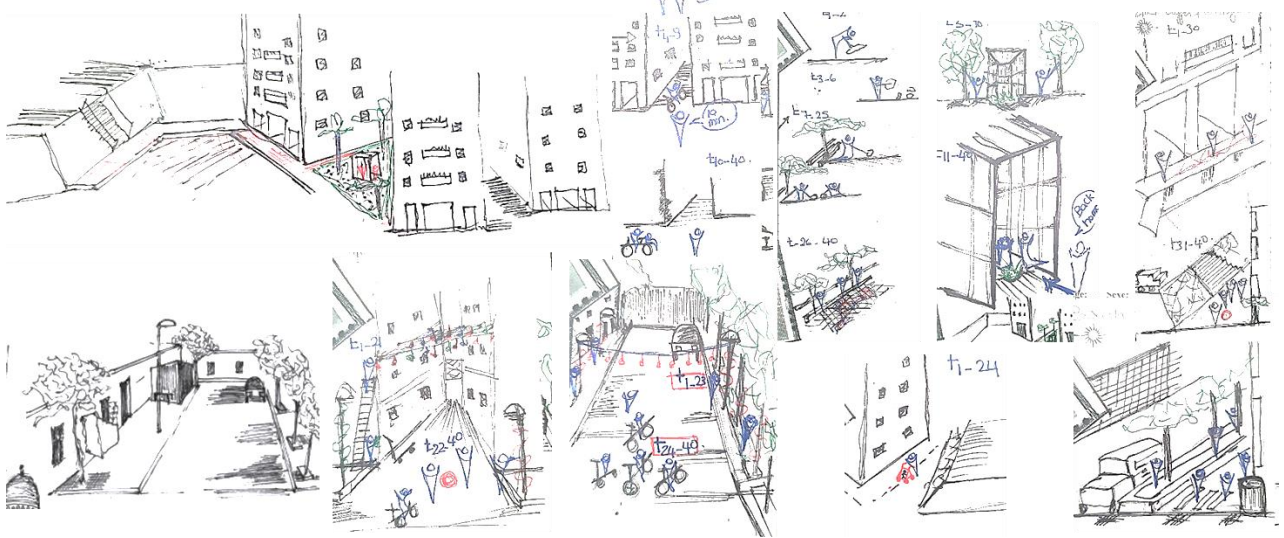
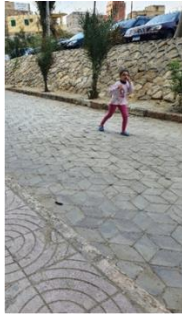
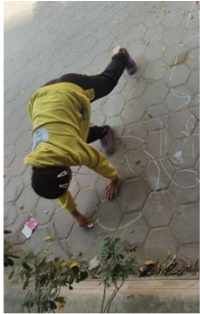


Figure 89: Sketches presenting the poor ground material diversity in every spatial typology, separately, at Abassia residential zone



Constructive play:

Spending long spans of time coloring and drawing on hard interlocking tiles using lime-chalk stones found in site.

Hard material might promote "games-with rules".

Functional and motor play: running, biking, ball play, and wheeled toy play, which are easier on hard smooth surfaces.



The same children playing differently on different materials due difficulty of wheeled toys on sand as a soft ground surface

Soft ground cover seemed to diverse play experiences and stimulate the children's sense of "exploration", "manipulation", and "curiosity".



Sand play is sedentary enhancing exploring, creativity, social interaction, and imagination.



Children incorporated the notions of "in" and "out"

Material diversity enhancing "dramatic play", where tree leaves might help young cooks prepare traditional plates "Molokhia/ "ملوخية" "



Colored ground surface were imagined as islands

Figures 90: Examples of different lived experiences promoted by ground cover diversity

4. Topographic variability: Ground level variability is achieved in the neighborhood through the presence of various elements, such as stair flights, curbs, sloped gravel retaining wall, ramps, elevated concrete manholes, and brick parapets. Observations noted that such variability had been suggested to promote “functional play” and gross motor play, such as, jumping, tumbling, sliding, and climbing. Moreover, variability in ground levels seemed to create challenging play experiences with high degree of stimulating, risk taking, and stretching children limits. The level variability was perceived by children as “elements which stimulate them physically”, consequently, it seemed to encourage “games-with-rules” by competing their abilities, (Figure 91).

Topographic variability had been suggested to enhance self-identity and self-restoration in children’s favorite places (Korpela, Kytta and Hartig, 2002). Children mentioned their preference of spaces, according to which spaces that afford them the complexity of real world; provide them with stages of accomplishment; and send them clear signals of achievement (Titman, 1994). Moreover, children were observed to select elevated places or elements, for its sense of privacy by offering a relaxed, peaceful, and quiet feeling.

In addition, topographic variability appeared to promote the creation and imagination by enhancing the sense of space boundaries for their play activities. Observations revealed that levels might provide feelings of security, privacy, control and develop self-identity through socially interaction as well as play. This was further interpreted by the interviewed children, who referred to steps and bridges as elements that provided them with a full perspective of the surrounding and helped them imagine the whole world is under their control, (Figures 92).

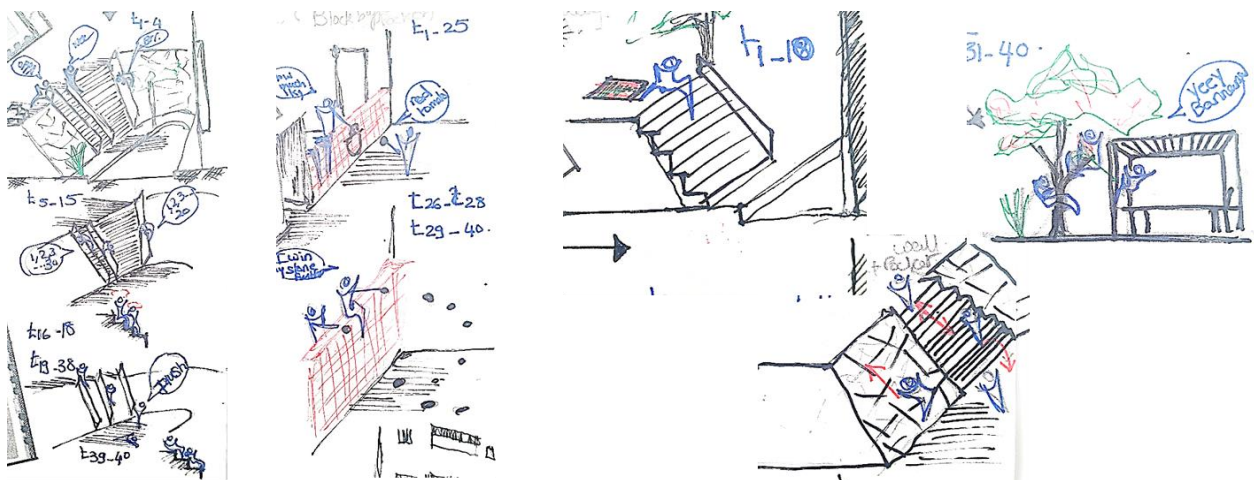


Figure 91: Sketches presenting the ground level variability at Abassia residential zone



Levels and elevated parapets promoted dynamic actions as jumping

Slightly sloped play sub-areas and ramps afforded climbing, sliding, and skating from them.



Variability of ground level helped children to promote imagination and creativity.

Levels and elevated parapets increased environmental complexity by affording hiding and promoting now you see me but now you do not



Levels and elevated parapets enhance "group play"

Levels were noticed to highlight spatial boundaries in children perception by incorporating the notions of "up" and "down" in their "dramatic play"

Figures 92: Examples of different lived experiences promoted by ground level variability

5. The presence of different urban spatial features: The spatial typologies of the neighborhood encompass benches, pergolas, different types of vegetation that offer climate moderation (shrubs, palm trees, flowery plants, trees, and other large shading trees types), flexible materials, and loose elements (tires, bricks, ladders, water hoses, unneeded home items, bottles, tanks, and wooden boxes of street vendors), recessed building pockets, and projected parapets, (Figure 93).

Observations tended to emphasize that the presence of vegetation and particularly climbable trees might help creating stimulating and challenging play environments for children that enhance general physical development (Fjørtoft, 2004). As for the flexible elements, children perceived them, not as being with a one fixed purpose, but to physically interact with and to manipulate according to their own needs as well as their own ideas, to satisfy their creativity and enhance their imagination. The presence of such elements tended to promote more “constructive play” as well as “dramatic play”, by encouraging children to create and invent their own objects for play. As cited in Hart (1979), “*The degree of inventiveness and creativity are directly proportional to the number and kinds of variables in it*”. Observations noted that these features and loose elements increased environmental complexity by stimulating children curiosity, exploratory behavior, general physical development, and imagination.

Moreover, according to the interviews and drawing descriptions, diversity in the design, such as fences, recesses, projections, pergolas, and low parapets, were perceived by children as multi-functional elements, as a challenging space to climb, or as a hiding place to observe without being observed, or as an intimate small-scale space, where they try to fit. These features seemed to provide children with the sense of security; allow children to mark up their boundaries; and claim an ownership. Observations suggested that these spatial features were desired ones that attracted and promoted relaxation, gatherings, group discussions, and other forms of “group play”. Additionally, they encouraged children to interact with them physically; stimulated children’s imagination; enhanced their curiosity; and allowed for appropriation, (Figures 94).

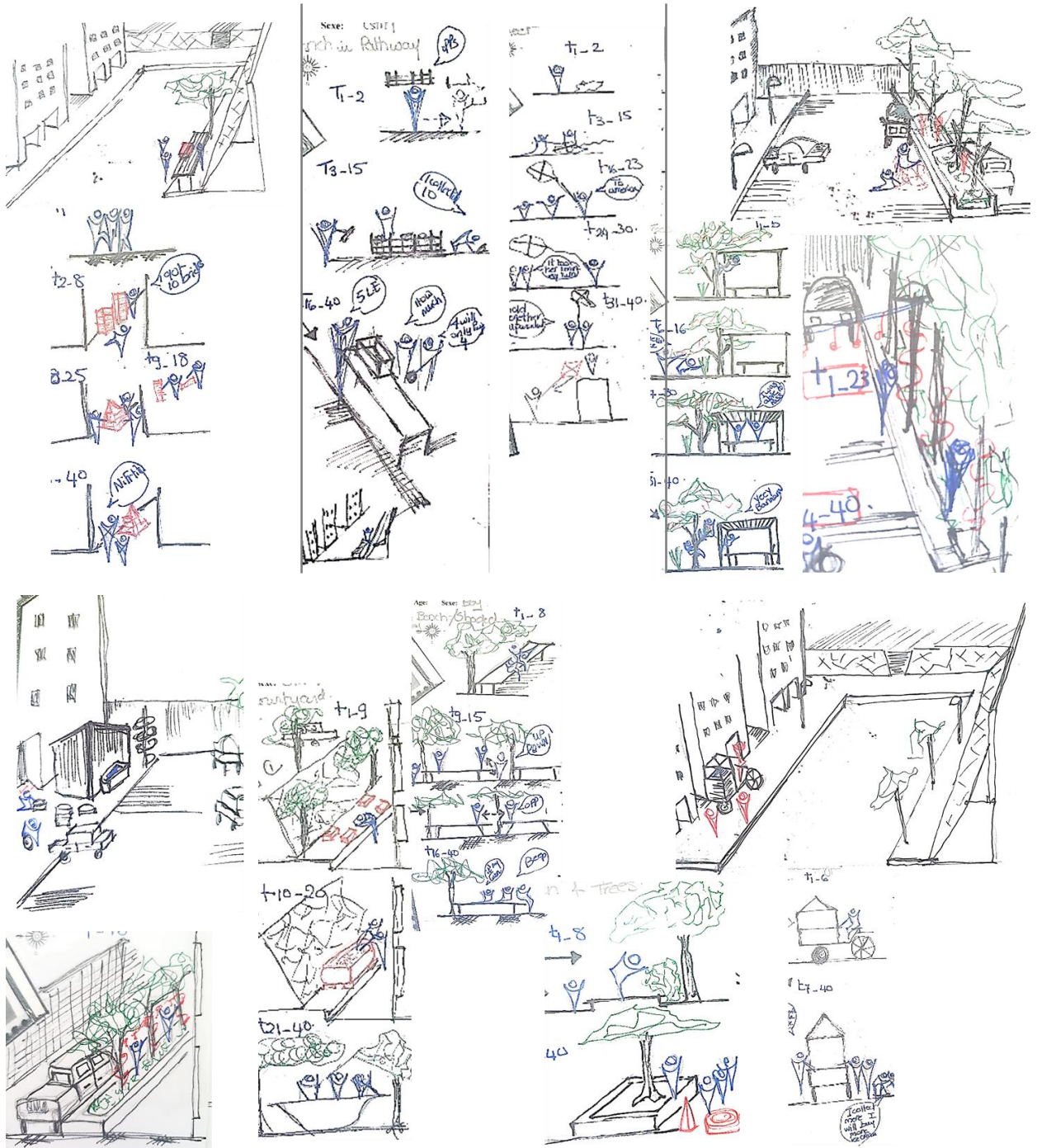


Figure 93: Sketches presenting the different spatial urban features at Abassia residential zone



Trees promoted climbing and forms of play that contribute to the improvement of motor skills, balance, and coordination.

Vegetation increased environment complexity by stimulating curiosity and exploratory behavior.

Vegetation elements were used by children to shelter and hide from each other and perceived as landmarks.

Vegetation tended to promote imagination and "dramatic play"

Children described how all materials were used in their play to create their own play equipment using old tires, a cement for fixation, leaves, coins, tires, ropes, sticks, bottle covers, plastic bottles...etc..

Figures 94: Examples of different lived experiences promoted by different urban spatial features

4. I. 2. Cité jardins residential neighborhood, south west of Paris (92), France

Regarding the eco-residential neighborhood of Cité jardins, the three spatial level analyses of the conceived, perceived, and lived ones, are presented, as follows:

4. I. 2. a. Conceived space

Unlike Abassia neighborhood, Cité jardins neighborhood is characterized by high spatial definition of the territory through medium degree of openness. Cité jardins residential neighborhood is considered as a semi-public/private residential urban space that is surrounded by walls and gates (Gamal Said, 2010). Accordingly, the collected data from Cité jardins residential neighborhood was analyzed on two phases, as follows:

On the first phase, the child-centered structured observational tables specified for Cité jardins residential neighborhood, (Appendix B.1), were analyzed to assess occurrence of different play types, (Figures 95 and 96). Concerning the cognitive play, observations revealed that the occurrence of “exploratory play” was a prevailing behavior. Children were observed to explore their sensory senses by **touching** different material textures such as mud, water, stones to realize different textures; or **hearing** different sounds such as the water fluctuation and the birds tweeting all over; or **smelling** different odors such as the grass and the sedentary water in ponds; or **watching** the affordances of different materials’ properties such as gravity of different objects. Observations highlighted that 26 children engaged in “exploratory play” for a total of 620 minutes, where the approximate mean per engaged child in “exploratory play” was 23.8 minutes.

While “constructive play” was observed to be the least prevailing cognitive play type, where only seven children were observed to engage for 66 minutes, with mean per engaged child of 9.43 minutes, due to the standardized design which lacks loose and flexible elements, unlike the neighborhood of Abassia.

Regarding the social play, there was clear differences between “solo play” and “group and parallel play types”, where 29 children were observed to engage in “solo play” for 531 minutes, with mean per engaged child of 18.3 minutes. While for “group play” 17 children were observed to engage for 313 minutes, with mean per engaged child of 18.4 minutes. As for the “parallel play”, as much as 27 children engaged in “parallel play” for 356 minutes, thus, the mean per engaged child was 13.2 minutes. Accordingly, it was clear that

although the number of the engaged children and the amount of the occurrence of “solo play” was approximately the double of those of “group play”, the mean per engaged child for both social play types was almost the same.



Figure 95: Examples of different observed cognitive and social play types

Furthermore, an analysis of “Student t-test” was initiated to assess the differences between girls and boys in relation to play types, (Table 13), which revealed that there is no significant difference between genders in relation to all different cognitive and social play types; where p-value was greater than 0.01, (Figure 97). Hence, this non significance might be associated to the learned and embedded notion of equality between genders’ roles in the French community.

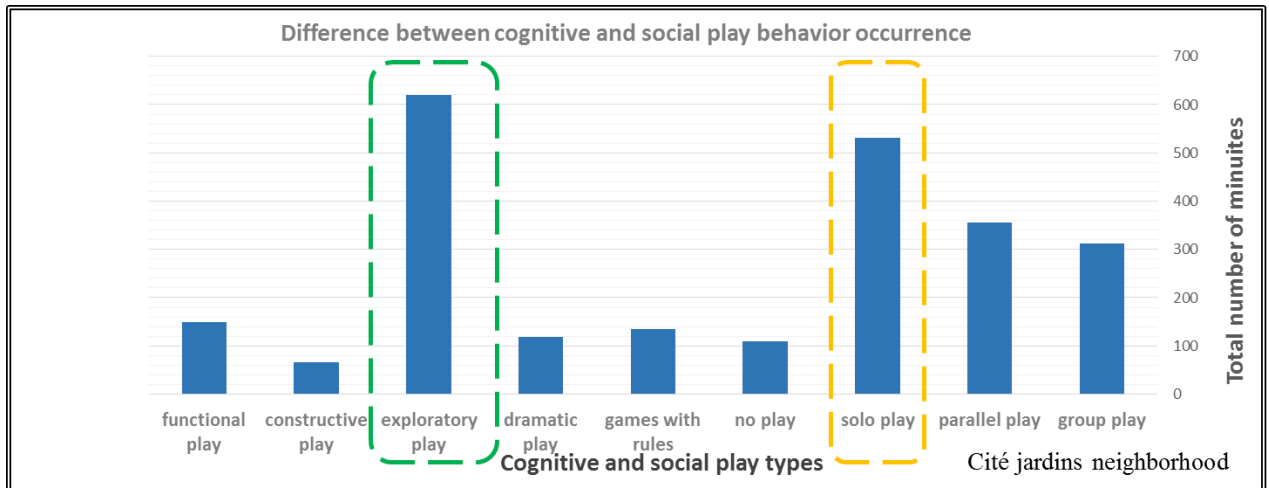


Figure 96: Amount of occurrence of cognitive and social play types in Cité jardins residential neighborhood

Table 13: Differences in cognitive and social play types between genders in Cité jardins residential neighborhood

Boys							Girls		
Student t-test (Cité jardins neighborhood)									
Play type	Cognitive play						Social play		
	functional play	constructive play	exploratory play	dramatic play	games with rules	no play	solo play	parallel play	group play
Total of minutes of girls	69	50	268	66	78	69	270	195	135
Mean per girl	4,6	3,3	17,9	4,4	5,2	4,6	18	13	9
No of engaged girls	7	5	11	4	7	10	14	13	7
Mean per engaged girl	9,9	10,0	24,4	16,5	11,1	6,9	19,3	15,0	19,3
Total of minutes of boys	81	16	352	53	57	41	261	161	178
Mean per boy	5,4	1,1	23,5	3,5	3,8	2,7	17,4	10,7	11,9
No of engaged boys	13	2	15	5	6	6	15	14	10
Mean per engaged boy	6,2	8,0	23,5	10,6	9,5	6,8	1,7	11,5	17,8
P-value significance	0,62	0,16	0,09	0,72	0,49	0,27	0,86	0,38	0,47
In favor to	boys	girls	boys	girls	girls	girls	girls	girls	boys

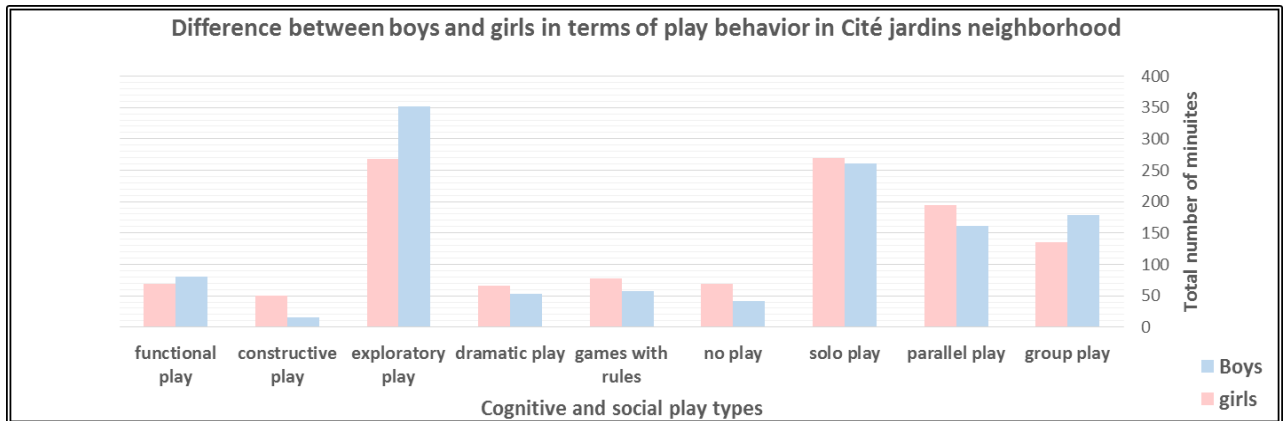


Figure 97: Gender differences in amount of observed cognitive and social play types in Cité jardins residential neighborhood

Regarding the second phase, collective behavioral mapping derived from the data of behavioral qualitative observations sessions that were complemented to the child-centered structured observations, was analyzed to investigate children’s presence within the neighborhood and in its different included space typologies that are characterized with elevated permeability in between, as previously mentioned (Figure 98).

Similar to Abassia residential zone, the observation session revealed that many children tended to engage in different activities in more than one spatial typologies, with higher degree of freedom and integration, keeping the different scale of the neighborhood in consideration. This was clear by the represented multiple other colored dots than red indicated on the behavioral map of at Cité jardins residential neighborhood. Children seemed to move freely in-between the included spatial typologies that might be associated to the sense of security enhanced by the enclosure achieved by the medium degree of openness of the outer boundary gates and the elevation from street level, in addition to, the high permeability within the included spatial typologies, which might help in not limiting children movement in the urban space as a whole. Therefore, a noticeable amount of the children playing, who belong to the neighborhood, considered it as their daily outdoor play space that offer them a safe environment separated from the outside. Moreover, the playing areas that represented the participants’ territorial range encompass the different included spatial typologies in the neighborhood. The children’s parents limited the territorial play range of their children, so they are only allowed to play in the gardens in front of their residential units, but not permitted to play out of neighborhood gates and they are not

allowed to cross the major streets alone. Furthermore, the transition between the semi-public and the semi-private zones seemed to impact the diffusion pattern of children's presence, where they were observed to be with high degree of freedom in the semi-public zone, while their presence's patterns were more clustered in the semi-private zones.

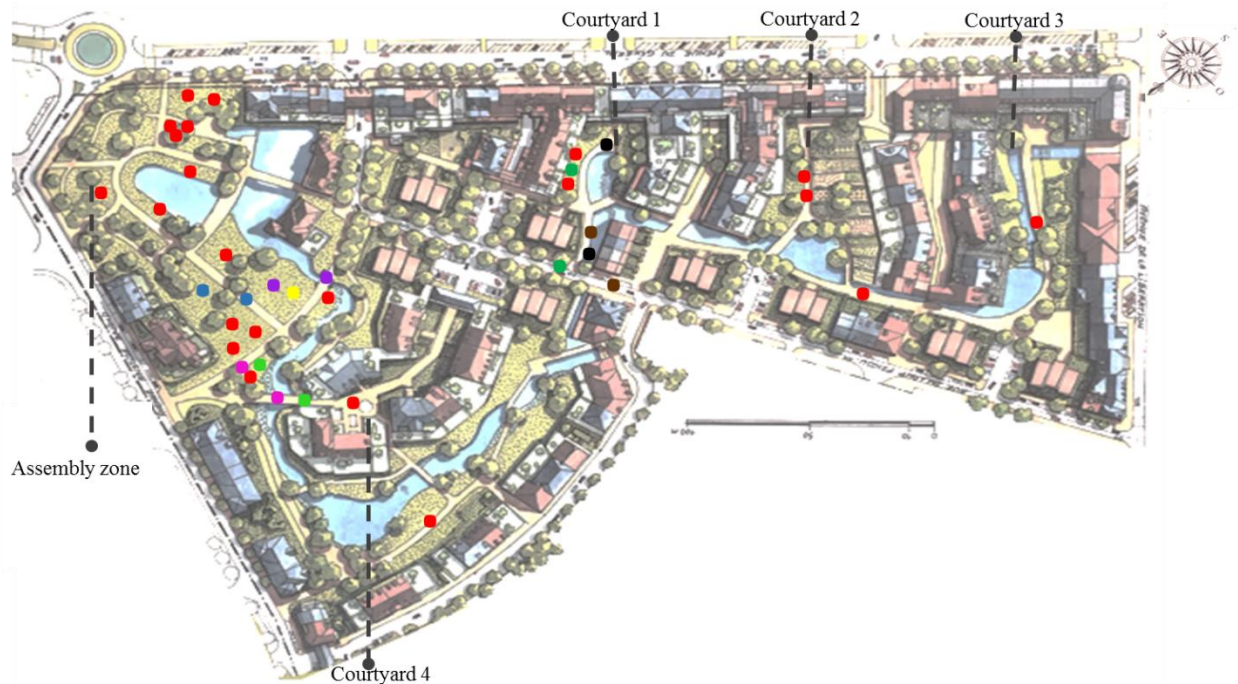


Figure 98: A behavioral map presenting children's presence in different spatial typologies at Cité jardins residential neighborhood

4. I.2. b. Perceived space

Cité jardins residential neighborhood encompasses similar typologies to Abassia residential zone that promoted different spatial preferences, patterns of play behavior, and perceptions. Data from the above behavioral mapping was further analyzed to assess children's different spatial preferences that appear in their presence percentage analysis in these spatial typologies, (Figure 99).

In Cité jardins residential neighborhood, gardens, pathways, and courtyards, with their different forms as well as configurations, followed by the open assembly zone encouraged children's presence, where gardens and pathways encompassed approximately half of the children sample. This presence percentage might be attributed to the fact of diversity in ground materials between the soft natural grass for gardens and the artificial concrete paved pathways, offering a great variety of play opportunities with high degree of freedom.

Unlike the back streets and parking zones that encompassed only 8% of children, they were perceived by children as unsecured places, where parents did not allow them to play there and limit their play territory from streets. As for block buffers, they were totally neglected by children and were rarely referred to, as they were considered as private territories that are accessible for residents only.

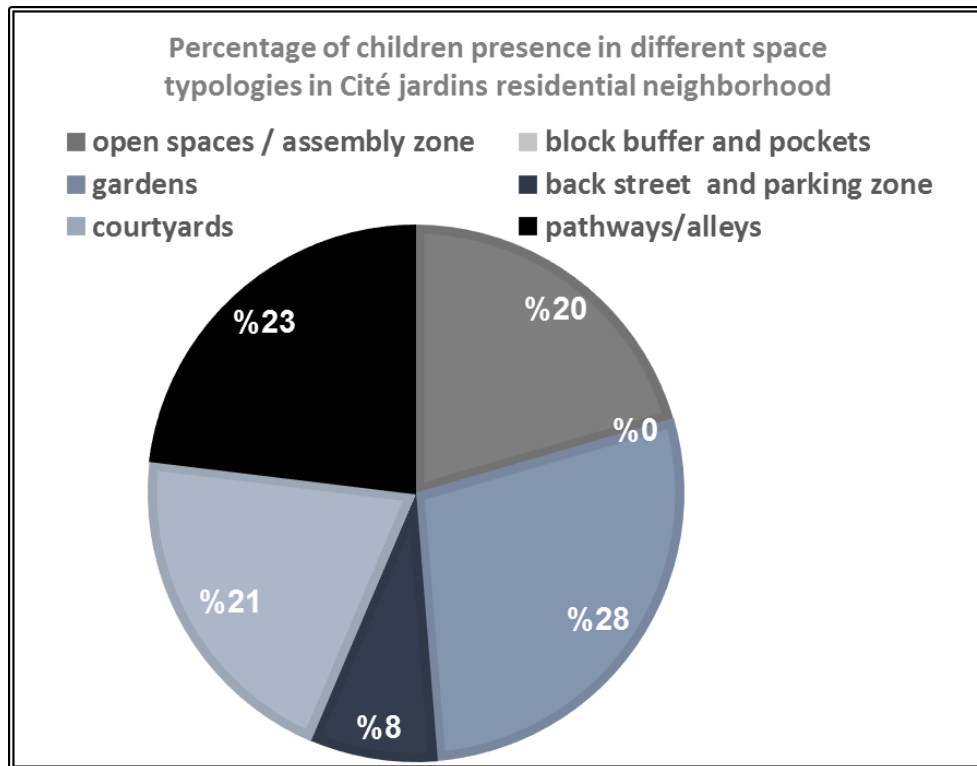


Figure 99: Percentage of children’s presence in the different spatial typologies according to their preferences in Cité jardins residential neighborhood

Similar to Abassia residential zone, the data from the child-centered structured observations of play behavior and the behavioral mapping was further analyzed to assess the differences between space typologies in terms of occurrence of different cognitive and social play types, (Figures 100). Accordingly, “exploratory play” was identified to be the most promoted play type in all spatial typologies, and more specifically by the assembly zone and the gardens.

Where in the gardens, 28% of the children sample were observed to engage in different play activities, where eight out of 11 children marked in the gardens, were observed engaging in “group exploratory play” for 175 minutes (mean minutes per engaged child was 21.9). The occurrence of the “group exploratory play” in the gardens might be

associated to the presence of multiple-spatial experience settings that has been interrelated with greater levels of activity concentration, longer spans of activity time, and better flow of play (Barbour, 1999; Podolska, 2014). In addition, the presence of nature elements such as water feature seemed to stimulate children curiosity. While “constructive play” was noticed to be the least prevailing behavior that occurred for only 8 minutes, due to the standardized design and the absence of loose element as well as flexible furniture that encouraged children to construct relying on their own ideas. Gardens seemed to encourage more in “solo play”, where the occurrence amount of time was 148 minutes.

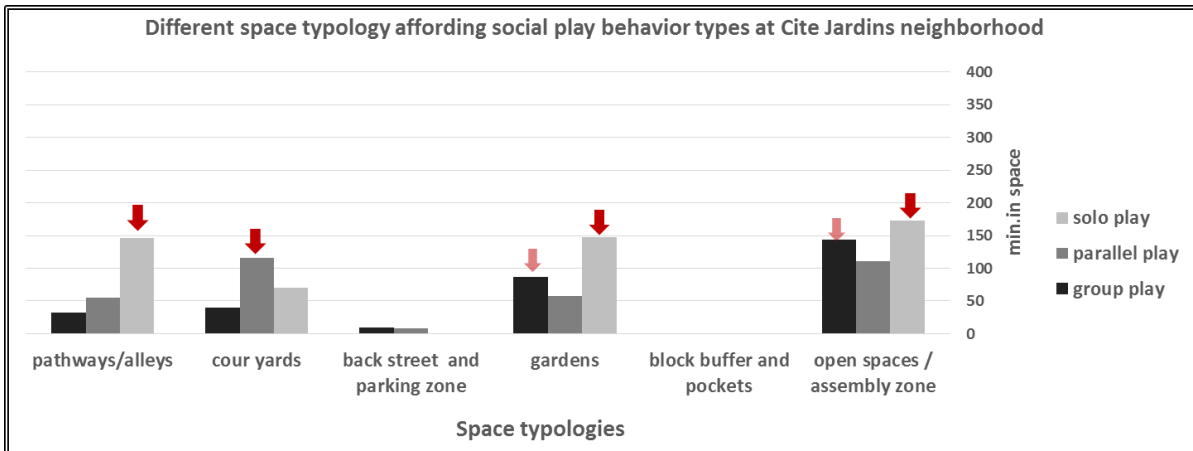
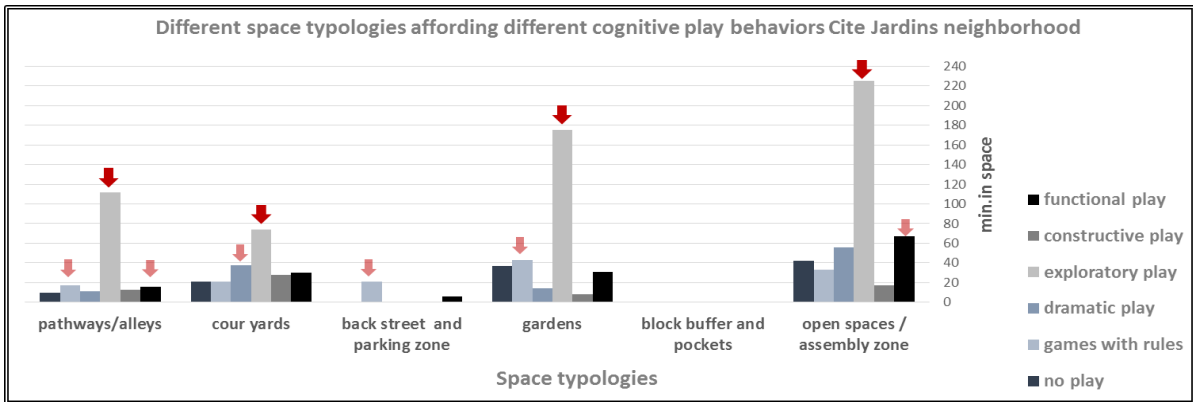
Concerning the other spatial typologies, pathways with their different forms, linear, curved, and looped, bounded by green belts and water feature that stimulated children’s curiosity. 23% of children were observed to engage in different play activities in the pathways and alleys with “exploratory play”, once more, as a prevailing cognitive play behavior for a total of 112 minutes, moreover, they were observed to additionally afford “functional play” and “games with rules”. In consequence, this attributes might help in converting the pathways from just transition lines to experimental laboratories by promoting children with space away from flow destruction to explore, manipulate, and experience. While “no play” was marked as the least prevailing behavior with occurrence amount of time of only 10 minutes. Furthermore, pathways were observed to encourage more “solo play” than other social play types, where 146 minutes of solitary play was observed to occur.

Regarding the courtyards, 21% of the children sample were observed to engage in different play activities. The courtyards are characterized by their sense of enclosure that seemed to encourage long concentration activities by promoting children’s imagination and invention, as “dramatic play”. Moreover, children were observed to engage more in “parallel play”, as a social play type, for a total of 116 minutes, while they engaged in “group play” for only a total of 40 minutes.

As for assembly zone, 20% of children were observed in the assembly zone to engage in different play activities. More specifically, the whole sample marked in the assembly zone, eight children were observed engaging in “exploratory play” for 255 minutes (mean minutes per engaged child was 31.9). According to the observations, this might be interpreted by the presence of multiple separated activity settings, bounding the transition lines as green belts and water feature that enhanced children’s curiosity. In addition to the

presence of curved, linear, and looped well-defined multi-activity routes, separating the above activity settings. These routes are characterized by their hard ground surfaces of different concrete colors and topographic variety that helped in integration with the adjacent multiple activity settings; afforded running and wheeled toy play; promoted motor play; but offered less opportunities for creative activities. Thus, “functional play” was observed to be the second prevailing behavior that occurred with a total amount of time of 67 minutes. Both “exploratory play” and “functional play” were observed in the assembly zone with greater amounts of time than other spatial typologies. Moreover, from the social play point of view, “group play” and “solo play” were observed to occupy the greatest amounts of time between the other spatial typologies. Children were observed to engage more in “solo play” for a total of 173 minutes, than “group play” that occurred for a total amount of 144 minutes, while “parallel play” occurred for a total amount of 111 minutes. As to the back streets and parking zones, although they only encompassed 8% of children’s sample, as previously mentioned, they promoted “games with rules”, and “functional play” in “group play” social form, that might be associated to the presence of ground color diversity, defining different functions. It might be also attributed to the fact of the presence of different urban spatial features as posts and metal sidewalk deviators that seemed to offer challenging complex environment by testing children’s limits through jumping and competing their abilities through motor play. However, back streets and parking zones offered less opportunities for creative activities.

From the social play behavior point of view and affordances, the different space typologies, in general, highly promoted “solo play” behavior, especially the gardens, pathways, and the assembly zone. Moreover, gardens and the assembly zone, in their different forms and configurations, were also observed to promote “group play” as secondary prevailing social play type, where seven of total the 11 observed children in the garden, engaged in “group play” for total 87 minutes, (mean minutes per engaged child was 12.4), while four of total eight observed children in the assembly zone, engaged in “group play” for total 144 minutes, (mean minutes per engaged child was 36). Unlike courtyards that highly promoted “parallel play” for total 116 minutes.



Figures 100: Different afforded cognitive and social play types by different spatial typologies in Cité jardins residential neighborhood

Relaying on the above preferences and affordances, children’s mental map drawings were analyzed to assess their perceptual cognitive skills with the same criteria that was applied for Abassia neighborhood, (Tables 14 and 15) and (Appendix B.2). For “5 to 7” aged children group, it was noticed that most of the children have high perception of large amount of details in the represented elements. Children were conscious of the presence of natural elements, especially the different types of vegetation and the multi-experience settings in the neighborhood, (Figure 101) and (Appendix B.2.I). While for the “older than 7” aged children group, cognitive skills’ criteria revealed that children were accurate in the represented elements with high perception of large amount of details in these elements and they were also accurate in representing the overall scene. Furthermore, they were aware of the surrounding buildings with their specific style and the streets that were referred to as unsecured play zone. Additionally, they were aware of the multi-experience settings in the

neighborhood's spatial typologies and the presence of different urban spatial features, such as, water features and different types of vegetation. Their drawing tended to explain their perception of different material through using different colors, (Figure 102) and (Appendix B.2.II).

Table 14: Perceptual cognitive skills assessment for drawings of 5 to 7 aged children group, at Cité jardins residential neighborhood

Child no.	Cité jardins neighborhood (below 7 years)		mean per child
	1. Accuracy of elements represented	2. Amount of detail in elements represented	
1.	3	3	3,00
2.	4	3	3,50
3.	4	4	4,00
4.	2	3	2,50
5.	3	3	3,00
6.	2	2	2,00
7.	4	3	3,50
8.	2	4	3,00
mean per criteria	3,00	3,13	

Table 15: Perceptual cognitive skills assessment for drawings of children above 7 aged group, at Cité jardins residential neighborhood

Child no.	Cité jardins (above 7 years)						mean per child
	1. Accuracy of elements represented	2. Amount of detail in elements represented	3. Accuracy of overall scene	4. Amount of detail in overall scene	5. Visual realism in terms of accuracy of spatial relationships	6. Visual Realism in terms of perspective and representation of depth	
1.	3	2	4	2	2	2	2,50
2.	2	4	4	3	3	3	3,17
3.	2	3	4	2	2	2	2,50
4.	3	2	3	4	4	4	3,33
5.	3	3	1	1	3	3	2,33
6.	4	3	3	3	3	4	3,33
7.	4	4	1	1	3	2	2,50
8.	4	3	4	4	3	3	3,50
mean per criteria	3,13	3,00	3,00	2,50	2,88	2,88	



Figures 101: Sample of drawings of children below 7 age group, representing different perceptual mean rating categories, at Cité jardins residential neighborhood



Figures 102: Sample of drawings of children above 7 age group, representing different perceptual mean rating categories, at Cité jardins residential neighborhood

In general, the drawings of the children belonging to Cité jardins residential neighborhood explained their perception of different materials and colors. Drawings tended to be of slight complexity, including a good number of represented elements with a good amount of details and accuracy, such as, natural elements (grass, flowers, and trees) as well as buildings. In addition, the drawings were of good visual realism in terms of spatial relationships representation, this was clear in the presence of street, zebra lines, cars, and buildings, (Figure 103). Furthermore, a good variety of colors were used in the drawings. Alike Abassia neighborhood, the results of Student t-test were analyzed to assess the differences between girls and boys relative to their perceptual cognitive drawing skills, where there was no significant difference revealed between genders, in terms of cognitive skills' criteria (p-value was greater than 0.01), (Table 16) and (Figure 104).

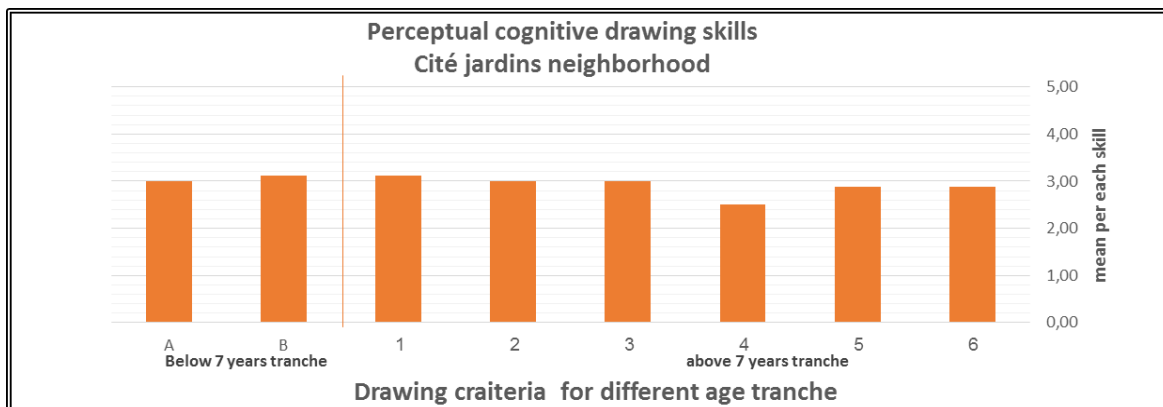


Figure 103: Mean rating of the perceptual cognitive skills evaluation for both age groups at Cité jardins residential neighborhood

Table 16: Statistical analysis presenting gender differences at Cité jardins residential neighborhood in terms of perceptual cognitive skills evaluation

Boys				Girls				
Student t-test (Cité jardins neighborhood)								
Criteria	Cité jardins neighborhood (above 7 years)					Cité jardins (5-7)		
	1. Accuracy of elements represented	2. Amount of detail in elements represented	3. Accuracy of overall scene	4. Amount of detail in overall scene	5. Visual realism in terms of accuracy of spatial relationships	6. Visual Realism in terms of perspective and representation of depth	1. Accuracy of elements represented	2. Amount of detail in elements represented
Mean per criteria for girls	2,5	2,8	3,8	2,8	2,8	2,8	3,3	3,3
Mean per criteria for boys	3,8	3,3	2,3	2,3	3,0	3,0	2,8	3,0
P-value significance	0,02	0,39	0,11	0,59	0,62	0,70	0,49	0,62
In favor to	boys	boys	girls	girls	boys	boys	girls	girls

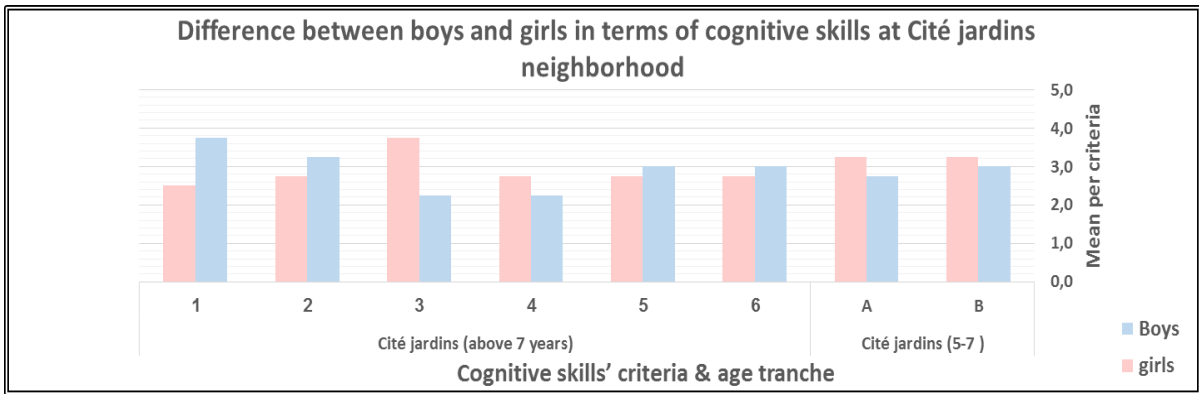





Figure 104: Gender differences in terms of perceptual cognitive skills evaluation at Cité jardins residential neighborhood

Concerning the matrixes that were created after drawings and informal interviews at Cité jardins residential neighborhood, showing children’s place preferences and descriptions of their drawings, the responses and feelings were documented during the classification process. Some keywords were extracted to clarify children’s mental perceived properties of space, such as: space boundaries; environment complexity and diversity; levels; sense of security and freedom; and texture recognition as well as sensation through hearing and distinguishing different colors, (Figures 105).

<p>Child basic information</p> <ul style="list-style-type: none"> • Participation in research stages: Engaged in drawing and photographical tasks • Mobility: Semi-restricted. • Age: 5 years • Gender: boy • Play spaces: pathways and alleys 		<p>Drawing description during interviews that might complemented by a child-led walk</p> 	<p>Mental perceived characteristics of space that different learned and experienced notions</p> <ul style="list-style-type: none"> - Space boundaries - Environment complexity and diversity - Up and down - Levels - In and out - Sense of hearing sounds - Sense of security and freedom - Sense of enclosure and protection - Texture recognition by hearing and distinguishing different colors - Risk taking - Color recognition - Space limits - Culture awareness - Imagination - Challenge - Emotional control 	<p>Extracted attractive physical features of the neighborhood in relation to research terminologies</p> <p>Spatial porosity</p> <ul style="list-style-type: none"> - Degree of closure <p>Spatial potentialities</p> <ul style="list-style-type: none"> - Flow and continuity - Topographic variability - Material diversity - Urban spatial features (water features & stones) 	<p>Experiences under-going applied theories:</p> <ul style="list-style-type: none"> - Affordances
		<p>Drawing description</p> <p>This is the park I always go with mama and papa, where I can play alone freely, there is no real cars inside but there is outside. There is a lot of high green trees and lakes everywhere. I drew the 2 bridges beside my home whom I love most. One of them is between the green gardens, I named it a slide and the other bridge passing through the lakes.</p> <p>Interview:</p> <p>I always play with my car on the bridges, I love the cars. Sometimes I love pretending to do skiing from the mountain and I try to stop by the white color line on the floor down the bridge but it is very difficult to succeed because I go down very fast and I can not control while going down the mountain, oohh, I mean the bridge. I like also the brown bridge in the lake, which I drew, but do not be afraid there is a fence so as not to fall in the lake. When I go rolling on it is very noisy but I enjoy the noise, which makes me laugh, I think all the people are bothered" HAHahaha". You know there are some ducks in the lake, sometimes I like relaxing on my car, when I am tired. I like watching them and relaxing.</p>			

<p>Child basic information</p> <ul style="list-style-type: none"> • Participation in research stages: Engaged in drawing and interview complemented by a child-led walk • Mobility: Free • Age: 8 years • Gender: girl • Play spaces: apartment entrance, garden in front of apartment (Building buffer and gardens). 		<p>Drawing description</p> <p>Look, this is my park in front of my home and this is my secret place. I drew myself out-of-the-way beside the lake where I like to hear, the lake plays with me, it is my friend.</p> <p>My park is separated from the forbidden street, the whole space is divided.</p> <p>For example, these lines are the bridge which protects my secret place under.</p>	<p>Interview and walks:</p> <p>I go playing there. I always play in the garden beside the lake and the above bridge shading my secret area. I like standing on the bridge and observing the space to control the world.</p> <p>I play only in front of my home, sometimes with my neighbors in the large green area with trees and vegetables. I play everything, jumping, climbing, pretending as if I am the queen of the world.</p> <p>There are a lot of things to do in the park. Look! I will show you my best place, (<i>lowering the voice and bending</i>), it is a small overhead place by the bridge, where I feel secured here. I called it my secret place because it is my favorite place here, in the park. Sitting up on the bridge, allows you to overlook the boys while playing football on grass or people drinking and eating there. The window looks nice.</p> <p>My favorite activity is to throw different things in water while sitting on the weedy stones, take care it is dangerous, and to see which will reach first down, but when I am sad I prefer listen to "SHHHHH" of water, and I become okay. You know, there are, also, some stones that you can write with, but only on the bridge, it is magic, I discovered this because I love drawing.</p>	<p>Extracted attractive physical features of the neighborhood in relation to research terminologies</p> <p>Spatial porosity</p> <ul style="list-style-type: none"> - Degree of closure - Degree of permeability <p>Spatial potentialities</p> <ul style="list-style-type: none"> - Multi-spatial experience defined settings - Topographic variability - Urban spatial diversity - Material diversity features (water features & stones) 	<p>Mental perceived characteristics of space that implement and different learned and experienced notions</p> <ul style="list-style-type: none"> - Ownership - Space boundaries - Environment complexity and diversity - Up and down - Observe and control from heights - Levels - In and out - Sense of isolation due to the water sound - Physical properties explored giving the sense that water engage with her in playing - ME not WE - Sense of security - Sense of enclosure and protection - Texture sensation - Activity variation - Risk taking - Imagination - Curiosity - Emotional control 	<p>Experiences under-going applied theories:</p> <ul style="list-style-type: none"> - Affordances in personal lived space and ambient envelop
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Figures 105: Sample of matrixes, including drawing description documentation and informal interviews' script for each age group, at Cité jardins residential neighborhood

4. I. 2. c. Lived space

Data from the behavioral qualitative observational sessions, informal interviews, and occasional child-led walks were analyzed to explore the potential associations between the various suggested spatial potentialities and children play opportunities, also, in order to understand the impact of their potential role in Cité jardins residential neighborhood. This was presented as follows:

1. Entity of activity settings: Unlike Abassia residential zone, every spatial typology in Cité jardins residential neighborhood, is divided to multi-spatial experience settings with good functional definition, and these settings are separated by multiple internal activity routes, (Figure 106). The spatial typologies are subdivided into a number of settings, well defined with tangible boundaries created by pathways and/or vegetation as well variations in ground materials, ground levels, and amount of shading. Observations noted that defined functional sub-areas might be associated with high levels of activity concentration, non-interfered activities, and better flow of play, (Figures 107). It has also been observed to be associated with more “exploratory play” behavior, with more sociability as well as social interactions, and with increased “dramatic play” (Barbour, 1999; Maxwell et al., 2008; Podolska, 2014).

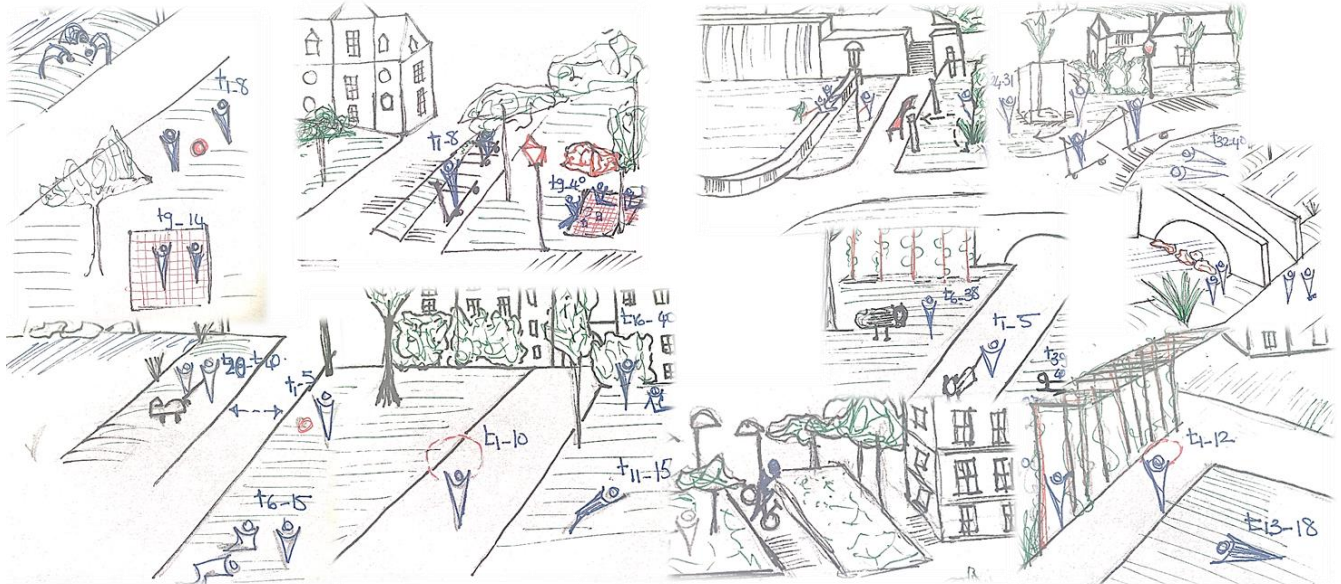
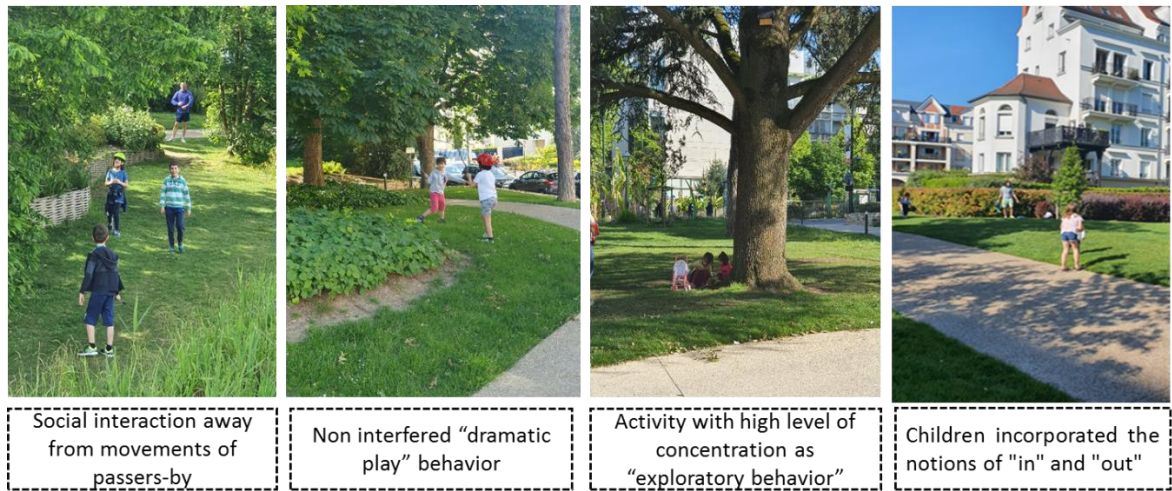


Figure 106: Sketches presenting multiple behavior settings of different spatial typologies at Cité jardins residential neighborhood



Figures 107: Examples of different lived experiences promoted by space entity of multiple settings.

2. Flow and fluidity: All spatial typologies are characterized by the presence of clear activity routes that achieve good flow continuity and remarkable smooth fluidity, (Figure 108). These routes are well-defined with the use of distinct material (hard or soft) or their form (linear, curved, or looped). According to literature, activity routes had been linked to the organized flow of play, higher level of physical activities, and gross as well as motor play (Cosco et al., 2010; Podolska, 2014). Observations revealed that activity routes might afford various forms of “functional play”, in a smooth flow of play forms, such as, running and biking. Moreover, the definition of these routes appeared to enhance imagination and creation in play themes that seemed to be important for “dramatic play”, (Figures 109).

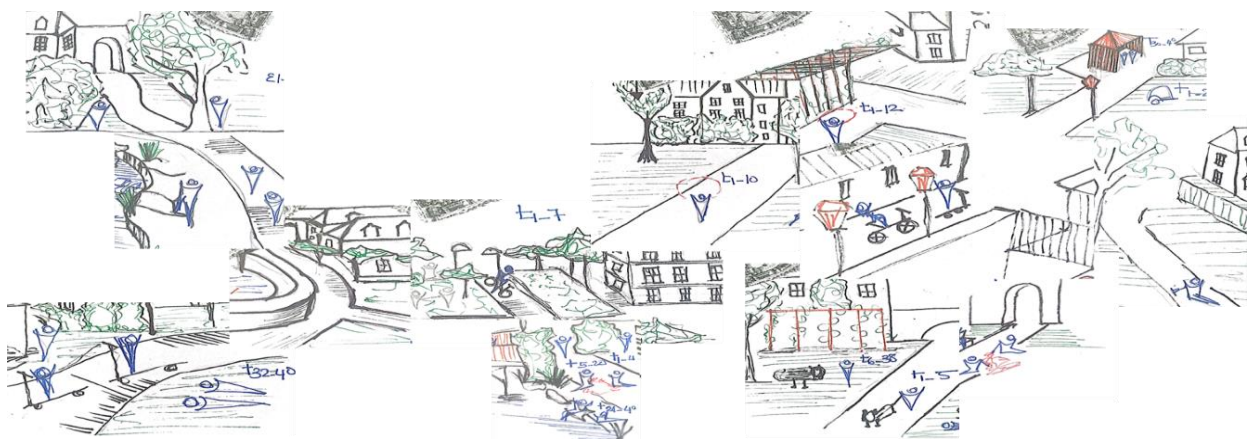


Figure 108: Sketches presenting the internal activity routes in different spatial typologies at Cité jardins residential neighborhood



Figures 109: Examples of different lived experiences promoted by the activity routes

3. Ground material diversity: Every spatial typology in Cité jardins residential neighborhood, is characterized by ground material diversity (concrete pavements with different colors for activity routes-; grass and green belts cover for settings; wooden stud platforms, bridges, and pergolas; concrete tiles for building buffers, and water cover), (Figure 110). Observations documented that this diversity might promote various forms of play, (Figure 111). For example, hard ground surfaces promoted running, biking, and wheeled toy play. Coherent to the literature, they are suggested to promote “functional play” and motor skills (Cosco et al., 2010; Christidou et al., 2013; Barbour, 1999; Fjørtoft, 2004). They have also been suggested to promote “games-with-rules” but to offer less opportunities for creative activities than the soft materials (Barbour, 1999; Christidou et al., 2013). As for soft ground surfaces, they were observed to be more appropriate for relaxation, group gathering, social interaction among children, tumbling, and acrobatic movements, while there were no wheeled activities observed. They have also been suggested to promote “games-with-rules” but to offer more opportunities for creative activities than hard materials (Barbour, 1999; Christidou et al., 2013). In general, diversity of ground materials appeared to promote imagination and creativity in the children’s play themes that were important for the “constructive play” and “dramatic play” by allowing them to invent their own play ideas, (Figures 112).

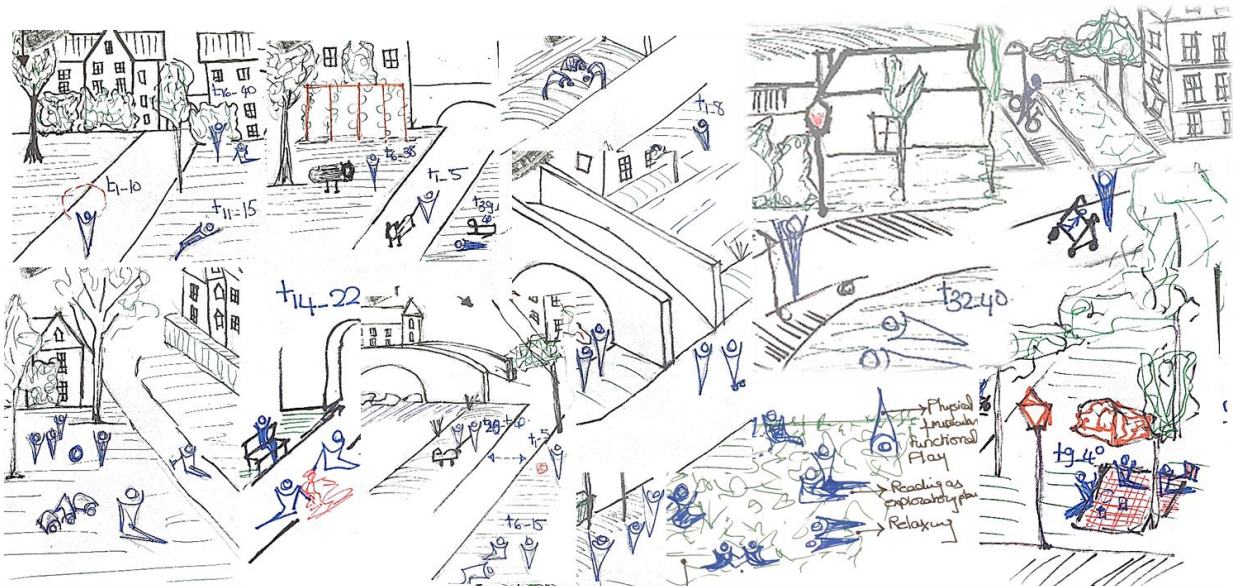


Figure 110: Sketches presenting the ground material diversity in every spatial typology at Cité jardins residential neighborhood



Hard materials promoting jumping, drawing, running, rolling, biking, and skating



Soft materials promoting tumbling, relaxing, exploring, acrobatic movements, and social interactions

Figures 111: Different affordances offered by ground cover diversity

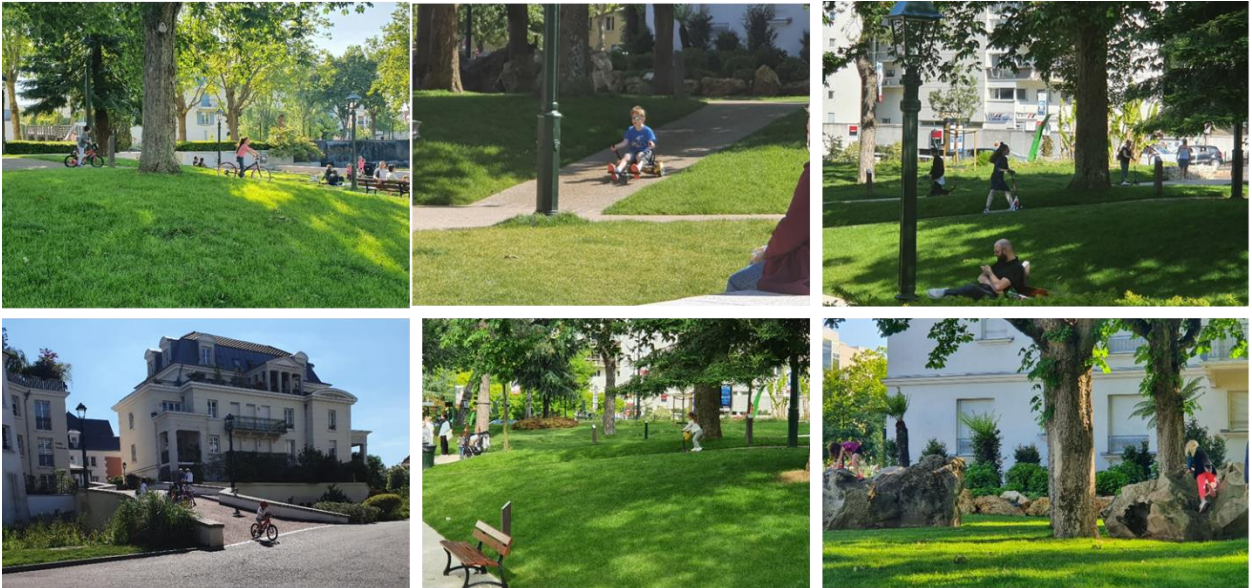


Figures 112: Examples of different lived experiences promoted by ground cover diversity

4. Topographic Variability: Ground level variability is achieved in the neighborhood through the presence of sitting steps, stairs, parapets, slopes, cliffs, ramps, and bridges, (Figure 113). Observations revealed that topographic variability was associated with more “functional play” and gross motor play, such as: jumping, sliding, rolling, tumbling, and climbing. Additionally, elevated platforms, pergolas, bridges, and climbable elements were observed to provide children with a full perspective of the surrounding that helped them to imagine that the world is under their control. Moreover, observational sessions showed that variability of levels might also be linked to various play activities such as social play and “games-with-rules”, (Figures 114). Coherent to literature, level variability afforded play behavior that develops hand-leg-eye coordination, risk taking, challenges children's abilities, and conquers their fear (Fjørtoft, 2004; Podolska, 2014).



Figure 113: Sketches presenting the ground level variability in Cité jardins neighborhood



Slightly sloped play settings and ramps afforded rolling down and skating from them.

Levels and elevated parapets promoted dynamic actions as jumping and climbing



Figures 114: Examples of different lived experiences promoted by ground level variability

5. The presence of different urban spatial features: Similar to Abassia neighborhood, the presence of different interactive features was noticed, such as landmarks (sculptures), elements stimulating senses (waterfalls, and lakes), different types of vegetation (shrubs, flowery plants, plants, and large shading trees that provide large shaded areas), natural loose and flexible materials (wooden chips and mud), and benches as well as pergolas, (Figure 115). Observations revealed that vegetation elements seemed to act as attractive elements affording climbing, exploring, and “group dramatic play”. Additionally, observations suggested that large shaded areas are perceived by children as desired places that encourage social play, support resting, gathering, as well as talking, especially due to the presence of some benches under these shading trees. Moreover, the diversity in loose parts encouraged children to create and invent, (Figures 116). As for the presence of water features, it might help children to promote creation and imagination, which afforded more “constructive play” and uninterrupted “exploratory play” that highlighted the environmental curiosity and complexity, (Figures 117).

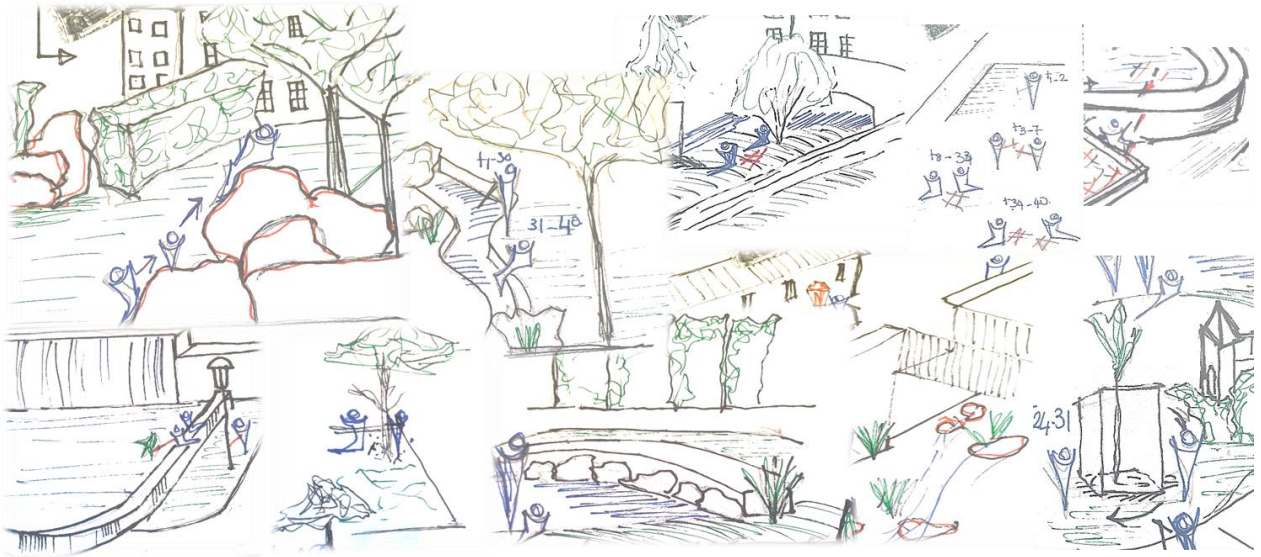


Figure 115: Sketches presenting the different spatial urban features in Cité jardins neighborhood



Grass might help young cooks prepare a salad

Grass might support resting

Shrubs and trees afforded hiding and climbing



- Water features increased children's curiosity, and allowed them to experience their 5 sensations (hearing, touching, smelling, tasting, and seeing).
- Also, it is an important element for exploring the properties of other material such as the densities and the gravity of other materials

Figures 116: Examples of different lived experiences afforded by vegetation and water features



Figures 117: Examples of different lived experiences promoted by different urban spatial features

4. II. Recreational urban spaces category

This section is concerned with the fieldwork documentation, results, and analysis of the third as well as the fourth case studies of the recreational urban category.

4. II. 3. Heliopolis Sporting Club (H.S.C) recreational urban space, Cairo, Egypt

Similar to other cases, the spatial triad level analyses for H.S.C recreational urban space are presented, in terms of (i.e. conceived, perceived and lived), as follows:

4. II. 3. a. Conceived space

As previously mentioned in the site description section, H.S.C is considered as a private gated recreational urban space (Gamal Said, 2010). It is distinguished by high spatial definition of the territory through high degree of closure of the urban space that is achieved by a surrounding wall with secured gates. Accordingly, the two phases of data collection from H.S.C field-work were analyzed as follows:

Concerning the first phase that was considered with the child-centered structured observations, which were collected by observational tables specified for H.S.C recreational urban space, (Appendix C.1), and were analyzed to assess the amount of occurrence of different play types, (Figures 118 and 119).

Observations revealed that the occurrence of “functional play”, and physical as well as motor activities were prevailing play types, where 21 children were observed to engage in “functional play” for a total of 374 minutes, thus the approximate mean per engaged child, was 17.8 minutes. Children were observed to engage in physical activities as running, climbing, jumping, swinging, sliding, throwing objects, pushing wheeled toys back or forth, and riding bikes. “Functional play” in H.S.C recreational urban space took place more in a “solo and parallel forms” of social behavior. This occurrences might be linked to the parents’ social class and education that do not accept the idea that their children share their personal equipment and toys, or play with strangers, thus the idea of partaking is less and imitating is more, since every child had his/her own toy.

As for the second prevailing play behavior, was the “no play behavior”, where it took place in a sedentary, in-active, digital, and solo play form. 27 children were observed to engage in “no play behavior” for a total of 309 minutes with approximate mean per engaged child, 11.4 minutes. More likely, children were observed engaging in mobile games, video watching on tablets, and chatting on mobiles

Moreover, children were monitored to engage in “games-with-rules”, like tag, hide and seek, and other competitive sports, as football games as well as games invented by children that required cooperative learning and negotiations, as racing with wheeled toys, although some of these play forms as wheeled toys and other competitive games are not allowed in all spaces of the club for security reasons, especially in the spaces, where the older people are sitting. Observations marked that 25 children engaged in “games-with-rules” for a total of 224 minutes with approximate mean per engaged child, 8.9 minutes.

Meanwhile, children were observed to engage in other activities and play types, so for example, only 12 children engaged in “dramatic play”, they were involved for a total of 171 minutes with approximate mean per engaged child, 14.3 minutes. Children were observed acting familiar activities such as playing with dolls, scooters, or imitating other socio-cultural community roles.

Others engaged in “constructive play”, where 10 children engaged in “constructive play” for only a total of 77 minutes, with approximate mean per engaged child, 7.7 minutes. The low number of the engaged children in this cognitive play type might be linked to the standardized fixed urban furniture with no loose or flexible elements in the place, as well as, respecting the regulations of the place achieved by high security monitoring. Thus, “constructive play” took place more in the form of chalk-ground drawing, building items with unfixed urban elements as chairs or chairs’ couches.

While, children were rarely engaged in “exploratory play”, although they have access to all natural elements and green spaces, where only seven children engaged in “exploratory play” and animal play as playing with cats for a total of 45 minutes, (approximate mean per engaged child was 6.4 minutes).

Regarding the social play, although, some children engaged in “solo play”. The observations of the social play indicated that “group play” was the prevailing social play type, where all the 30 children were observed to engage for 717 minutes, thus the approximate mean per engaged child in “group play” was 23.9 minutes. However, 29 children were observed to engage in “solo play”, which was almost the total as well, but only for 257 minutes, thus the approximate mean per engaged child in “solo play” was just 8.9 minutes.



Figure 118: Examples of different observed cognitive and social play types

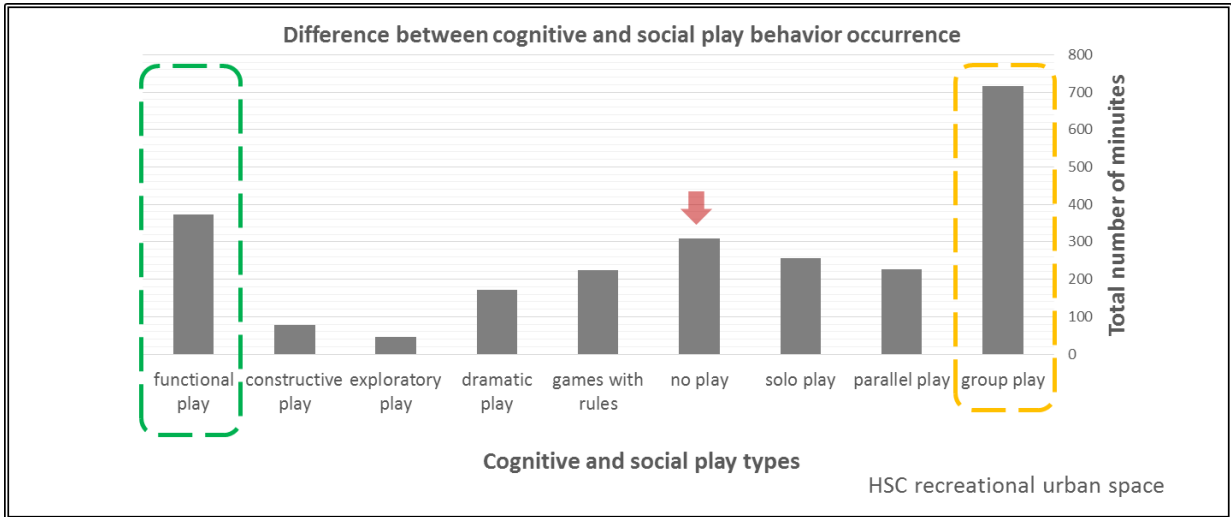


Figure 119: Amount of occurrence of cognitive and social play types in H.S.C recreational urban space

Furthermore, similar to the previous residential case studies, the difference in the occurrence of play behavior, in terms of different genders was further analyzed through applying the Student t-test, (Table 17). The statistical analysis identified that there was a significant difference in the occurrence of “functional play” in favor to boys. Where 15 boys were observed to engage in “functional play” for a total of 308 minutes, therefore, the average minutes per engaged boy was 20.5, while only 6 girls, almost one third of the engaged number of boys, were observed to engage in “functional play” for a total of 66 minutes, therefore, the average minutes per engaged girl was 11, almost the half. In contrast, there was a significant difference in the occurrence of the “dramatic play” in favor to girls. Where 11 girls were observed to engage in “dramatic play” for a total of 166 minutes, therefore, the average minutes per engaged girl was 15.1, whereas only 1 boy was observed to engage in “dramatic play” for just a total of 5 minutes. For all significant results, p-value was less than 0.01. Similar to Abassia residential zone, in Cairo, this significance might be related culturally and linked to the inequality of genders’ roles in the community, where boys were more involved in physical activity games and wheeled toys showing their strength and power in the form of “functional play”, as highlighted by the community traditions.

However, there was no significant difference between genders in relation to the rest of different cognitive and social play types, where p-value was greater than 0.01. Moreover, the analysis highlighted that the engaged number of girls and boys in “games-with-rules” is equal, with a slight difference in the amount of occurrence of the behavior in favor to boys. Similar to the “no play behavior”, where the number of girls and boys engaged were almost equal, but there were a slight difference in the amount of occurrence of the behavior in favor of girls, since they seemed to be more sedentary and matured, (Figure 120).

Table 17: Differences in cognitive and social play types between genders in H.S.C recreational urban space

Boys							Girls		
Student t-test (HSC recreational urban space)									
Play type	Cognitive play						Social play		
	functional play	constructive play	exploratory play	dramatic play	games with rules	no play	solo play	parallel play	group play
Total of minutes of girls	66	42	30	166	110	186	127	127	346
Mean per girl	4,4	2,8	2,0	11,1	7,3	12,4	8,5	8,5	23,1
No of engaged girls	6	6	5	11	12	15	14	14	15
Mean per engaged girl	11,0	7,0	6	15,1	9,2	12,4	9,1	9,1	23,1
Total of minutes of boys	308	35	15	5	114	123	130	99	371
Mean per boy	20,5	2,3	1,0	0,3	7,6	8,2	8,7	6,6	24,7
No of engaged boys	15	4	2	1	13	12	15	14	15
Mean per engaged boy	20,5	8,8	7,5	5,0	8,8	10,3	8,7	7,1	24,7
P-value significance	0,00	0,75	0,35	0,00	0,86	0,10	0,91	0,16	0,40
In favor to	Boys	Girls	Girls	Girls	Boys	Girls	Boys	Girls	Boys

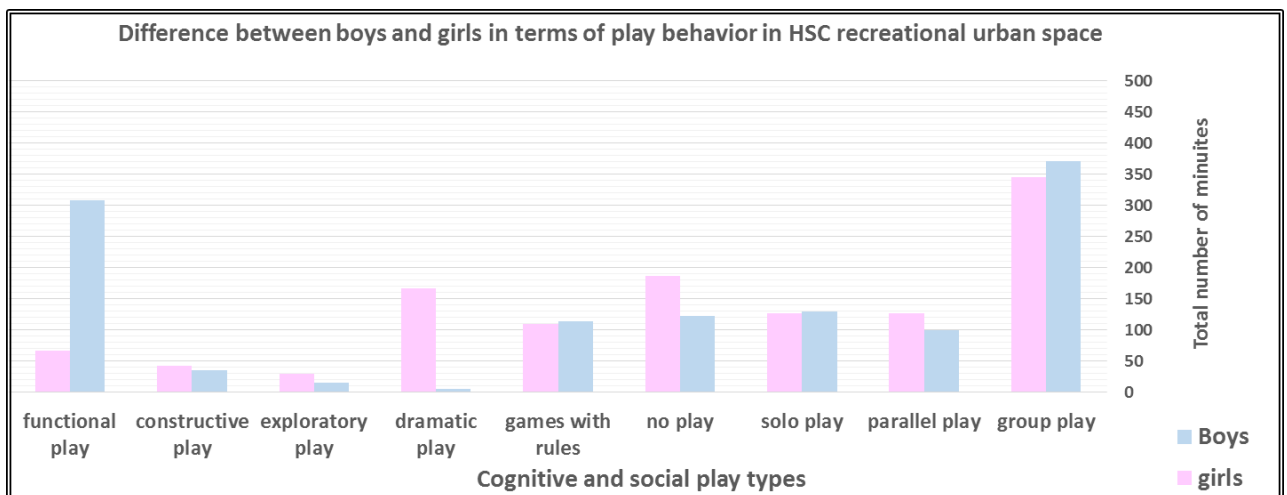


Figure 120: Gender differences in amount of observed cognitive and social play types in H.S.C recreational urban space

As for the second phase, it considered data from the behavioral qualitative observational sessions, complemented to the child-centered structured observations. Collective behavioral mapping of H.S.C recreational urban space, was analyzed to investigate children's presence in the different included space typologies that are characterized by low permeability in-between, achieved by closed and confined spatial typologies, as previously mentioned (Figure 121).

Unlike the maps of the residential neighborhoods, this behavioral map presented mainly red dots, with absence of multiple other colored dots. Observations indicated that only as little as three children were engaged in different activities in more than one spatial typologies. During the observational sessions, children seemed to be with lower degree of freedom in-between the different spatial typologies and they seemed to be trapped in different confined ones. Additionally, observations revealed that children tended to engage in longer spans of time in the same spatial typology with higher level of activity concentration, since some parents limited the territorial play range of their children in specific spatial typologies. However, children were plotted to spread freely in the circulation networks in-between the typologies and in the assembly zones, which might be associated to the sense of security and enclosure achieved by the high degree of closure of the outer boundaries through the secured gates. Unlike the sense of being socially isolated from others, which is associated by the low inside permeability within the included spatial typologies.

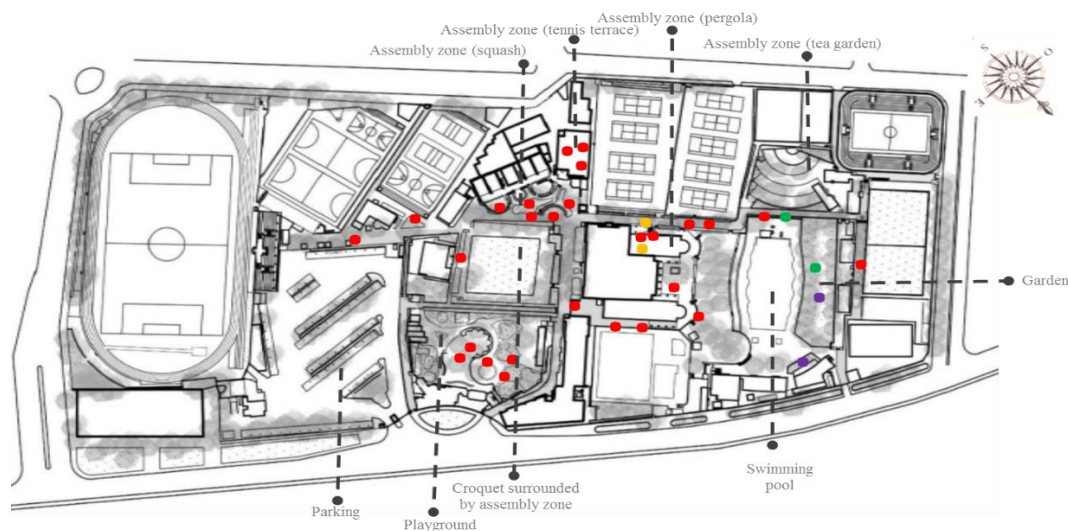


Figure 121: A behavioral map highlighting children's presence in different spatial typologies at H.S.C recreational urban space

4. II. 3. b. Perceived space

Different from the residential neighborhoods, the recreational urban spaces include different spatial typologies, such as, gardens, pathways, assembly zones, and playgrounds, which promoted play patterns differently; associated with different space preferences; and enhanced different perceptions. Accordingly, the collected data from different included spatial typologies in H.S.C recreational urban space was analyzed.

Further analysis was held to the data extracted from the above behavioral mapping to assess children's different spatial preferences of these spatial typologies through the percentage of their presence in different spatial typologies, (Figure 122).

The analysis presented that the assembly open zones and the pathways highly encouraged children's presence by encompassing two third of the observed sample. The high children presence in the assembly open spaces and pathways might be linked to the low level of confinement of these spaces, since they have higher permeability with the surrounding spatial typologies than others. Although, they are mostly surrounded by tangible boundaries that seemed to achieve linkage to other spatial typologies through visual continuity. Consequently, children showed more preferences to the intergenerational spaces, where they did not feel socially and visually isolated. Moreover, pathways, in particular, acted as linkage lines that are defined with the other segmented functional spaces and lined with sittings as well as other urban spatial features, which enhanced the idea to be perceived by children as social connecting hubs that promoted discussing, resting, and exchanging outside the large pedestrian flows. In addition, both spatial typologies are characterized by their different configurations achieved through ground material diversity, by the presence of soft materials, hard materials, different textures, as well as colors; level variability; and the presence of different spatial urban features that seemed to afford a wider degree of play opportunities and choices of freedom.

However, children showed less preference to the playground, although they are deprived to enter certain other spatial typologies in H.S.C recreational urban space, as previously mentioned. Where in the playground less presence percentage was observed, where there was only 15% of the children's sample were present, which reflected the rejection sense of being confined in a certain island specified for them. Consequently, children indicated more interest to challenge their capabilities through the use of other elements and spaces

planned to be used for other generations and that are not designed as well as conceived for children, since they perceived these elements of higher complexity.

As for the garden, it occupied the least presence and preferences, thus it encompassed 7% of the observed sample. Observations noticed that the garden is characterized by poor diversity and variability in its configuration as well as its environmental complexity that attracted the least children’s attention. Therefore, observations highlighted that children showed preference to some places more than others according to the accommodation of their preferred activities.

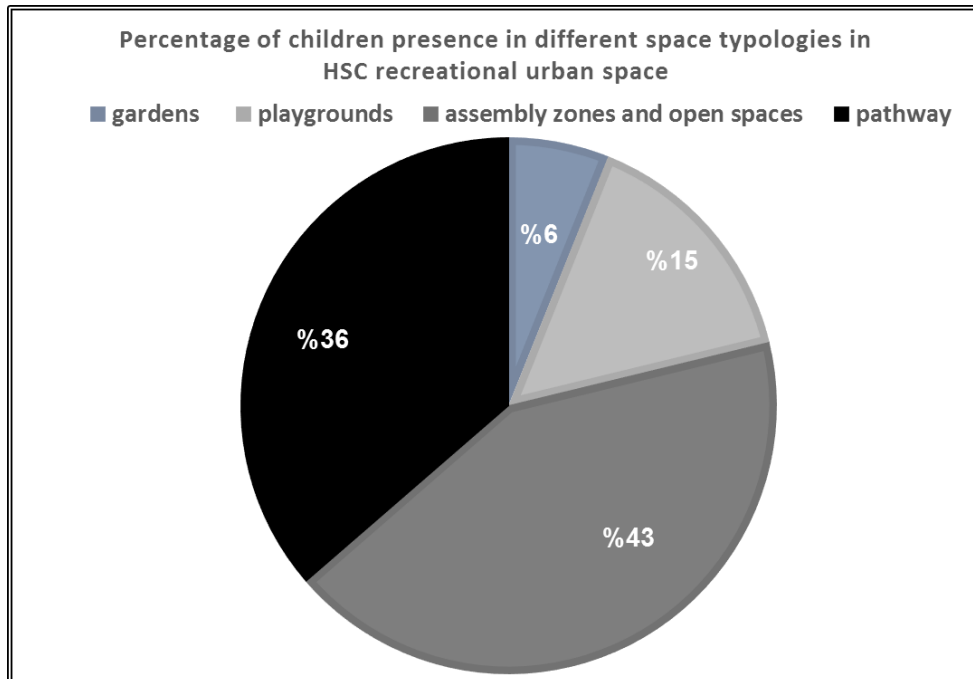


Figure 122: Percentage of children’s presence in the different spatial typologies according to their preferences in H.S.C recreational urban space

Successively, data from the child-centered structured observations of children’s play behavior and the behavioral mapping, was further analyzed to assess the differences between the different spatial typologies in the occurrence of different cognitive and social play types, (Figures 123).

Regarding the assembly zones, 43% of children’s sample, were observed to engage in different play activities. Children were engaged in “no play” more than “functional play”, where 13 out of 14 children plotted in the different assembly zones were marked to engage in “no play” behavior for 160 minutes (mean minutes per engaged child was 12.3 minutes),

whereas nine children engaged in “functional play” for 123 minutes (mean minutes per engaged child was 13.6 minutes). While “exploratory play” was considered as the least prevailing behavior, with an occurrence of total 20 minutes. Where assembly zones acted as open spaces that are characterized by flexibility in use to accommodate different patterns of play and different generations, therefore, they were appreciated by children for the feeling of freedom and choice, they provided. Additionally, most of the children indicated that they felt free in the large open spaces, because of their clarity and continuity, where they had the freedom to explore their surrounding environments and to choose where to play within the adult territories.

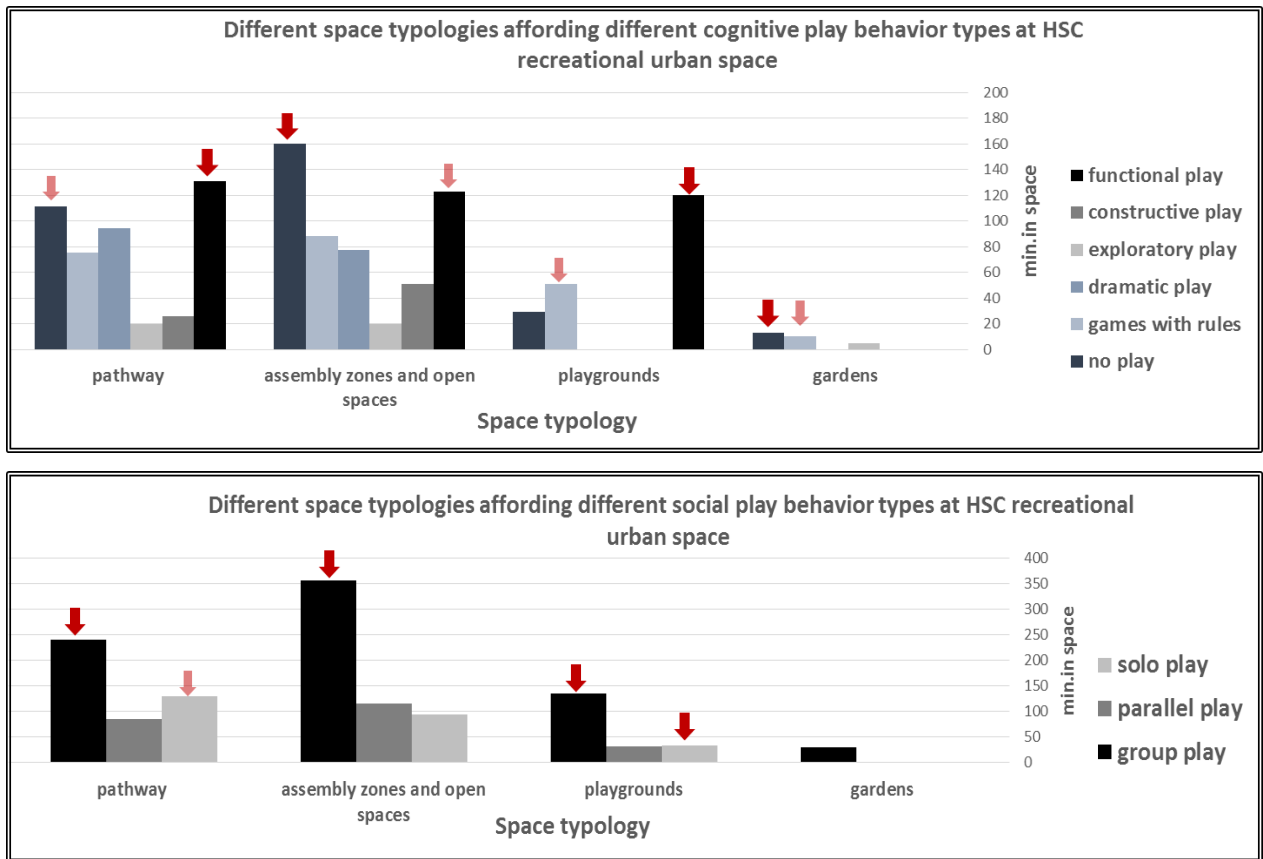
While for pathways, 36% of children’s sample at H.S.C recreational urban space, were observed to engage in different play activities in the pathways and alleys. Children were observed to engage more in “functional play”, as a prevailing behavior. Where seven out of 12 children observed in the pathways, were marked to engage in “functional play behavior” for 131 minutes (mean minutes per engaged child was 18.7 minutes). The prevalence of “functional play” might be linked to the hard ground material cover that afford biking, wheeled toys, running, and jumping, which further allowed children to travel back and forth. Following the advancement of occurrences of “functional play”, “no play” behavior was observed to occur for 111 minutes with the engagement of nine children, (mean minutes per engaged child was 12.3 minutes). Alike the assembly zones, “exploratory play” was noticed to be the least prevailing behavior with similar occurrence of just 20 minutes that might be interpreted, due to the dense flow in the pathways, and the absence of enclosed activity settings that protected long concentration activities.

In playgrounds, only 5 children were marked, mainly, they were all observed to engage in “functional play” for 120 minutes (mean minutes per engaged child was 24 minutes). These children were also observed to engage in “games-with-rules” behavior, for 51 minutes (mean minutes per engaged child was 10.2 minutes). While 4 of them were engaged in “no play” behavior for just 29 minutes (mean minutes per engaged child was 7.25 minutes), which was marked to be the least prevailing play type, in playground, different from the other spatial typologies. While “exploratory play”, “constructive play”, and “dramatic play”, were considered as absent behaviors. Therefore, coherent to previous literature, a playground is not only about the equipment it encompasses in a confined and secured

setting, but rather a playground could stimulate children's interest and allow exploration simultaneously, by offering various kinds of activity settings (Metin, 2003, Elnesr, 2018). Although the presence in the garden as a spatial typology was the least, only 6% of the children sample were present. The garden promoted "no play" and "games-with-rules" as prevailing behaviors. Children were observed either to challenge themselves by inventing rules for new games, or to rest in gatherings. While "functional play", "constructive play", and "dramatic play", were considered as absent behaviors, which might be related to the presence of single spatial open setting with no internal routes, mono ground grass material cover, with no topographic levels and a lot of offered shade by trees that might promote relaxation, conversations, socialization and challenging competes. In addition to the "exploratory play" that was marked to be the least prevailing cognitive play type in the garden spatial typology. Similar to the case in Abassia residential zone, where nature is to be regarded but not to integrate with. In H.S.C recreational urban space, parents warned their children not to spoil their clothes or appearances, which resembles for them a guidance to their socio-cultural standard and class. Thus, only one from the two children marked in the garden, were observed to engage in "exploratory play" for 5 minutes.

In general, the pathways and the assembly zones seemed to afford a wider range of play type variety than other spatial typologies, where some cognitive play types were absent. Concerning the social play behavior, "group play" was observed to be a prevailing social type in all the included space typologies. Assembly open zones so as open spaces highly promoted "group play", so as "parallel play". "Parallel play" was more promoted in these spatial typologies than others, which might be interrelated to the space encapsulation and visual continuity that gather children with different capabilities, promoting the chance of on-looking each other, and encouraging them to imitate others to challenge their abilities. Assembly zones and open spaces, in their different forms and configurations, advanced in the occurrence "group play", where all the marked 14 children in the assembly zones, were observed to engage for 356 minutes (mean minutes per engaged child was 25.4 minutes), while 12 of them engaged in "solo play" with total 94 minutes, (mean minutes per engaged child was 7.8 minutes). While pathways promoted "group play", followed by "solo play" that was observed to occur more than in other typologies. Although pathways followed the assembly zones in promoting "group play", however, they were the highest in promoting

“solo play” among the other spatial typologies, where all the marked 12 children in the pathways were observed to engage in “solo play” with total occurrence of 130 minutes, (mean minutes per engaged child was 10.8 minutes). It is also important to highlight that the different cognitive play behaviors observed in the garden, were promoted only in “group play” form of social behavior.



Figures 123: Different afforded cognitive and social play types by different spatial typologies in H.S.C recreational urban space

The above preferences and different play pattern affordances at H.S.C urban recreational space, seemed to impact children’s perceptions and their mental maps, (Appendix C.2). In addition, they helped to implement different learned and experienced notions that were highlighted in their drawings, descriptions, photographs, and informal interviews.

Consequently, by analyzing children’s drawings to assess their perceptual cognitive skills with the same criteria used in the previous residential neighborhoods, according to age tranches (Piaget, 1956), it was noticed that most of the children of the “5 to7” age group, had good perception and accuracy to the represented elements, with notable amount of

details, (Table 18). Drawings tended to confirm their awareness of the presence of a specified spatial typology for them, which is the playground. Additionally, their drawing seemed to explain their preference to different play equipment, as well as, different surrounding landscape elements. Their drawing highlighted their perception of the material diversity, color, and texture in the space, by using different colors and adding different materials to their drawing, (Figures 124) and (Appendix C.2.I).

Table 18: Perceptual cognitive skills assessment for drawings of 5 to 7 children aged group at H.S.C recreational urban space

Child no.	HSC recreational urban space (below 7 years)		mean per child
	1. Accuracy of elements represented	2. Amount of detail in elements represented	
1.	4	4	4
2.	1	3	2
3.	2	2	2
4.	4	3	3,5
5.	3	2	2,5
6.	1	1	1
7.	3	2	2,5
8.	2	2	2
mean per criteria	2,5	2,38	

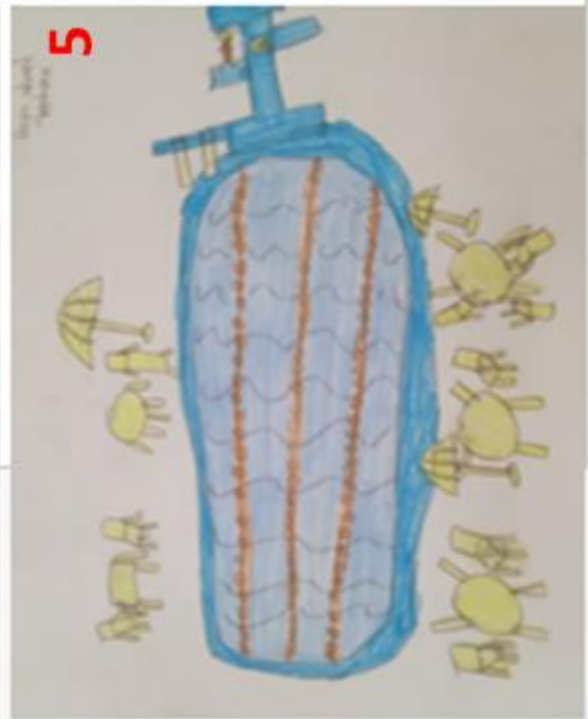


Figures 124: Sample of drawings of children below 7 age group, representing different perceptual mean rating categories, at H.S.C recreational urban space

Concerning the age group of “above 7”, the applied criteria revealed that their drawings tended to present high accuracy of the represented elements and high accuracy of overall scene of the whole recreational space, however, with little precise amount of details in the overall scene, (Table 19). It was noticed that most of the children had high perceptual recognition of the different spatial typologies represented as mosaic form with their inner multi-experience settings, offering them different forms of play opportunities. For this age group, some children used letters, symbols, and writing to aid their drawing skills and to make sure of delivering their drawing meanings. Most of the drawings were noticed to express absence of the children themselves and their friends, as drawn characters. This absence might question their social relations, although “group play” was a prevailing social play type. Moreover, children were aware of the different physical characteristics of the surrounding space, different types of vegetation, water features, and benches. Moreover, similar to the group aged 5 to 7, children were aware of the different textures and materials, which they expressed by using different colors and adding different materials to their drawings, (Figures 125) and (Appendix C.2.II).

Table 19: Perceptual cognitive skills assessment for drawings of above 7 age group at H.S.C recreational urban space

Child no.	HSC recreational urban space (above 7 years)						mean per child
	1. Accuracy of elements represented	2. Amount of detail in elements represented	3. Accuracy of overall scene	4. Amount of detail in overall scene	5. Visual realism in terms of accuracy of spatial relationships	6. Visual Realism in terms of perspective and representation of depth	
1.	2	2	3	1	3	1	2,00
2.	3	3	2	1	2	2	2,17
3.	3	2	2	1	2	2	2,00
4.	2	3	2	2	2	2	2,17
5.	3	2	3	1	2	1	2,00
6.	3	2	3	2	3	2	2,50
7.	3	2	3	1	3	2	2,33
8.	4	2	3	3	2	3	2,83
mean per criteria	2,88	2,25	2,63	1,50	2,38	1,88	



Figures 125: Sample of drawings of children above 7 age group, representing different perceptual mean rating categories, at H.S.C recreational urban space

For both different age groups (5 to 7 and older than 7 groups), the children’s drawings tended to explain their different perceptions, their comprehension of the segmented different typologies, and their preferences to these typologies, by highlighting the presence of multi-experience settings that include different elements as well as physical features (levels, materials, colors, and different types of vegetation). These elements as well as the overall scene were represented with high accuracy and good amount of details, (Figure 126).

However, children were not aware of the spatial territory of the recreational urban space and the surrounding buildings. They represented H.S.C recreational urban space, as being completely isolated from the outer surrounding context. In general, the drawings focused on the existing spatial configurations of different typologies and excluding characters that they daily interacted with.

For further details, Student t-test denoted that there was no significant difference between genders in terms of cognitive skills’ criteria, where p-value was greater than 0.01, (Table 20) and (Figure 127).

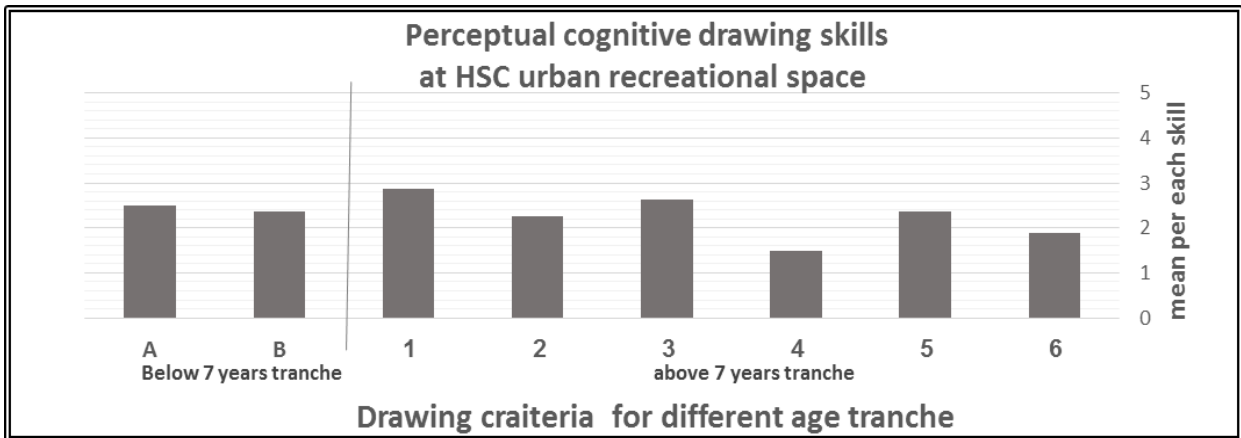


Figure 126: Mean rating of the perceptual cognitive skills evaluation for both age groups at H.S.C recreational urban space

Table 20: Statistical analysis presenting gender differences at H.S.C recreational urban space in terms of perceptual cognitive skills evaluation

Boys					Girls			
Student t-test (HSC recreational urban space)								
Criteria	HSC (above 7 years)						HSC (5-7)	
	1. Accuracy of elements represented	2. Amount of detail in elements represented	3. Accuracy of overall scene	4. Amount of detail in overall scene	5. Visual realism in terms of accuracy of spatial relationships	6. Visual Realism in terms of perspective and representation of depth	1. Accuracy of elements represented	2. Amount of detail in elements represented
Mean per criteria for girls	2,5	2,5	2,3	1,3	2,3	1,8	2,3	1,8
Mean per criteria for boys	3,3	2,0	3,0	1,8	2,5	2,0	1,8	1,5
P-value significance	0,10	0,13	0,02	0,39	0,54	0,62	0,59	0,04
In favor to	Boys	Girls	Boys	Boys	Boys	Boys	Girls	Girls

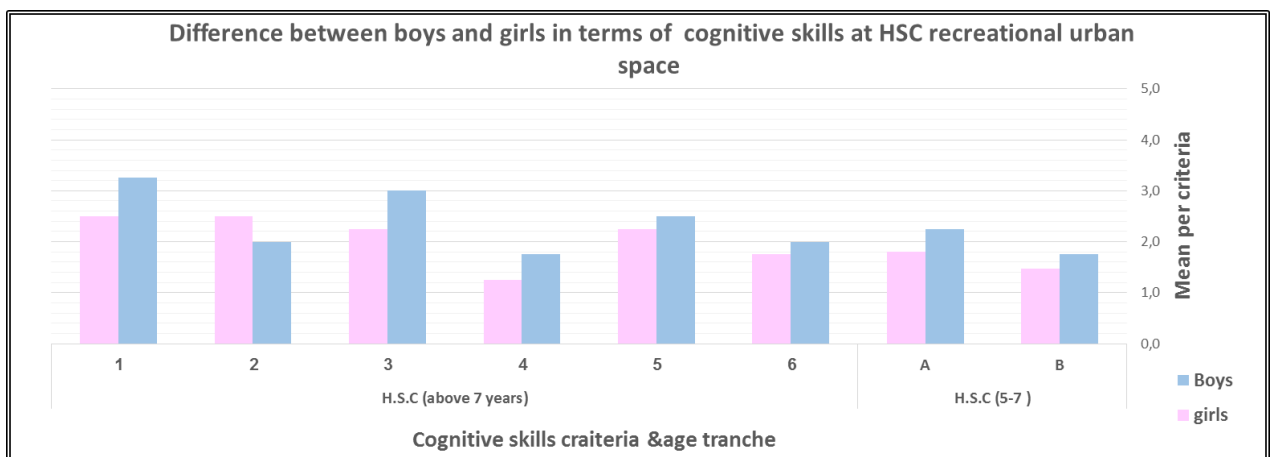


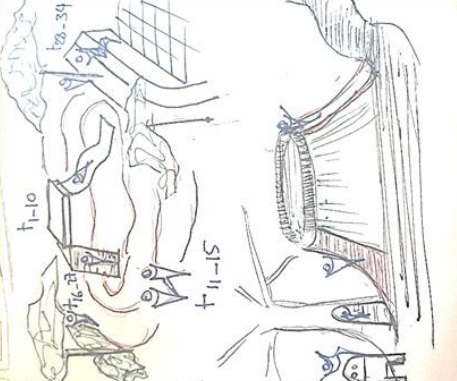





Figure 127: Gender differences in terms of perceptual cognitive skills evaluation at H.S.C recreational urban space

Concerning the clustering task, where the matrixes were conducted for H.S.C recreational urban space after drawings, informal interviews, and occasional walks, it documented the common recurring ideas, physical features, and qualities that attracted children during their play. It was denoted that certain participants' keywords and adjectives described their responses and feelings through implemented different learned and experienced notions that represented their mental perceived properties of the space as well as the frequent attractive physical properties, such as: space limits, scale of the space, new perspectives, sense of enclosure, sense of freedom, marked territories, sense of activity isolation, awareness of social surrounding environment, awareness of adult supervision, sense of accomplishment, and activity identity, (Figures 128).

<p>Child basic information</p> <ul style="list-style-type: none"> • Participation in research stages: Engaged in drawing, and photographic tasks • Mobility: Semi-restricted. • Age: 7 years • Gender: girl • Play spaces: playground 	<p>Drawing description during interviews that might complemented by a child-led walk</p> 	<p>Mental perceived characteristics of space that different learned and experienced notions</p> <ul style="list-style-type: none"> - Color recognition - Environment complexity and diversity - Challenge - Imagination and invention - Levels - Up and down - Observe and control - Emotional control - Risk taking - Physical properties recognition - Texture sensation - Friendship - Me and We - Sense of ownership - Activity variation - Awareness of parental supervision - New perspectives - Curiosity - Space boundaries - In and out - Sense of enclosure and protection - Sense of security and freedom - Sense of accomplishment 	<p>Extracted attractive physical features of the urban space in relation to research terminologies</p> <p>Spatial porosity</p> <ul style="list-style-type: none"> - Degree of permeability (Confined segmented space typologies) <p>Spatial potentialities</p> <ul style="list-style-type: none"> - Flow and continuity - Ground material diversity - Topographic variability - Urban spatial features (vegetation/ parapets) <p>Experiences under-going applied theories:</p> <ul style="list-style-type: none"> - Affordances - Trialectic theory - "lived space"
<p>Drawing description</p> <p>I drew the playground of our club, it is colorful, full of different shapes, and difficult objects. I name it the Minions city, because there are a lot of minion statues that invite us to play, we play with them and we go above them.</p> <p>I love swings and slides, especially sliding in the air. I love heights. But Look! here in front of the tree house, where we catch leaves from the surrounding real trees and play with them, there is a green hill to jump from and it is very elevated. Sometimes we use it as a stage, a girl sings and we act like audience.</p> <p>Also, we love to play skating from the hill to slide on the walk way, the paving is different, from smooth area to another rough one, so I like specifically playing on this walkway with my plasma bike, it makes different noises.</p> <p>I also drew me and my friends, I can't play without my friends, I always play with Laila, Nelly, Younnes, Yassin, and Youssef.</p> <p>Interview:</p> <p>The club is my second home, I called it my home, because it is my favorite place, where I always play in the playground. We play everything on these equipment, jumping, climbing, and pretending. There are a lot of things to do in it. We always play a lot of games like for example "kitty kitty color, what is your color?", there must be a lot of colors around, so one can put the color in mind and others guess.</p> <p>The playground has nice food court and it is a shaded area, where we can sit like adults and relax but of course when there is not a lot of parents. When I am tired of playing, I like standing on the bridge and observing the space. I have no secret places in the club, but my best place, is the small hill in the playground, it is closed from all sides and has an overview on all the playing equipment, we feel up and secured. Here I feel I am the chef of the security of the playground.</p>	 	<p>Experiences under-going applied theories:</p> <ul style="list-style-type: none"> - Affordances - Trialectic theory - "lived space" 	<p>Experiences under-going applied theories:</p> <ul style="list-style-type: none"> - Affordances - Trialectic theory - "lived space"

Child basic information	Drawing description during interviews that might complemented by a child-led walk	Mental perceived characteristics of space that implement different learned and experienced notions	Extracted attractive physical features of the urban space in relation to research terminologies
<ul style="list-style-type: none"> Participation in research stages: Engaged in drawing, complemented by child-led walk and photographic tasks Mobility: Free Age: 11 Gender: boy Play spaces: garden and pool complex 		<ul style="list-style-type: none"> Space limits Space boundaries Ownership Scale of space New perspective Sense of enclosure Sense of freedom Marked territories Sense of activity Isolation Activity identity Environment complexity and diversity Up and down Observe and control from heights Levels In and out Physical properties of surrounding environment ME not WE Texture sensation Texture and color recognition Sound/ material distinction Appropriation Curiosity Emotional control Challenge of capabilities Sense of accomplishment Exploration Manipulation Awareness of surrounding social environmental identity Awareness of adult supervision 	<p>Spatial porosity</p> <ul style="list-style-type: none"> Degree of permeability (Confined segmented space typologies) <p>Spatial potentialities</p> <ul style="list-style-type: none"> Spatial entity Topographic variability (elevated parapet) Material diversity Urban spatial features (vegetation/ parapets/ fences)
<p>Drawing description</p> <p>This the paper that I drew, I drew the pool complex, because I come daily to practice swimming, so I added the three sized pool with the plastic blue mat in between that you have to walk on, otherwise you will slip down, and it is very dangerous, my mother tell me this daily before the practice. But do know, sometimes me and my friends try to challenge ourselves to run on both the mat and the normal floor to challenge, who won't fall. When I am alone I enjoy the sound of my slipper when walking on this plastic mat. And here is the brown wooden separator where the captain always stands beside, it separates between our big pool and the tiny pool for babies, sometimes after the practice if I was good, my mother allows me to play in the smaller pools where I can explore reaching the floor and jumping and some acrobatic movements, but I prefer the medium one. Also, I like the garden in the club beside the shops and the restaurants.</p>	<p>Interview and walk:</p> <p>I got bored from the playing area especially after its renovation; it is too crowded and noisy. I hate the playground I feel imprisoned and can not breath in it. I don't know from where to go inside and to get out of it. You know I don't like any closed areas.</p> <p>My favorite space is the garden and pool complex. I love open, huge, and green spaces with trees. There are a lot of restrictions to ride a bike and play with balls in the club, even at home my mum rejects to play or ride a bike in the surrounding streets. Me and my friends are playing always in this garden football match and a lot of other things as playing hide and seek, volley ball, and other competitive games.</p> <p>I love sitting in the garden sometimes, where you will see and watch a lot of things from there. Also relaxing and observing birds while flying sometimes, I feel I want to be a bird.</p> <p>Look! I forget to tell you something in the drawing, the pool is surrounded by a green barred fence, on the right in the drawing, when I am bored, I love sitting on the parapet entering my legs in-between these bars or even on the top of the fence, exactly like the bird and watching others from higher levels in during their swimming practice.</p> <p>But when I am crossing the club, I love having a coin and enjoying the noise of bumping on this steel fence with my step on the parapet below, I know the rhythm of my step, too many steps, too many bumps, so I am fast, and I also experience balance on the tiny brown, non smooth parapet, here is a photo, Omar a friend of mine, took it for me.</p> <p>The sound of the bump, is similar to what I hear during the swimming practice, when the captain, wants us to start swimming between the red plastic separators in the pool, he uses a key to bump on the steel stairs or ladders, look they are in the drawing, as well.</p>	<p>Experiences under-going applied theories:</p> <ul style="list-style-type: none"> Affordances Trialectic theory "conceived, perceived, and personal lived space" 	 

Figures 128: Sample of matrixes, including drawing description documentation and informal interviews' script for each age group at H.S.C recreational urban space

4. II. 3. c. Lived space

Data from sketches and descriptive notes, encountered during behavioral qualitative observations sessions, informal interviews, and occasional child-led walks, were analyzed to explore as well as to better comprehend the potential associations between the five suggested spatial potentialities and children play opportunities at H.S.C recreational urban space, as follows:

1. Entity of activity settings: H.S.C recreational urban space, as previously described, is subdivided into segmented functional spatial typologies promoting in the creation of “Mosaic ambiance” (Gamal Said, 2013), which enhances sensory breaks or sensory-spatial segregation, confinement and isolation. Entity of activity settings of the typologies in H.S.C recreational urban space, is classified into three forms, (Figure 129). First, segregated confined islands with multiple-spatial experience settings, with good functional definition, and the settings are separated with multiple internal activity routes, as the playground, pathways, the croquet and the squash assembly zones. Where children activities were observed to associate with less organized frequent shifts from one activity setting to another and with greater levels of activity concentration that seemed to stimulate children’s space limit and territory recognition. Second, multiple-spatial experience settings, with functional definition, but with no internal separating activity routes in-between settings, as the rest of assembly zones, where observations revealed more dynamic undetermined actions with frequent change in an overwhelmed behavior that decrease the sense of marking the space boundaries. Third, single-spatial experience setting, with good functional definition, and with no internal separating activity routes, as the garden spatial typology, that was observed to provide a flexible variety of play experiences and children seemed to shape and appropriate it, according to their will for longer spans of activity time and with more social interactions, that appeared to increase the sense of space boundaries (Barbour, 1999; Jones, 2000; Smith, 2004; Maxwell et al., 2008; Zamani, 2013), (Figure 130).

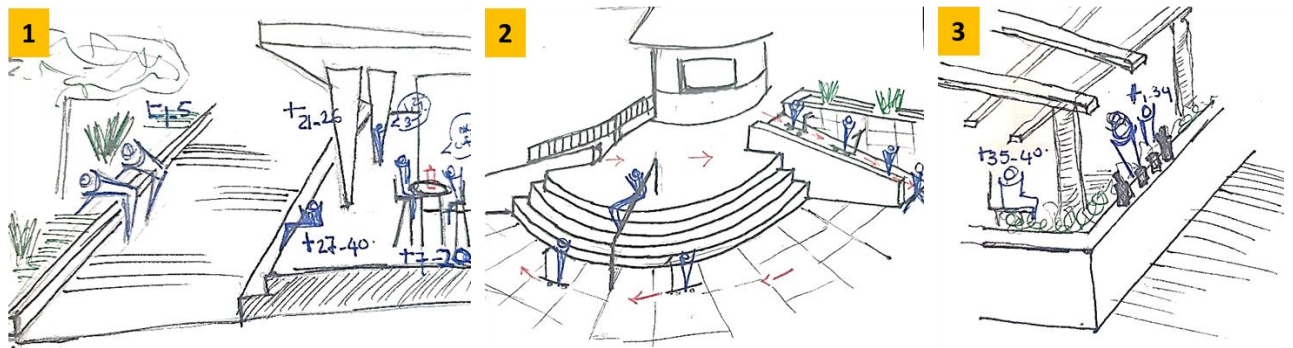
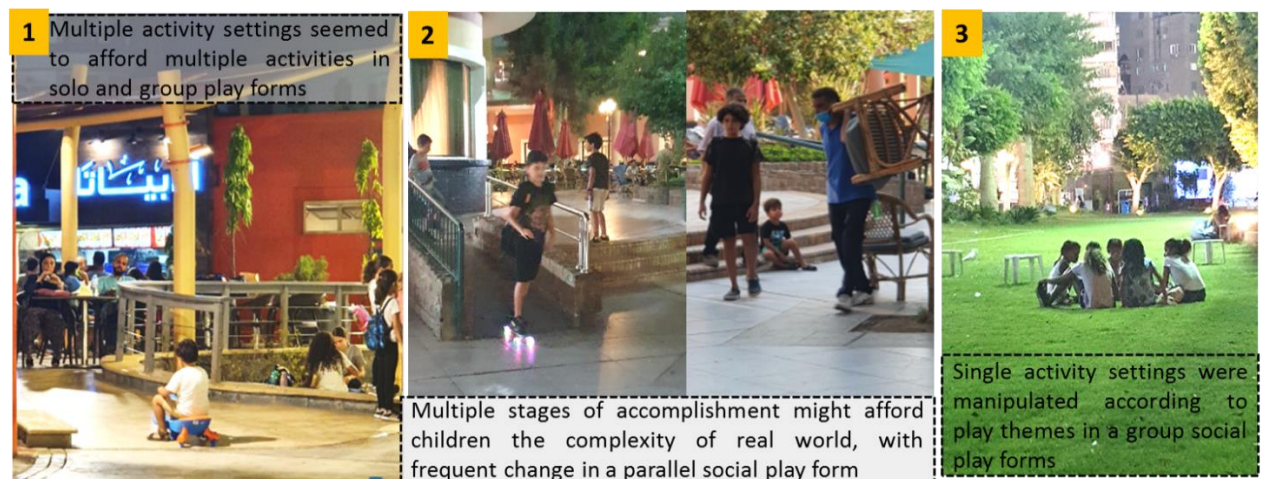


Figure 129: Sketches presenting the different entity forms of activity settings in the different spatial typologies at H.S.C recreational urban space



Figures 130: Examples of different lived experiences promoted by different entity forms of activity settings at H.S.C recreational urban space

2. Flow and fluidity: Spatial typologies in H.S.C have different forms of flow and fluidity. For example, multiple internal activity routes separating the multiple-spatial experience settings with good functional definition, seemed to promote organized, smooth, as well as continuous flow of play with higher level of physical activities, gross and motor play forms, on the included clear defined activity routes. Activity routes are well defined with the use of hard distinct material (tiling), color, or shape (linear, curved, or looped). While, the absent internal separating activity routes within the visual divided multiple-spatial settings, appeared to enhance impulsive play activities and obstructed flow as well as fluidity. As for the absence of internal separating activity routes within the single undivided settings, they were observed to afford by random flow and fluidity, (Figure 131).

According to the literature, activity routes might promote various forms of “functional play”, such as running and biking (Cosco et al., 2010; Podolska, 2014). While absence of activity routes might promote various forms of repetitive behavior, rapid shifts from one setting or object to another, and ineffective, as well as incomplete actions. According to Moore, G., (1986), this behavior is classified as “Random behavior”. Observations revealed several events of random movements interfering with the play activities of others that was escalated into fights between children, (Figures 132). According to the fieldwork documentations, the presence of clear defined activity routes had been suggested to encourage smooth flow of play and high chance of playability. Moreover, defined routes appeared to promote imagination and creation in play that were important to “dramatic play”, (Figures 133).

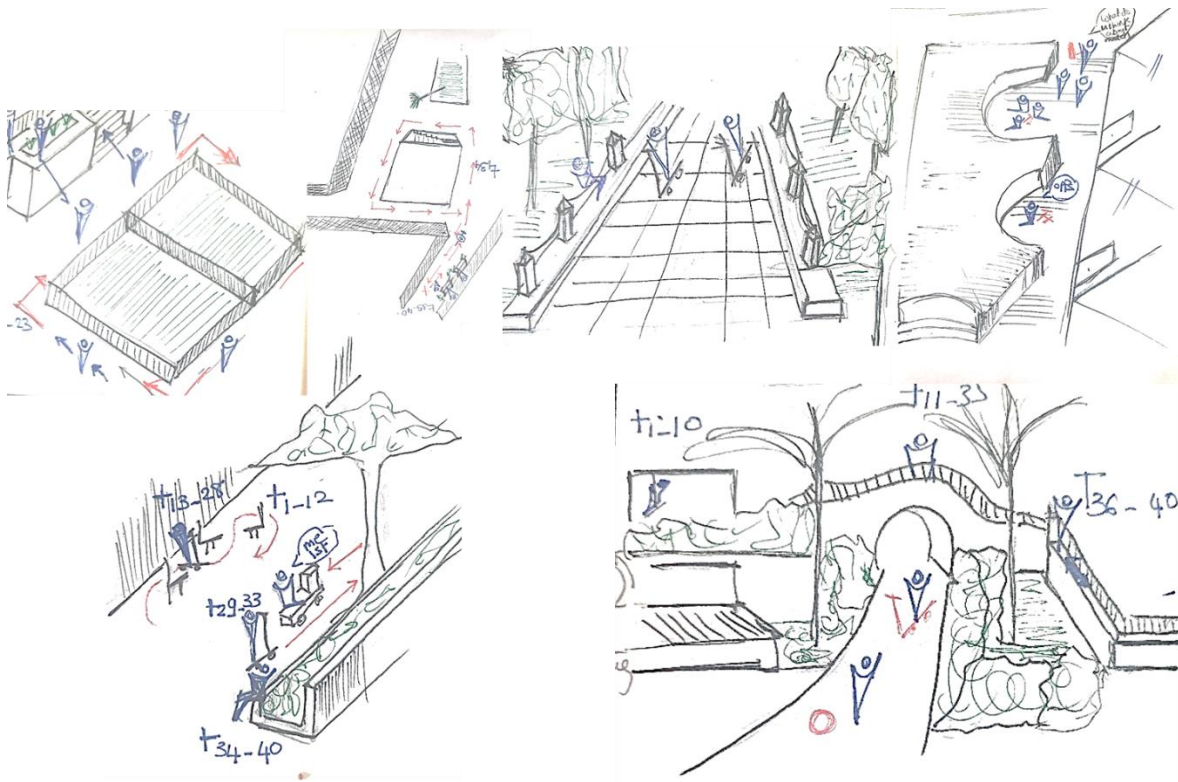


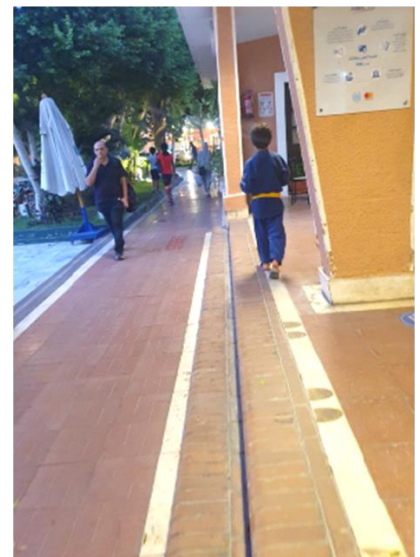
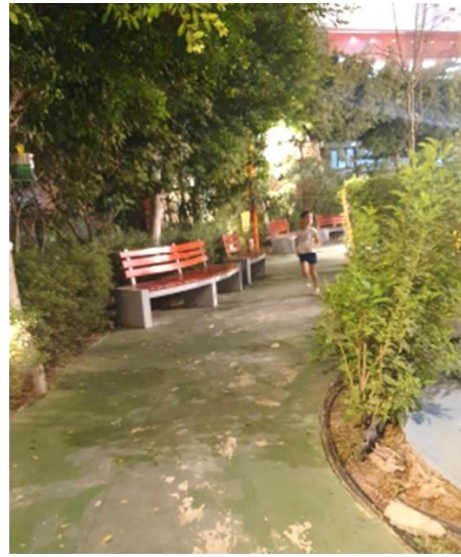
Figure 131: Sketches presenting the impact of the presence of internal activity routes in different spatial typologies at H.S.C recreational urban space



The presence of activity routes, especially hard surfaced ones, appeared to afford biking, playing with wheeled toys, and high levels of physical activities, in an organized and smooth flow form

The absence of activity routes had been suggested to encourage high chance of fights and aggression

Figures 132: Examples of different lived experiences promoted by different forms of flow and fluidity



Linear routes are less comfortable that were perceived as dead-end and might result in conflicts

Looped and curved shaped routes had been suggested to be more enjoyable and to offer perceptual complexity “now you see me, now you do not”

Colored pathways appeared to promote imagination, since it acted as guiding lines of flow

Figures 133: Definition of activity routes appeared to promote imagination and creation

3. Ground material diversity: Some typologies in H.S.C recreational urban space feature high variety of ground materials, texture, and color, such as the playground (i.e. rubber flooring for play equipment areas, artificial as well as natural grass-paved areas, and concrete cover with different colors as well as patterns for pathway). In contrast to other typologies, as the garden, that has poor ground material diversity and characterized by mono- texture of grass covering material and mono-color.

In general, diversity of ground material was observed to promote imagination, creativity, and more “dramatic play”, (Figure 134). Coherent with the literature, observations confirmed that diversity of ground material might promote various forms of play. Thus, hard ground surfaces had been associated with running, biking, and wheeled toy play. They were suggested to promote “functional play” and motor skills (Cosco et al., 2010; Christidou et al., 2013; Barbour, 1999; Fjørtoft, 2004) but to offer less opportunities of creative activities than the soft materials (Barbour, 1999; Christidou et al., 2013). On the contrary, soft ground surfaces had been suggested to be more appropriate for relaxation, group gatherings, and social interactions among children (Zamani, 2013; Christidou et al., 2013). Additionally, soft and semi-soft materials seemed to afford tumbling, acrobatic movements, but no more wheeled activities. They had also been suggested to promote “games-with-rules”; to offer more opportunities for creative activities; and to enhance more imagination than the hard materials (Barbour, 1999; Christidou et al., 2013). In conclusion, diversity of ground material or color appeared to promote imagination and creativity in play that were important to accommodate new invented forms of “constructive play” and “dramatic play”, (Figures 135).

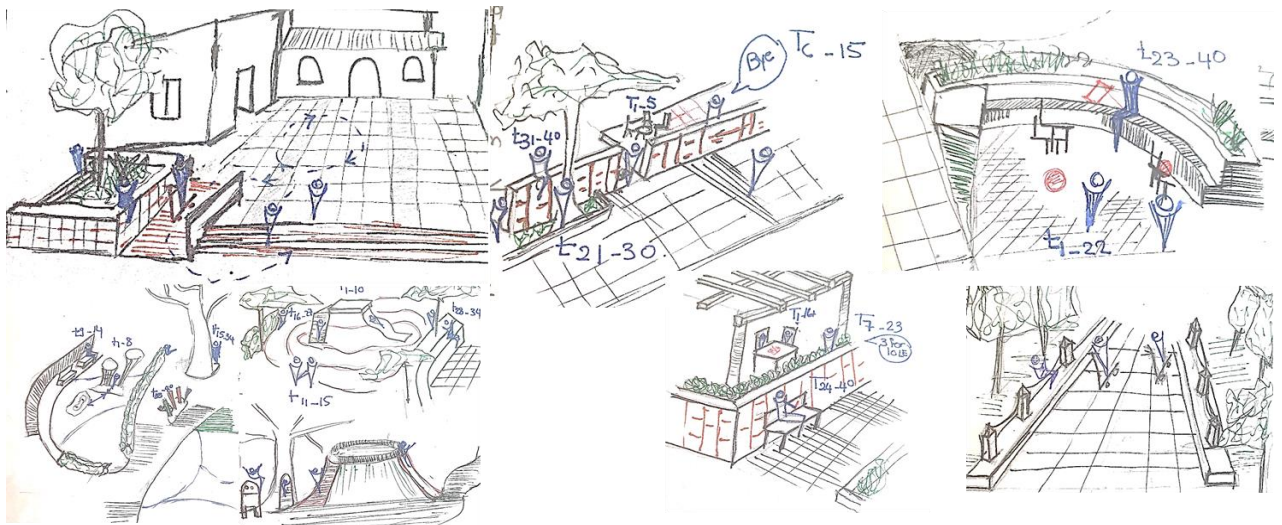


Figure 134: Sketches presenting the ground material diversity in different spatial typologies at H.S.C recreational urban space





Soft material seemed to promote acrobatic movements and social interactions among children



Texture diversity seemed to enhance creativity, imagination, and "dramatic play"



Material diversity might enhance exploration and innovation



Figures 135: Examples of different lived experiences promoted by ground cover diversity

4. Topographic Variability: At H.S.C recreational urban space, topographic variability is achieved by the presence of different ground levels, such as, elevated or depressed terraces, cantilevered terraces, ramps, bridges, sitting steps, stair flights, curbs, climbable gravel parapets, and brick bases, which seemed to offer children safe-risk by stretching their limits of challenge, (Figure 136). Coherent to previous literature, variability was observed to afford play behavior that develop hand-leg-eye coordination through challenging children’s abilities and conquering their fears.

During the fieldwork, it was clear that levels were perceived by children as “elements that stimulated them physically” in a challenging way. Diversity in levels appeared to create challenging play experiences that offer high degree of stimulation and risk taking. Moreover, observation revealed that topographic variability might increase the possibilities of affording “functional play”, gross motor play, and “games-with-rules” by competing children’s abilities.

Furthermore, levels seemed to provide children’s with feelings of security, privacy, and control, through enhancing their sense of space boundaries of their playing activities integrated with social interactions. Accordingly, children mentioned during interviews, that they preferred elevated spaces, because they enhanced their feelings of security, where they

might develop their self-identity and self-restoration (Kytta, et al., 2002). Consequently, topographic variability had been suggested to promote creation and imagination by providing children with a full perspective of the surrounding, (Figures 137).

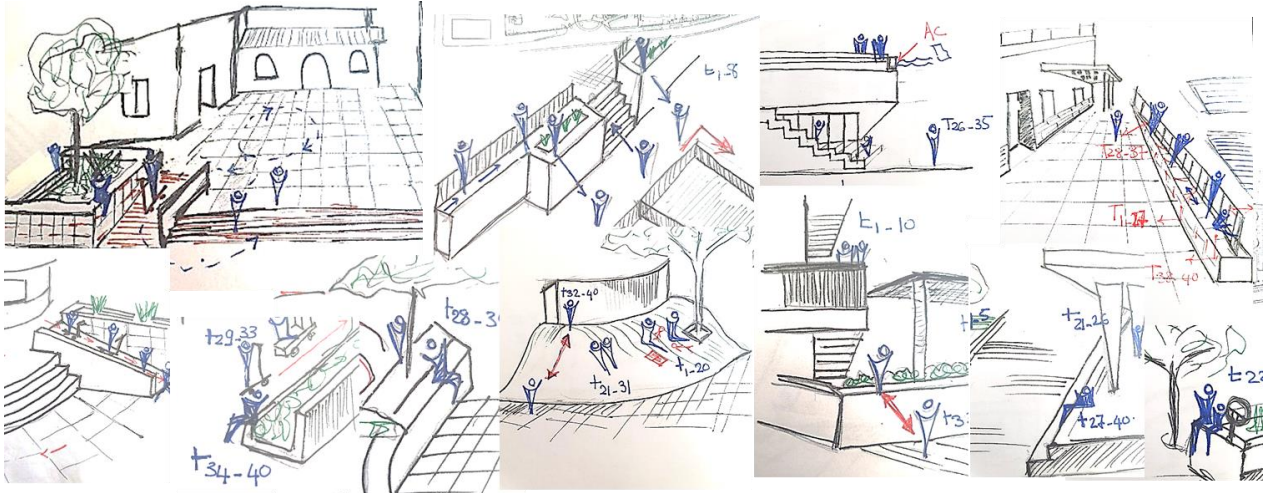


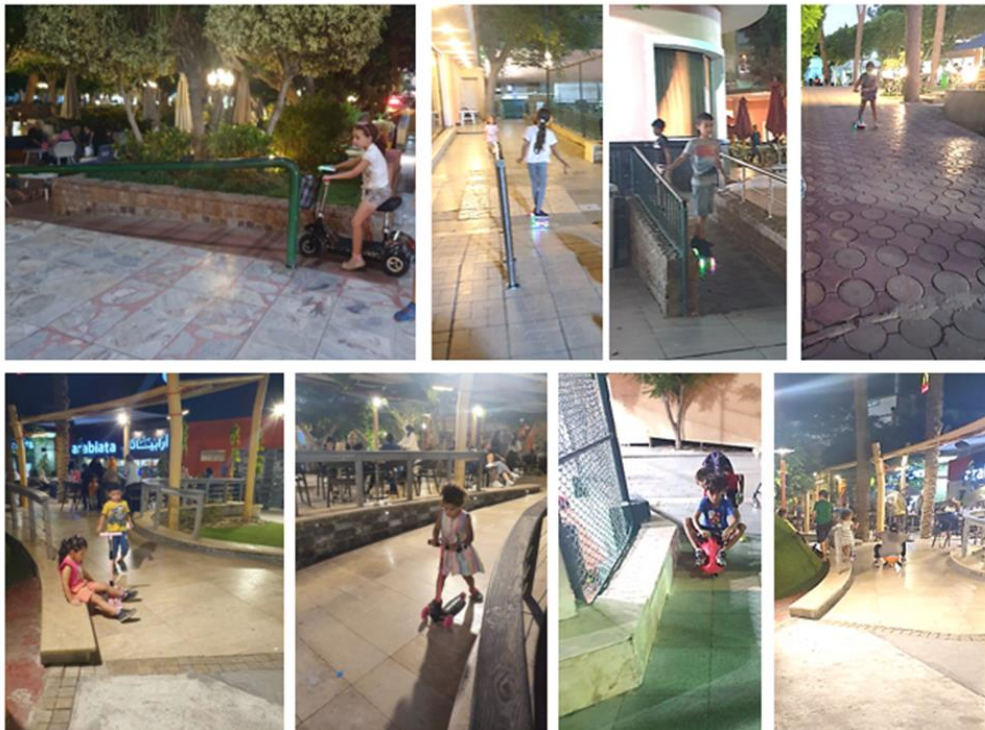
Figure 136: Sketches presenting the ground level variability in H.S.C recreational urban space



Levels seemed to enhance children's risk taking



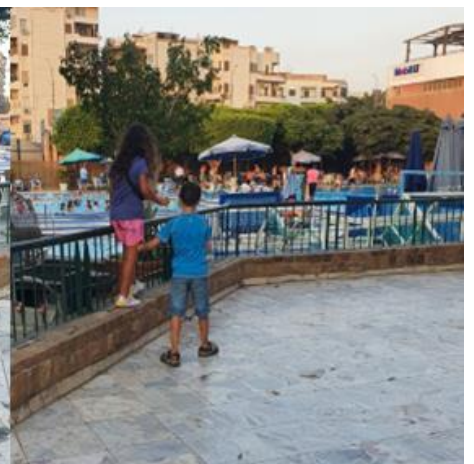
Levels appeared to promote social interactions



Slightly slopes and stairs afforded sliding and skating



Elevated elements had been suggested to increase environment complexity by affording dynamic actions as jumping and hiding (now you see me and now you do not)



Levels were noticed to highlight children's spatial boundaries in their perceptions



Variability of levels helped children to promote their imagination



Elevated elements seemed to enhance children's sense of privacy by offering relaxed and peaceful settings and new perspectives

Figures 137: Examples of different lived experiences promoted by ground level variability in the different spatial typologies at H.S.C recreational urban space

5. The presence of different urban spatial features: As previously described, all the different spatial typologies at H.S.C recreational urban space are characterized by the presence of different urban spatial features, for example, the presence of interactive features, such as sculptures and landmarks; different types of vegetation including shrubs, flowery plants, greenery plants, and large shading trees, providing relatively large shaded areas; elements stimulating senses, as waterfalls; benches; and pergolas, (Figure 138). Observations tended to emphasize that vegetation seemed to offer climate moderation that stimulated challenging play activities for children. In addition, the presence of spatial

features were observed to encourage children’s exploration, creation, and invention, by promoting “constructive play”. Moreover, spatial features appeared to increase environmental curiosity and complexity, through affording more “exploratory play”. Furthermore, according to the interviews and drawing descriptions, children perceived fences, recesses, projections, pergolas providing shade, and low parapets, as attractive elements that encouraged them to invent more of their own play strategies, (Figures 139).

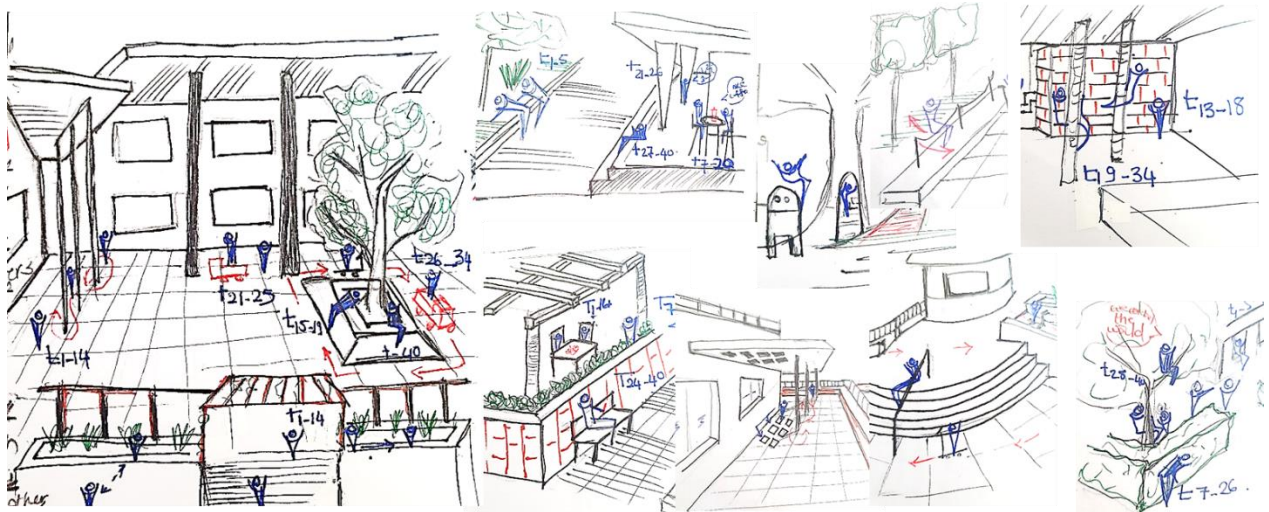


Figure 138: Sketches presenting the different urban spatial features at H.S.C recreational urban space



Different types of vegetation as grass and large shading trees might afford resting and social “group play”

Trees appeared to promote climbing and improve motor skills, balance, and coordination



Vegetation elements were perceived as iconic elements that afforded sheltering and hiding



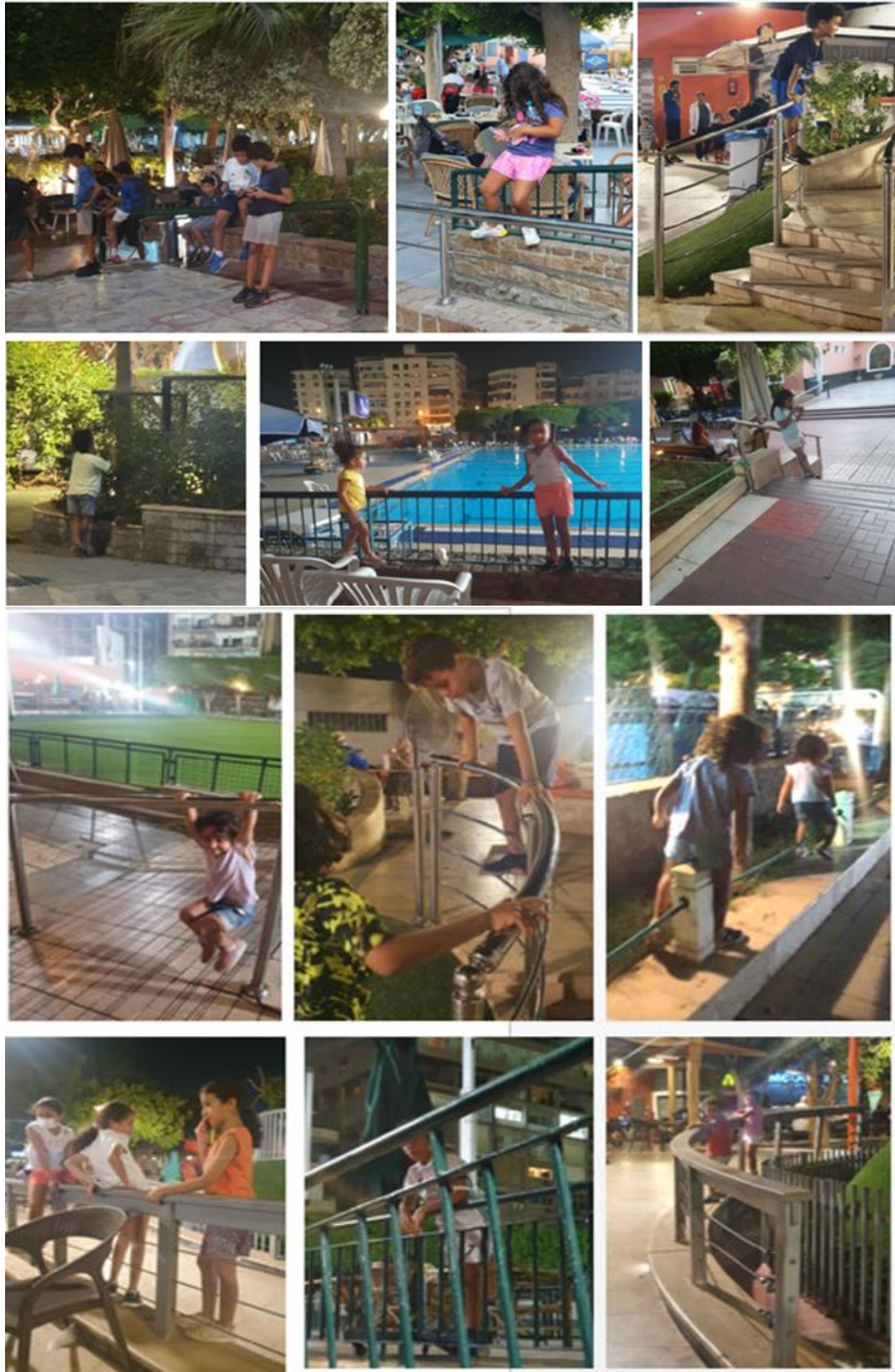
Vegetation elements appeared to increase environment complexity by stimulating curiosity and “exploratory play behavior”



Some urban features might provoke children's five sensations through experiencing the surrounding environment by hearing, touching, smelling, tasting, and seeing



Children explored urban elements and used them according to their invented ideas that created their own objects for play



Fences were described by children as desired elements that encouraged their physical activities, social interactions, and could be appropriated according to the function needed



Benches and sitting elements were perceived by children as multi-functional elements that promoted relaxation, gatherings, and discussions



Iconic urban features seemed to increase children's curiosity and clarity of their in their mental map of the space, since they had been suggested to increase environmental complexity by acting as landmarks

Figures 139: Examples of different lived experiences promoted by different urban spatial features

4. II. 4. Châtelet-Les Halles - Jardin Nelson Mandela- recreational urban space, Paris, France

Concerning the case study of Châtelet-Les Halles recreational urban space, the analysis of the three spatial levels, i.e. conceived, perceived, and lived, are presented, as follows:

4. II. 4. a. Conceived space

Unlike H.S.C recreational urban space, Châtelet-Les Halles recreational urban space is characterized by high spatial definition of the territory through medium degree of openness. Châtelet-Les Halles recreational urban space is considered as a daily intergeneration outdoor urban recreational public space or park that is emerged in the middle of the Parisian urban fabric, achieving high integration with the surrounding context. Accordingly, the collected data from Châtelet-Les Halles recreational urban space was analyzed, similar to the previous case studies, on two phases, as follows:

As for the first phase of analyzing the child-centered structured observational tables specified for Châtelet-Les Halles recreational urban space, (Appendix D.1), it assessed the amount of occurrence of different play types, (Figures 140 and 141). For the cognitive play, it was observed that the occurrence of “functional play”, was revealed to be the prevailing play type, where all the 30 observed children at Châtelet-Les Halles recreational urban space, were noticed to engage in “functional play” for a total of 628 minutes, and the approximate mean per engaged child, was 20.9 minutes. They were observed engaging in running, climbing, jumping, swinging, sliding, lifting, balancing, throwing objects, pushing a toy back as well as forth, playing with wheeled toys, and riding bikes. Coherent to previous literature, “functional play” involved gaining strength, agility, and coordination between children’s heads and limbs (Weilbacher, 1981; Barbour, 1999; Metin, 2003). Moreover, children seemed to learn more about how things feel, taste, smell, and sound, by examining the functions as well as the properties of objects, through pushing, pulling, banging, and dropping them. Accordingly, children were observed attempting to apply the same limited activity to all objects with the objective to comprehend how they react. The goal of this type of play, according to the observations, might be with the objective to expose curiosity and motivate children to learn more about the surrounding environment.

In addition, there was obvious occurrence of “no play”, where 25 children were observed to engage for a total of 296 minutes, with approximate mean per engaged child of 11.8 minutes. Children were identified engaging in relaxing activities, gatherings, and group picnic discussions.

Similar to H.S.C recreational urban space, “constructive play” did not acquire great occurrences by children, where only three children engaged for a total of 15 minutes, that might be associated to the fact of the presence of standardized fixed urban furniture, the absence of loose materials as well as flexible elements, and the elevated solidary regulations of the place.

Regarding the social play, similar to Cité jardins residential neighborhood, while different from H.S.C recreational urban space, the “solo play” was observed as a prevailing social play type, where 29 children, almost the totality, were observed to engage in “solo play” for 553 minutes, thus the approximate mean per engaged child in “solo play” was 19 minutes. On the other hand, 19 children were observed to engage in “group play” for just 342 minutes, thus the approximate mean per engaged child in “group play” was 18 minutes. Unlike H.S.C recreational urban space, for gender difference in terms of play behavior, the Student t-test results were analyzed to assess the differences between genders relative to play types, where there was no significant difference designated, for both play types, social and cognitive, and p-value was greater than 0.01, (Table 21). Similar to Cité jardins residential neighborhood in France, this might be relevant to the community social role which highlights equality through equal chances, equal access to opportunities, and even distributed tools as well as assistance, in order to raise a community system that offers justice through equal access to both tools as well as opportunities, and that promotes equity through tools that identify as well as address inequality between genders, (Figure 142).



Figure 140: Examples of different observed cognitive and social play types

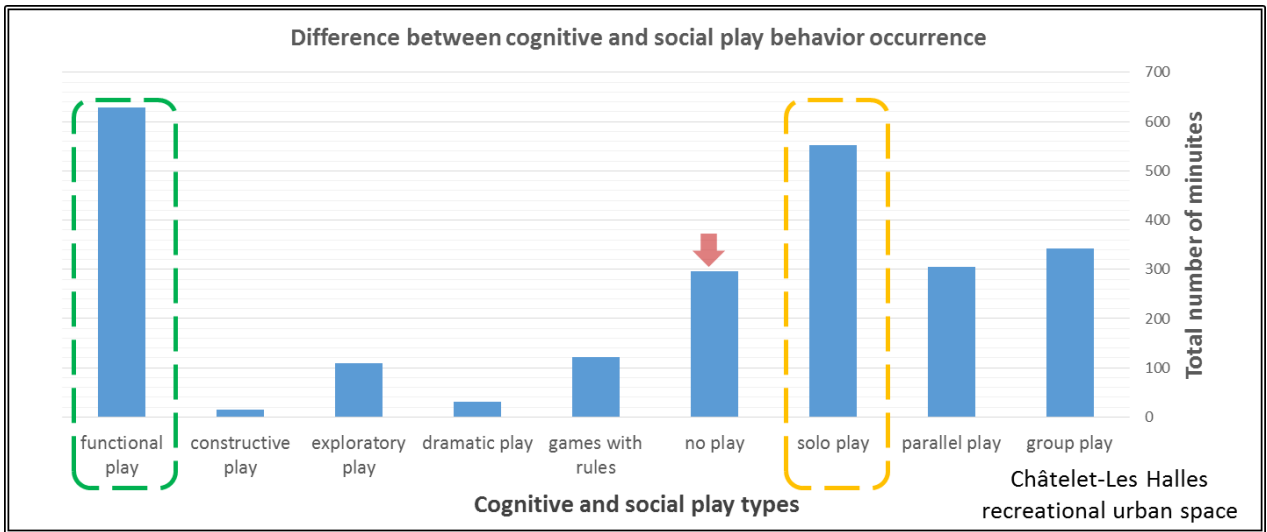


Figure 141: Amount of occurrence of cognitive and social play types in Châtelet-Les Halles recreational urban space

Table 21: Differences in cognitive and social play types between genders in Châtelet-Les Halles recreational urban space

	Boys						Girls		
Student t-test (Châtelet-Les Halles recreational urban space)									
	Cognitive play						Social play		
Play type	functional play	constructive play	exploratory play	dramatic play	games with rules	no play	solo play	parallel play	group play
Total of minutes of girls	293	15	84	31	62	115	267	210	123
Mean per girl	19,5	1,0	5,6	2,1	4,1	7,7	17,8	14,0	8,2
No of engaged girls	15	3	8	5	5	13	14	12	8
Mean per engaged girl	19,5	5,0	10,5	6,2	12,4	8,8	19,1	17,5	15,4
Total of minutes of boys	335	0	25	0	59	181	286	95	219
Mean per boy	22,3	0,0	1,7	0,0	3,9	12,1	19,1	6,3	14,6
No of engaged boys	15	0	3	0	7	12	15	8	11
Mean per engaged boy	22,3	0	8,3	0	8,4	15,1	19,1	11,9	19,9
P-value significance	0,40	0,09	0,05	0,02	0,92	0,12	0,74	0,03	0,13
In favor to	Boys	Girls	Girls	Girls	Boys	Boys	Boys	Girls	Boys

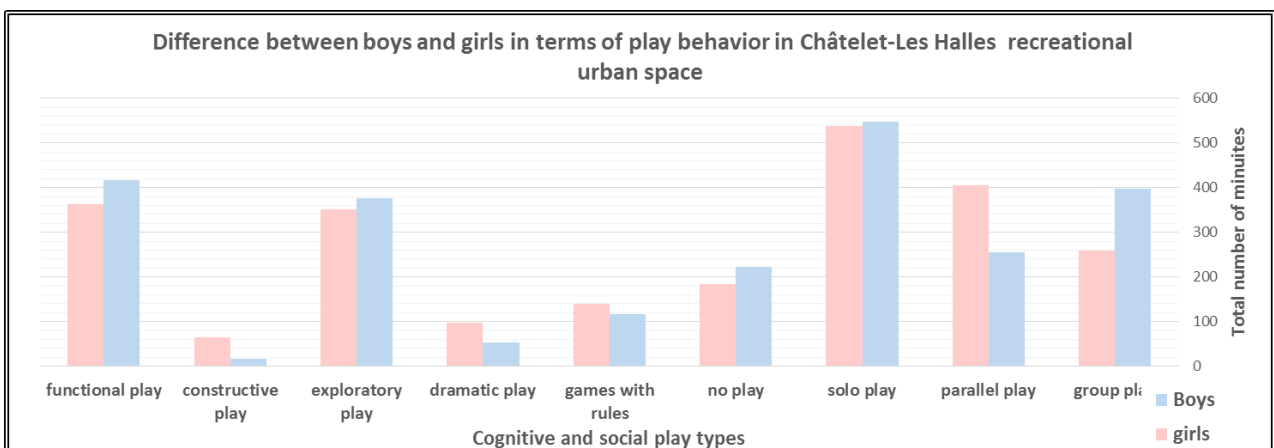


Figure 142: Gender differences in amount of observed cognitive and social play types in Châtelet-Les Halles recreational urban space

As for the second phase, that was concerned with the collective behavioral mapping analysis, which was extracted from the data of behavioral qualitative observational sessions, complemented to the child-centered structured observations, children presence was investigated in the different included space typologies that are characterized with their medium permeability in-between, through a mixture of visual and tangible boundaries, (Figure 143).

The behavioral map indicated multiple presence of other colored dots than red ones. Thus, observations revealed that some children tended to engage in different activities in multiple spatial typologies, during the observational session, with higher degree of freedom, shorter span of activity shifts, and behavioral variety. Moreover, it was observed that a noticeable amount of the children were playing under high parental supervision due to the consideration of this site as a public space with high degree of openness, especially that it is connected to public streets with the presence of strangers, homeless people, and alcoholics. Thus, the children's parents limited the territorial range for their children's free play.

They were only allowed to play freely alone in spatial typologies, where their parents were sitting in, or in spatial typologies that are tangibly bounded, secured, and closed, such as the playgrounds. Consequently, the plotted dots on the map representing children were accumulated densely in the confined playgrounds. Moreover, according to the observations, other children seemed to move more freely in-between different other spatial typologies. These spatial typologies are circumscribed by visual boundaries, achieving visual continuity, sense of scale, security, and integration, which facilitated parental supervision, in which children were permitted to play within.

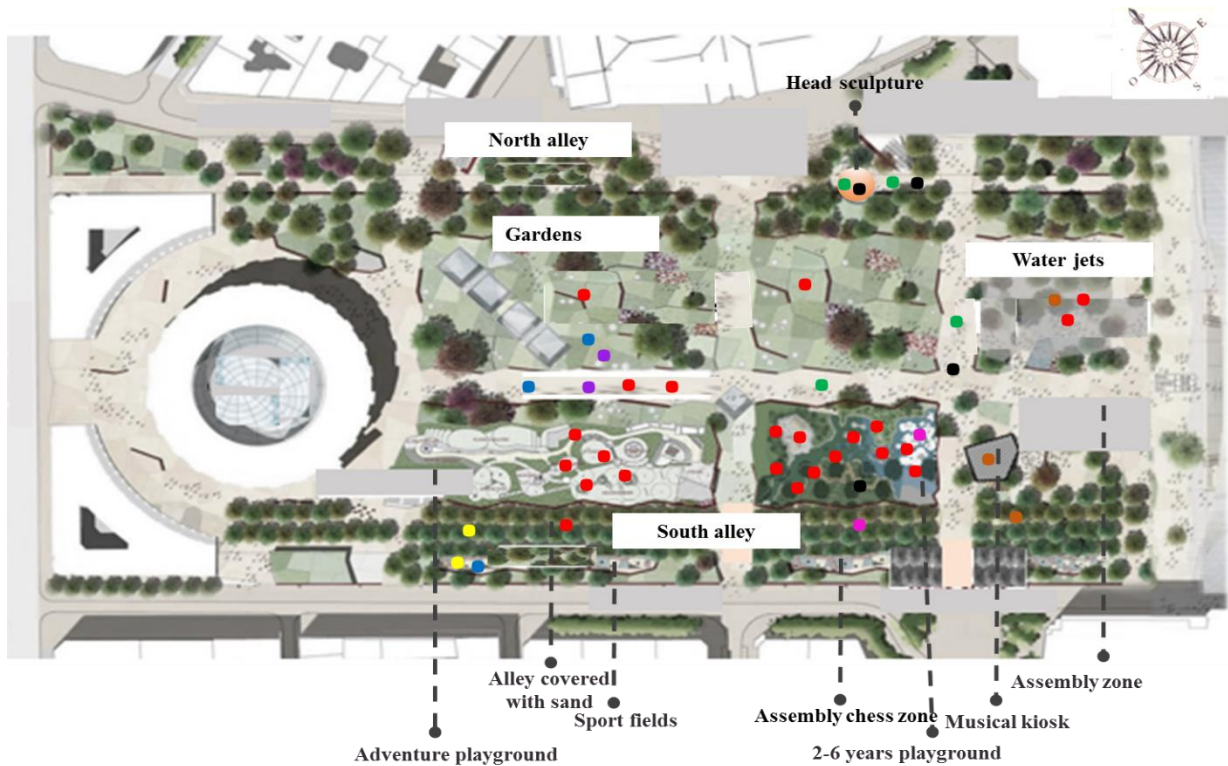


Figure 143: A behavioral map highlighting children’s presence in different spatial typologies at Châtelet-Les Halles recreational urban space

4. II. 4. b. Perceived space

Similar to H.S.C recreational urban space, Châtelet-Les Halles encompasses the same spatial typologies that promoted different children’s spatial preferences, patterns of play behavior, and perceptions. According to the further analysis of the behavioral map, these spatial typologies with their different configurations promoted children’s different spatial preferences that was clarified in their presence percentages inquiry, (Figure 144).

Differently from H.S.C recreational urban space, in Châtelet-Les halles recreational urban space, the playgrounds followed by the pathways appeared to highly encourage children’s presence. In particular, playgrounds encompass almost half of the sample observed in Châtelet-Les halles recreational urban space, while the alleys and pathways encompassed one third of it. The high presence percentage observed in the playgrounds might be interpreted by their high sense of security and confinement, since they are surrounded by fences to control space accessibility, where observations revealed that children were left to play freely without stiff parental supervision. For further clarifying the high sense of

confinement and security, even parents are not allowed to access in the middle childhood playground. Additionally, the high children's presence in the playgrounds might be related to their innovative design that pictures the surrounding daily environment within a scaled beautiful model suitable for children.

Unlike the highly confined playgrounds, the pathways are visually defined with elevated segmented concrete bases and with the use of a distinct concrete paved material that afforded various quite frequent play activities, such as, biking, playing with wheeled toys, (scooters, skateboards, roller skates, and strollers), sitting, stopping to rest, discussing, and exchanging outside the large pedestrian flows.

Regarding the least children's presence percentage, it was observed to take place in the gardens. Accordingly, this low presence percentage might highlight how children perceived places as convenient or not for their preferred activities. Moreover, children revealed, during the interviews, their concerns about the adults' unwelcoming behavior towards their activities and their noise, by regarding them as if they were outside of their specified places, and invading adult's places, for example, gardens and assembly zones.

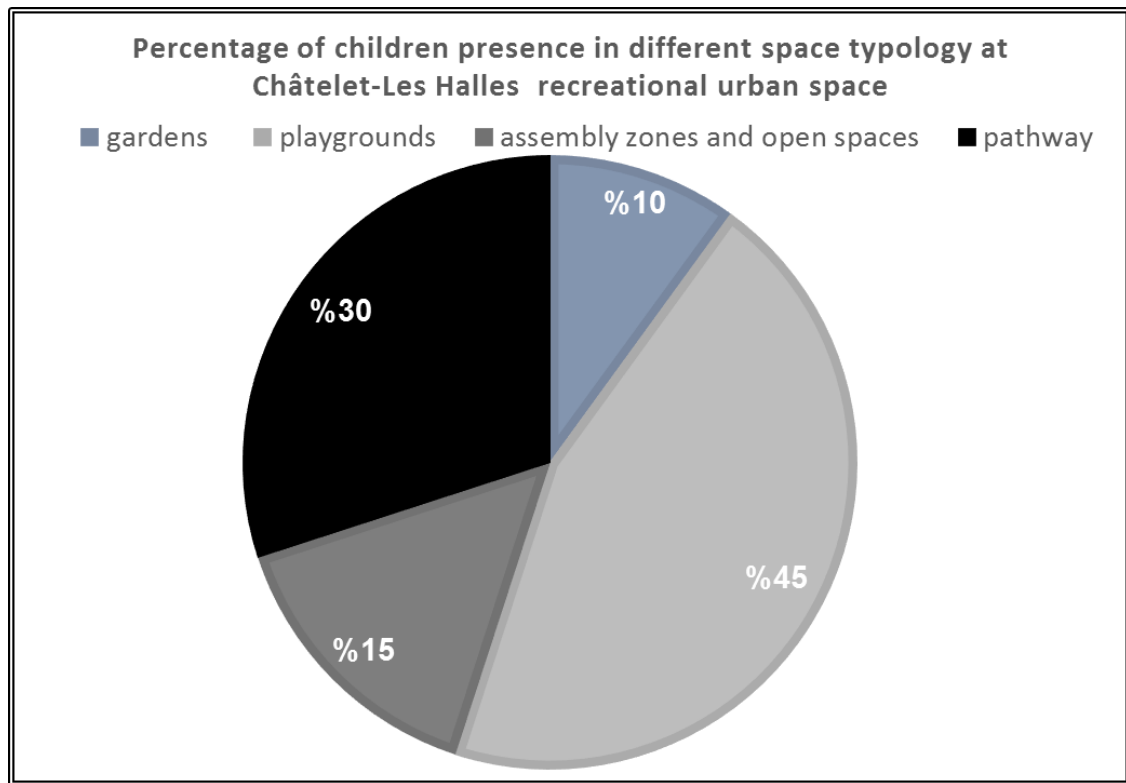


Figure 144: Percentage of children's presence in the different spatial typologies according to their preferences in Châtelet-Les Halles recreational urban space

As previously proceeded, child-centered structured observations and the behavioral mapping were further analyzed to assess the differences between space typologies in terms of the occurrences of different cognitive as well as and social play types, (Figures 145). Similar to H.S.C recreational urban space, the analysis indicated that concerning the cognitive play behavior, pathways and playgrounds promoted more “functional play” than other spatial typologies. The prevalence of the “functional play” was observed in different space typologies, such as, pathways, assembly zones and more specifically, in the playgrounds. In playgrounds, 45% of children’s sample, were observed to engage in different play activities. The presence of various cognitive and social play types might be associated to the presence of multiple-spatial experience settings that had been linked with spatial manipulation according to the accommodation of children’s different play ideas, which helped in creating their own strategies (Barbour, 1999; Podolska, 2014). In addition, due to the presence of nature elements, such as, trees, shrubs, and flowers that enhanced the environmental complexity. Where 16 of the 18 children observed in the playgrounds, were marked to engage in “functional play” for total of 360 minutes, (mean minutes per engaged child was 22.5 minutes). However, the whole 18 children were marked to engage in “no play” behavior for 149 minutes, (mean minutes per engaged child was 8.3 minutes). While “constructive play” was noticed as the least prevailing behavior due to the absence of loose elements and the presence of standardized design.

For the pathways and alleys, 30% of children’s sample, were observed to engage in different play activities. Similar to H.S.C recreational urban space, children were observed to engage more in “functional play”, as a prevailing behavior in the pathways. Eight out of 12 children marked in the pathways, were observed to engage in “functional play” for 142 minutes, (mean minutes per engaged child was 17.75 minutes). Following “functional play”, “no play” behavior was observed to occur for 101 minutes, by means of seven children, (mean minutes per engaged child was 14.4 minutes).

As for the assembly zones, they promoted more “functional play” and “games-with-rules”. The assembly zones encompassed 15% of children’s sample. As previously described, they are characterized by single-spatial experience-settings, with good functional definition, and single behavior setting clarity that is defined by ground materials of different hard-concrete forms and colors, topographic variability, and the presence of different urban spatial

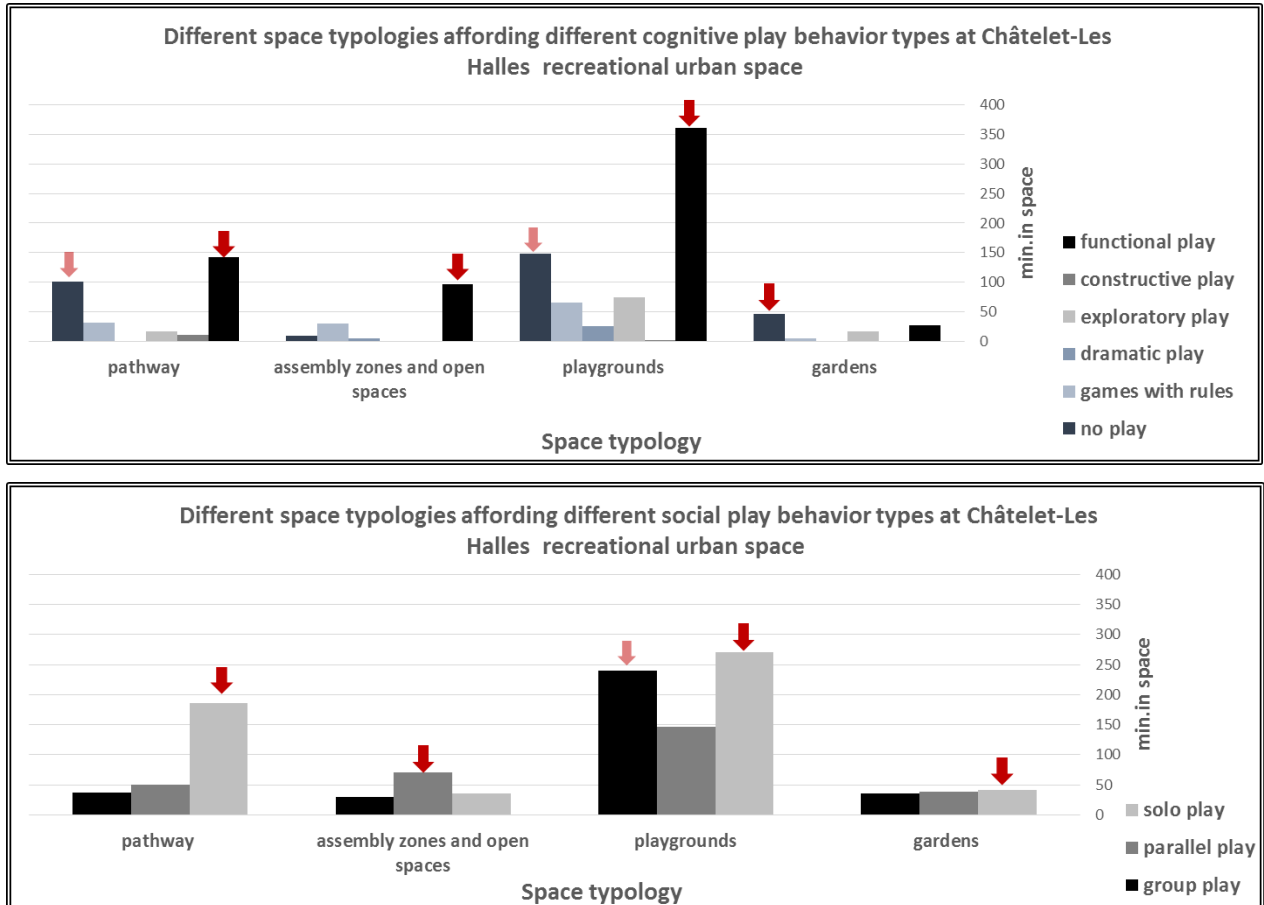
features, (i.e. different types of vegetation offering huge amount of shade including shrubs, flowery plants, large shading trees, greenery plants, water jets, benches, pergolas, sculptures, and landmarks). Thus, these assembly zones, with the above different configurations, seemed to promote running, wheeled toy play, motor play, however, they appeared to offer less opportunities for creative activities, since some of them are already signed with certain functions, as the sport fields.

Concerning the gardens, with their different ground materials used, which could be categorized as hard and soft ones, each of these categories tended to afford – permit or facilitate – different forms of play (Barbour, 1999; Cosco et al., 2010; Zamani, 2013; Podolska, 2014). However, only 10% of the children's sample were observed to engage in different play activities. "No play" behavior was prevalent cognitive play type, where two of the four observed children in the gardens engaged for a total time of occurrence of 46 minutes, (mean minutes per engaged child was 23 minutes), followed by "functional play", and "exploratory play". While "constructive play" and "dramatic play" were noticed as absent behaviors that might be associated to the presence of fixed urban features.

Concerning the social play behavior, "solo play" was prevalent social play type for all spatial typologies except for the assembly zones, "parallel play" was the prevalent type. Although "solo play" was a prevailing social play type in the playgrounds, with their different forms and configurations, they were also observed to highly promote "group play", alike H.S.C recreational urban space. Thus, the whole 18 children that were marked in the playgrounds, were observed to engage in "group play" for total 240 minutes, (mean minutes per engaged child was 13.3 minutes). While 17 of the 18 children engaged in "solo play" for total 270 minutes, (mean minutes per engaged child was 15.9 minutes).

As for the assembly zones and open spaces, with their different forms and configurations, they were observed to promote more "parallel play", as a prevailing social play type, this might be linked to the space encapsulation by visual boundaries achieving visual continuity that gather children with different capabilities, promoting the chance of on-looking each other, and encouraging them to imitate others to challenge their abilities. Where 4 of 6 children marked in the assembly zones and open spaces, were observed to engage in "parallel play" for total 70 minutes, (mean minutes per engaged child was 17.5 minutes).

Regarding the pathways, children were observed to engage more in “solo play”, as a prevalent behavior. Eight of 12 children marked in the pathways, were observed to engage in “solo play” for 186 minutes (mean minutes per engaged child was 23.25 minutes).



Figures 145: Different afforded cognitive and social play types by different spatial typologies in Châtelet-Les Halles recreational urban space

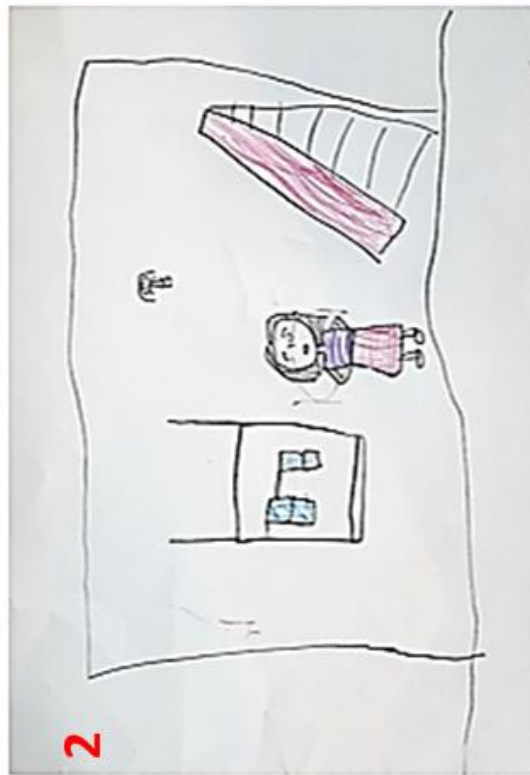
Children’s perceptions of the urban recreational space seemed to be influenced by the different afforded play patterns and their spatial preferences that was clear in their mental map drawings, which implemented different learned and experienced notions during their drawings’ descriptions, photographs, and informal interviews, (Appendix D.2).

Considering the same criteria previously used in the different case studies, the children’s drawings were analyzed according to the two age groups’ criteria (Piaget, 1956), to assess their perceptual cognitive skills. In Châtelet-Les Halles recreational urban space, most of the children of the "5 to 7" aged group, were not very accurate about the represented elements, nor the amount of details of the represented elements, (Table 22). However,

children were aware of the specified spatial typologies for them, the playgrounds. Their drawings tended to explain their preferences to different play equipment, rather than the surrounding landscape design and spatial configurations. Their drawings seemed to explain their perception of different materials by using different colors. In addition, they were aware of the parental supervision and their restricted mobility, (Figures 146) and (Appendix D.2.I).

Table 22: Perceptual cognitive skills assessment for drawings of 5 to 7 aged children group at Châtelet-Les Halles recreational urban space

Child no.	Châtelet-Les Halles recreational urban space (below 7 years)		mean per child
	1. Accuracy of elements represented	2. Amount of detail in elements represented	
1.	2	1	1,5
2.	2	2	2
3.	1	1	1
4.	2	3	2,5
5.	2	2	2
6.	1	1	1
7.	1	1	1
8.	3	1	2
mean per criteria	1,75	1,5	



Figures 146: Sample of drawings of children below 7 age group, representing different perceptual mean rating categories, at Châtelet-Les Halles recreational urban space

Concerning the "older than 7" aged children group, their perceptual cognitive skills were noticed to be of good visual realism, in terms of the accuracy of spatial relationships, good accuracy of the represented elements, and the represented amount of details of the elements. However, the amount of details in the overall represented scene of Châtelet-Les Halles recreational urban space, were not that much, (Table 23). The children of this aged group, seemed to be aware of the spatial territory of the recreational urban space, the urban context, and the surrounding buildings' style. Additionally, their drawings indicated the segmented different spatial typologies and their space preferences. Children presented the playgrounds in many of the drawings, with its multi-experience settings that offered them different forms of play behaviors. Moreover, children were aware of the included different physical characteristics, especially the different types of vegetation and the water features, (Figures 147) and (Appendix D.2.II).

Table 23: Perceptual cognitive skills assessment for drawings of above 7 age group at Châtelet-Les Halles recreational urban space

Child no.	Châtelet-Les Halles recreational urban space (above 7 years)						mean per child
	1. Accuracy of elements represented	2. Amount of detail in elements represented	3. Accuracy of overall scene	4. Amount of detail in overall scene	5. Visual realism in terms of accuracy of spatial relationships	6. Visual Realism in terms of perspective and representation of depth	
1.	3	3	3	1	2	3	2,50
2.	3	2	3	2	3	1	2,33
3.	2	2	1	1	2	2	1,67
4.	3	1	2	1	2	2	1,83
5.	3	3	2	1	1	1	1,83
6.	2	2	1	1	3	1	1,67
7.	3	1	1	1	1	2	1,50
8.	3	2	2	2	3	2	2,33
mean per criteria	2,75	2,13	1,88	1,25	2,13	1,75	



Figures 147: Sample of drawings of children above 7 age group, representing different perceptual mean rating categories, at Châtelet-Les Halles recreational urban space

Generally, the drawings of Châtelet-Les Halles recreational urban space tended to explain the children’s perceptions, in addition to their comprehension of both the outer spatial territory of the recreational urban space as a whole and the different segmented spatial typologies, (i.e. garden, playground, assembly zones, and pathways), according to children’s preferences. Besides, the drawings tended to highlight a good number of included elements and physical features, (i.e. levels, materials, colors, and vegetation) that were represented with a good amount of details. Most of children's drawings, indicated one or more natural feature, such as, sun, sky, birds, greens, trees, sand and water elements that might explain that they perceived nature as an opportunity for their play strategies, rather than just a setting or background. More specifically, trees seemed to act as attractive elements in children’s play environment that were highlighted in many of their drawings. To conclude, the drawings presented the existing physical spaces, objects, and characters that they daily interacted with, (Figure 148).

Alike the previous case studies, Student t-test results were analyzed to assess the differences between girls and boys relative to their perceptual skills, where there was no significant difference between genders, in terms of their perceptual skills, according to the cognitive criteria, since p-value was greater than 0.01, (Table 24) and (Figure 149).

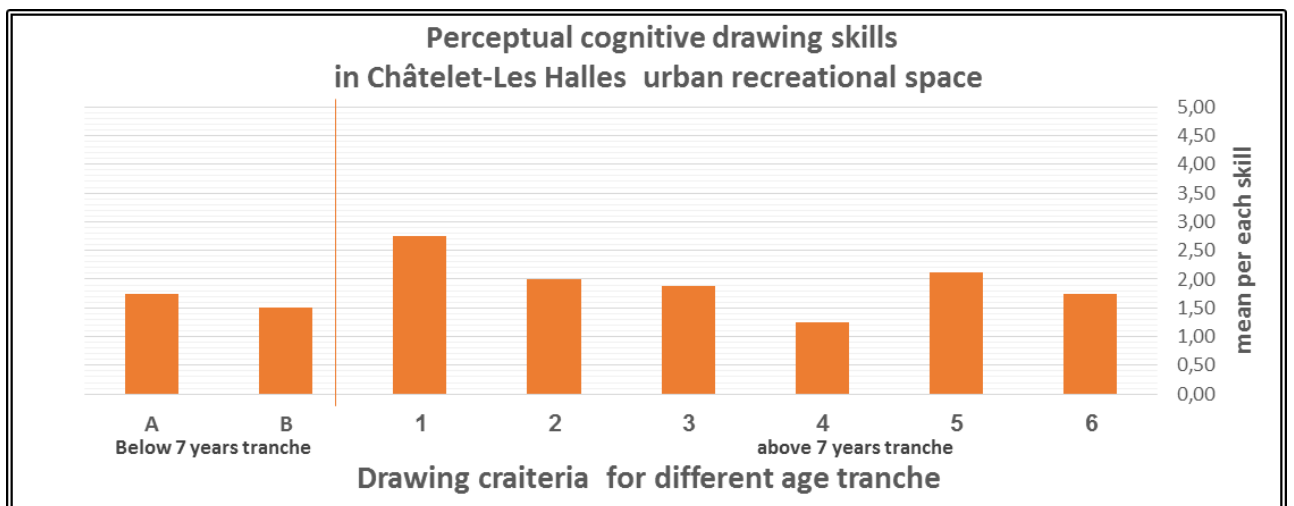


Figure 148: Mean rating of the perceptual cognitive skills evaluation for both age groups at Châtelet-Les Halles recreational urban space

Table 24: Statistical analysis presenting gender differences at Châtelet-Les Halles recreational urban space in terms of perceptual cognitive skills evaluation

Boys					Girls			
Student t-test (Châtelet-Les Halles recreational urban space)								
Criteria	Châtelet-Les Halles (above 7 years)						Châtelet-Les Halles (5-7)	
	1. Accuracy of elements represented	2. Amount of detail in elements represented	3. Accuracy of overall scene	4. Amount of detail in overall scene	5. Visual realism in terms of accuracy of spatial relationships	6. Visual Realism in terms of perspective and representation of depth	1. Accuracy of elements represented	2. Amount of detail in elements represented
Mean per criteria for girls	2,8	2,0	2,3	1,3	2,3	2,0	1,4	0,9
Mean per criteria for boys	2,8	2,0	1,5	1,3	2,0	1,5	1,8	1,3
P-value significance	1,00	1,00	0,23	1,00	0,70	0,36	1,00	0,39
In favor to	Girls/Boys	Girls/Boys	Girls	Girls/Boys	Girls	Girls	Boys	Boys

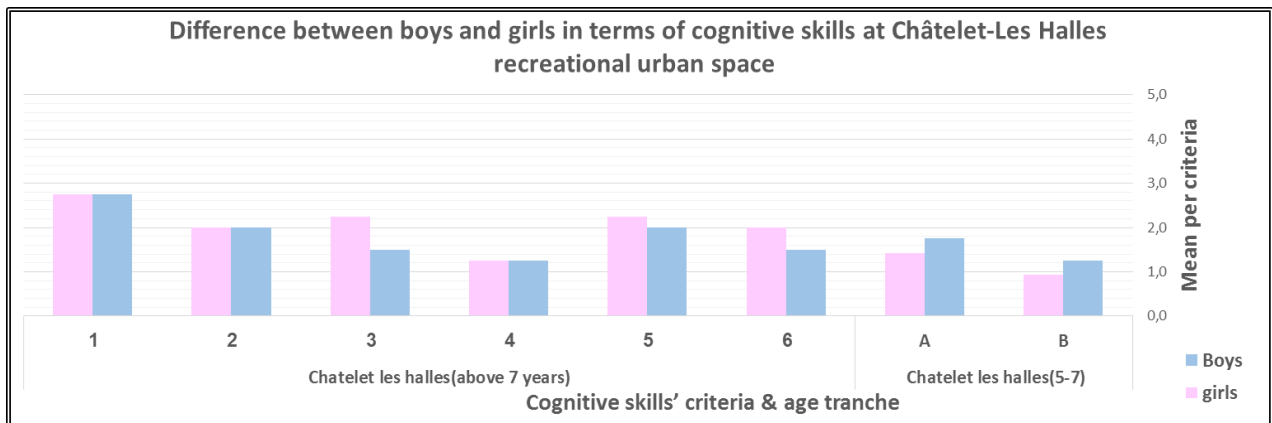
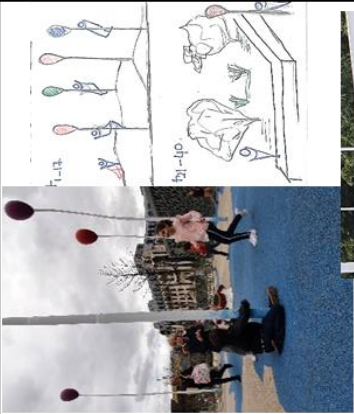
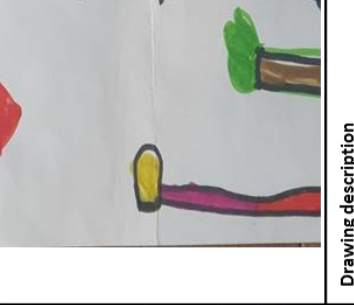


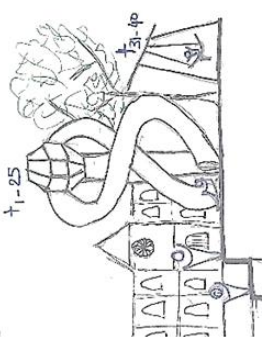
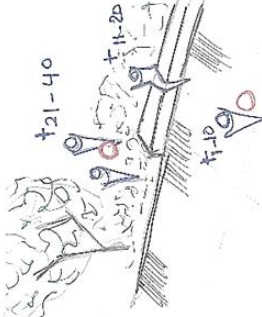


Figure 149: Gender differences in terms of perceptual cognitive skills evaluation at Châtelet-Les Halles recreational urban space

After the drawings and the informal interviews, the matrixes created for Châtelet-Les Halles recreational urban space, were presented in order to comprehend children’s different place preferences and description of their drawings. During this classification process, children’s reactions, expressions, and emotions were documented, to highlight some extracted keywords that clarified their mental perceived properties of the surrounding space. Some of these extracted keywords are presented as follows: emotional control, dealing with different situations as well as fear, sense of accomplishment, ability of manipulation, comprehension of capabilities, texture sensation, play diversity, sense of appropriation, marking of space limits, and awareness of parental supervisions, (Figures 150).

<p>Child basic information</p> <ul style="list-style-type: none"> • Participation in research stages: Engaged in drawing and photographic tasks • Mobility: Semi-restricted • Age: 5 years • Gender: girl • Play spaces: younger playground 	 	<p>Drawing description during interviews that might complemented by a child-led walk</p> 	<p>Drawing description</p> <p>I drew the place, where we are now, it is a rectangular shaped, as my father told me when we walked around the whole park, it is really a rectangle. The big rectangle is divided into small ones, my father said "it is the tiling, like the Lego". But I also added in the drawing the black ventilators, they are many lines beside each other, they are scary and whatever I put inside, is stuck. I don't like walking on, I feel afraid, but my father ensured that they are safe. Finally, we look to the most wonderful part in the park, it is inside the park but a part which is makes me feel alone, we have everything there, trees, slides, the colorful buttons on floor, and balloon sticks reaching the sky.</p>	<p>Interview:</p> <p>This playground is my dreaming place, where I always play in, it is full of hard snow balls, on which me and other children take turn and wait in queue to climb up and try to jump, it is very stimulating. Also, the cloud floor, where one can try a new thing that never had been tried before, even a new texture that never had been touched before. Look! this is my doll's stroller, I like walking on the clouds to feel like flying. And I love sliding down the balloon sticks as well as if I am a fire man, look as my friend is trying to do now, but he never succeeds to, but I can, I will show you now.</p> <p>I love the closed entertainment spaces here, where I usually come with my parents and I am totally free to play inside but I am not allowed not to pass the fences, it is surrounded by tall fence and trees, as you see. Sometimes I feel imprisoned, when I make no friends.</p> <p>But normally, I make instant new friends here, we got bored of our playing spaces in schools. We only walk and talk to each other's nothing more to do. Even equipment is too easy.</p>	<p>Mental perceived characteristics of space that different learned and experienced notions</p> <ul style="list-style-type: none"> - Space boundaries - New perspective - In and out - Sense of enclosure and protection - Sense of security and freedom - Environment - complexity and diversity - Up and down - Levels - Risk taking - Color recognition - Space limits - Territory - Imagination - Challenge - Sense of accomplishment - Capabilities - comparison - Manipulation - Emotional control - Friendship - Me and We - Sense of cooperation - Physical properties recognition - Texture sensation - Activity variation - Awareness of parental supervision 	<p>Extracted attractive physical features of the urban space in relation to research terminologies</p> <p>Spatial porosity</p> <ul style="list-style-type: none"> - Degree of permeability <p>Spatial potentialities</p> <ul style="list-style-type: none"> - Ground material diversity - Topographic variability - Urban spatial features (ventilators/vegetation/fences) 	<p>Experiences under-going applied theories:</p> <ul style="list-style-type: none"> - Affordances - Trialectic theory - "perceived space"
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Child basic information	Drawing description during interviews that might complemented by a child-led walk	Mental perceived characteristics of space that implement different learned and experienced notions	Extracted attractive physical features of the urban space in relation to research terminologies
<p>Participation in research stages: Engaged in drawing, interviews, complemented by child-led walk, and photographic tasks</p> <p>Mobility: Free</p> <p>Age: 10 and 1/2 years</p> <p>Gender: girl</p> <p>Play spaces: adventure playground and pathways</p>   	<p>Drawing description</p> <p>Look, this is my drawing, including the park, where me and my brother play, it is front of some Parisian houses, like my grandma says. I drew myself out-of-the-way, crossing the zebra lines to the park side. I also drew myself playing football with my brother and as well inside the fenced playground.</p> <p>Also, I drew some strange people sitting (= alcoholic and homeless people), they are always at the back pathway next to the church, where my brother likes to skate on the steps, these lines are the steps, but I am always afraid to go there, I will show them to you during the walk.</p> <p>Interview and walks:</p> <p>These buildings are overlooking the whole park; it is huge and not enclosed, there are green spaces, water elements, and sitting spaces everywhere. This is one of my special places, the kids area, I feel more freedom, it is huge and without restrictions, no one can control us (= the children) you know why, because simply adults are not allowed, all the space is ours. I love open, huge, green spaces, the bridges, and the elevated places in it. There are a lot of things to do, I feel satisfied. Look! This is still my best place. My favorite activity is to swing and slide, especially swinging up in the air.</p> <p>The pathway are one of the best spaces that me and my brother like to sit in, on those grey elevated cuboids, look! you can, also, walk on, but only when there is no one sitting. We get out in the pathways, with the adults and strangers to play ball games, it is huge and opened, but we are sometimes afraid to knockout someone.</p> <p>My brother, also, plays skating in the walk way, the paving is different a smooth area and another area zigzag, so I like playing in this walkway specifically on these steps with my brother, also, sometimes we use it as a stage, a girl sings and we act like audience. But all of this when there is no strange people sitting. Sometimes, I like observing, all too from the statue, last time the ambulance took one of them, he was over drunk, is not it frightening? But, when you are up, you feel secured away from the danger, where no one can reach you.</p> <p>Talking together and showing to you, is much better, because I was not able to draw all this feelings.</p>	<ul style="list-style-type: none"> - Space limits - Space boundaries - Scale of space - New perspective - Sense of enclosure and protection - Sense of security and freedom - Territory - Environment complexity and diversity - Up and down - Observe and control - Levels - In and out - Physical properties of the surrounding environment - ME not WE - Texture sensation - Texture and color recognition - Activity variation - Appropriation - Risk taking - Curiosity - Emotional control - Dealing with different situations and fear - Challenge - Sense of accomplishment - Manipulation - Awareness of physical and social surrounding environment 	<p>Spatial porosity</p> <ul style="list-style-type: none"> - Degree of openness - Degree of permeability <p>Spatial potentialities</p> <ul style="list-style-type: none"> - Spatial experience defined settings - Transition in between settings - Topographic variability (stairs, elevated concrete seats) - Material diversity - Urban spatial features (vegetation/ steps/ urban seats) <p>Experiences under-going applied theories:</p> <ul style="list-style-type: none"> - Affordances - Trialectic theory "personal lived space"

Figures 150: Sample of matrixes, including drawing description documentation and informal interviews' script for each age group, at Châtelet-Les Halles recreational urban space

4. II. 4. c. Lived space

Analyzing the data gathered from the behavioral qualitative observational sessions, informal interviews, and occasional child-led walks, enabled to explore the potential associations between the various proposed spatial potentialities and the afforded different children's play behaviors that helped to comprehend their potential role in the different spatial typologies at Châtelet-Les Halles recreational urban space, as follows:

1. Entity of activity settings: All spatial typologies in Châtelet-Les Halles recreational urban space are visually confined, or tangibly highly confined. As previously described, this confinement creates a minor segregated recreational islands that are characterized by multi-spatial experience and perceived as private spaces imitating as miniature of the complexity of the real world. Such spaces seemed to be associated with greater levels of activity concentration and better flow of playability (Barbour, 1999; Podolska, 2014). Unlike the assembly zones, which are characterized by a single whole activity setting, and consequently, considered as a single whole activity setting, well-defined by variations in ground materials, ground levels, and with no internal separating activity routes within this single undivided setting that achieves functional clarity as well as definition. Some of these assembly zones are highly permeable that appeared not to afford protected play activities, while others are visually or tangibly confined, (Figure 151). Although, as previously mentioned, confined spatial typologies are referred to, by a study of Gamal Said (2013), as inner sensory islands "Mosaics", which might enhance series sensory breaks or sensory-spatial segregation, confinement, and isolation. However, coherent to previous literature and observations, segregated confined spaces, were perceived by children, as hiding places that allowed them to observe without being observed, or as an intimate small-scale space, where they fit (Smith, 2004; Jones, 2000). Moreover, observations revealed that confined space typologies with multi-spatial experience settings were perceived as private spaces that afforded the complexity of real world by providing stages of accomplishment, and by sending children clear signals of achievement. Accordingly, these spaces, with multi-experience settings, seemed to be associated more with dynamic action; to help stimulating children's imagination; and to enhance their curiosity as well as their sense of exploration (Barbour, 1999; Maxwell et al., 2008; Podolska, 2014).

On the contrary, single-spatial experience settings that are visually or tangibly confined, tended to be associated with longer spans of activity time, more social interactions, and less frequent shifts from one activity to another, which was coherent to the interpretations at some spatial typologies in H.S.C recreational urban space.

While the spatial typologies with single-spatial experience settings and high permeability at Châtelet-Les Halles recreational urban space, such as some of the assembly zones, seemed to afford non-protected play activities, from the interference and movements of other users, and tended to promote destructed play activities. According to observations, they had also been associated with more “solo play”, “parallel functional play”, or “no play” behaviors, which appeared to require further appropriation and re-purposing of the spaces into places for children’s play themes, (Figures 152).

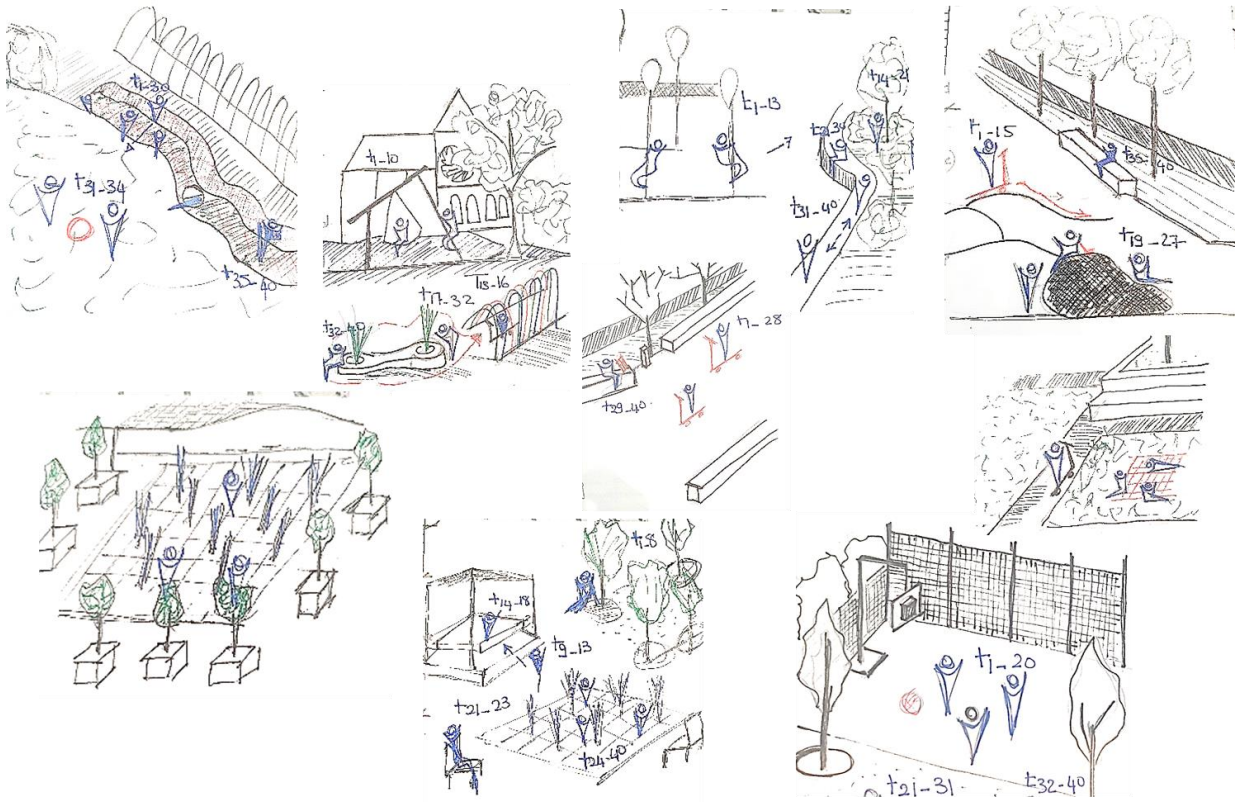


Figure 151: Sketches presenting different entity of activity settings in different spatial typologies at Châtelet-Les Halles recreational urban space



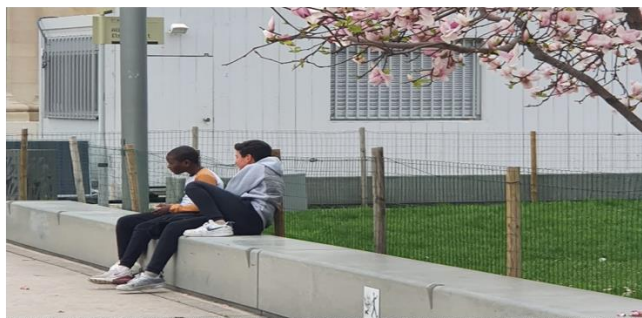
Single spatial experience setting seemed to enhance long span activity with high level of sociability, in the form of “games-with-rules”



Multiple spatial experience settings appeared to promote non-interfered activity with high level of concentration, in the form of “exploratory behavior”



Sensory islands “Mosaics” helped children incorporate notions of “in” and “out”



Tangible confined single settings might afford social interactions away from movement, in the form of “no play”

Single spatial experience setting with high permeability seemed to afford destructed play activities Interfered by movements of other users



Figures 152: Examples of different lived experiences promoted by different space entities of multiple and single settings

2. Flow and fluidity: Every spatial typology at Châtelet-Les Halles recreational urban space, is characterized by flow continuity and fluidity, achieved through the presence of clear defined activity routes with distinct material (hard, or soft), or shape (linear, curved, or looped), (Figure 153). Observations suggested that these activity routes might encourage smooth flow of play, organized flow of playability with higher level of physical activities, gross play, and motor skills. Moreover, clear defined activity routes might promote higher chance of playability with various forms of “functional play”, such as, running and biking (Cosco et al., 2010; Podolska, 2014). In addition to many instances confirming that defined activity routes appeared to promote imagination and creation in children’s play ideas, which tended to be important for “dramatic play” themes.

Unlike the assembly zones, with no internal separating activity routes, due to their single spatial entities, where random flow and fluidity was observed, that was associated with repetitive children’s behaviors escalated to fights. According to literature, random flow and

fluidity had been linked to the absence of activity route networks, which seemed to be associated with children’s haphazard movements and interferences with the play activities of others (Maxwell et al., 2008; Cosco et al., 2010; Podolska, 2014).

However, circulation network in the whole recreational urban space is well-defined by distinct concrete slabs, with linear shapes, offering integration with adjacent zones, linkages, and inviting accesses, (Figures 154).

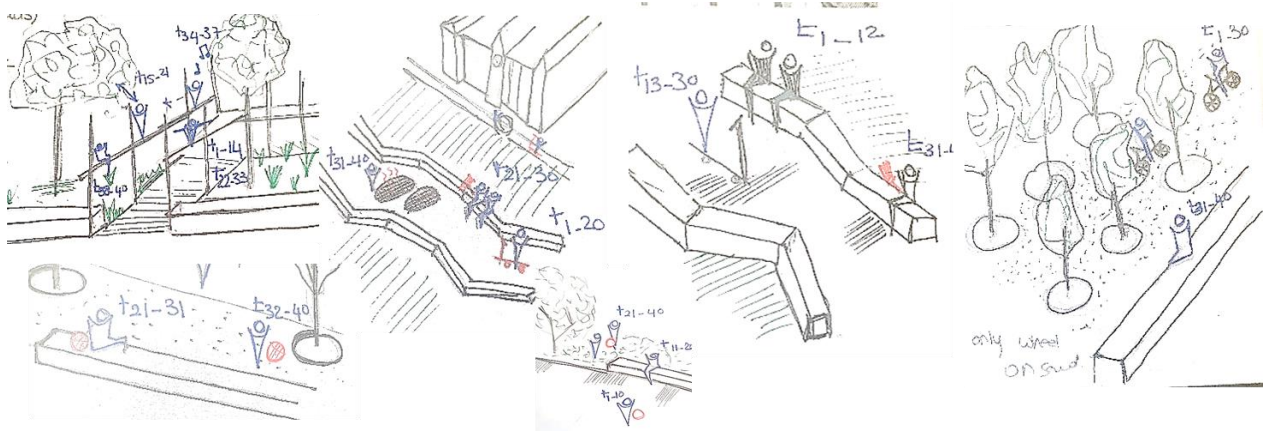


Figure 153: Sketches presenting the internal activity routes in different spatial typologies at Châtelet-Les Halles recreational urban space



The hard surfaces used for circulation network afforded and appeared to promote biking, playing with wheeled toys, and high levels of physical activities



Figures 154: Examples of different lived experiences promoted by different forms of flow and fluidity

3. Ground material diversity: Variety of ground materials are evident in different spatial typologies, which seemed to promote various forms of play, (Figure 155). Hard ground materials were observed to be associated with running and wheeled toy play, but to offer less opportunities for creative activities than the soft materials. While soft ground surfaces had been suggested to be more appropriate for relaxation, group gatherings, and

social interactions among children, and no more wheeled activities (Zamani, 2013; Christidou et al., 2013). For example, the sand covered alleys, which is classified as soft ground cover material, appeared to promote other play opportunities, as “exploratory play”, but less frequent “functional play” than hard surfaces. As for, semi-hard materials, as rubber coverings, in playgrounds and sport fields, had also been suggested to promote wider degree of play opportunities, such as, “games-with-rules”, tumbling, acrobatic movements, opportunities for creative activities, and wheeled toys, by enjoying the slippery properties of the rubber coverings (Barbour, 1999; Christidou et al., 2013). Moreover, diversity of color as well as material, were also observed to promote imagination and creativity in play that were important for the themes of “constructive play” and “dramatic play”. Unlike, the assembly zones and open spaces that feature poor ground material diversity, through the presence of mono-texture, color, and material, as rubber flooring for the open sport areas, and concrete tiles for the assembly zones encompassing the water jets, and musical kiosk, (Figure 156).

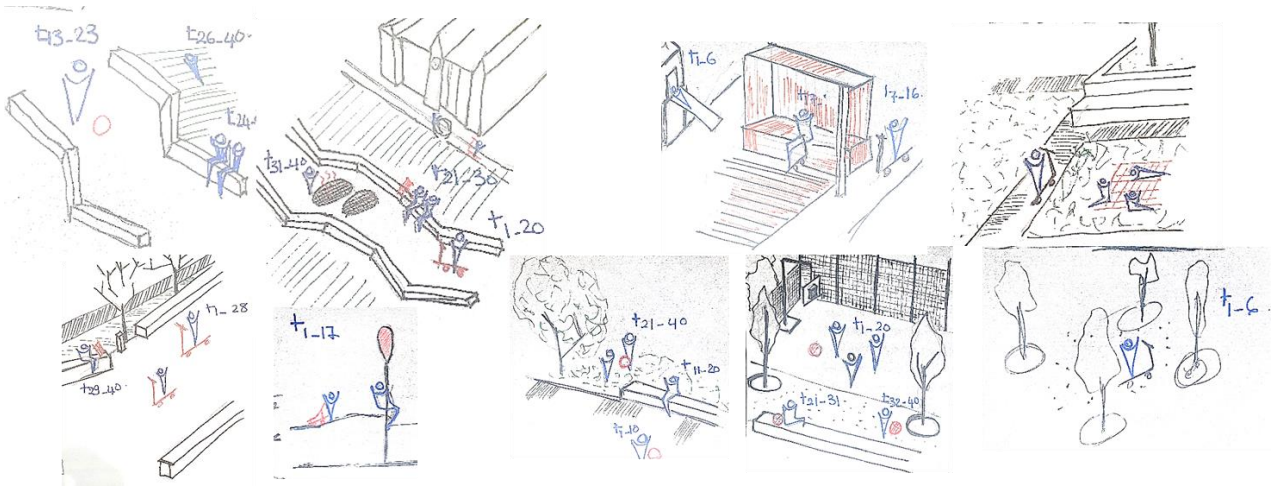


Figure 155: Sketches presenting the ground material diversity in different spatial typologies at Châtelet-Les Halles recreational urban space



Hard and smooth surfaces seemed to promote “Functional play” and motor skills, such as, running, biking, ball play, and wheeled toy play



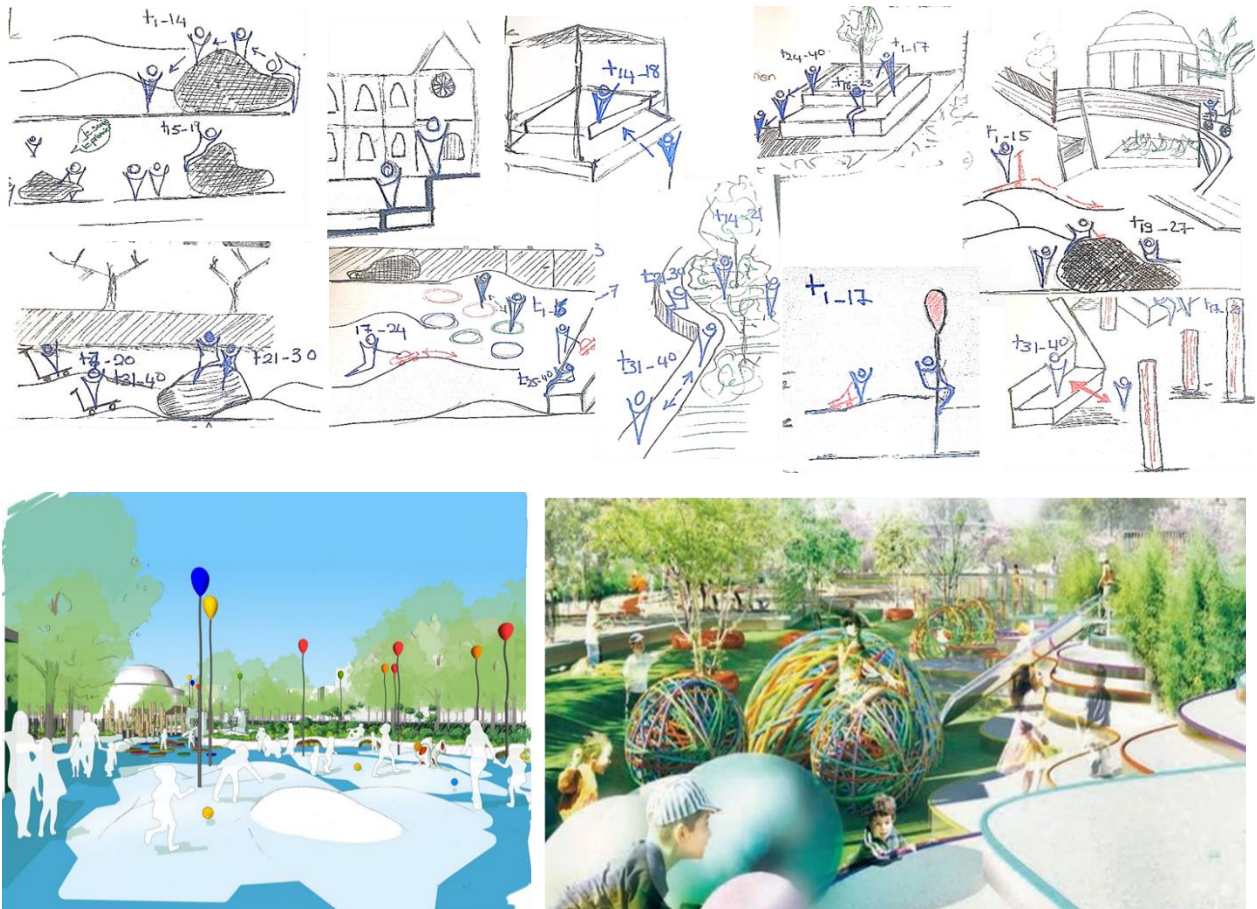
Sand cover appeared to enhance exploring, creativity, and imagination

Soft ground cover had been suggested to diverse play experiences, group gatherings, but not to afford wheeled activities

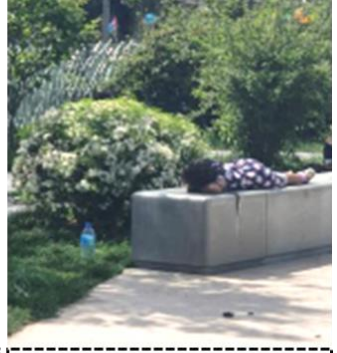
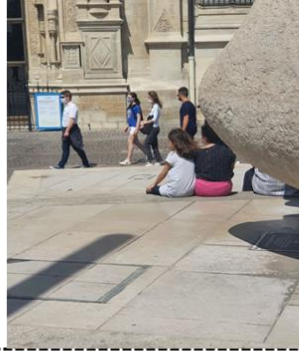


Figures 156: Examples of different lived experiences promoted by ground cover diversity

4. Topographic Variability: Châtelet-Les Halles recreational urban space is designed as a flat large area with noticeable variability of levels, as positive or negative topography, such as, depressed levels, ramps, bridges, sitting steps, steps, elevated concrete bases, bumps, and climbing stones. Diversity in levels seemed to create challenging play experiences that provided high degree of stimulation, sense of accomplishment, and risk taking to compete children’s abilities, (Figures 157). Observations revealed that steps, bridges, and climbable trees seemed to provide children with a full perspective of the surrounding that helped them imagine the whole world under their control. Thus, topographic variability appeared to promote more creation and imagination by enhancing the sense of space boundaries for children’s play activity. Coherent with previous case studies and observations, levels might enhance the feelings of security, privacy, as well as control; and might develop self-identity through social interactions, while negotiating about capabilities, (Figures 158).



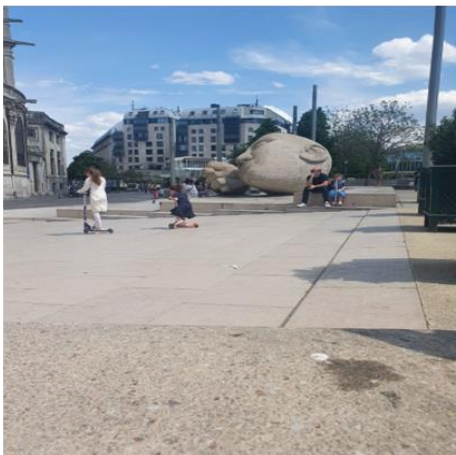
Figures 157: Sketches and illustrations presenting the ground level variability affordances at Châtelet-Les Halles recreational urban space



Level seemed to enhance social interactions and challenge children's capabilities through risk taking

Levels were noticed to highlight children's spatial boundaries in their perceptions

Elevated elements appeared to promote privacy by offering relaxed and peaceful sense



Slightly slopes and stairs afforded sliding and skating



Elevated elements had been suggested to increase environmental complexity by affording dynamic actions, as jumping as well as hiding with the theme of *"now you see me and now you do not"*

Figures 158: Examples of different lived experiences promoted by ground level variability

5. The presence of different urban spatial features: Spatial typologies in Châtelet-Les Halles encompass various interactive features, such as, landmarks (sculptures), benches, elements stimulating senses (water jets and sand), different types of vegetation (shrubs, flowery plants, greenery plants, and large shading trees that provide large shaded areas), (Figure 159). Trees were observed to promote climbing and different forms of play that contributed to the improvement of motor skills, balance, and coordination. While water features seemed to promote “exploratory play” and “constructive play” through the achievement of creative and imaginative play ideas that appeared to answer children about their environmental curiosity. As for the iconic urban features, they were noticed to increase environmental complexity perceptions. In general, urban features might enhance children’s innovation, (Figures 160).

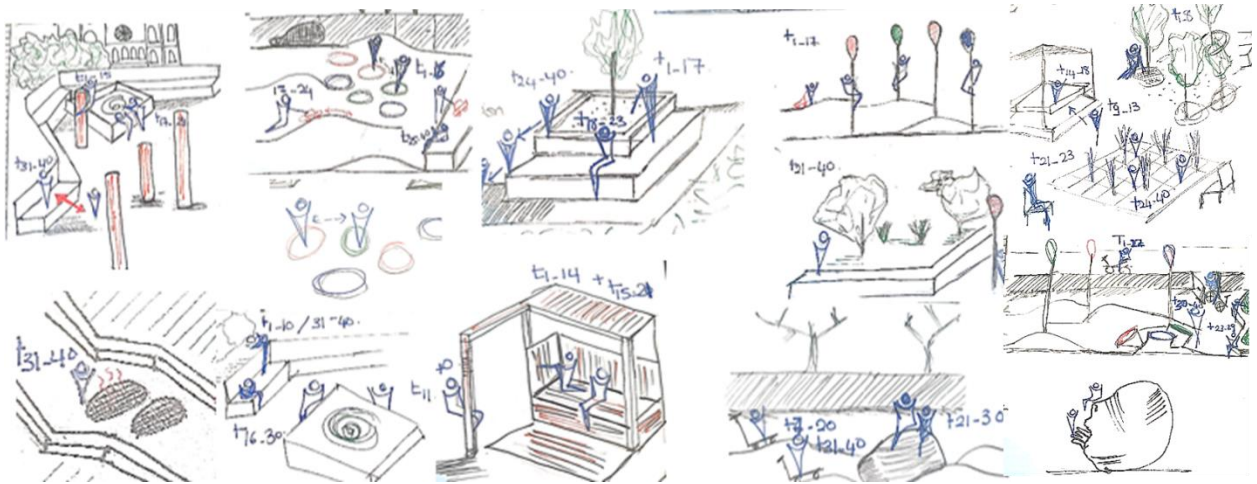


Figure 159: Sketches presenting the different spatial urban features in different spatial typologies at Châtelet-Les Halles recreational urban space





Water features seemed to allow children to experience their five sensations of hearing, touching, smelling, tasting, and seeing



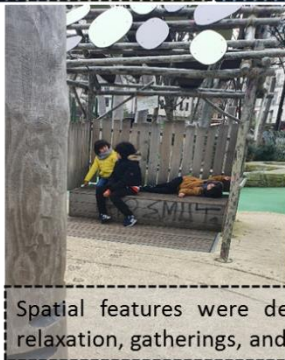
Iconic urban features tended to increase children's curiosity in their mental maps of the space



Children explored the urban elements and used them in order to create and invent their own objects for play



Benches were perceived as multi-functional elements



Spatial features were desired ones that promoted relaxation, gatherings, and group discussions



The presence of fences in the design, encouraged children's physical interaction and appropriation

Figures 160: Examples of different lived experiences promoted by different urban spatial features

Chapter 5	Cross-reading Analysis and Design Approach
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Chapter 5: Cross-reading Analysis and Design Approach

This chapter presents a cross-reading analysis of the results of the documented data from both the qualitative and quantitative observational fieldwork sessions in the four urban spaces of the case studies. It ends with a conclusion that introduces a child-friendly design approach, which might help in the conception of the daily urban spaces within big metropolitan cities.

5.1. Analysis and spatial triad outcome

This section is concerned with an analysis that is presented in terms of cross-reading across the two urban categories, residential and recreational, encompassing the four case studies, in an attempt to elaborate three concluded levels, through merging the theories of affordances and spatial triad, in order to explore potential associations between various landscape design aspects, functional qualities, as well as physical features, and children play behavior. These levels are presented in terms of a concluded spatial triad outcome, as follows: standardized spatial conception and play patterns; spatial analogy perception and cognitive representations; as well as spatial potentialities and ambient lived envelop.

5.1.1. Standardized spatial conception and play patterns

In this outcome level, the different afforded children's play patterns are illustrated, based on the accumulated data from the four urban spaces, in terms of the different spatial conceptions of the sites, their norms, and their regulations.

Category I: Residential streets and neighborhoods

As, previously mentioned, the analyzed results of the two residential neighborhoods' layout indicated that Abassia neighborhood is characterized by medium degree of closure, while Cité jardins neighborhood is characterized by medium degree of openness, through well-defined outer spatial boundaries of space territories of both neighborhoods. Whereas, both neighborhoods have elevated spatial permeability between the included spatial typologies, achieved by smooth flow in-between, good interaction, and linkage to adjacent zones, which provide good circulation network in each of the neighborhoods.

In consequence, the spatial porosity of the conceived layouts seemed to impact children play behaviors differently in both neighborhoods. The data from the structured observations of play behavior, in both neighborhoods, was overlapped to highlight differences between them in terms of the occurrence of the different types of play, (Figure

161). In addition to further Student's t-tests analysis, which assessed the significant differences between both neighborhoods in the occurrence of cognitive and social play types. Regarding the cognitive play types, the occurrence of “constructive play” “dramatic play”, as well as “games-with-rules”, were statistically greater at Abassia residential zone, while the occurrence of “functional play” as well as “exploratory play” were statistically greater at Cité jardins neighborhood. As for social play types, the occurrence of “group play” was statistically greater at Abassia neighborhood, while “solo play” was statistically greater at Cité jardins neighborhood, (Table 25).

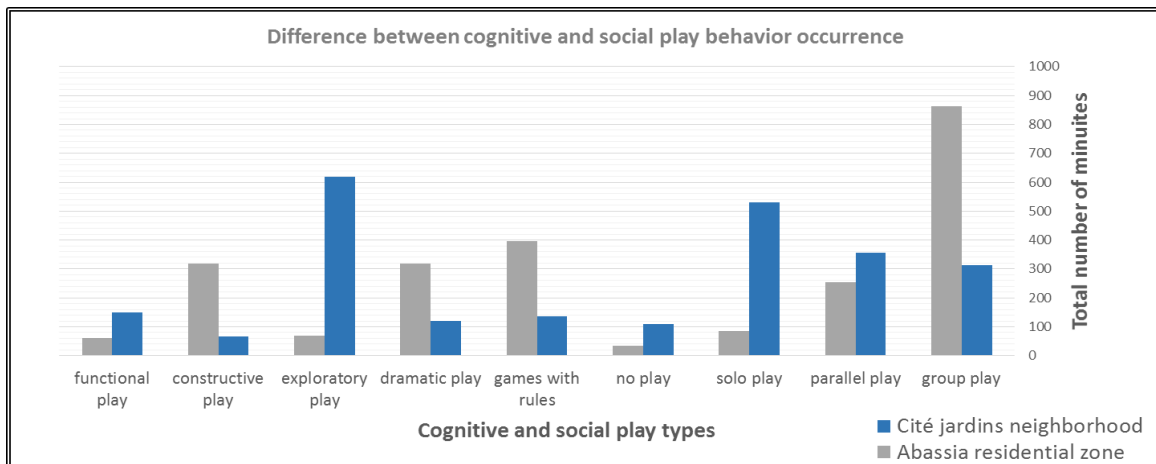


Figure 161: Difference between the amount of occurrence of cognitive and social play in the two residential neighborhoods

Table 25: Statistical differences between the two residential neighborhoods in terms of cognitive and social play

Student t-test											
Play type			Cité jardins neighborhood N=30			Abassia Residentialal zone N=30			significance		In favor
			No of children engaged	Mean minutes per children	Standard deviation	No of children engaged	Mean minutes per children	Standard deviation			
Cognitive play	1	Functional play	20	5.00	4.32	12	2.07	3.14	Significant P< 0.001	France	
	2	Constructive play	7	2.20	4.37	19	10.63	10.05	Significant P< 0.001	Egypt	
	3	Exploratory play	26	20.67	9.11	9	2.33	3.83	Significant P< 0.001	France	
	4	Dramatic play	10	3.97	6.48	19	10.60	9.78	Significant P< 0.001	Egypt	
	5	Games with rules	14	4.50	5.41	22	13.20	9.67	Significant P< 0.001	Egypt	
	6	No play	16	3.67	4.57	4	1.17	2.79	NOT SIGNIFICAT P=0.013	France	
Social play	A	Solo play	29	17.70	9.27	16	2.80	3.20	Significant P< 0.001	France	
	B	Parallel play	27	11.87	6.98	21	8.47	7.52	NOT SIGNIFICAT P=0.075	France	
	C	Group play	17	10.43	10.54	29	28.73	8.33	Significant P< 0.001	Egypt	

At the Cité jardins residential neighborhood, 20 children were observed to engage in “functional play” for a total of 150 minutes. While 12 children at Abassia residential zone were observed to engage in “functional play” for a total of 62 minutes. In fact, the difference between the two residential neighborhoods in mean minutes of “functional play” per child (5.00 for Cité jardins neighborhood and 2.07 for Abassia residential zone) was found to be significant.

While at Abassia residential zone, there was clearly more occurrence of “constructive play”, where 19 children were observed to engage in this type of play for a total amount of time of 319 minutes. At Cité jardins neighborhood, only seven children were observed to engage in “constructive play” for a total of 66 minutes. The difference between the two neighborhoods in mean minutes of “constructive play” per child (2.20 for Cité jardins neighborhood and 10.63 for Abassia residential zone) was found to be statistically significant.

There was also a clear difference in the occurrence of “exploratory play” between the two residential zones. As many as 26 children were observed to engage in this type of play at Cité jardins neighborhood for a total of 620 minutes. At Abassia residential zone, only nine children engaged in “exploratory play” for a total of 70 minutes. Here again, the difference between the two neighborhoods in mean minutes of “exploratory play” per child (20.67 for Cité jardins neighborhood and 2.3 for Abassia residential zone) was found to be statistically significant.

For the “dramatic play”, only ten children, at Cité jardins neighborhood, engaged in “dramatic play” for a total of 119 minutes. Though as many as 19 children were observed to engage in this type of play at Abassia residential zone for a total of 318 minutes. Thus, the difference between the two residential zones in mean minutes of “dramatic play” per child (3.97 for Cité jardins neighborhood and 10.60 for Abassia residential zone) was found to be statistically significant.

Regarding “games-with-rules”, less occurrence time of this type was observed at the Cité jardins neighborhood than at the Abassia residential zone. The total number of minutes of “games-with-rules” behavior recorded at the Cité jardins neighborhood was 135. However, at the Abassia residential zone, as much as 396 minutes of “games-with-rules” behavior were observed. The difference between the two neighborhoods in mean minutes of “games-

with-rules” behavior per child (4.50 for Cité jardins neighborhood and 13.20 for Abassia residential zone) was also found to be statistically significant.

Concerning the last cognitive play type, the “no play”, a greater amount of time of “no play” was observed at the Cité jardins neighborhood than at the Abassia residential zone. While only four children of the Abassia residential zone sample engaged in “no play”, as many as 16 children were observed to engage in this type of play at Cité jardins neighborhood. However, the difference between the two neighborhoods in mean minutes of “no play” per child was not found to be statistically significant.

As for the social play types, very clear differences between the two neighborhoods in amounts of time of “group play” and “solo play” were observed. In the Cité jardins neighborhood, only 17 children were observed to engage in “group play”. In the Abassia residential zone, as many as 29 children of the 30 observed children were recorded to engage in “group play”. In addition, the total amount of time of “group play” observed was much greater at Abassia residential zone (862 minutes) than at Cité jardins neighborhood (313 minutes). In fact, the difference between the two residential zones in mean minutes of “group play” per child (10.43 for Cité jardins and 28.73 for Abassia residential zone) was found to be statistically significant.

Conversely, the total amount of time of “solo play” observed was much greater at Cité jardins neighborhood (531 minutes) than at Abassia residential zone (84 minutes). The difference between the two neighborhoods in mean minutes of “solo play” per child (17.70 for Cité jardins neighborhood and 2.80 for Abassia residential zone) was also found to be statistically significant.

The two neighborhoods were not found to really differ in terms of occurrence of “parallel play”. At Cité jardins neighborhood, 27 children were observed to engage in “parallel play” for a total of 356 minutes. While at the Abassia residential zone, 21 children engaged in “parallel play” for a total of 254 minutes. The difference between the two neighborhoods in mean minutes of “parallel play” per child (11.87 for Cité jardins neighborhood and 8.47 for Abassia residential zone) was not found to be significant.

In terms of “negative interaction”, it is interesting to note that only two children were excluded from the Cité jardins neighborhood sample, while only one child was excluded from the Abassia residential zone sample, for engaging in aggressive behaviors.

The above collected data from the structured observations of play behavior was further analyzed across the neighborhoods, to assess differences between girls as well as boys in relation to cognitive play, thus “functional play”, “constructive play”, “exploratory play”, “dramatic play”, “games-with-rules”, and “no play”, in addition to social play, thus “group play”, “parallel play”, and “solo play”, (Figures 162 and 163).

For “exploratory play”, the differences were found to be statistically significant in favor of both girls and boys of Cité jardins neighborhood. In addition to “no play”, the difference were found to be statistically significant only in favor of girls of Cité jardins neighborhood, while “functional play” differences were found to be statistically significant only in favor of boys of the Cité jardins neighborhood.

On the other hand, concerning the “dramatic play”, the differences were found to be statistically significant in favor of girls of Abassia residential zone. While for “constructive play”, and “games-with-rules”, the differences were found to be statistically significant in favor of boys of Abassia residential zone.

Regarding the social play types, across neighborhoods, the differences of “solo play”, were found to be statistically significant in favor of both girls and boys of Cité jardins neighborhood. Whereas for “group play”, the differences were found to be statistically significant in favor of both girls and boys of Abassia residential zone, (Tables 26 and 27).

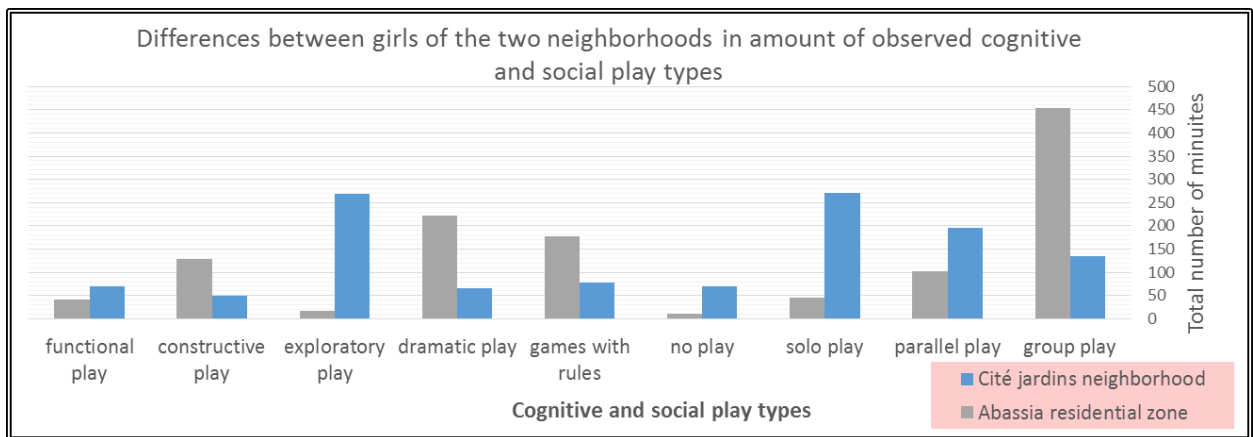


Figure 162: Differences between girls of the two residential neighborhoods in amount of observed cognitive and social play

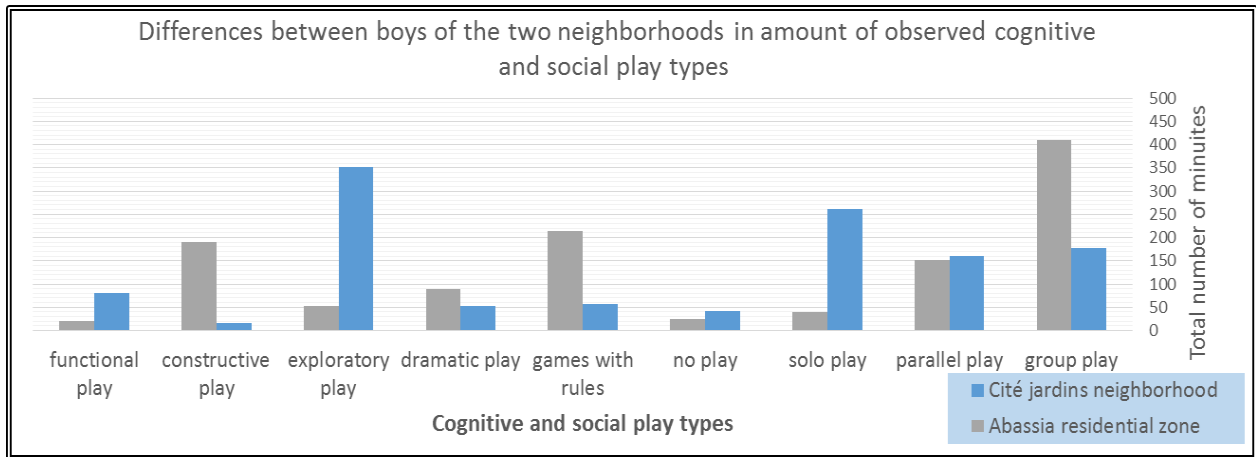


Figure 163: Differences between boys of the two residential neighborhoods in amount of observed cognitive and social play

Tables 26 and 27: Statistical differences of cognitive and social play between the two neighborhoods in terms of gender

Girls										
Student t-test between the two residential urban spaces										
Play type	Cognitive play	Cognitive play					Social play			
		Functional play	Constructive play	Exploratory play	Dramatic play	Games with rules	No play	Solo play	Parallel play	Group play
Cité jardins neighborhood	Mean minutes per engaged girl	9,9	10,0	24,4	16,5	11,1	6,9	19,3	15,0	19,3
	Total engaged minutes	69	50	268	66	78	69	270	195	135
Abassia residential zone	No. of engaged girls	8	8	2	12	11	4	10	9	15
	Mean minutes per engaged girl	5,3	16,1	9,0	18,6	16,2	2,5	4,5	11,3	30,2
	Total engaged minutes	42	129	18	223	178	10	45	102	453
P-value and significance		0,290	0,081	0,000	0,002	0,026	0,005	0,000	0,020	0,000
In favor to		France	Egypt	France	Egypt	Egypt	France	France	France	Egypt

Boys										
Student t-test between the two residential urban spaces										
Play type	Cognitive play	Cognitive play					Social play			
		Functional play	Constructive play	Exploratory play	Dramatic play	Games with rules	No play	Solo play	Parallel play	Group play
Cité jardins neighborhood	No. of engaged girls	13	2	15	5	6	6	15	14	10
	Mean minutes per boy	5,4	1,1	23,5	3,5	3,8	2,7	17,4	10,7	11,9
	Total engaged minutes	81	16	352	53	57	41	261	161	178
Abassia residential zone	No. of engaged girls	4	11	7	7	11	3	6	12	14
	Mean minutes per boy	1,3	12,7	3,5	5,9	14,3	1,7	2,6	10,1	27,3
	Total engaged minutes	20	190	52	89	215	25	39	152	409
P-value and significance		0,000	0,000	0,000	0,350	0,001	0,470	0,000	0,829	0,000
In favor to		France	Egypt	France	Egypt	Egypt	France	France	France	Egypt

Category II: Recreational urban zones

As for the recreational urban spaces, as previously mentioned, Châtelet-Les Halles recreational urban space layout is distinguished by its high spatial definition of the territory through high degree of openness, while H.S.C recreational urban space layout conception is characterized by its high spatial definition of the territory through high degree of closure, even though both have low spatial permeability in-between closed, or semi closed, and confined included spatial typologies, which is achieved through linear flow in-between, linkage within adjacent zones, and inviting access to each, that implements planned circulation networks in the whole recreational urban spaces.

Similar to the residential category, the spatial porosity of the conceived layouts of the recreational urban spaces, described as the degree of openness and closure of the outer spatial defined boundaries of space territory and spatial permeability between the inner included spatial typologies, appeared to impact children's play patterns differently. This was evident through overlapping the data from the structured observations of play behavior, concerning both recreational urban spaces, to assess differences in terms of the occurrence of the different types of play, (Figure 164). In addition to further analysis of Student's t-tests, which assessed the significant differences between both recreational urban spaces in the occurrence of cognitive and social play types. Regarding the cognitive play types, the occurrence of "dramatic play" and "games-with-rules", were statistically greater at H.S.C recreational urban space, while the occurrence of "functional play" as well was statistically greater at Cité jardins neighborhood.

Concerning social play types, the occurrence of "group play" was statistically greater at Châtelet-Les Halles recreational urban space than at H.S.C recreational urban space. As for social play types, the occurrence of "group play" was statistically greater at H.S.C recreational urban space, while "solo play" was statistically greater at Châtelet-Les Halles recreational urban space, (Table 28).

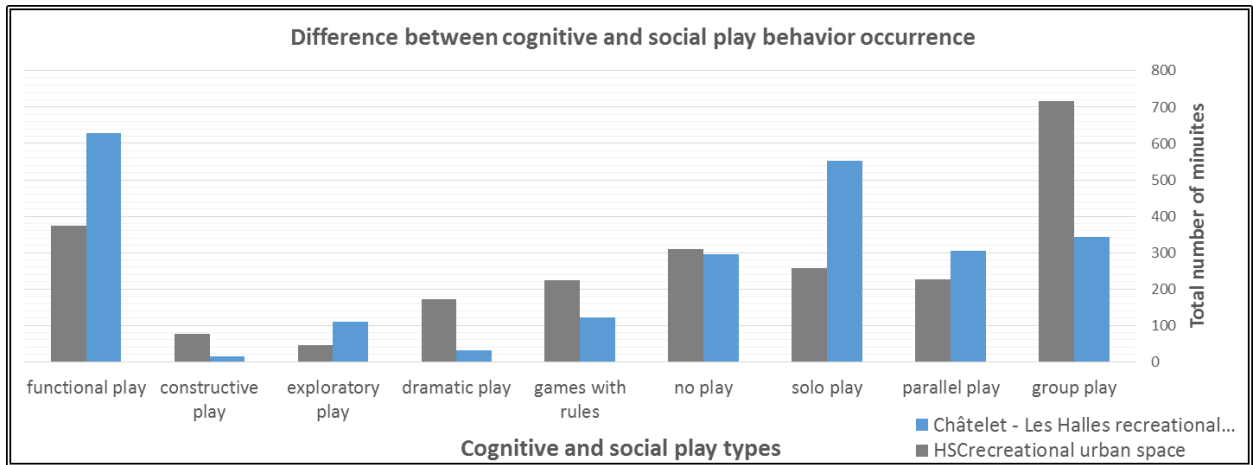


Figure 164: Difference between the amount of occurrence of cognitive and social play in the two recreational urban spaces

Table 28: Statistical differences between the two recreational urban spaces in terms of cognitive and social play

Student t-test											
Play type			Châtelet - Les Halles recreational urban space N=30			HSC recreational urban space N=30			significance		In favor
			No of children engaged	Mean minutes per children	Standard deviation	No of children engaged	Mean minutes per children	Standard deviation			
cognitive play	1	Functional play	30	20,93	8,91	21	12,47	10,85	Significant P< 0.001	France	
	2	Constructive play	3	0,50	1,61	10	2,57	3,98	NOT Significant P=0,011	Egypt	
	3	Exploratory play	11	3,63	5,50	7	1,50	2,90	NOT Significant P=0,065	France	
	4	Dramatic play	5	1,03	2,57	12	5,70	8,64	Significant P< 0.001	Egypt	
	5	Games with rules	12	4,03	5,63	25	7,47	4,09	Significant P< 0.001	Egypt	
	6	No play	25	9,87	7,65	27	10,30	7,02	NOT SIGNIFICAT P=0.82	France	
Social play	A	Solo play	29	18,43	10,33	29	8,57	4,80	Significant P< 0.001	France	
	B	Parallel play	20	10,17	9,60	28	7,53	3,60	NOT SIGNIFICAT P=0.16	France	
	C	Group play	19	11,40	11,56	30	23,90	5,32	Significant P< 0.001	Egypt	

At Châtelet-Les Halles recreational urban space, 30 children were observed to engage in “functional play” for a total of 628 minutes. While 21 children at H.S.C recreational urban space were observed to engage in “functional play” for a total of 374 minutes. In fact, the difference between the two recreational spaces in mean minutes of “functional play” per child (20.93 for Châtelet-Les Halles recreational urban space and 12.47 for H.S.C recreational urban space, which was almost the half) was found to be significant.

While a less occurrence of “constructive play” was observed at Châtelet-Les Halles recreational urban space than at H.S.C recreational urban space. However, the difference between the two recreational urban spaces in mean minutes of “constructive play” per child was not found to be statistically significant. What is interesting, is that while only three children of the H.S.C recreational urban space sample engaged in “constructive play”, as many as ten children were observed to engage in this type of play at Châtelet-Les Halles recreational urban space.

Regarding “exploratory play”, a greater amount of time of this type, was observed at Châtelet-Les Halles recreational urban space than at H.S.C recreational urban space. However, the difference between the two urban spaces in mean minutes of “exploratory play” per child was not found to be statistically significant. Nevertheless, only seven children of the H.S.C recreational urban space sample engaged in “exploratory play”, and as many as 11 children were observed to engage in this type of play at Châtelet-Les Halles recreational urban space.

For the “dramatic play”, only five children at Châtelet-Les Halles recreational urban space, engaged in this type of play for a total of 31 minutes. While as many as 12 children were observed to engage in “dramatic play” at H.S.C recreational urban space for a total of 171 minutes. The difference between the two recreational zones in mean minutes of “dramatic play” per child (1.03 for Châtelet-Les Halles recreational urban space and 5.70 for H.S.C recreational urban space) was found to be statistically significant. Moreover, in H.S.C recreational urban space, three children of the 12 engaged in “dramatic play”, were observed during their play observational sessions to show a replicating scene of the cultural and political recent situations.

A less amount of time of “games-with-rules” was observed at Châtelet-Les Halles recreational urban space than at H.S.C recreational urban space. The total number of minutes of “games-with-rules” behavior recorded at Châtelet-Les Halles recreational urban space was 121 minutes for 12 engaged children. At H.S.C recreational urban space, 25 children were observed to engage in this behavior for 224 minutes, almost the double. The difference between the two urban spaces in mean minutes of “games-with-rules” behavior per child (4.03 for Châtelet-Les Halles recreational urban space and 7.47 for H.S.C recreational urban space) was found to be statistically significant.

A slight less amount of time of “no play” was observed at Châtelet-Les Halles recreational urban space than at H.S.C recreational urban space. However, the difference between the two recreational urban spaces in mean minutes of “no play” per child was found to be statistically insignificant. What is remarkable, is that almost same number of engaged children in “no play” behavior, was observed in both recreational urban spaces, where 25 children were observed to engage in this type of play at Châtelet-Les Halles recreational urban space, while 27 children were observed to engage in this type of play at H.S.C recreational urban space. Therefore, in both urban spaces, “no play” behavior seemed to be correlated with standardized design, where children were more sedentary, and had no chances to invent their play themes with the fixed furniture and design.

Regarding the social play types, very clear differences between the two recreational urban spaces in amounts of time of “group play” and “solo play” were observed. In Châtelet-Les Halles recreational urban space, only 19 children were observed to engage in “group play”. In the H.S.C recreational urban space, all the observed 30 children were recorded to engage in “group play”. In addition, the total amount of time of “group play” observed was much greater at H.S.C recreational urban space (717 minutes) than at Châtelet-Les Halles recreational urban space (342 minutes). In fact, the difference between the two urban spaces in mean minutes of “group play” per child (11.40 for Châtelet-Les Halles recreational urban space and 23.90 for H.S.C recreational urban space) was found to be statistically significant.

On the contrary, the total amount of time of “solo play” observed was much greater at Châtelet-Les Halles recreational urban space (553 minutes) than at H.S.C recreational urban space (257 minutes). The difference between the two urban spaces in mean minutes of “solo play” per child (18.43 for Châtelet-Les Halles recreational urban space and 8.57 for H.S.C recreational urban space) was also found to be statistically significant.

The two recreational urban spaces were not found to really differ in terms of occurrence of “parallel play”. At Châtelet-Les Halles recreational urban space, 20 children were observed to engage in “parallel play” for a total of 305 minutes. While, at H.S.C recreational urban space, 28 children were observed to engage in this type of social play for a total of 226 minutes. The difference between the two urban spaces in mean minutes of “parallel play”

per child (10.17 for Châtelet-Les Halles recreational urban space and 7.53 for H.S.C recreational urban space) was found to be insignificant.

As for the “negative interaction”, it can be noted that no child was excluded from the Châtelet-Les Halles recreational urban space sample, while seven children were excluded from the H.S.C recreational urban space sample, because of their engagement in aggressive behavior, although the socio-economic standards of children at H.S.C recreational urban space were higher than those of the Abassia residential zone, in Cairo.

In terms of “fight behavior or conflicts”, it can be noted that only one child engaged in this form of behavior in the observed sample of Châtelet-Les Halles recreational urban space, while three children engaged in fight behaviors from the H.S.C recreational urban space sample. In addition to one child from H.S.C recreational urban space sample was observed to experience “anxious behavior”.

It is important to highlight that the “sedentary passive interaction”, such as, digital mobile or tablet play, occurred more at H.S.C recreational urban space than at Châtelet-Les Halles recreational urban space, where only two children were observed to engage in this form of passive play from the Châtelet-Les Halles recreational urban space sample, while four children engaged in this form of play from the H.S.C recreational urban space sample.

While for “random impulsive movements”, no children were observed to engage in this form of movement from the Châtelet-Les Halles recreational urban space sample, while two children were observed in random impulsive repetitive movements at H.S.C recreational urban space.

Similar to the residential neighborhoods, data from the structured observations of play behavior was further analyzed to assess differences across the two recreational urban spaces, in terms of differences between both girls as well as boys in relation to cognitive and social play types, thus “functional play”, “constructive play”, “exploratory play”, “dramatic play”, “games-with-rules”, “no play”, “group play”, “parallel play”, and “solo play”, (Figures 165 and 166).

Thus, the differences of “functional play” were found to be statistically significant in favor of girls of Châtelet-Les Halles recreational urban space. While, “dramatic play” differences were found to be statistically significant in favor of girls of H.S.C recreational urban space.

Unlike “constructive play”, “exploratory play”, “games-with-rules”, and “no play” the differences were not found to be statistically significant within both genders across the recreational urban spaces.

As for social play, across the recreational urban spaces, the differences of “solo play”, were found to be statistically significant in favor of both girls and boys of Châtelet-Les Halles recreational urban space. Whereas for “group play”, the differences were found to be statistically significant in favor of both girls and boys of H.S.C recreational urban space, (Tables 29 and 30).

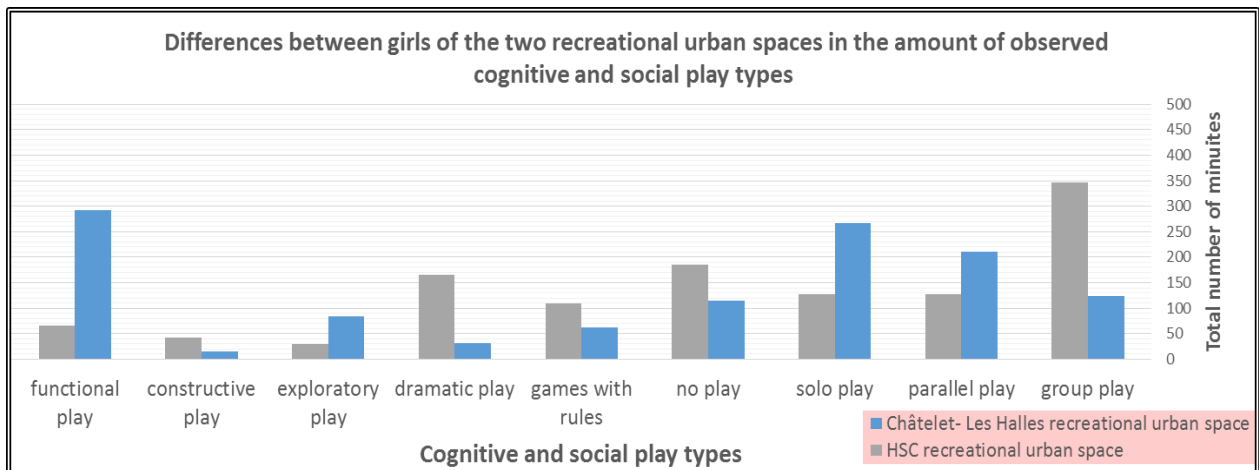


Figure 165: Differences between girls of the two recreational urban spaces in amount of observed cognitive play and social play

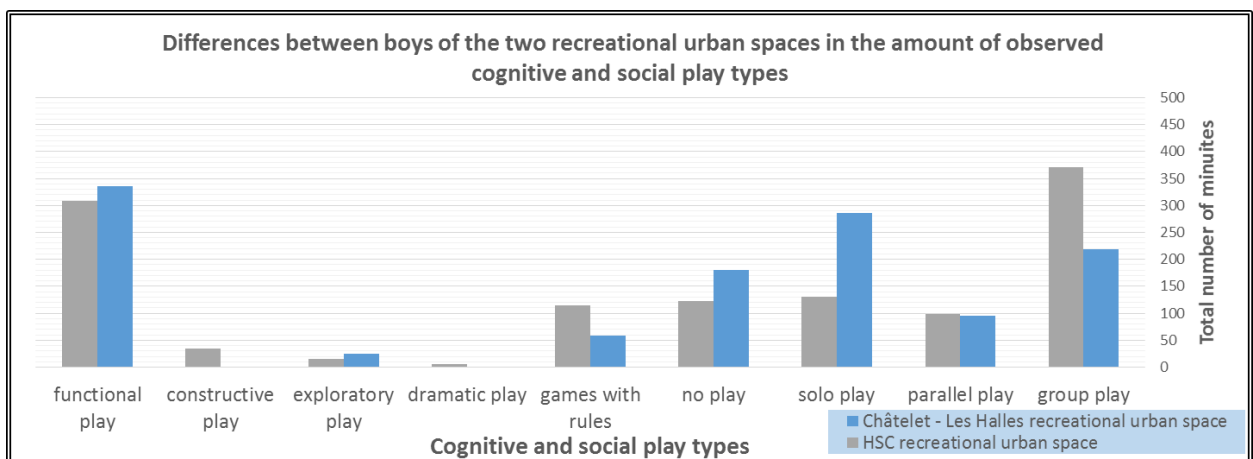


Figure 166: Differences between boys of the two recreational urban spaces in amount of observed cognitive play and social play

Tables 29 and 30: Statistical differences in cognitive and social play in the two recreational urban spaces in terms of gender

Girls										
Student t-test between the two recreational urban spaces										
	Play type	Cognitive play						Social play		
		Functional play	Constructive play	Exploratory play	Dramatic play	Games with rules	No play	Solo play	Parallel play	Group play
Châtelet- Les Halles recreational urban space	No. of engaged girls	15	3	8	5	5	13	14	12	8
	Mean minutes per engaged girl	19,5	5,0	10,5	6,2	12,4	8,8	19,1	17,5	15,4
	Total engaged minutes	293	15	84	31	62	115	267	210	123
HSC recreational urban space	No. of engaged girls	6	6	5	11	12	15	14	14	15
	Mean minutes per girl	11,0	7,0	6,0	15,1	9,2	12,4	9,1	9,1	23,1
	Total engaged minutes	66	42	30	166	110	186	127	127	346
P-value and significance		0,000	0,121	0,025	0,002	0,191	0,066	0,005	0,037	0,000
In favor to		France	Egypt	France	Egypt	Egypt	Egypt	France	France	Egypt

Boys										
Student t-test between the two recreational urban spaces										
	Play type	Cognitive play						Social play		
		Functional play	Constructive play	Exploratory play	Dramatic play	Games with rules	No play	Solo play	Parallel play	Group play
Châtelet- Les Halles recreational urban space	No. of engaged boys	15	0	3	0	7	12	15	8	11
	Mean minutes per engaged boys	22,3	/	8,3	/	8,4	15,1	19,1	11,9	19,9
	Total engaged minutes	335	0	25	0	59	181	286	95	219
HSC recreational urban space	No. of engaged boys	15	4	2	1	13	12	15	14	15
	Mean minutes per boys	20,5	8,8	7,5	5,0	8,8	10,3	8,7	7,1	24,7
	Total engaged minutes	308	35	15	5	114	123	130	99	371
P-value and significance		0,586	0,045	0,596	0,326	0,053	0,205	0,001	0,909	0,004
In favor to		France	Egypt	France	Egypt	Egypt	Egypt	France	Egypt	Egypt

For further analysis, a cross-reading between the two urban categories, residential and recreational urban spaces, in terms of the spatial porosity, elaborated as the degree of openness and closure of the outer spatial boundaries of the space territory and spatial permeability of the inner included spatial typologies, that seemed also to impact children play patterns differently, (Figure 167). In consequence, the data from the structured observations of play behavior, were further analyzed through Student's t-test, to assess differences between residential neighborhoods and recreational urban spaces, in the occurrence of cognitive and social play types, (Table 31).

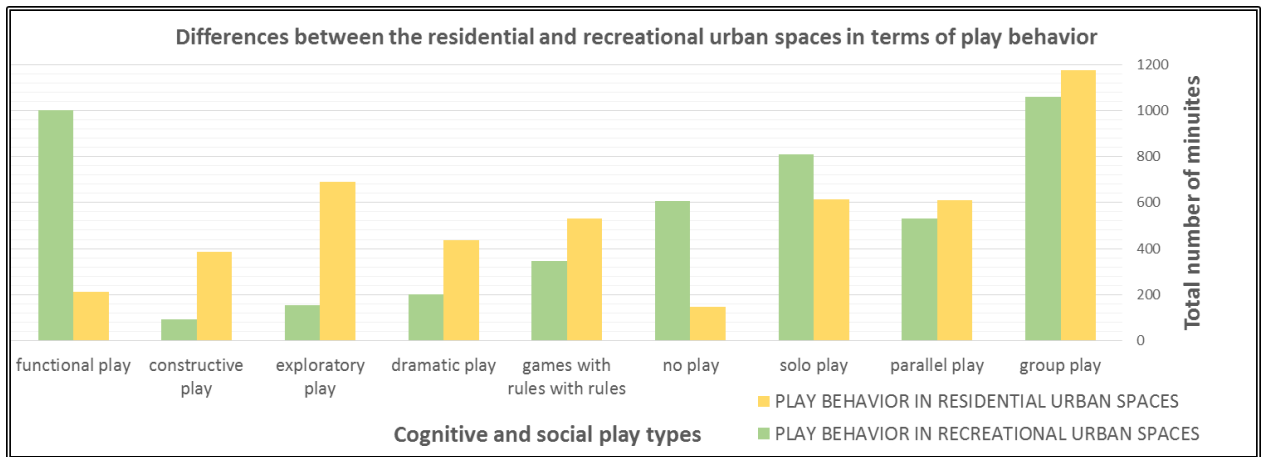


Figure 167: Difference between residential and recreational urban spaces in the amount of observed cognitive play and social play

Table 31: Statistical differences across the residential and recreational urban spaces in terms of cognitive play and social play

Student t-test											
Play type			Recreational urban spaces N=60			Residential urban spaces N=60			significance		In favor
			No of children engaged	Mean minutes per children	Standard deviation	No of children engaged	Mean minutes per children	Standard deviation			
Cognitive play	1	Functional play	51	33,40	16,10	32	7,07	6,08	Significant P< 0.001	Recreational	
	2	Constructive play	13	3,07	4,77	26	12,83	10,43	Significant P< 0.001	Residential	
	3	Exploratory play	18	5,13	6,10	35	23,00	10,73	Significant P< 0.001	Residential	
	4	Dramatic play	17	6,73	9,38	29	14,57	12,0	Significant P< 0.001	Residential	
	5	Games with rules	37	11,50	5,59	36	17,70	11,33	Significant P< 0.001	Recreational	
	6	No play	52	20,17	10,73	20	4,83	5,00	Significant P< 0.001	Recreational	
Social play	A	Solo play	58	27,00	12,27	45	20,50	10,05	NOT SIGNIFICAT P=0.02	Recreational	
	B	Parallel play	48	17,70	10,41	48	20,33	10,80	NOT SIGNIFICAT P=0.34	Residential	
	C	Group play	49	35,30	12,00	46	39,17	14,45	NOT SIGNIFICAT P=0.26	Residential	

Concerning cognitive play, in total for all participating children at the recreational urban spaces, H.S.C and Châtelet-Les Halles, 51 out of 60 children were observed to engage in “functional play”, for a total of 1002 minutes. At residential urban spaces, in Abbasia residential zone and Cité jardins neighborhood, there was clearly less occurrence of “functional play”. Only 32 out of 60 children were observed to engage in this type of play for a total amount of time of 212 minutes. The difference between the two urban categories in mean minutes of “functional play” per child (33.40 for recreational urban spaces and 7.07 for residential urban spaces) was found to be statistically significant.

In addition, there was also a clear difference in the occurrence of “constructive play” between the two urban categories. At recreational urban spaces, only 13 children engaged in “constructive play” for a total of 92 minutes. While as many as 26 children were observed to engage in this type of play at residential urban spaces for a total of 385 minutes. Here again, the difference between the two urban categories in mean minutes of “constructive play” per child (3.07 for recreational urban spaces and 12.83 for residential urban spaces, almost the double) was found to be statistically significant.

For “exploratory play”, at the recreational urban spaces, 17 children were observed to engage for a total of 154 minutes. As for the residential urban spaces, as many as 35 children were observed to engage in “exploratory play” for a total of 690 minutes. In fact, the difference between the two urban categories in mean minutes of “exploratory play” per child (5.13 for recreational urban spaces and 23.00 for residential urban spaces) was found to be significant.

Moreover, there was also a clear difference in the occurrence of “dramatic play” between the two urban categories. At recreational urban spaces, 17 children engaged in “dramatic play” for a total of 202 minutes. While 29 children were observed to engage in this type of play at residential urban spaces for a total of 437 minutes. Once more, the difference between the two urban categories in mean minutes of “dramatic play” per child (6.73 for recreational urban spaces and 14.57 for residential urban spaces) was found to be statistically significant.

Although almost the same number of children were observed to engage in “games-with-rules” behavior at both urban categories (37 children in recreational urban spaces and 36 in residential urban spaces), there was a very clear difference between the urban categories in the observed total number of minutes of “games-with-rules “. The total number of minutes of “games-with-rules” behavior recorded at the recreational urban spaces was only 345 minutes. However, at the residential urban spaces, as much as 531 minutes of “games-with-rules” behavior was observed. The difference between the two urban categories in mean minutes of “games-with-rules” behavior per child (11.50 for recreational urban spaces and 17.70 for residential urban spaces) was found to be statistically significant.

Unlike the “no play” behavior, where a greater amount of time was observed at the recreational urban spaces than at the residential urban spaces. Moreover, the difference

between two urban categories in mean minutes of “no play” behavior per child (20.17 for recreational urban spaces and 4.83 for residential urban spaces) was found to be statistically significant. What is interesting, however, is that while only 20 children of the residential urban spaces samples engaged in “no play” behavior for a total of 145 minutes, as many as 52 children were observed to engage in this type of play for a total of 605 minutes, at recreational urban spaces.

Regarding social play types, the two urban categories were not found to really differ in terms of occurrence of social play. For “group play”, in the recreational urban spaces, as many as 49 children of the 60 children observed engaged in “group play”, while 46 children were observed to engage in “group play” at the residential urban spaces. In addition, the total amount of time of “group play” observed was slightly less at recreational urban spaces (1059 minutes) than at residential urban spaces (1175 minutes). In fact, the difference between the two urban categories in mean minutes of “group play” per child (35.30 for recreational urban spaces and 39.17 for residential urban spaces) was found to be statistically insignificant.

Conversely, the total amount of time of “solo play” observed was slightly greater at the recreational urban spaces (810 minutes) than at residential urban spaces (615 minutes). The difference between the two urban categories in mean minutes of “solo play” per child (27.00 for recreational urban spaces and 20.50 for residential urban spaces) was also found to be statistically insignificant.

For “parallel play”, at the recreational urban spaces, 48 children were observed to engage in “parallel play” for a total of 531 minutes. Similarly, at the residential urban spaces, 48 children engaged in “parallel play”, but for a total of 610 minutes. The difference between the two urban categories in mean minutes of “parallel play” per child (17.70 for recreational urban spaces and 20.33 for residential urban spaces) was also found to be insignificant.

In terms of “negative interaction”, it can be noted that only two children was excluded from the residential urban spaces samples for engaging in aggressive behavior. While at the recreational urban spaces, as many as ten children were excluded from the samples for engaging in this type of behavior.

In summary, for cognitive play types, the differences between the two urban categories, in terms of “functional play”, “constructive play”, “exploratory play”, “dramatic play”,

“games-with-rules”, and “no play” were found to be significant difference. Where “constructive play”, “exploratory play”, and “dramatic play”, were found to be more prevailing in the residential zones than the recreational urban spaces. While “functional play”, “games-with-rules”, and “no play” were more prevailing in the recreational urban spaces than the residential zones. As for the “social play”, there was no significant difference between the two urban categories in terms of different types of social play behavior, however, “solo play” was more prevailing in recreational spaces, while “parallel play” and “group play” were a more prevailing in residential spaces. Converging on "negative interaction", 3 children was excluded from the residential urban spaces samples for engaging in aggressive behavior and 7 were excluded in the recreational urban spaces. For further interpretation, differences between the two urban categories in each of the two countries separately, were analyzed in relation to cognitive play and social play. In Egypt, while there was no significant difference between the two urban categories in relation to “dramatic play” and “exploratory play”, there was a significant difference in relation to “functional play” and “no play” in favor of recreational urban space. Furthermore, there was a significant difference in relation to “constructive play”, and “games-with-rules”, in favor of residential urban space. As for “social play”, there was a significant difference in relation to “solo play” in favor of recreational urban space, while there were no significant differences between residential and recreational urban spaces in mean minutes per child of other social play types, (Figure 168).

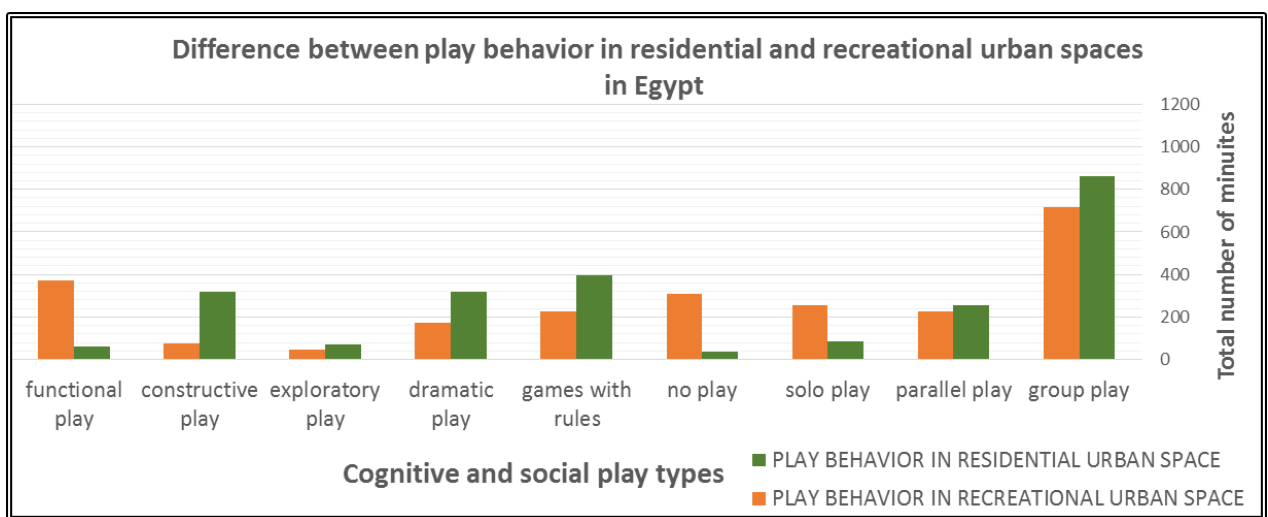


Figure 168: Amount of observed cognitive play and social play in the two urban categories in Egypt

However, in France, there was a significant difference between the two urban categories in relation to “functional play” and “no play” in favor of recreational urban space. Additionally, there was a significant difference in relation to “exploratory play” in favor of residential urban space. While no significant difference in mean time per child was found in relation to the rest of types of play behavior in France. In addition, there were no significant differences between residential and recreational urban spaces in mean minutes per child of “group play”, “parallel play”, and “solo play”, (Figure 169).

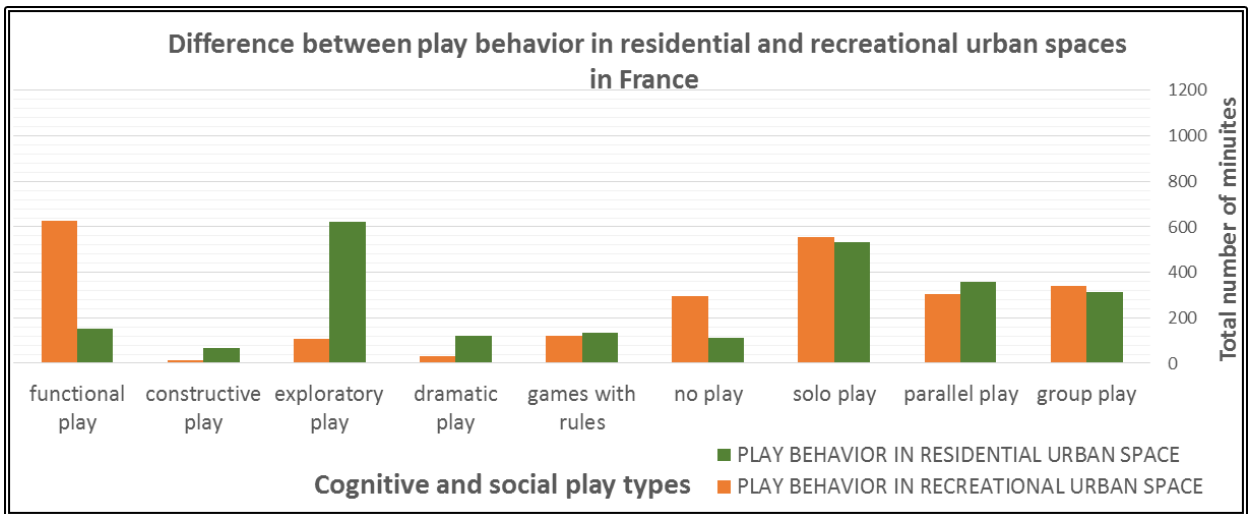


Figure 169: Amount of observed cognitive play and social play in the two urban categories in France

Moreover, gender differences between amount of cognitive play and social play, were analyzed in each of the countries, separately, independently from the urban category. Accordingly, in Egypt while there was no significant difference between girls and boys in relation to “constructive play”, “exploratory play”, “games-with-rules”, and “no play”, there was a significant difference in “dramatic play”, where girls were observed to engage more than boys in this type of play behavior. Furthermore, there was a significant difference in “functional play”, where boys were observed to engage more than girls in this type of play behavior.

Unlike France, where differences between boys and girls in all types of play behavior were found to be insignificant, in mean time per child.

Moreover, for all types of social play behavior, no significant difference between girls and boys in mean minutes per child of “group play”, “parallel play”, and “solo play” in France and Egypt, (Figures 170 and 171).

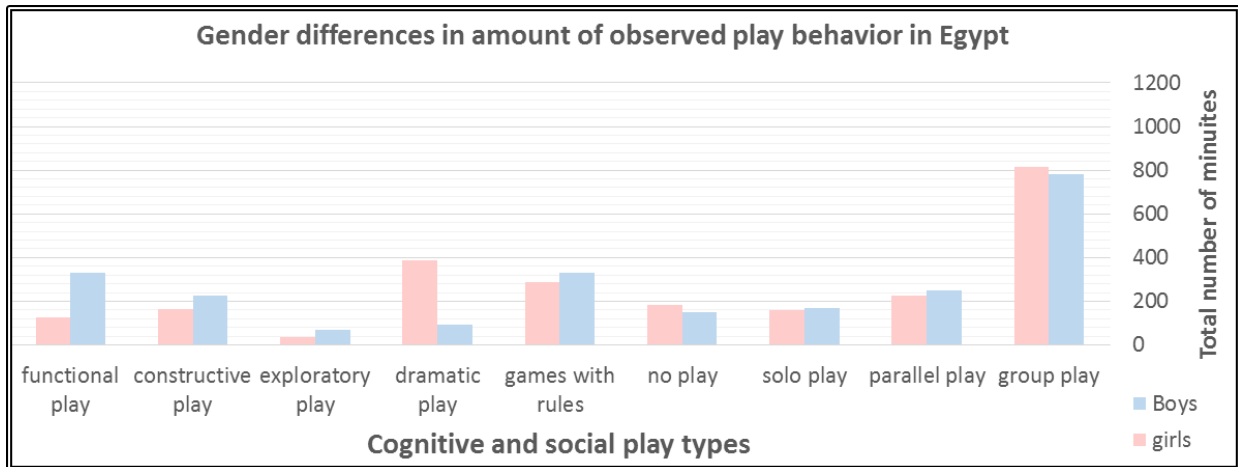


Figure 170: Gender differences in amount of observed cognitive play and social play in Egypt

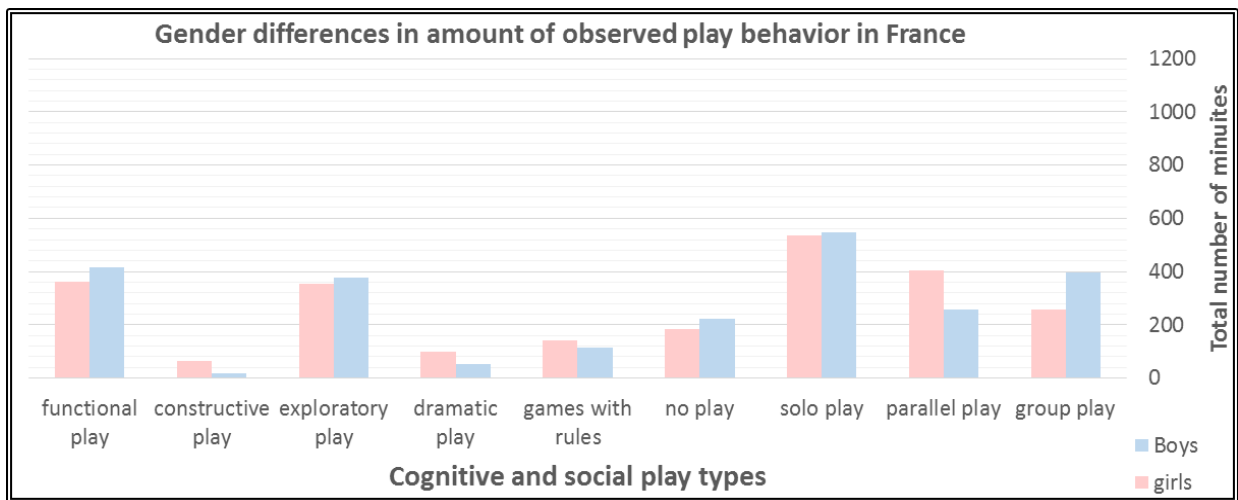


Figure 171: Gender differences in amount of observed cognitive play and social play in France

Reposing on the above analysis and the different behavioral mappings, it is concluded that spatial porosity seemed to influence children’s presence according to the affordances of different play behaviors and their preferences. On the scale the degree of closure and openness of the spatial boundaries of the outer territory, some children were more attracted to well-defined urban spaces with high degree of closure, since they provided children with sense of enclosure and security by encouraging their presence. This form of urban spaces

tended to territorialize functions and to enhance a better flow of play (Barbour, 1999; Podolska, 2014). These findings were consistent with Ackerely (2003) and Chatterjee (2005), who added that any place that allows creation of “identifiable territories” might afford the children’s the sense of “ownership” and “control” over his/her space.

Therefore, well-defined urban places with higher degree of closure, not only tended to allow for creation of territory, but also, seemed to enhance the sense of encapsulation and possession. Moreover, the participating children from the four case studies, pointed to their preferences in playing in such identifiable spaces, where they had a wider choice where to play freely and how to encapsulate their own play space. Consistent with this findings, Cohen et al. (1999) mentioned, that children’s feeling of security while playing is strongly related to the degree of enclosure within a play space.

In addition to Jones (2000), who referred to the minor scale of the spatial porosity, the spatial permeability in-between the spatial typologies, where the monomorphic isolated spaces, and the confined sub-spaces that are frequently dominated by particular use, these subspaces were not appealing for children’s play. While polymorphic spaces, which are in use within adult structures, but also can be appropriated and re-purposed by children to accommodate their play themes, were more attractive to them. Thus, he concluded by calling for more permeable, heterogeneous, and flexible spaces for children to help them in creating their own geographies within a secured space.

This study was consistent with the findings clarified by the different degree of permeability achieved in the different urban categories, where the recreational urban spaces are characterized by the presence of more mosaic isolated functionalized islands, on the contrary, the residential urban spaces are characterized with permeably and high porous integrated urban spaces. Accordingly, some children of the recreational urban spaces samples declared that they felt imprisoned and suffocated in kids playing zones. As they stated while describing, *“The space is overcrowded with elements. It is a fenced place surrounded by high trees. You can’t see out of it, and you even don’t know from where to get out, only one access and exit point”*. Thus, it might be clear that high permeable spatial typologies tended to enhance the sense of community presence by avoiding isolation that might decrease violence actions, due to the high sense of surveillances of the surrounding, achieving security.

5.1.2. Space analogy and perceptual cognitive representations

In this section, the different preferences and perceptions of children are discussed in relation to the data collected from overlapping the behavioral maps during the behavioral qualitative observations sessions, which took place in the four case studies and their included different spatial typologies that afforded different play patterns, enhanced different perceptions, and encouraged variant children's presence, according to their preferences. In accordance to Titman (1994), who clarified that children comprehend the space as segmented places, and do not understand the space as a whole, but classify it so as they could adapt their different play experiences. The above explanation might help understand the associations between the different spatial typologies, the children's different spatial preferences, and their percentage of presence. Consequently, the data from all the behavioral maps was investigated to assess the percentage of children's presence in different space typologies, in general, (Figure 172). It indicated that pathways, assembly zones, and playgrounds, with their different forms and configurations in the 4 sites, seemed to highly encourage children presence, where pathways and assembly zones encompassed almost half of the children samples. Unlike the block buffers that were neglected by children and were rarely referred to, as they were considered as private territories. While the back streets and parking zones that encompassed only 6% of children, were perceived by them as unsecured places, where parents do not allow them to play and limit their playing territory.

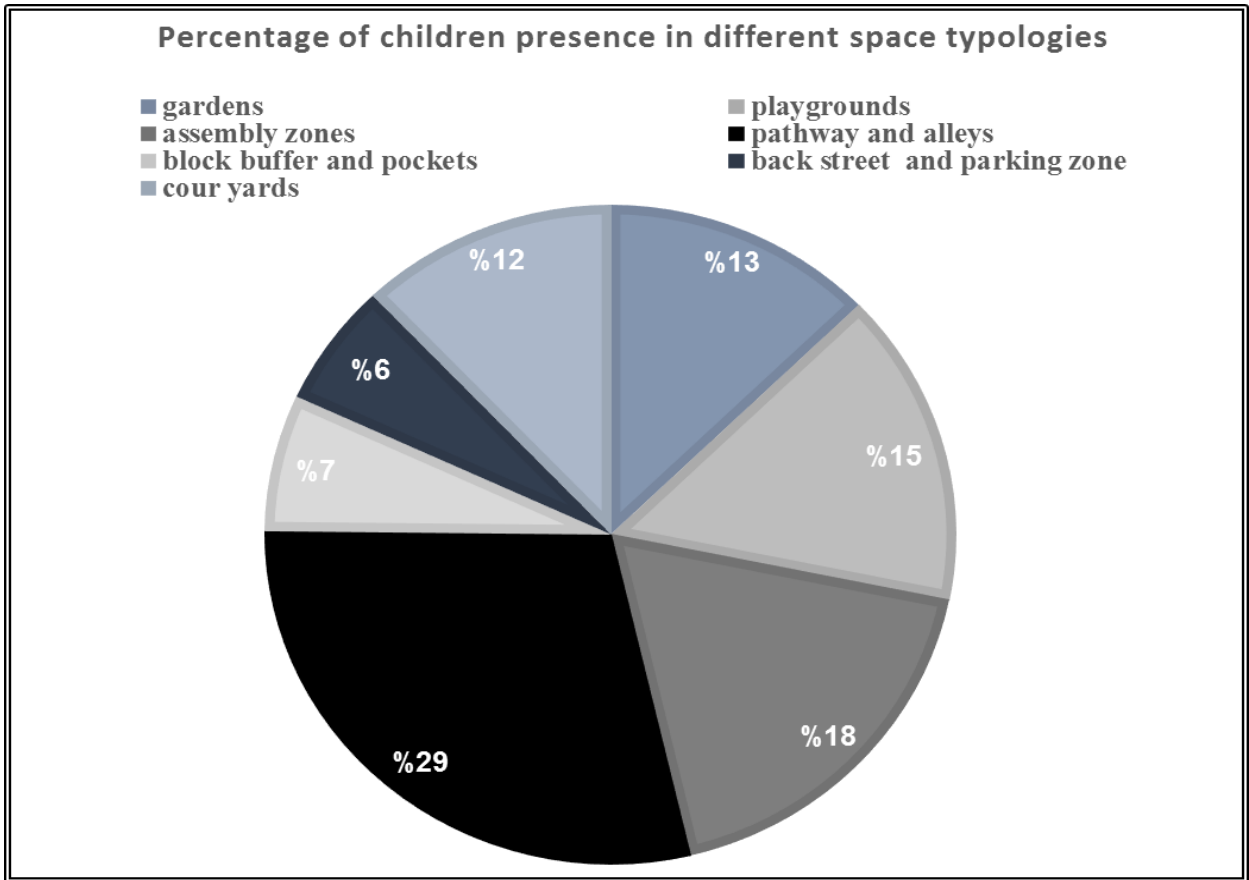


Figure 172: Percentage of children presence in different spatial typologies

Moreover, according to the analyzed results of the structured observations, in addition to the behavior mapping, apparent was that every spatial typology, such as pathways, open gardens, courtyards, back axial serving-street connecting parking pockets, private block buffers, open assembly zones, and playgrounds, is typically associated with higher level of specific play behavior and activities, (Figures 173 and 174).

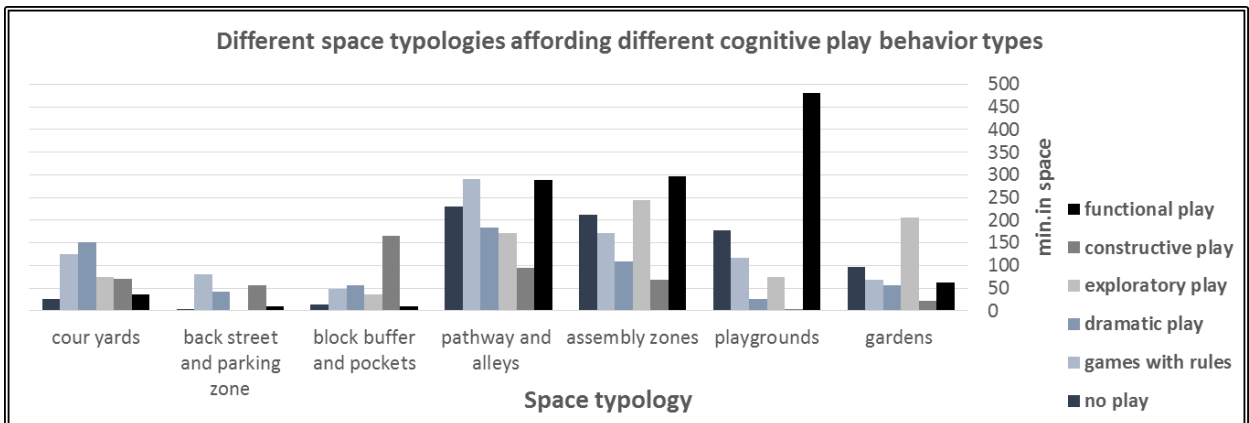


Figure 173: Different afforded cognitive play types by different spatial typologies

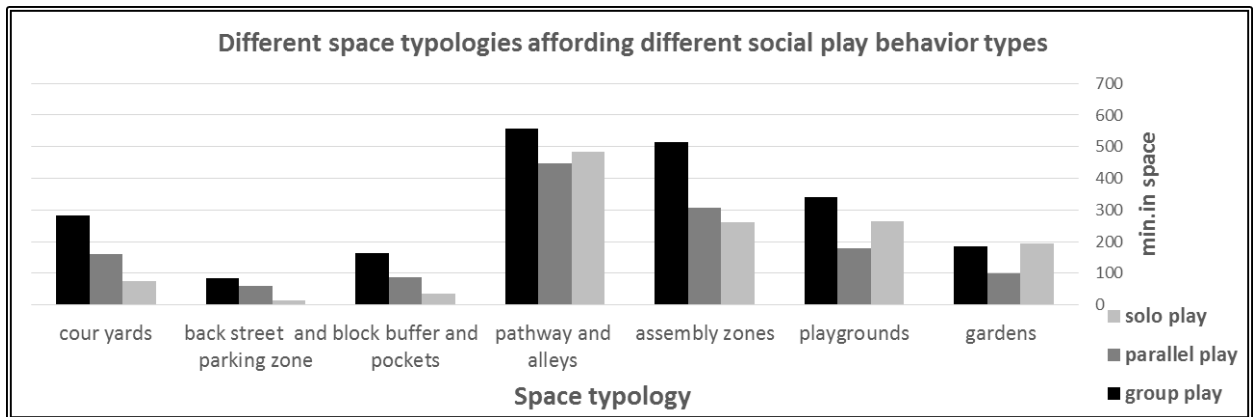


Figure 174: Different afforded social play types by different spatial typologies

The above differences in children’s presence, and total cognitive as well as social play behaviors promoted by the different spatial typologies, in the four investigated sites, that were characterized by different forms and configurations, might help in understanding the impact of spatial typologies on the use and the activities afforded. However, the amount of use and the afforded levels of different activities seemed to be substantially further affected by physical features, functional qualities, and landscape aspects, such as surface quality (hard, or soft), space boundaries, and form, which will be interpreted in the following spatial level outcome. Through a cross-reading of the collected data from the four studied sites, the analysis of the results assisted in visualizing the mutual impact between affordances of the different typologies and children’s perceptions, as follows:

Gardens:

In general, the garden as a spatial typology, in the different urban spaces, residential and recreational, seemed to promote more “exploratory play” as prevailing cognitive play behavior, with a total occurrence percentage of 40% of the total different types of cognitive play behavior, (Figure 175). This might be related to the presence of specific urban spatial elements introduced in the form of natural elements such as trees, shrubs, bushes, palm trees, and flowers that tended to enhance environmental complexity and acted as attractive elements for children (Fjørtoft and Sageie, 2000).

Nature, whether a forest, seashore, creek, gardens, or mountain area, appeared to represent a dynamic environment a stimulating as well as challenging natural playgrounds for children. If a tree is climbable, it might afford climbing; if a stone fits the hand, it might be grasp-able or throw-able, and thus affords grasping as well as throwing. If a sloped lawn is

smooth and steep enough, it might be slide-able and thus affords sliding. This is consistent with Gibson (1979), who noted that children perceive the functions of the environment and use them for play. In the context of the present study, function referred to the structure and complexity of the environment. The complexity of the environment was defined as the variety in vegetation elements as physical features.

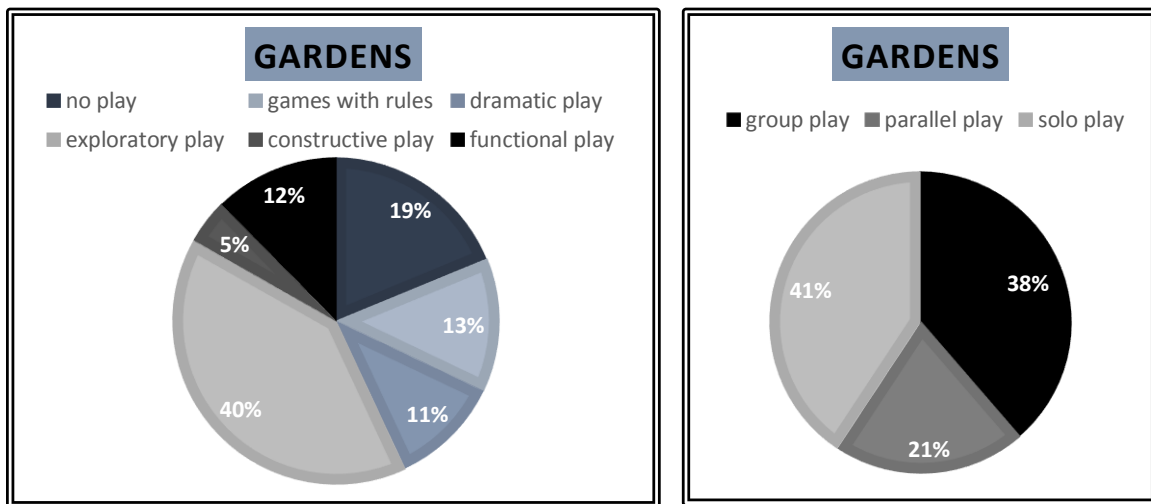
Trees were available in the climbing habitats; shrubs in the hiding, construction, and role-play habitats; in addition to open fields formed the running, catch and seek habitats. These habitats corresponded to the children's intuitive perception of the landscape elements, consequently became determinants for the children's play behavior. The garden in this study not only afforded structures for different play activities (Heft, 1988), but also, the natural environment introduced in gardens as spatial typology, was considered to be a seasonal potential play-scape for children that helped to trigger their five senses.

Gardens were perceived by children as spaces for discovery, exploration, and hypothesizing, like a lab, a space that seemed to support creativity, constructing, building, testing, and idea-generating. Gardens are temporary in nature. They are also flexible, alive, messy, and emergent. They are filled with materials, mud, sand, water, wood, buckets, tools, and other types of loose parts that were essential for children's play ideas in the four urban spaces. Trees, shrubs, and vegetation elements seemed to be strong features of these spatial typology. They are alive, containing ecosystems that attract birds, butterflies, insects, and worms. They create habitat on different scales and to attract a diversity of plant and insect species.

According to the observations, they offered children's access to water, soil, and plants. They are a real-life demonstration of the cycles in waste, energy, and water. Moreover, they tended to inspire children with creative thinking, to invite observation, and to provoke inquiry. Gardens can look messy and beautiful at the same time. In addition, gardens seemed to evoke an emotional response, nurture, a sense of responsibility, and offer moments for reflection. So for example, seasonal trees tended to offer changeable as well as colorful play-scape throughout the year mainly during the autumn. While, the evergreen trees seemed to highlight the space identity with their same appearance and presence in space. While fruit trees seemed to offer seasonal fruits, which allow children to learn more about nature and how to respect; which they use in various play themes and experiments.

In addition, when children interact with animals, they build the all-important senses of connection, empathy, and caring. They feel a sense of responsibility and are curious to find out more about the animal (birds, insects, or fish) (Elnesr and Gamal Said, 2023).

Moreover, in accordance to the results gardens seemed to be often very social, offering opportunities for the development of communication and language skills. In fact, very clear was that gardens helped to afford social interaction and integration, rather than “solo play”, while it might be clear, that it might also encourage more “solo play” than “parallel play”, since it tended to encourage children for self-concentration during exploratory behaviors, where there is child/environment relation, (Figure 176).



Figures 175 and 176: Percentage of cognitive and social play behavior types in garden as spatial typology

Pathways and alleys:

Relaying on the analysis of the results, pathways as a spatial typology in the four studied urban spaces, seemed to promote more “functional play” as well as “games-with-rules” simultaneously, as prevalent cognitive play behaviors, with a total occurrence percentage of 23% each, of total different types of cognitive play behavior, (Figure 177). Between the presences of pathways in different case studies and their absences in the Abassia residential urban space, observations revealed the fact that they helped in providing important ‘links’ for children to connect the varying target areas, they were perceived by children act as a connectors. They also seemed to provide boundaries, and to accommodate informal play, since urban spaces that are characterized by good defined circulation network can as be

considered a core catalyst for creativity. Pathways appeared to create visual identity and to encourage exploration of diverse play settings.

Consistent to the study of Moore (1987), pathways seemed to create continuity for the children's play experience, according to the fieldwork held in the four case studies, children tended to like to be where the action was, where the life of the community took place. Moore also emphasized on that the special attraction of the pathways, which cannot be duplicated elsewhere. This was clear, in the different urban spaces, where children interacted with the various elements that appeared stimulate their play, such as, lampposts, beams, kiosks, different types of trees, and loose parts along these transition lines.

Pathways were observed to be essential for not only a highly functional space typology, but also they seemed to inspire spontaneous acts of play. The purpose of pathways in the urban spaces appeared to be integrating play into walkable and bikeable transition lines, infused with 'play pockets', which provide children with opportunities for playing along the way. Thus, the findings were coherent to the interpretations given by Cosco et al. (2010), who elaborated that pathways do not only serve to connect disparate areas, but also afford opportunities for "functional play" and competitive behavior (e.g. bike riding loops). Cosco et al. (2010) further highlighted that the form, texture, color, the different level, and the material used of pathways, might be important. For example, they suggested that curved pathways are more attractive for children than straight ones. They also suggested that linear pathways force children to travel back and forth, which make the maneuvering of wheeled toys difficult and might result in conflicts between children. In contrast, looped pathways promote higher levels of physical activity, afford circular motion, provide a more interesting as well as enjoyable experience for children, and add perceptual complexity by the blocking of direct views. In addition, the wide range of materials used for pathways, afford variant play activities.

The above interpretation is consistent with the observed play activities that were frequent at the four case studies, where pathways with their different forms appeared to promote more biking and playing with wheeled toys. However, according to study observations, conflicts resulted in the linear pathways, could be a starting points of the civility rules emergence, which might have started since childhood through controlling the themes

created for the games-with-rules play type, as between the accordance and non-accordance of children play is originated.

Moreover, regarding the social point of view, very slight differences between the percentages of occurrences of the three types of social play that were promoted by pathways as: “group play”, “parallel play”, and “solo play”, (Figure178).

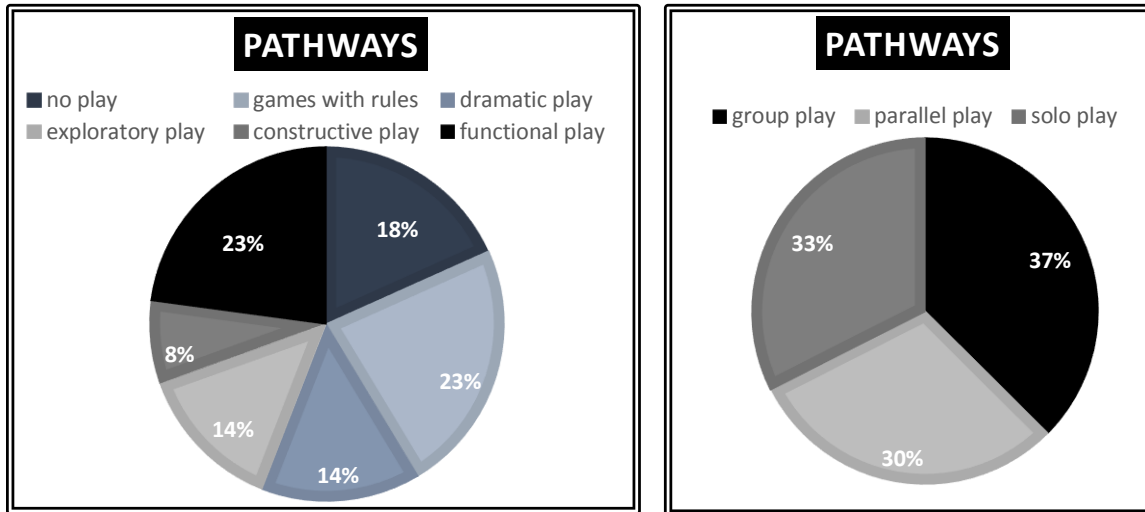


Figure 177 and 178: Percentages of cognitive and social play behavior types in pathways as spatial typology

Assembly and open spaces:

Generally, assembly zones and open spaces, as a spatial typology at the four case studies, seemed to stimulate various opportunities of cognitive behaviors with a great chance for social interactions, which might be linked to the intentional design function as well as the different forms of space entity that appeared to offer different forms of flow and activities, especially “functional play”, ‘exploratory play”, and “no play”, with a total occurrence percentages of 27%, 22%, and 19% correspondently, with almost two third of the total percentage of other occurrences of cognitive play types, (Figure 179).

According to observations, assembly zones and open spaces can be perceived by children as safe and exciting places to play that were integrated to the surrounding community, since they are flexible as well as accommodate multiple uses and users (children, staff, and parents). In the different urban spaces, the assembly zones, offered sitting, or other activities in shade, within a balance of soft and hard surfaces. Gathering spaces seemed to

function as a stage for planned events or spontaneous creativity. They might be used in varied ways for formal and informal activities.

Thus, Cele, (2005), pointed to an untapped potential for these spaces, to be designated as vibrant landscapes for play and learning, where children can explore nature on daily basis. In addition, depending on the design of the assembly zones, they might stimulate children’s physical level as well as challenge, and therefore enhance the promotion of “dynamic action”.

During the fieldwork, children showed preferences to play spaces, which allow flexible ways of playing and ‘appropriation’ by themselves. The idea of “appropriation” was consistent with the explanation given by Valentine (2004, p.74), where children need designs without defined meaning, which stir up the “imagination” of children and tickle their “curiosity” (Korthals, 2013, p.29).

Gathering spaces appeared to typically welcoming, fostering of social interactions, and focused on communication, negotiation, and sharing. They tended to provide a sense of comfort, encourage use, and interactions. In fact, very clear was that assembly zones afforded “group play”, rather than “solo play” and “parallel play”, where “group play” occurrence percentage was almost half of the total occurrence percentage of the social play, (Figure, 180).

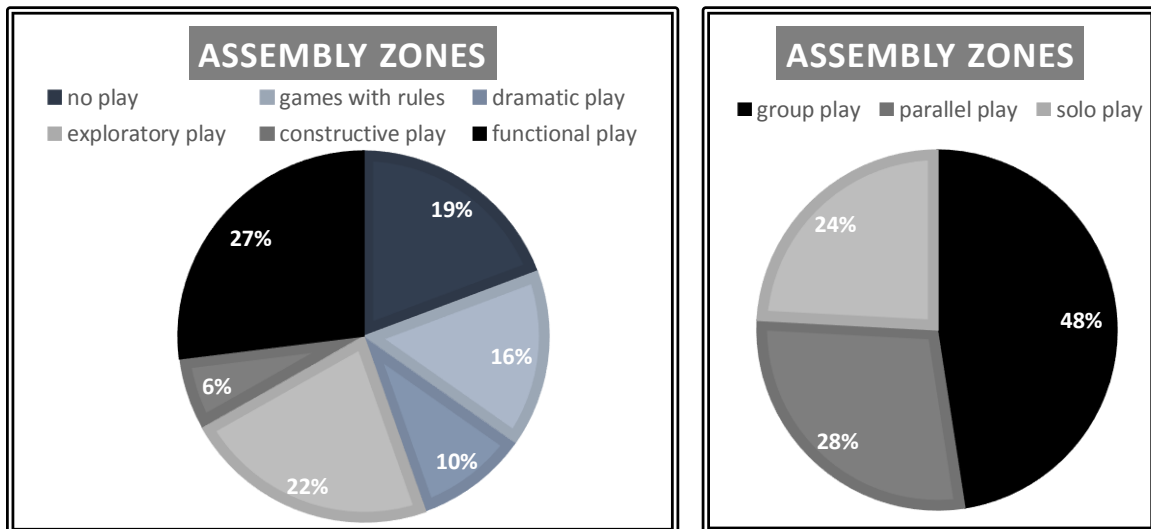


Figure 179 and 180: Percentages of cognitive and social play behavior types in assembly zones as spatial typology

Courtyards:

Following the results analysis, across the different urban spaces, the courtyards as a spatial typology, seemed to promote more “dramatic play” as well as “games-with-rules” as prevailing cognitive play behaviors, for a total percentage of occurrences of 31% and 26%, successively, of the total occurrences of different cognitive play types, in a prevalent form of “group social play”, that an occurrence percentage occupied 54% of incidences of the social play behaviors, (Figures 181 and 182).

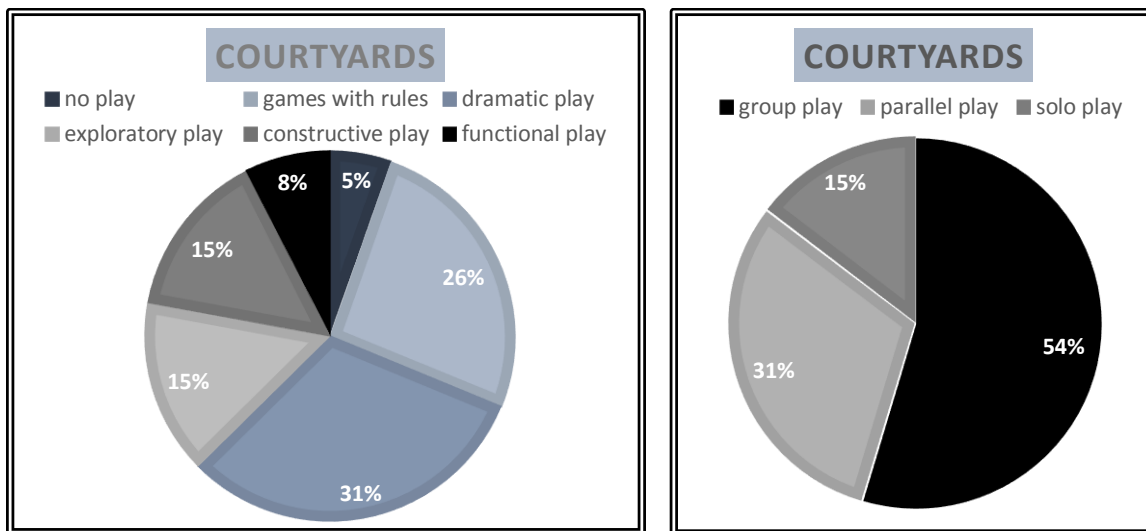
Louis Chawla (1992) and Sobel (1990) indicated that courtyards provide children with the feeling of security, privacy, warmness, and control. Moreover, Sobel (1990), identified several attributes that characterizes those special places: they are outdoor places, co-constructed by children, they are safe, as well as secretive, where children can hide, and have a chance to escape without being seen. Thus, these special places contributed to the creation of childhood place attachments, as described by Chawla “served as personal anchors during both childhood and adulthood”.

Relying on previous literature, children value places, but also they value ‘belonging’. Through several studies, children showed preference to places that evoke their feelings and give them the sense of belonging and well-being (Hart, 1979; Rasmussen, 2004; Burke, 2005; Kytta, 2002, Elshater, 2018). Furthermore, Burke (2005), described through a phenomenological research that children’s places have special attributes, which primarily satisfy their physical needs, while the next and higher level of relation is the children’s feelings of attachment towards certain places. As Chawla pointed out in her study that, “*Children are attached when they value the place not for the satisfaction of physical needs, but for its own intrinsic qualities.*” (Chawla, 1992). In addition to Sofia Cele (2005) who was concerned with children’s experience of their everyday environment in a dense inner city, in central Stockholm. Cele explained in “On Foot in the City of Children”, that children are experiencing their environments continuously through their sensations: looking, listening, touching, and even smelling. She focused on feelings that emerged in certain spaces, feelings of excitement, feelings of happiness, feelings of boredom, and feelings of fear.

Reposing on the above mentioned literature and fieldwork observations, courtyards were spaces that were preferred by many children in the selected residential urban spaces and

frequently referred to in the interviews. Moreover, they were perceived as urban pockets, which tended to encapsulate their play activities with high concentration of play activities away from the interference of the surrounding movements that might help children to construct their own personal identity of the space.

Moreover, the findings were in accordance to Marc Breviglieri (2013), where he described the difference between the playful city and the guarantee city. Additionally, Breviglieri and Landoulsi (2016) had described the courtyards as a source of space qualifications that achieve enclosure and enveloping to the users’ activities by creating the ambience of the space. Courtyards have been also associated with the feeling of identifiable territories, and belonging, which reinforces certain social behaviors and social interactions (Breviglieri and Landoulsi, 2016, Gamal Said, 2016).



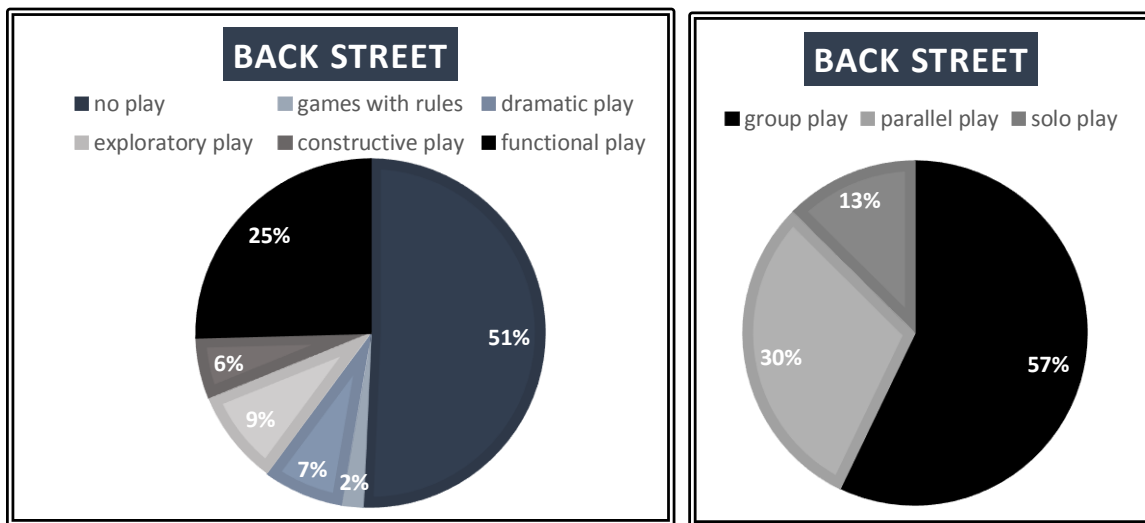
Figures 181 and 182: Percentages of cognitive and social play behavior types in assembly zones as spatial typology

Back street and parking zones:

Back streets and parking zones, as a spatial typologies, tended to promote more “no play” followed by “functional play” as prevailing cognitive play behaviors, for a total occurrence percentage of 51% and 25%, successively, of the total occurrences of different cognitive play types, mainly in the form of “group social play”, since they appeared to promote a total percentage of 57% of the occurrence of social play behaviors, (Figures 183 and 184). The above findings are consistent to the study of Milward and Wheyway (1997), who found that back streets and parking zones are considered as traffic calmed streets, which are

popular for play, in addition to the parents' assessment to these types of streets as safe ones, and therefore permission to play out is increased. Moreover, Matthews (2003), described back streets and parking zones, as places of multiple affordances and opportunities for middle childhood play.

According to observations at residential urban spaces, it was clear that through playing in streets children seemed to experience real world complexity, as in streets a multi-cultural integration might take place through play. Streets tended to function as social spaces for playing and hanging out that create children's identities. Thus, they were observed to attract more relaxation, gatherings, and group discussions.



Figures 183 and 184: Percentages of cognitive and social play behavior types in back streets and parking zones as spatial typologies

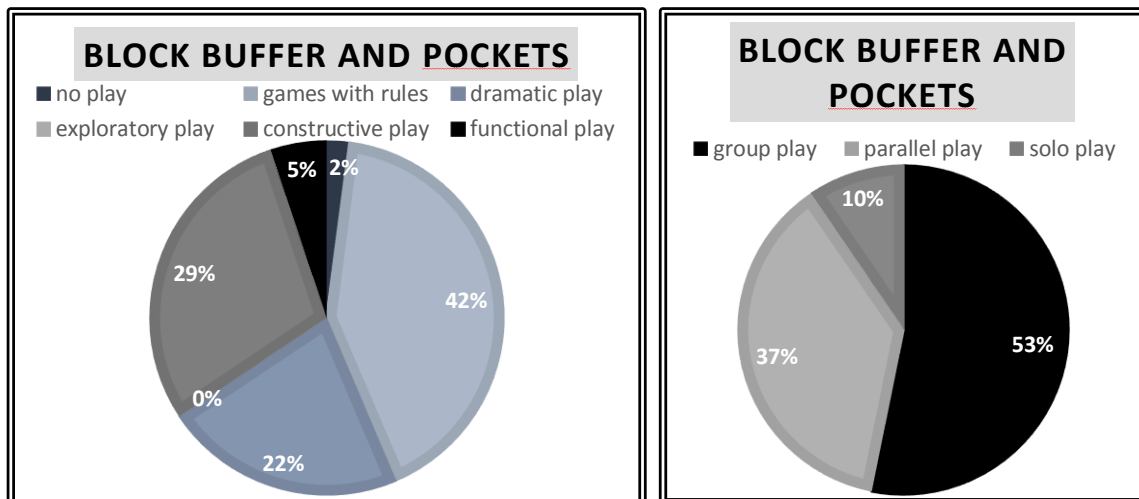
Block buffer and pockets:

In general, the building buffers and pockets as a spatial typologies seemed to promote more “games-with-rules”, for a total occurrence percentage of 42% of the occurrence of the total different types of cognitive play behavior in the form of “group social play”, since it appeared to promote a total percentage of occurrence of 53% of the occurrence of the social play behaviors, (Figures 185 and 186).

Relying on observations at the residential urban spaces, these small pockets, which were perceived as abandoned spaces in adult geography, had the potential to promote a great variety of play experiences, where children can shape them according to their will. In these settings, children tended to wonder, to get bored, to develop their own creativity, and to

develop self-identities. Coherent to these findings, Percy-Smith (2004) and Elshater (2018), defined this type of places as free informal spaces, where children regard as left overs of their neighborhoods.

Reliable on Jones research about children’s geographies in 2000, this type of spaces offer children the opportunity to create their play and play spaces by ‘molding’ through the fabric of adult geographies. Such hidden spatial dimensions of a place experience are perceived as children’s incidental spaces that they come across daily, which has no boundaries between the children’s imagination and the real experience children encounter, as well as the importance of the social aspects in place preferences (Thwaites & Simkins, 2008). Moreover, Jacobs opposed large, complex urban renewal projects that destroyed and divided neighborhoods and argued for communities that possessed diversity and a blending of uses. Jacobs (1961) discussed the three primary roles that sidewalks played in neighborhoods: safety, contact, and the assimilation of children. Jacobs further believed that walking, talking, playing, sitting, and watching make a viable and safe place. Thus, the interactions and constant activities produce a place with a high degree of social contact for residents, children and pedestrians passing through neighborhoods.



Figures 185 and 186: Percentages of cognitive and social play behavior types in building buffers and pockets as spatial typologies

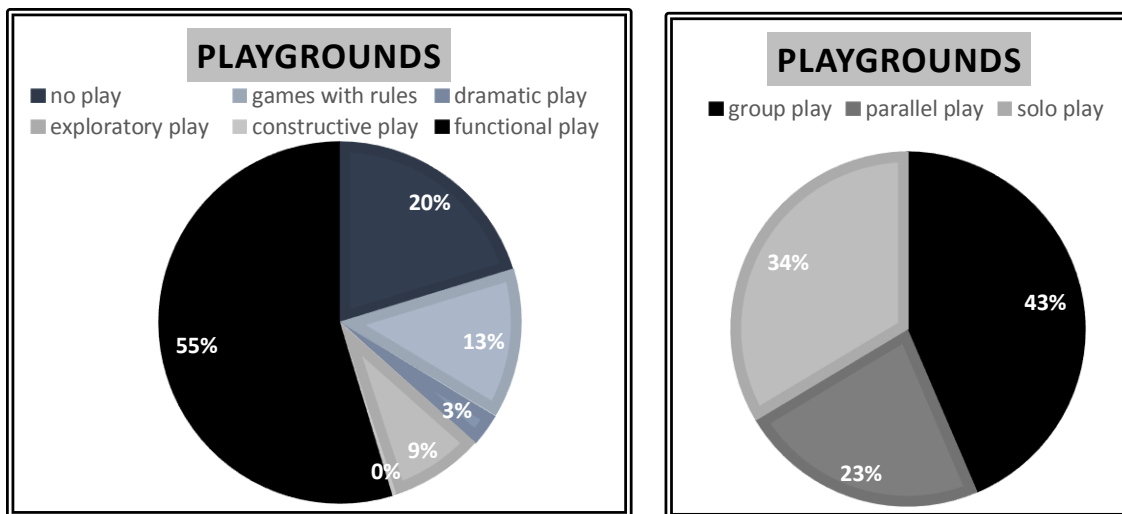
Playgrounds:

Generally, playgrounds as a spatial typology, seemed to stimulate more “functional play”, occupying about 55% of the total occurrence of different cognitive play types, and “group

play” as a prevailing social play behavior occupying 43% of the occurrence of social play, in the different urban spaces.

In accordance to the observations at the recreational urban spaces, playgrounds appeared to promote muscular activities, as they seemed to be often stimulating and challenging children. It has been shown that playgrounds were associated with greater levels of creativity and tended to be associated with greater levels of enthusiasm, (Figures 187 and 188).

Research had shown that playgrounds helped children to display their genius, since play structures seemed to be spontaneously appealing children into playing and they tended to be the starting point for children to generate their play activities, (Metin, 2003). Furthermore Shell (1994), added that children are in need of opportunities and not equipment, in playgrounds, since the consequences of insufficient play possibilities in a playground might result in poor imagination, nervousness, deficiency of physical development, and craving for entertainment. Thus, playground designers should mainly be concerned with the effect of playground design on children’s cognitive, social, physical, and emotional development (Hart, C., 1993 and Elnesr, 2018). Unlike some qualitative studies, revealing playgrounds as play environments that remove challenge, surprise, and risk from children’s play experiences (Hart, 2002). These studies suggested that middle childhood, in particular, seemed to wish exploring and experiencing a wide range of settings, than fenced segregated playgrounds (Matthews, 1992; Moore, R., 1986).



Figures 187 and 188: Percentages of cognitive and social play behavior types in playgrounds as spatial typologies

Children's perceptual cognitive representations:

These spatial typologies, with different affordances and children's preferences, tended to enhance children's mental perceptions of the urban space differently, which was clear through implementing the learned and the experienced notions that appeared in the perceptual cognitive skill documentations (e.g. drawing and photographic descriptions, as well as informal interviews). For further analysis, supplementary Student's t-tests were used to illustrate the differences in space perceptions across the four urban spaces, in terms of drawing skills.

According to the pre-mentioned two age group evaluations criteria, the mean ratings of residential zones' drawings were slightly higher than those of recreational urban spaces' drawings, (Figure 189). In consequence, Student's t-tests showed that the differences between the two urban categories in terms of drawing skills were significant for the different age tranches. This might be linked to the advancement of "constructive play" and "dramatic play", as cognitive play types in the residential neighborhoods, as according to Elnesr (2018), the amount of "constructive play" and "pretend play" showed associations with children's cognitive skills. In addition, this might be referred to the intention of the design status of the residential neighborhoods that seemed to have an impact on children's place preferences, since residential urban spaces are un-designed areas or the unplanned spaces for recreational activities. Thus, children appeared to enjoy the richness afforded to them by the environments, where they can manipulate and invent their own spatial environment for play. Same findings were illustrated by Chawla (2002), who found that children in the unplanned areas for them, are more likely to engage in outdoor activities independently. In addition, they have the freedom to explore their surrounding environments and choose where to play.

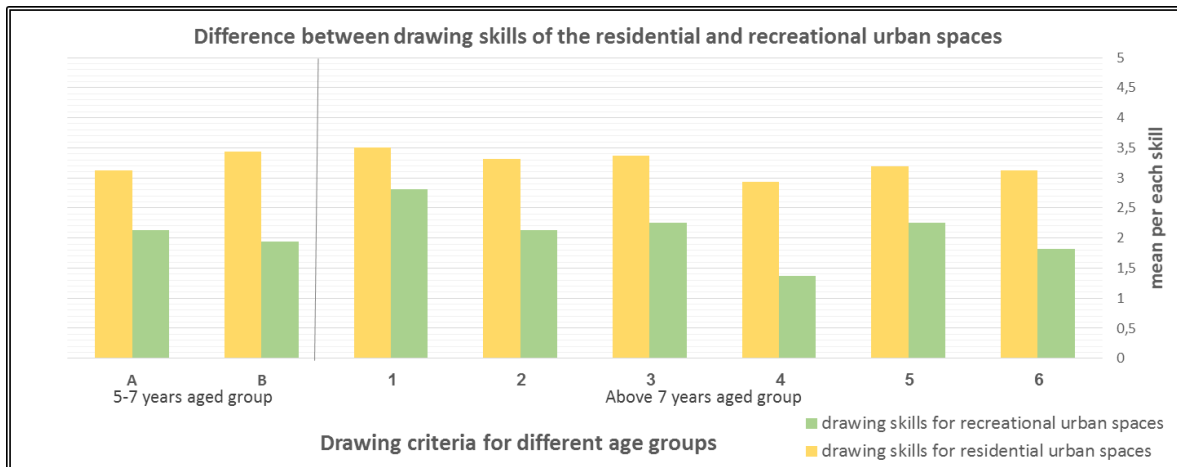


Figure 189: Difference between the drawings mean ratings of residential neighborhoods and recreational urban spaces

Concerning the “Category I”, of the residential streets and neighborhoods, most of the children have high perception, so as accuracy of the represented elements, and aware of the different typologies that appeared to offer them secret places and mysterious spaces. Their drawings were characterized by high complexity, great number of elements represented, great amount of details, great use of colors, and noticeable presence of natural elements (such as grass, flowers, and trees).

Moreover, the Student’s t-tests showed that the differences between the two neighborhoods in terms of drawing skills were not found to be significant, with the different age groups. However, the mean ratings of Abassia residential zone drawings were slightly higher than those of Cité jardins residential neighborhood drawings, (Figure 190). In addition, it was noticed from the analyzed documentation of the cognitive skills and informal interviews, held in both neighborhoods, for the children of 5 to 7 aged group, that their mental perceived properties of the space, helped them implement different learned and experienced notions, such as, up and down; levels; in and out; sense of hearing sounds; sense of secure and freedom; sense of enclosure and protection; texture recognition by hearing and color distinguishing; risk taking; culture awareness; imagination; challenge; and emotional control. As for the children above 7, their mental perceived attributes of the spaces helped them to implement more expressive notions, such as, ownership; environment complexity and diversity; up and down; observe and control from heights; in and out; sense of isolation due to the water sound; we not me; sense of secure; sense of

enclosure and protection; variation of activities; risk taking; imagination; curiosity; and emotional control.

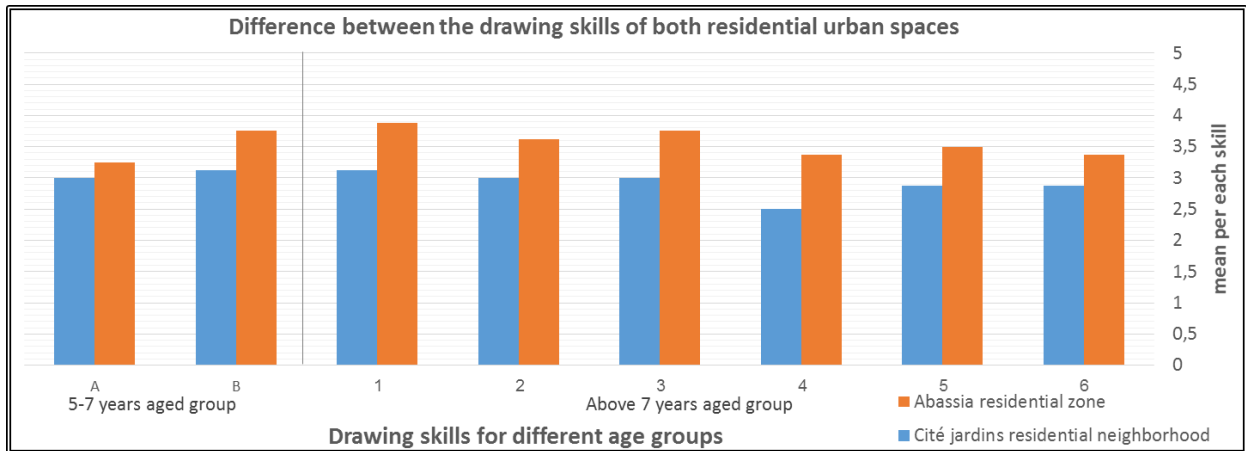


Figure 190: Differences in evaluations of drawing skills between the two neighborhoods

Regarding the “Category II”, of the recreational urban spaces, most of the children used words that expressed their spatial typologies preferences and their perception according to the different attributes. In addition, this was clear in their drawings skills assessment that tended to be of high accuracy in the amount of details of overall scene, high visual realism in terms of accuracy of spatial relationships, and detailed representation of the depth, great use of colors, and awareness of isolated spatial typologies with their different configurations.

Additionally, Student’s t-tests showed that the differences between the two recreational urban spaces in terms of drawing skills were not found to be significant in the different age groups. However, the mean ratings of H.S.C recreational urban space drawings were slightly higher than those of Châtelet-Les Halles recreational urban space drawings, (Figure 191).

Moreover, the analyzed documentation of the cognitive skills and informal interviews, held in both recreational sites, indicated that the children of the 5 to 7 aged group, seemed to perceive the different attributes of spaces, which helped them implement different particular learned and experienced notions describing colors; levels; physical properties recognition; sense of secure and freedom; space boundaries; new perspectives; challenge; manipulation; sense of cooperation; and awareness of parental supervision. As for the children above 7, they perceived more precisely the physical features, landscape attributes,

and functional qualities of the spaces that helped them to implement deeper notions linked to space limits; sense of activity isolation; colors recognition; and environment complexity.

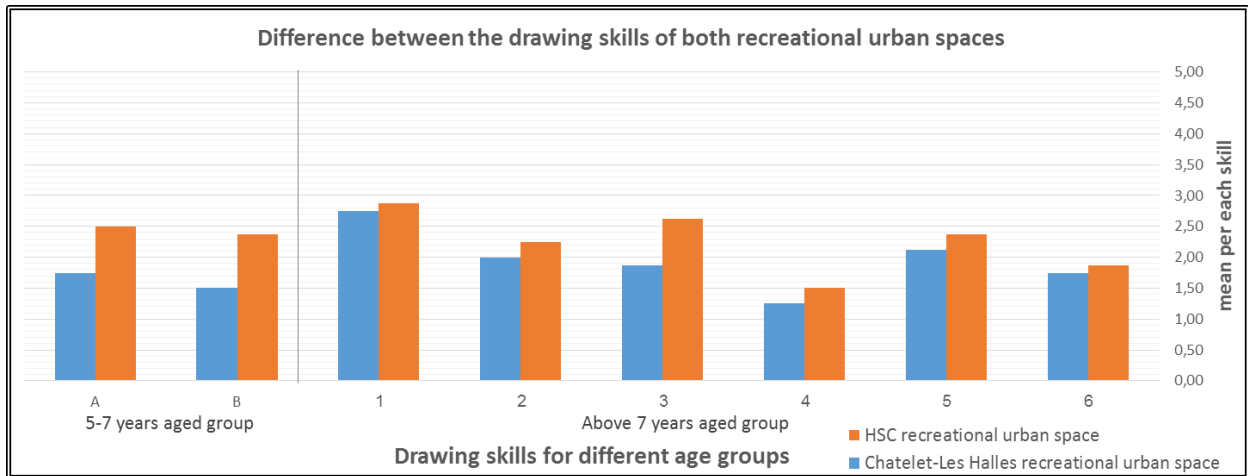


Figure 191: Difference in evaluations of drawing skills between the two recreational urban spaces

Associations between children’s perception and representations through drawings samples:

In general, through a proofreading between the children’s drawings of the four urban spaces, residential and recreational, different representations of children’s eye-level perceptions were illustrated through several children’s drawings samples:

Sample 1: Different representations of the same place with different level of perception, Abassia residential zone, Cairo, Egypt, (Figures 192).

- The three drawings represented the pedestrian pathway, back the residential units, at Abassia residential zone, where some cars might be found parking there, but no traffic circulation.
- Different children illustrated the same place differently, when they were asked to draw their residential zone, through representing differently the different materials, textures, and colors.
- Moreover, the three drawings highlighted the different degree of perception and the importance of the benches and trees as urban spatial features that afford different play behaviors.
- The first drawing emphasized on the perception of the wooden benches using the proper color choice to indicate material and texture, representing the two benches as the main perceived features with high amount of details, unlike the surrounding trees, which are

characterized by less details as well as colors, or the parking cars, which are represented using the same color, just to signalize their presence. The drawing might highlight the significance of the represented urban features in relation to the amount of details and accuracy in the elements represented that surely impacted the child's play behavior negatively or positively. In general, the drawing tended to be of mild accuracy of the overall scene with few amount of details of overall scene. Moreover, it achieved mild visual realism in terms of accuracy of spatial relationships and moderate representation of the depth.

- The second drawing indicated a higher level of perception through the high accuracy in the elements represented with high amount of details, which were clear in the benches, trees, and retaining wall, using different colors to present the existing colors and textures. Even the cars were represented in different colors and forms, which might present a constrain to their play themes or might be a potential for hiding play themes. The drawing tended to be of high accuracy of the overall scene with high amount of details. Moreover, it achieved high visual realism in terms of accuracy of spatial relationships and detailed representation of the depth.
- The third drawing indicated a moderate level of perception through the moderate accuracy in the elements represented with good amount of details, which were clear in the benches, trees, and retaining wall, although the different used colors did not really present the existing colors and textures, however, the drawing indicated the presence of different textures and materials. In this drawing, it was obvious that the absence of the cars and the presence of interactive features, such as the represented animal and the vegetation element, which might point to the interests of the child representing the urban space through a drawing. In general, the drawing tended to be of moderate accuracy of the overall scene with high amount of details. Moreover, it achieved high visual realism in terms of accuracy of spatial relationships and moderate representation of the depth.



The pedestrian pathway back the residential units, at Abassia residential zone, Cairo, Egypt

Figures 192: Children’s drawings illustrating different representations of the same place with different level of perception

Sample 2: Different representations of the perceived different architectural identity in residential zones, France and Egypt, (Figures 193).

- The two drawings represented the building units in both residential neighborhoods in Cairo and Paris suburbs.
- Both drawings highlighted the perception of different climate conditions, where the represented sun and sky in the drawing of Cité jardins residential neighborhood, indicated cooler and cloudy weather, with choosing the white background color, and giving no more attention for further illustration.
- Unlike the representation in the drawing of Abassia residential zone, where the sun and the sky were represented with high accuracy and high amount of details, using the hot yellow color and clear blue for the sky, indicating the significance of the represented climate to the child that might impact the child’s play behavior negatively or positively.
- Moreover, the drawings emphasized on the children’s awareness of the surrounding architectural styles, which might help in enhancing the identity of their surroundings, where the child of Cité jardins residential neighborhood represented the French

architectural style through inclined roof of the building, the window's shapes with small opening, and the hanged flowers from the windows, unlike the child of Abassia residential zone, who represented the hot climatic architectural style through flat roofed buildings and windows shapes with wider openings.

- Furthermore, the child of Cité jardins residential neighborhood, represented him/herself and one of the family members within the drawing, that might indicate the strength of oneself position in the surrounding community, which might be related to in the French slogan “liberty, equality, fraternity”.



Cité jardins residential neighborhood , Paris suburbs, France



Abassia residential zone, Cairo, Egypt

Figures 193: Children’s drawings illustrating different representations of the perceived different architectural identity in residential zones, France and Egypt

Sample 3: Different representations of different perceived cultural backgrounds in two communities, France and Egypt, (Figures 194).

- The two drawings highlighted the symbolic awareness of the surrounding urban space related to each society, from where they were raised.
- The drawings clarified that children do not only perceive the space, excluded from the surrounding background, but they seemed to be aware of the surrounding buildings and the symbolic icons, related to their different communities and specific cultural background.
- Concerning the drawing of Saint-Eustache Cathedral, surrounding one of the sides of Châtelet-Les Halles recreational urban space, Paris, France, it seemed that the child perceived this cathedral as the main huge iconic symbol of the urban space, to define this recreational urban space when asked to draw the space. The drawing was in line

with the Gothic and Renaissance architectural concept, where they emphasized on the human small scale in relation to the huge religious building at that time, to clarify the sacredness of the place.

- Moreover, the child emphasized on the included items that clarify the function of the building, religious signs and symbols, such as, the rose window, the towers, the podiums, and the niches.
- Regarding the drawing of the mosque, although the scale of the mosque was very small in relation to the residential urban space, the child had chosen to draw it as big as the main iconic item for the urban space. Moreover, the child tried to emphasize on the spiritual side through the drawing representations, by adding some writings, religious signs, and symbols, such as the dome, the crescent, and the lightings cord.



Saint-Eustache cathedral, Châtelet-Les Halles recreational urban space, Paris, France



Small mosque, at Abassia residential zone, Cairo, Egypt

Figures 194: Children’s drawings illustrating different representations of different perceived cultural backgrounds in the two communities, France and Egypt

Associations between children’s perception and representations through drawings’ descriptions samples:

Moreover, during the drawing description and interviews phases, generally, children used expressions that indicated their comprehension of several notions extracted from their cultural background and community, which had been documented in the matrices scripts, (previously presented in “chapter4”). Furthermore, these expressions elaborate their space perceptions through verbal representations of spaces. Thus, these children’s descriptive quotes had imposed the importance of being mentioned as is, to describe the surrounding ambiance and avoid translation bias.

Accordingly, these learnt and experienced notions, seemed to highlight a link to the theme of “Ambiances in translation”, introduced by the International Research Group (GDRI) of CNRS, during a conference that was initiated by the International Ambiances Network to explore the issue of ambiances in translation, (<https://www.ambiances.net/seminars/gdri-translating-ambiances.html>). The word ‘translation’ should be taken in the broad sense of the term, and not reduced to a strictly language-based meaning, in order to address the topic of architectural and urban ambiances, by looking at the disparities as well as shifts, this topic was involved. The translation serves as both, a point of entry to the topic of ambiances, and as a collaborative working principle for the inquiry. With regard to methodology, the approach involved ‘putting researchers in translation’.

The idea of using ‘translation’ as a point of entry, may be developed in four ways. The first form of translation consists of the “Translation in terms of language”, in this study, the first form is achieved through looking for words in English language equivalent to the mentioned terms, in Arabic or French, during the interviews and drawing descriptions done by the children themselves, to be documented by the researcher. Thus, according to Paul Ricoeur (1992), any translation work must focus on the differences between cultures and bring into consideration the ‘linguistic hospitality’, by putting the foreign language to the test in this way, therefore means giving up the pretenses of a perfect, literal translation, and adopting in its place a series of reformulations. Moreover, it should involve looking for equivalents and wondering the best possible version, while requiring to clarify, as much as possible of the understanding, which in turn reveals the potential and limits of the languages in face of experience. In short, the purpose here is to achieve greater clarity.

The second form of translation is “Translation in terms of discipline” that involves creating links and contributions between separate disciplines, such as: sensory anthropology, computer modelling, architecture, urban studies, applied physics, or indeed fine arts. However, the purpose of this form, is to explore various bridges, areas of agreement, and transverse commonalities between the various approaches involved. Therefore, in the current study expressions mentioned by children were further translated into learned as well as experienced notions to explain their mental perceptions of the designed spaces.

As for the third form of translation is the “Translation in terms of the senses”, which experiments multimodal forms of expressions and builds experimental bridges between

senses (light, sound, smell, or heat). It informs about inhabiting experiences and the design. This form was accomplished by the participated children themselves, who translated their senses and experiences to perceived drawings, and mental maps, then from drawings into spoken description during the interview to describe their drawings, senses, as well as experiences.

The fourth form of translation is the “Translation in professional terms” that aims to investigate the scope for exchange and circulation between the world of research and that of architecture as well as planning. The aim here, is to look at how experiences are transformed and hybridized as soon as it comes into contact with design practice as well as developmental constraints. This form was applied in the formed matrices, to transform the learned notions expressed by the children, to a final form related to the terminologies used in this research, in order to be able to extract solid guidelines for the landscapers, urban designers, and architects.

The four levels of translation were central to the study, specifically, the second spatial level of perception, (Tables 32, 33, 34, and 35). By placing the research between languages, disciplines, senses, and experiences, a process of investigation seemed to be capable of taking account of the complexity of the field of ambiances, and of the scientific as well as the cultural diversity involved.

Table 32: The used expressions and words at Abassia residential zone

Translated learnt and experienced notions in English	Exact children’s words and expressions in original language (Arabic)
Our place	مكاننا
We climb up	نتشعلق (نتسلق)
Overlooking the whole district	بيشوف المكان كله من فوق (تطل على الحي كله)
Neighborhood	الحي
Near the sky	فوق خالص فوق في السماء (بالقرب من السماء)
Without ceiling	مكان مفتوح مش مخنوق (بدون سقف)
On top of everything	كل حاجة تحتى (فوق كل شيء)
My favorite space	ده مكاني المفضل
I feel refreshed with the air	بحس هنا اني بتتنفس (منتعشة بالهواء)
My friends from the district	صحاب المنطقة (أصدقائي من الحي)
Do not allow	لن يسمح
Never get afraid	مش مرعب (لا تخافوا ابدا)
Gives us the chance	هيدينا فرصة (يعطينا الفرصة)
Hiding spaces	أماكن نستخبة فيها (أماكن الاختباء)

Can't see the end	ملوش نهاية (لا أستطيع رؤية النهاية)
High, huge, and empty	مكان كبير أوى و فاضي (عالية وضخمة وفارغة)
Safe	أمان (أمن)
We can relax and have a conversation	نريح و ندردش (يمكننا الاسترخاء وإجراء محادثة)
We are crazy as we use the stairs differently	نحن مجانين لأننا نستخدم السلم بشكل مختلف
I created	لقد اخترعت
Competition	مسابقة
Decoration	الزينة
Feel comfortable	بحس اني مرتاحه (اشعر بالراحة)
Feel satisfied	راحة نفسيه (تشعر بالرضا)
Try new things	يجرب جديدة حاجات (أريد تجربة أشياء جديدة)
Explore different things	يكشف حاجات مختلفه
I am free	أنا حره و برحتي
I don't like control	مش بحب أباه متكته (أنا لا أحب السيطرة)

Table 33: The used expressions and words at Cité jardins residential neighborhood

Translated learnt and experienced notions in English	Exact children's words and expressions in original language (French)
Play alone freely	Je joue par moi-même et je reste calme
Inside but outside	J'ai le sentiment d'être dans et dehors
Pretending	Je fais le docteur, imitation
I cannot control	J'arrive pas à contrôler ça
Very difficult	C'est dur et compliqué
Very noisy	On entend pas mal de bruit
I like relaxing	J'aime détendre
Protects my secret	Il garde le secret
It is forbidden	On a pas le droit
The whole space is divided	On trouve beaucoup d'endroits dans un grand espace
I like observing the space	je suis en train de regarder l'espace
Control the world.	Moi je suis comme un super-hero, nous régnons sur tout le monde
Feel that I am the queen	Je suis dans le ciel et vous êtes sur la plante à terre, je suis la reine
Small overhead place	Viens au petit abri
Overlook	Venez voir
It is dangerous	C'est quelque chose très dangereux, on saute de ciel
I discovered	J'ai découvert quelque chose, un os de dinosaure
It is an open place	C'est ouvert parce que ça a l'aire
I like playing with water although it is encircled	J'aime bien la fontaine et l'eau, mais il était protégé par un mur (petit en même), l'eau est potable, j'ai déjà essayée
It is a nice place	C'est sympathique

I feel connected with other people in the other spaces	Je vois le monde, j'ai l'impression d'être connecté
--	---

Table 34: The used expressions and words at H.S.C recreational urban space

Translated learnt and experienced notions in English	Exact children's words and expressions in original language (Arabic)
Colorful	ملون اوي (ألوان مختلفة)
Different shapes	أشكال مختلفة
Difficult objects	حاجات صعبه شويه (أشياء صعبة)
We go above them	كل الحاجات تحتى (نذهب فوقهم)
In the air	في الهواء الطلق
Use it as if it is	استخدمه كأنه
The paving is different	الارضية مختلفة (الرصف مختلف)
Smooth area but the other are is rough	خشن وناعم في نفس الوقت
It is closed from all sides	إنه محدد من جميع الجنبات بحس اني مش عارفه أطلع من المكان
Feel up and secure	يشعر بالعلو و بالأمان
Slip down	نتسحب لتحت (ينزلق)
Challenge	التحدي
Dangerous	خطير
Tiny and warm	صغين ودافئ كدا (صغيرة ودافئة)
Too big and open	كبير و مبهوء (كبير جدًا ومفتوح)
Too crowded and noisy	مليانة ناس و دوشة (مزدحمة للغاية وصاخبة)
Restrictions	قيود
Surrounded by bared fence	محاط بالحواجز
In-between	ما بين اثنين
On the top	أعلي حاجة (بالقمة)
Experience balance	بنشوف (أستكشف) التوازن
Non-smooth parapet	حاجز مش ناعم (حاجز غير أملس)
Compacted	ضيق
Imprisoned	محبوسه (مسجونون أو محاصرون)
Suffocated	مخنوق
Too easy	سهله أوي (سهل جدا)
Harder things (more complicated)	عايزين حاجات معقده شوية (أكثر تعقيدًا و أشياء أصعب)

Table 35: The used expressions and words at Châtelet-Les Halles recreational urban space

Translated learnt and experienced notions in English	Exact children's words and expressions in original language (French)
A rectangular shaped	Il a une forme rectangulaire
Divided into small ones	Chaque partie est un petit jeu
They are scary	C'est flippant
It is inside the park, but a part	C'est dans le parc, mais c'est à part

Colorful buttons on floor and balloon sticks to the sky.	Des boutons colorés à même le sol et des bâtons de ballons dans le ciel, c'est la joie
My dreaming place	Un endroit que j'attends depuis un bon bout de temps, c'est un endroit dont je rêve
Me and the others	Moi et tout le monde, il y a un tas de gens m'entourent
Take a turn	Le tour est à chacun
Try a new thing that never had been tried before	Je veux tenter ma chance
New texture	C'est tout doux, c'est bizarre, et étrange
Sliding down	Regarde-moi, je suis en train de redescendre
He never succeeds to, but I can	Il sait pas le faire, mais moi oui
Feel imprisoned	J'ai l'impression d'être pris au piège
The closed entertainment spaces	Zones ludique closes, je peux pas sortir
Instant new friends	Regarde, on est copine
I usually come with my parents	Je viens avec mes parents
The fenced playground	Une barrière entourant l'air des jeux
Strange people sitting there	Il y a des gens bizarres, là-bas
Skate on the steps	On va skater dans les escaliers
Always afraid to go	J'ai peur d'y aller
It is huge and not enclosed	C'est grand et impossible de sortir
Adults are not allowed, all space is ours	Les adultes n'ont pas le droit d'entrer, c'est à nous
Swinging up in the air	Je peux voler haut en l'air
Elevated cuboids	Ce sont de grands cubes
Afraid to knockout someone	J'ai peur de cogner
Paving is different a smooth area and another area zigzag	Le sol est lisse et l'autre est biscornu
It as a stage	Ça semble être une scène
Observing all	Je suis curieux, je m'occupe de tout, je regarde chacun d'entre eux et je les surveille tous
I feel isolated	Parfois, c'est bien enfermer sans gens, mais je me sens pas connecter
I play under the supervision of my parents, the place is full of strangers	Il y a beaucoup de personnes étrangères, je joue sous la supervision de mes parents

5.1.3. Spatial potentialities and ambient lived envelop

In this section, the different resulted lived ambient envelopes across the four sites, are illustrated in relation to the different spatial potentialities, and the afforded play opportunities. The behavioral and perceptual differences enhanced by the same space

typology in the four different sites seemed to reflect the engagement, of different spatial configurations, in terms of different spatial potentialities across the four case studies, in creating different lived spaces and experiences, (Figures 195 and 196). These potentialities are (1) Entity of activity setting, (2) Flow continuity and fluidity, (3) Diversity of ground materials, (4) Topographic Variability, and (5) Presence of different urban spatial features.

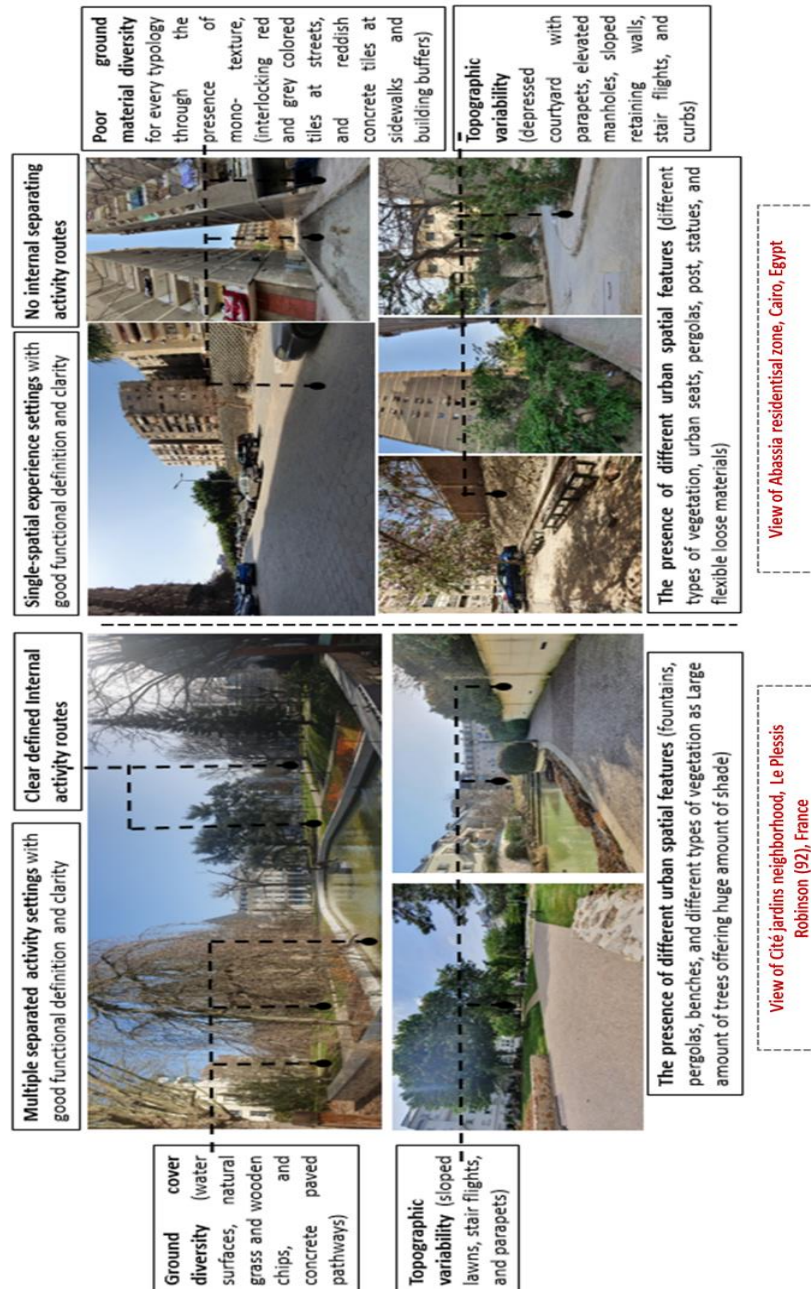


Figure 195: Differences between the two residential neighborhoods in terms of the spatial potentialities



Figure 196: Differences between the two recreational urban spaces in terms of the spatial potentialities

This part explains the affordances of each of those potentiality, while tying them to literature and previous studies. In an attempt to explore the potential associations between various landscape aspects, physical features, functional qualities, and play opportunities, degree of freedom, gestures tactile, lived space, as well as ambiance. Accordingly, such associations were explored to understand the impact of the potential role of the five suggested spatial potentialities, independently from the spatial typology itself. Based on the data collected from the behavioral qualitative observations sessions, informal interviews, and walks, held in the four urban spaces, which differ in their configurations of the spatial potentialities, these potentialities are elaborated, as follows:

5.1.3.1. Entity of activity setting:

As previously described, concerning the residential urban category, the Cité jardins residential neighborhood spatial typologies are subdivided into multiple activity settings. These activity settings are spatially well defined and separated by multiple internal activity routes as well as by variations in ground materials, ground levels, and the presence of different urban spatial features. On the other hand, the Abassia residential zone spatial typologies are not divided into multiple activity settings. They constitute of single-spatial experience settings.

While for the second category of the two recreational urban spaces (Châtelet-Les Halles recreational urban space and H.S.C recreational urban space recreational urban spaces), some of the included spatial typologies are characterized by the presence of multiple-spatial experience settings with good functional definition, and separated by multiple internal activity routes. Whereas, other included spatial typologies, such as assembly zones, are characterized by single-spatial experience settings with good functional definition, thus no internal separating activity routes within the single undivided settings. According to this study, perceptual differences constructing contradictory lived experiences and notions that were resulted by the two different forms of space entity, (Figures 197).

Regarding the multiple activity settings, according to the qualitative observations, they were more related to flexibility in using by accommodating different patterns of play and they were appreciated by children for the feeling of freedom they appeared to provide. These findings were consistent with Cohen et al. (1999), who stated that “*A play space should incorporate a variety of different spaces for different types of play*”, and with other

qualitative studies such as Percy-Smith (2004) and Jones (2000), who further explained that different activity settings provide a flexible variety of play experiences, where children can shape them according to their will. Moreover, Barker, R. (1976) described activity settings through direct observations of children, by clearly identifiable spatial and temporal boundaries, with components that function independently of adjacent behavioral units (i.e. climbing areas, sand pit, water play settings, tricycle paths, vegetable gardens, ...etc.) and Barker further opposed to the idea of treating the play area as a generalized context for behavior.

Moreover, a few studies of outdoor children spaces had shown similar findings, and further linked the presence of multiple activity settings to greater levels of play concentration and to increased social interactions as well as “dramatic play” (Moore, R., 1986; Barbour, 1999; Maxwell et al., 2008; Podlska, 2014).

So for instant, in a study that investigated the impact of the entity of play areas, Moore, G., (1986) found that better spatial definition of multiple play sub-areas, was associated with more “exploratory behavior” of children, more social interactions, greater concentration in play activities, and less random movements. As previously explained, Moore, G., (1986) defined random movement as erratic actions that switch quickly between one setting, or object, and another, in a successive and fast paced manner. In consequence, arranging the space into clear zones separated by boundaries, seemed to allow children to focus on the play materials in each area, and to promote complex play as well as interactions with other children (Doctoroff, 2001).

According the observations during the fieldwork, the differences between the spatial typologies of the four urban spaces in the observed play behaviors appeared to further confirm the findings of these previous studies. First, as reported before, there was a wider degree of play freedom and variability at the multiple behavioral settings of the different spatial typologies encompassed by the Cité jardins residential neighborhood and the two recreational urban spaces, such as the playgrounds, than at the single behavioral settings of different spatial typologies at the Abassia residential zone, at Châtelet-Les Halles recreational urban space, such as the assembly zones, as well as at H.S.C recreational urban space, such as some assembly zones and the garden. Furthermore, observations revealed a higher level of activity concentration at Cité jardins residential neighborhood, as children

there tended to engage in the same activity for longer spans of time. While at Abassia residential zone, activity time spans tended to be shorter and shifts from one activity to another were much more frequent. Furthermore, much more random and impulsive movements were recorded at Abassia residential zone than at Cité jardins residential neighborhood. It is also possible that the greater incidence of aggressive and fighting behaviors were observed at Abassia residential zone and H.S.C recreational urban space recreational urban space, which encompassed more single spatial settings, is in fact related to the greater amount of random movements and lower levels of activity concentration.

However, there were variations in place preferences and perceptions among children for the multiple behavioral settings in different spatial typologies, encompassed by the Cité jardins residential neighborhood and the two recreational urban spaces. Thus, some observations showed the importance of the presence of multiple activity settings for children that are spatially well defined and separated by multiple internal activity routes. Where they repeatedly described these multiple activity settings, in some of the interviews as *“large open spaces with small ones that have clear boundaries”*. In different accomplished interviews, children further stated that they liked different activity settings that are clear to their perception. It was also noticed that the presence of clear defined multiple activity settings incorporate the notions of “in” and “out” in children’s “dramatic play”. This was also clear in some drawings, which they further explained stating, *“this is our city, where everything is sub-divided into small areas, closed from all sides, and we feel secure here”*. The above is coherent to what Cohen et al. (1999) mentioned, that children’s feeling of security while playing, is strongly related to the degree of enclosure within a sub play space.

In consequence, children seemed to search for places that are well-defined, where they insured stating *“the place is enclosed and so my friends and I, love to play here away from people flow”*. This was clear during the observations, at the multiple behavioral settings of different spatial typologies encompassed by the Cité jardins residential neighborhood and the two recreational urban spaces, where the existing different types of play, appeared to benefit from the protected behavioral settings from the interference and movements of passers. Thus, children were attracted to well-defined sub-spaces that tended to provide them with a sense of enclosure and privacy. Many children through the interviews followed

the drawings, stressed on the importance of 'intimate scale' as a physical spatial quality for them, where they described these sub-spaces as places that appeared to suit their scale. They also expressed that they perceived these intimate scale sub-spaces as "*a sub divisions of the main space*". Consistent with the observations, Christensen (2004) concluded that children interact with spaces of different sizes in a variety of situations.

On the contrary, other children of both genders, wished that the spatial typologies were not divided into multiple sub-enclosed places, as the single settings, and appreciated the presence of a single large wide setting.

For example, at the different spatial typologies characterized with the absence of multiple activity settings at the Abassia residential zone, the Châtelet-Les Halles recreational urban space as well as H.S.C recreational urban space, several instances of place preferences were declared by children. Further, they revealed that their best places to play in, was the courtyard in front of their residential unit, for the case of Abassia residential zone, or assembly zones, and gardens in the recreational urban spaces, since they are well-defined and large enclosed spaces, where they mentioned "*you can do anything and everything, in this open-wide area; there you can run, jump, climb, race, roll on the grass, sing, shout, and pretend*". A certain inclination of children showed preferences toward spatially single defined setting, as the courtyard, where they tended to engage in a variety of play activities and particularly "group dramatic play". Additionally, most of the children referred to single activity settings in both recreational spaces, by expressing their perception as, "*we feel free in large open spaces, because of the visual clarity and continuity*". Hence, children who showed preferences to the single spatial zones, seemed to consider them as huge open space, where they can be 'appropriated' by children, which emphasized the idea that children might also need designs without defined tangible meaning.



Cité jardins neighborhood, Le Plessis Robinson (92), France



Abassia residential zone, Cairo, Egypt



HSC recreational urban space, district of Heliopolis, Cairo, Egypt



Châtelet- Les Halles recreational urban space, Paris, France

Figures 197: Examples of different ambient envelopes and experienced notions promoted by the different forms of space entity

5.1.3.2. Flow continuity and fluidity:

Activity routes in outdoor spaces could be, generally, defined with the use of a distinct material, texture, color, a different level, or the presence of physical boundaries. While at different spatial typologies at Abassia residential zone, assembly zones at Châtelet-Les Halles recreational urban space, as well as, H.S.C recreational urban space's assembly zones and garden, there are no internal separating activity routes within the single undivided settings, unlikely, the spatial typologies of the Cité jardins residential neighborhood, the rest of the spatial typologies in the recreational urban spaces, such as the playgrounds and pathways in H.S.C recreational urban space, in addition to the garden in Châtelet-Les Halles recreational urban space, that are characterized by a well-defined separating multiple internal activity routes, connecting the different entry points,

defining the different multiple activity settings, and achieving flow continuity as well as fluidity between them. Therefore, between the presence and the absence of activity routes in the above different spatial typologies of the residential neighborhoods and recreational urban spaces, observed differences in play behaviors, perceptions, and flow of play seemed to confirm such an impact on the constructed lived experiences and notions, (Figures 198). According to Cele (2005, p.96), a stimulating design challenges children through promoting dynamic action and increasing their physical level. In accordance to the study observations, the presence of spatially defined activity routes in the different spatial typologies of the four urban spaces, tended to attract more “parallel functional play”, or “group games-with-rules” in an organized form of flow and fluidity between spaces. Moreover, consistent to Valentine (2004, p.74), who stated that children prefer play spaces that allow for flexible ways of playing flow, most of the boys in the different studied fields, pointed out that “*alleys are one of the best places for playing football*”. They said that, “*there you can run, bike, and kick the ball far away*”. It was, also, observed during the fieldwork that activity routes were considered as multi-purpose spaces, which were interpreted in many ways that seemed to challenge children’s imagination and appeared to encourage their social interactions. These activity routes helped to separate areas into different play spaces, offering an organized circulation that might serve different functions with specific boundaries and had been suggested to promote informal play and to enhance creativity. Wide paths can be perceived as recreational play spaces, while smaller trails might provide private moments or facilitate a game of hide and seek. Paths, tracks, and trails diversify the play environment by allowing children to move between and through elements, and by helping them to orient themselves in space.

Additionally, a number of previous studies had also suggested that the presence of well-defined activity route networks tended to organize the flow of play and reduce random movements as well as the interferences with the play activities of others (Maxwell et al., 2008; Cosco et al., 2010; Podolska, 2014). This was confirmed by the previously reported findings of the study, where the absence of activity routes seemed to be associated with much more random movements that were observed for instant at Abassia residential zone and other spatial typologies in the recreational urban areas than at Cité jardins residential neighborhood spatial typologies with their well-defined activity routes. Furthermore, due

the chaotic flow of play, several events of movements and interfering fluidity distracted play activities of other children that were observed to escalate into fights between children. On the other hand, at Cité jardins residential neighborhood, the flow of play appeared to be much more organized and the interferences of movements with the play activities of others were rarely observed. Therefore, the organized flow of movement achieved by the internal well defined activity networks in the Cité jardins residential neighborhood and some of the spatial typologies of the recreational urban spaces, might contribute to an increased concentration in play activities and to the occurrence of “group play” in the different play sub-areas. For example, several instances of groups of children playing different activities, for extended time spans, were more observed in spatial typologies encompassing well-defined activity route networks, than in single undivided zones characterized by the absence of activity routes. Thus, numerous occurrences of groups of children drawing and coloring with chinks on the concrete paved areas, for extended spans of time, were observed at multiple zoned playground at H.S.C recreational urban space. This high concentration play activity was never witnessed in single zoned spatial typologies with the absence of activity routes, although covered with same materials. Consequently, the presence of well-defined activity route network might help stimulating organized flow of creative play that seemed to prove a secure feeling of fluidity in play activities between settings. Moreover, the presence of organized form of flow was observed to be associated with more structured “dramatic play” by the creation of territory and giving the sense of enclosure. The participating children who had free accessibility to their spaces and a choice where to play preferred playing in identifiable spaces through the activity routes, where some of them stated that *“the pathway is bounded by the gardens and green belts that make us feel secured if we decided to play inside the garden, for example, as we are away from the passers-by flow, thus we can play for longer time without being disturbed, while on pathways we use our scooters to travel between spaces and challenge our speed”*. Similarly, in Châtelet-Les Halles and H.S.C recreational urban spaces, children were observed on the activity routes to behave in different imaginative ways. They climb on fences bounding the routes, sit and pretend to be on a train, by imitating the direction of flow.

As for the activity routes in the different activity routes at H.S.C recreational urban space, play activities were observed to be associated with such “dramatic play”, as children were recorded imagining driving on a city street network, imaging rowing on a river, imagining being a plane taking-off a runway, and imagining being a train on railroad tracks moving from station to station.

Consequently, children appeared to experience their play places in their particular way, even if the place is produced by adults, they still tried to manipulate the space by their imagination to satisfy their own needs. Such activity routes were the focus of structured flow of children’s play in the different urban spaces, recreational and residential, as they seemed to promote organized dynamic action, to stimulate children’s imagination, and to enhance their curiosity as well as their sense of exploration. Therefore, designed fluidity might enhance the re-purposing of spaces into places for play, which tended to be an important aspect for stimulating various children’s play opportunities.



The flow of play appeared to be much more organized

Cité jardins neighborhood, Le Plessis Robinson (92), France



The chaotic flow of play seemed to distract play activities and to escalate into fights between children

Abassia residential zone, Cairo, Egypt



Activity networks were perceived as railroad tracks promoting a train drive

HSC recreational urban space, district of Heliopolis, Cairo, Egypt



“ I am stuck with passers-by”

Châtelet- Les Halles recreational urban space, Paris, France

Figures 198: Examples of different ambient envelopes and experienced notions resulted by the presence and absence of activity routes

5.1.3.3. Diversity of ground materials:

The impact of diversity of ground materials on diversity of play activities was explained by the concept of affordances (Gibson, 1977). Ground materials used in outdoor spaces can be categorized as hard, semi-hard, and soft, where each of these categories tended to permit different forms of play and to create space physical and visual boundaries (Barbour, 1999; Cosco et al., 2010; Zamani, 2013; Podolska, 2014).

While the Cité jardins residential neighborhood spatial typologies are characterized by a high diversity of ground materials, as well as textures, and used colors, at Abassia residential zone spatial typologies feature poor ground material diversity for every typology.

In addition to, Châtelet-Les Halles and H.S.C recreational urban spaces' spatial typologies are characterized by a high diversity of ground materials, as well as textures, and colors used, except for the garden at H.S.C recreational urban space and the assembly zones at Châtelet-Les Halles recreational urban space are characterized by poor ground material diversity. Accordingly, a wide range of perceptual and afforded lived experiences differences were promoted by high and poor diversity of ground materials, (Figures 199).

In this study, the finding highlighted more play diversity at spatial typologies, in both urban categories, residential and recreational, with high diversity and variability in ground materials. The above “diversity and variety” in different spaces were observed to offer the chance of creating new affordances and gaining diverse play experiences, which appeared to stimulate the child sense of “exploration” and “curiosity”. Because children are much closer to the ground than adults, a varied palette of surface materials in the space can be a strong stimulant to a children’s creativity. These findings were consistent with Cohen et al. (1999), Cele (2004) and Simkins and Thwaites (2008), who concluded that children’s play is stimulated by variation within space characteristics, which stir up the ‘imagination’ of children and tickle their ‘curiosity’ (Korthals, 2013, p.29).

In addition, ground material diversity seemed to enhance highlighting the space boundaries visually. According to observations during the fieldwork, those visually defined places appeared to allow creation of identifiable territories and to provide children with the sense of control and manipulation. This is consistent to Moore, G., (1986), who interpreted that places with identifiable boundaries afford the child’s sense of ‘appropriation’ and ‘re-

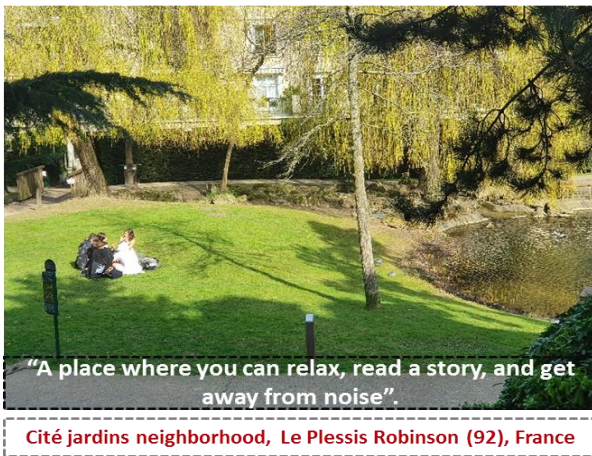
purposing' over his/her space. In addition, they provide children with a greater range of play affordances, diversity of ground materials appears to promote the imagination and creativity in play, by incorporating the notions of 'in' and 'out' in children's "dramatic play" and "constructive play". For example, the variety of ground materials used at Cité jardins residential neighborhood was observed to help a child imagine territories for being inside an imaginary shelter or outside, as the child expressed "*we prefer places with boundaries to territorialize it*".

Furthermore, these lived and perceptual differences were clear in both recreational urban spaces, which encompass both cases of high and poor ground material diversity in different spatial typologies. Thus, for example, even color diversity of the same material used at some spatial typologies at H.S.C recreational urban space, and material diversity in some spatial typologies at Châtelet-Les Halles recreational urban space, were observed to help children imagine fishing by the sea border and help another child create an island territory in the ocean.

Unlikely, at the Abassia residential zone, where its spatial typologies are characterized with poor diversity of ground material, several instances were observed, in which children invented and created various play activities on the appearance of new materials than what they were used to in the neighborhood, where children further expressed saying "*we wait the laborers who come and repair drainage systems, because they extract for us sand, as a new material, by which we can invent new games*".

Moreover, a balance between hard and soft surfaces provide a variety of textures and surfaces that seemed to allow an array of play options. Thus, observations in Cité jardins residential neighborhood suggested that the softer materials used, such as, natural grass cover and lawns, appeared to provide more cushioned surfaces for play and cooler surfaces for relaxing, gatherings, and discussing. Some children described the soft covered spaces, by stating "*a place where you can relax, read a story, and get away from noise*". On the other hand, the hard surfaces, such as, the asphalt observed at the Abassia residential zone spatial typologies and stamped concrete pavements used for the pathway network of the Châtelet-Les Halles recreational urban space spatial typologies appeared to afford and promote biking as well as playing with wheeled toys. While rubberized surfaces,

considered as semi-hard surface, observed at the playgrounds of Châtelet-Les Halles and H.S.C recreational urban spaces tended to encourage tumbling and acrobatic moves. Therefore, according to Samonsky (2007), spatial ground material diversity affords opportunities for social, physical, and cognitive development, through challenging the children’s capabilities of all ages and graduated levels of challenge. For instance, at Cité jardins residential neighborhood, playing with wheeled toys, such as, scooters, skateboards, roller skates, and strollers, was quite frequent, which tended to encourage children’s physical as well as motor development. In addition, these types of play activities were less frequently observed on the soft material, as grass or sand, which more likely tended to encourage energetic moves and social interactions that appeared to promote children’s social and cognitive development.



Figures 199: Examples of different ambient envelopes and experienced notions resulted by the high and poor diversity of ground materials

5.1.3.4. Topographic variability:

The concept of affordances (Gibson, 1977), also, helped in the interpretation of the impact of topographic variability on certain forms of play behavior that are less likely to occur in flat or limited topographic spaces, evolving children's different space preferences. This reveals that certain kinds of potentialities might offer a greater degree of freedom and more varied opportunities than others, (Figures 200). For example, the presence different ground levels seemed to permit children to step up as well as down, jump, and climb.

As emphasized in the literature, different levels increases the complexity of the play environment and tends to promote dynamic actions as well as forms of "functional play", which help children develop their skillfulness by enhancing the ability to perform actions that involve the hands, legs, and eyes together and overcome their fear through adventurousness behaviors (Fjørtoft, 2004; Wan and Zulkiflee, 2010; Zamani, 2013; El-Husseiny, 2016). Moreover, Cohen et al. (1999) agreed with Heng Zhang and Min-Jin Li (2010) highlighted that challenging complex environments seems to test children's limits. While, Hart (1979), Titman (1994), Cele (2004) and Armitage (2011) concluded in their qualitative studies that children are seeking out places and elements which stimulate them physically in challenging way by presenting opportunities for 'risk' and 'complexity'. One of these places is the elevated spaces with different leveled elements. Furthermore, Cele (2004) mentioned that other children search for a space to feel relaxed, peaceful, and quiet, most of the time these spaces are elevated ones. In accordance to Rasmussen (2004), most of these elevated places help in enhancing children's sense of privacy. Thus, for Sobel (1990), this type of places provides children with the feelings of security, privacy, control, and self-identity development as well as self-restoration (Korpela, Kytta, and Hartig, 2002).

The present study was found to be in accordance with these previous studies. The observed differences in the afforded play opportunities at the Cité jardins residential neighborhood and the Abassia residential zone spatial typologies, seemed further to confirm the role of topographic variability. As previously described, the Cité jardins residential neighborhood spatial typologies are characterized by noticeable varying ground levels through the presence of steps, slopes, stair flights, parapets, cliffs, lawns, ramps, and bridges. Observed play activities associated with the parapets and steps tended to involve sitting, stepping up

and down, jumping, climbing, as well as hiding. While, play activities associated with the slopes, cliffs, lawns, and bridges, appeared to frequently involve sliding, diving, and rolling. For example, one of the children stated “*this place has different levels, so we can jump, race, and sit up, to observe people activities in the whole neighborhood from above*”. Likewise topographic variability in the Abassia residential zone spatial typologies, it is characterized by the presence of stair flights, parapets, slopes, elevated manholes, ramps, and retaining walls. Observations further showed that variability in ground level seemed not to just promote “functional play” forms, but also tended to afford gatherings, additionally, such elements as the steps and the parapets were found also to promote the occurrence of “group play”. According to observations, groups of children were frequently observed to sit together talking, painting, singing, or even eating together.

As for the H.S.C recreational urban space spatial typologies, topographic variability is achieved by offering different ground levels, such as elevated or depressed terraces, cantilevered terraces, ramps, bridges, seating steps, stair flights, curbs, climbable gravel parapets, slopes, and brick bases. According to the observational sessions at H.S.C recreational urban space, one of the observed children was noticed repeatedly sliding down an artificial grass slope, imagining being on a slide that offer safe-risk. Thus, slopes and ramps had been suggested to stretch children’s limits through challenging them and to enhance their imagination burdens.

Unlike Châtelet-Les Halles recreational urban space, these types of play activities were much less frequently, since it is designed as a flat large recreational urban space including different spatial typologies that are designed as flat spaces defined with elevated parapets or encompass noticeable topographical elements, except for the playgrounds, which are designed with noticeable topographic variability, such as, depressed and elevated levels, ramps, bridges, and seating steps, and elevated concrete bases for sitting, where the playgrounds seemed to be associated with greatest level of “functional play” behavior, such as, jumping, climbing, hiding, sliding, diving, and rolling.

The above findings are relevant to what Tovey (2010) claimed, she highlighted that children in general are drawn to adventurous activities that include ascending height and speed, like climbing trees, steps, or sliding down deep slopes. She further elaborated that playing on elevated places, climbing up and being on top, provide children with a great

sense of pride and self-esteem. In addition, Cohen et al. (1999) discussed the rich opportunities for children's play and their development offered by the elevated places, according to the design, they could provide an environment for social interaction. Thus, according to the observational sessions at the Abassia residential zone, a group of children was challenging their abilities on the retaining wall, by climbing it inversely. They stated that "*we race ourselves by taking big steps and run to the wall there*", and a boy added that "*it is hard to climb up but my friends and I, always do it*". Hence, for instant, this retaining wall appeared to provide children with complex challenges and to encourage them to compete.

Topographic variability tended to provide stages of accomplishment, which seemed to provide children with a sense of pride, when they meet their challenges, as it had been suggested to send them clear signal of achievement. This concept was further emphasized through the children's drawings and discussions, where one of the participated children quoted that "*this is my home, I drew myself up, overlooking the whole neighborhood, on top of everything*". These words "on top of everything" were repeated by several children in both neighborhoods, which highlighted how elevated spaces offered children the sense of control over the complex surrounding environment. Others quoted that "*here I feel I am the prince of the world, this space I call it my home, it is mine and from which I control the whole neighborhood*". Children showed preference in occupying high places, which appeared to provide them with the sense of ownership. Accordingly, one of the participating children stated that "*this stair flight is one of our favorite places in the neighborhood, from up here, you can see the whole world*", while explaining the viewed landmarks. Therefore, children seemed to depend on themselves and to build strong believes in their abilities by climbing up the structures and doing physical challenging moves. They seemed to do that fearlessly after several times and consequently to build self-confidence, where a child declared comparing capabilities to others, stating "*it is difficult for other children to climb up and sit on this bridge but my friends and I, are capable of doing it*". Accordingly, levels tended to provide children with diversity in perspectives and views, as Marc Armitage (2011) and Cohen et.al (1999) discussed that children like to climb and reach heights where they can gain a 'new perspective' of their surroundings. Moreover, according to the fieldwork, ground level variability was often perceived by the

participated children to be attributed with a very wide range of creative meanings. Thus, choosing places that are depressed below street level, elevated, walled, or surrounded by few vertical elements tended to territorialize children's play zones and to develop the notions of "up" and "down". Therefore, topographic variability appeared to promote the imagination, creativity, and competition in play and consequently contributed to the occurrence of "dramatic play", "games-with-rules", and social interactions. For instant, a child interviewed in the playground of Châtelet-Les Halles recreational urban space, imagined flying like a bird, while crossing a bridge over a depressed ground part. The child explained that the ground was so far away and further described his feelings by stating "*I feel like flying birds and the ground is beneath me*". It was, also, observed that children showed preferences to steps and considered steps as multi-functional elements, where children explained "*We like to sit here down the stairs 'as if' we are audience in a theatre, some of us are pretending up on the stair landing and others are watching*". As another example, one of the participated children at Abassia residential zone, was observed to repeatedly slide down the retaining wall pretending that he was sand surfing a mountain in a military mission.

Moreover, children of both urban categories, recreational and residential, used words indicating heights, levels, and topography, while searching for solitary places, for privacy and getting away from others intrusion as well as distraction. This was clear in their drawings, which presented some of cliffs, stairs, retaining wall, and tree houses, besides during the discussions, some explained "*when I am upset, I sit alone on the top of stairs, I feel relaxed and free away from people supervision, especially at night the lights are adorable*".

Therefore, topographic variability seemed to be associated with some risks and dangers that face children, and appeared to stimulate them to deal with it and to think properly about problem solving. For instance, Châtelet-Les Halles recreational urban space, some children were noticed to feel unsafe using the monkey bars in the adventure playground, so they thought out a solution for that and brought sand as well as mud to spread underneath the structure, in case they fell down, to be safe. Consequently, climbing up structures and playing above bridges, tended to teach children a lot of principles, and scientific as well as

mathematical issues. Children seemed to learn more about heights and numbers, by counting steps as they went up or down.

According to the executed fieldwork documentation, children appeared to prefer spaces that afforded them the complexity of real world, provide them with stages of accomplishment. Since elevated places helped children to stretch their limits by challenging them, in order to compete and climb them. Thus, diversity in levels had been suggested to create challenging play experiences that provide high degree of complexity and risk.



Elevated elements helped children to develop the notions of 'up' and 'down'

Cité jardins neighborhood, Le Plessis Robinson (92), France



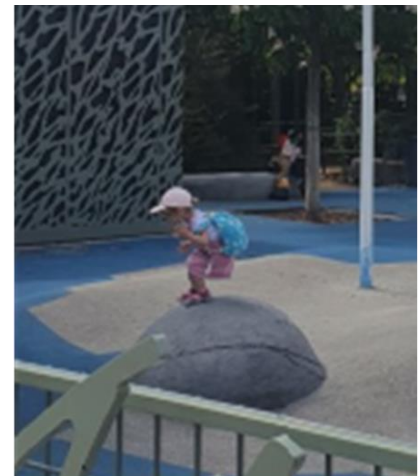
Elevated elements appeared to present opportunity for 'risk' and 'complexity'

Abassia residential zone, Cairo, Egypt



Elevated elements seemed to challenge children's capabilities and to enhance risk-taking

HSC recreational urban space, district of Heliopolis, Cairo, Egypt



Diversity in levels appeared to challenge children's abilities

Châtelet- Les Halles recreational urban space, Paris, France

Figures 200: Examples of a great degree of freedom and varied ambient envelopes offered by topographic variability

5.1.3.5. Presence of Urban spatial features:

As previously described, the Cité jardins residential neighborhood spatial typologies encompass a high presence of different urban spatial features, such as, landmarks; sculptures; interactive features, as water jet and lakes; and flexible natural material, as mud and wooden chips; but limited amount of loose elements. On the other hand, Abassia residential zone spatial typologies feature large amount loose urban spatial elements, such as, leaves, coins, tires, ropes, sticks, bottle covers, plastic bottles, flexible materials, and natural loose materials, while both neighborhoods feature the presence of different types of vegetation including shrubs, flowery plants, palm trees, large shading trees, fixed urban seats, and pergolas.

As for the H.S.C and Châtelet-Les Halles recreational urban spaces, their spatial typologies are characterized by standardized design to achieve safety, though H.S.C recreational urban space has more flexible urban spatial features that offered a greater opportunity of freedom in use. Both recreational urban spaces are characterized by the presence of different urban spatial features, by the presence of elements stimulating senses, as natural loose materials e.g. mud, and water jets or falls; interactive features, such as, sculptures and landmarks; different types of vegetation, e.g. including shrubs, flowery plants, large shading trees, and greenery plants that provide relatively large shaded areas; urban seats, and pergolas. According to this study, the presence of different urban spatial features in the above different spatial typologies of the residential neighborhoods and recreational urban spaces, afforded different play behaviors, perceptions, lived ambient experiences, and resulted experienced notions, (Figure 201).

In the four settings of study, the following notes were found common that appeared to confirm the findings of relatively large number of studies, which had investigated the associations of different play behaviors with different urban spatial features (Wardle, 2000; Fjørtoft & Sageie, 2000; Fjørtoft, 2001) and natural elements including vegetation (Moore & Wong, 1997; Burke, 2005; Kuh et al., 2013). These studies tended to emphasize that the presence of these features, especially the vegetation elements helped to create stimulating and challenging play environments for children and to promote forms of play that contributed to the improvement of motor skills, balance, coordination, and general physical children's development (Fjørtoft, 2004). For instant, grassy areas are the places, where

children appeared to feel comfortable, to run as they don't fear falling down, to get hurt while playing ball games or hide and seek. Nature seemed to teach children a lot of experiences that could not be substituted by manufactured environments (Wike, 2006). Moreover, according to observational sessions, playing with fine particles like sand or mud, tended to enhance hand and finger co-ordination, where children practiced skills of handling the small objects and using their hands, fingers, as well as eyes, developing their fine motor skills. Especially if children added water to their combinations, these mixtures could offer a lot of choices and opportunities for creative conducted mixtures with their hands, besides, soothing emotions and providing rich, as well as tactile experiences. Therefore, 'loose fine parts' seemed to be vital to foster "construction play", "dramatic play", social interactions, and experimentation with physical properties.

Regarding the natural elements and vegetation elements, a large amount of vegetation was observed to associate with "functional play", at the four settings. In particular, children were frequently observed climbing up and jumping from trees. Additionally, the presence of shrubs and trees, seemed to increase the complexity of the surrounding urban environment, to stimulate curiosity, and to promote "exploratory play" behavior. According to observations, these vegetation elements were often used by children to shelter and hide from each other. Moreover, the presence of vegetation tended to promote imagination and creativity. For example, a group of children was observed using tree leaves to prepare lunch "molokhia", a traditional Egyptian meal. Others mixed water and mud to prepare chemical experiments. In sum, not only the presence of vegetation tended to afford various forms of "function play", but it also appeared to promote "dramatic play" and "constructive play". Thus, trees had been suggested to act as attractive elements in children's play environment, that were frequently highlighted in children's drawings, interviews, and through observations. Children had also positive responses towards trees in the interviews, they liked trees for their shade, and because they can spin around it. Moreover, children had some preferences for the trees they liked, some asked for a big trunk, and short trees, with bright clean leaves. A tree can engage children for long time with different forms of activities, as described by one of the children at Châtelet-Les Halles recreational urban space, "*we climb it, hide behind it, swing and sit on it, and sit under its offered shade*".

In addition, the presence of large amount of vegetation are related to create shaded areas, which seemed to be obviously important in hot climates, as the case of Egypt; particularly during the hot seasons. Accordingly, it was noticed that at Abassia residential zone, where there is less amount of shading than H.S.C recreational urban space, very few children were observed to play in the neighborhood during the day times in summer, than at H.S.C recreational urban space, where there is large connected shading trees that provide large shaded areas. Consequently, larger number of children were observed to play there, during the day time in summer. In general, shaded areas were observed to attract and to promote relaxation, gatherings, group discussions, and other forms of “group play” (Wan and Zulkiflee, 2010; Christidou et al., 2013). In addition, shaded areas appeared to promote higher play concentration.

Concerning Châtelet-Les Halles recreational urban space, the vegetation elements, as trees, plants, flowers, and grass, were the most popular elements mentioned during the interviews with children, more than mud and water play. Some children mentioned watering plants, smelling flowers, and other activities like climbing trees as well as running on grass, as their preferences. Unlike some children, who were interviewed at H.S.C recreational urban space, they mentioned that they didn't prefer playing with natural elements, where four children expressed words like ‘messy’ and ‘dirty’, related to their play with natural features. In general, according to fieldwork documentation, nature and natural features seemed to have a powerful incidence in children’s play world. For children, nature appeared to be a stimulator and experiential place that offered a lot of opportunities for play, not like adults, who generally perceived nature as background for their activities.

As for the interactive features, observations are consistent to the idea of ‘ambiguous playgrounds’ introduced by Cohen et al. (1999), who further emphasized that the designer should include objects that could be freely interpreted by children to enrich their imagination and creativity. In addition, he further explained that providing loose objects tend to promote dramatic acts and pretend play. Observations in the four case studies, revealed that children’s play seemed to be stimulated by the variation offered by different urban spatial features. Thus, children showed preferences to places that had various elements stimulating their play like landmarks, sculptures, fences, low walls, recesses, projections, urban seats, pergolas, and kiosks. These elements were perceived by them as

multi-functional elements that they used differently in every new invented situation. Such elements were the focus of children's play in their space, as they tended to promote dynamic action, to stimulate children's imagination, and to enhance their curiosity as well as their sense of exploration. Thus, gates and fences can afford opportunities for creating sense of place that seemed to target children's imagination and creativity. They helped to provide children with opportunities for artistic expressions, magical transitions from one space to another, and a playful sense of entry. As for the free parts, they appeared to promote certain children's activities including, carrying heavy objects, and handling tools. These skills had been suggested to develop children's physical skills and to stimulate their muscles as well as their fine motor qualities. While children used the fixed spatial features in the urban spaces in different ways, for instant, they stood on urban benches pretending to be a plane or a bird in the air that was not touching the ground. They sat and arranged urban seats imaging to be on a 'train'. They also played with the shadow rhythm of columns, or they climbed the wooden studs of pergolas, in order to challenge their fitness, where a child described playing with the pergola as "*I am dancing with the bar's shadow of the pergola while playing*".

In addition, during observations, it was noticed that recesses of building pockets at Abassia residential zone, were also used as multi-functional elements, children used these recesses as challenging spaces for hiding to observe without being observed. In addition, children perceived these spaces as intimate small-scaled spaces, where they tried to fit in. Some children described these recesses as "*a place where no one can see you, but you can monitor all*", others revealed that "*these are our secret zones, here we are free, we do what we want to do, listening to music, chatting, reading, none of the parents see us, it is our own space*". While some girls also stated "*in these places we get away from the boy's noise and stress, since boys occupy most of the alleys for playing football*".

Consequently, it was clear in all case studies that playtime was full of activities and movements, as children rushed and flew from place to another. While, sitting seemed to provide opportunities for time out, in order to reflect, or to socialize. Additionally, sculptures and landmarks were described by children as artworks that can make urban spaces perceived by them as alive place. Landmarks can figure children's mental map, as interpreted by Lynch (1960) in his famous book of "The image of the city", and can also

allow the creative abilities of children. To conclude, the concept of appropriation and re-purposing of the different elements into ideas for play chances seemed to be also an important aspect that appeared to stimulate children's play. Moreover, these above mentioned skills helped supporting social skills, sharing, and co-operation (Korthals, 2013).

Concerning the loose elements, Wardle (2000) suggested that the presence of loose elements tends to promote "constructive play". In addition, Simon Nicholson (1971) interpreted the theory of 'Loose Parts', by explaining that "*In any environment, both the degree of inventiveness, creativity, and the possibility of discovery, are directly proportional to the number as well as kinds of variables in it.*" (Nicholson, 1971, p.31 cited in Hart, 1979). Literature described loose parts and free objects as the most flexible and manipulative of play opportunities. Accordingly, the designer should provide children with opportunities for fantasy play, arrangement games, individually or in groups (US Army, 1988). Previous studies showed that children and young people, prefer to play with these flexible parts, such as, sticks, movable furniture, ropes, and boxes, more than traditional toys and play equipment, because they can use their imagination and have greater control in their play. At Abassia residential zone spatial typologies, a large amount of flexible loose material was observed, with no standard regulations to use, such as old tires, bricks, ladders, water hoses, unneeded home items, bottles, tanks, wooden boxes, ropes, coins, sticks, bottle covers, and plastic bottles. Availability of such loose tools in Abassia residential zone, seemed to encourage children to create and invent their own objects for play. Children highly preferred elements that were flexible in form and uses. They further described how they invented play equipment using all these materials. For example, a bath tub was one of the most attractive elements in the neighborhood, where its form appeared to encourage children to physically interact with it, specifically jumping into it. It also tended to enrich their imagination, where it was confirmed by one of the children's quote who stated "*I sail daily with my friends in the canal, and the captain is changed by turn. Look! We also try to protect this red flower in the tub from any harm while playing*".

Consequently, children seemed to perceive such elements as flexible ones, not with a one fixed purpose, but it was changeable according to their own ideas and imagination. For instance, children can roll tires around them, sit in them, or ride them. Children can use old

tires, a thick rope and cement to fix it. These elements with different design ideas appeared to stimulate children’s play and to attract them to interact with these elements physically. Therefore, availability of loose tools helped children to enhance their creativity and to give them more possibility for innovation. According to observations, children seemed to experience these loose tools, by trying to manipulate them to satisfy their own needs and ideas.



Figure 201: Examples of different play behaviors, perceptions, lived ambient envelops, and experienced notions afforded by different urban spatial features

5.2. Conclusion

In this chapter a foundation for the thesis was provided, in order to understand how children and places are implemented. Nowadays, cities have lost accessibility, security, and intimacy, where there is no opportunity for children to create their own play spaces (Chawla, 1992; Punch, 2000; Freeman and Tranter, 2011). Children, in modern societies, are not able to determine their access, neither to invent their own play spaces, since their

lives are scheduled, supervised, and controlled in different scattered standardized islands on the map of the cities. Adults think there is a form of proper play, therefore, they are limiting children's play into designated settings, while children seemed to prefer hideouts and leftovers in the cities. They showed preferences to places that allow them to explore and create their own places for play (Titman, 1994).

Play is children's manner of experiencing and exploring spaces, through dealing with the geographical environment that aides children to differentiate the attributes and the meanings afforded by it. Moreover, children have their own way of seeing, thinking, feeling, and expressing. Thus, their perception of a space is not common to adults, as they use all their senses in experiencing their places. Children's experience is built from their eyelevel, based upon color, sound, odor, texture, scale, movement, and form, of the surroundings. Children don't comprehend a place by standing and looking at it, but rather they perceive the place through actions; by using it, moving around it, observing it, and reshaping it, thus, through their lived experiences. Therefore, conceived and designed surrounding environment acts as big sensory Exploratorium for children.

The above is consistent with Titman (1994), who interpreted that children perceive their environments through a variety of environmental transactions, as reflections of their own needs for 'being', 'doing', 'thinking', and 'feeling' simultaneously. In accordance to Titman's interpretation (1994) and study observations, children's seemed to respond to spaces according to their potentialities. They might see a certain afforded potential by a specific landscape aspect, in one of the spatial typologies, which may seem useless to the adults, but had certain spatial qualities in children's eyes, (Figure 202).

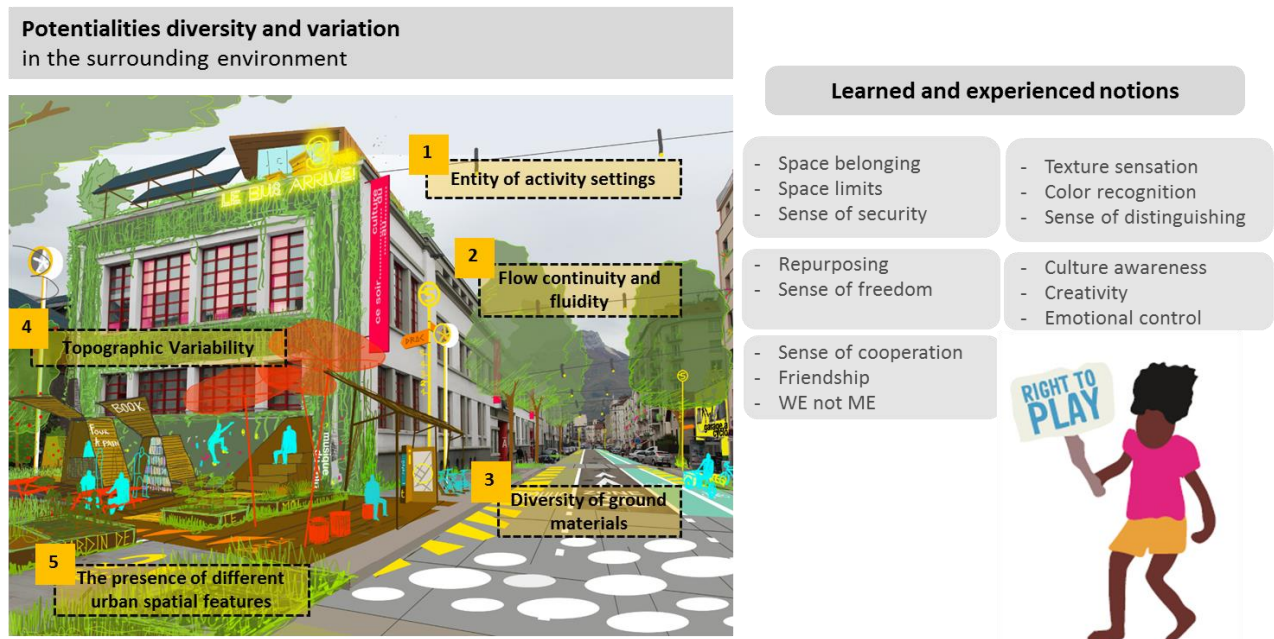


Figure 202: Different experienced notions enhanced by the suggested potentialities

The above interpretations relied on the concept of affordance, which developed a language for studying the meaningful features of the environment. According to the fieldwork sessions, the features of a place were perceived by affording multiple uses for children's play. The direct bodily interaction with the conceived place resulted from children's curiosity and exploration. Moreover, play was found to be central to children's perception of a place and lived experience. Thus, the conception and configuration of space seemed to provide children with the largest number of opportunities, and each feature in the space appeared to have different influences on children's developmental skills, according to its perceived affordances. For instance, trees were perceived offering multiple affordances and opportunities for physical activities rather than being independent objects, such as, climbing, hiding, spinning, swinging, or making a den. Thus, trees simultaneously tended to develop social skills like taking turns, accepting rules, feeling pride in accomplishments, or just creating a place underneath to sit in the shade with others enhancing social relations. In addition, trees might also enhance children's cognitive skills such as, first-hand experience with nature, recognizing the differences in colors, sizes, and species.

Regarding sand, mud, and water, they were found to be highly related, since together they seemed to create opportunities for children to use their hands and to develop their eye-hand co-ordination skills, during building a sand fortress or mixing up a sand cake, that tended

also to enhance social “group play”, building new friendships, and cognitively developing their creativity, through decision making skills, training their mathematical thinking, scientific reasoning, and problem solving.

Whereas grass, greenery areas, and other natural features, appeared to provide children with more opportunities to practice their physical skills, since they might offer large spaces to run around, play ball games, hide, crawl, jump, and roll, in addition to other social and cognitive benefits. Moreover, playing with animals had been suggested to enhance physical and cognitive development chances, in addition to provide a rich social environment, where children socially tended to develop their emotions, relations with peers, and with other creatures. As for, rocks, wood, boulders, and other rough features, were found to offer physical opportunities, in addition to social and cognitive ones.

In conclusion, these associations helped in confirming that children do not perceive the conceived environment entirely, but tended to classify it into potential affordances, which might be perceived as collections of signifiers, based on the culture and background, in order to be used and shaped by the children, to accommodate their needs creating specific lived ambient envelops. This interpretation raised by the study, seems to further confirm the concept presented by Spencer and Blades (2006, p.1), who stated that “*environments of children are not necessarily the environments for children*”. Consequently, this concept sheds the light upon one of the messages of the study, which is to develop a design approach for conceiving child-friendly environments that help in accommodating more creative ideas and a more interesting experience.

Following the literature discussions, fieldwork investigations, and case studies cross-readings of selected daily urban spaces, it seemed that some proposed guidelines could be taken into consideration that might help in designing the daily urban spaces. Thus, giving more attention to children's play spaces' design in the communities, based on the five suggested potentialities, in this study, tended to enhance the construction of spatial qualities through promoting main children's behavioral themes. These behavioral themes had been suggested to help in fulfilling children's priorities, developing children's skills, creating attractive engaging play settings, and designing a beneficial play experience for children (El-Husseiny, 2016), (Figure 203). The four behavioral main themes are introduced in this study as follows:

“Community presence and identity”; “Challenge”; “Territory”; and “Exploration and Manipulation”.

However, from a critical point of view, classifying the proposed spatial potentialities in the suggested categories, might be questionable, since sometimes during the experience ethnographical observations, they were in conflict to each other.

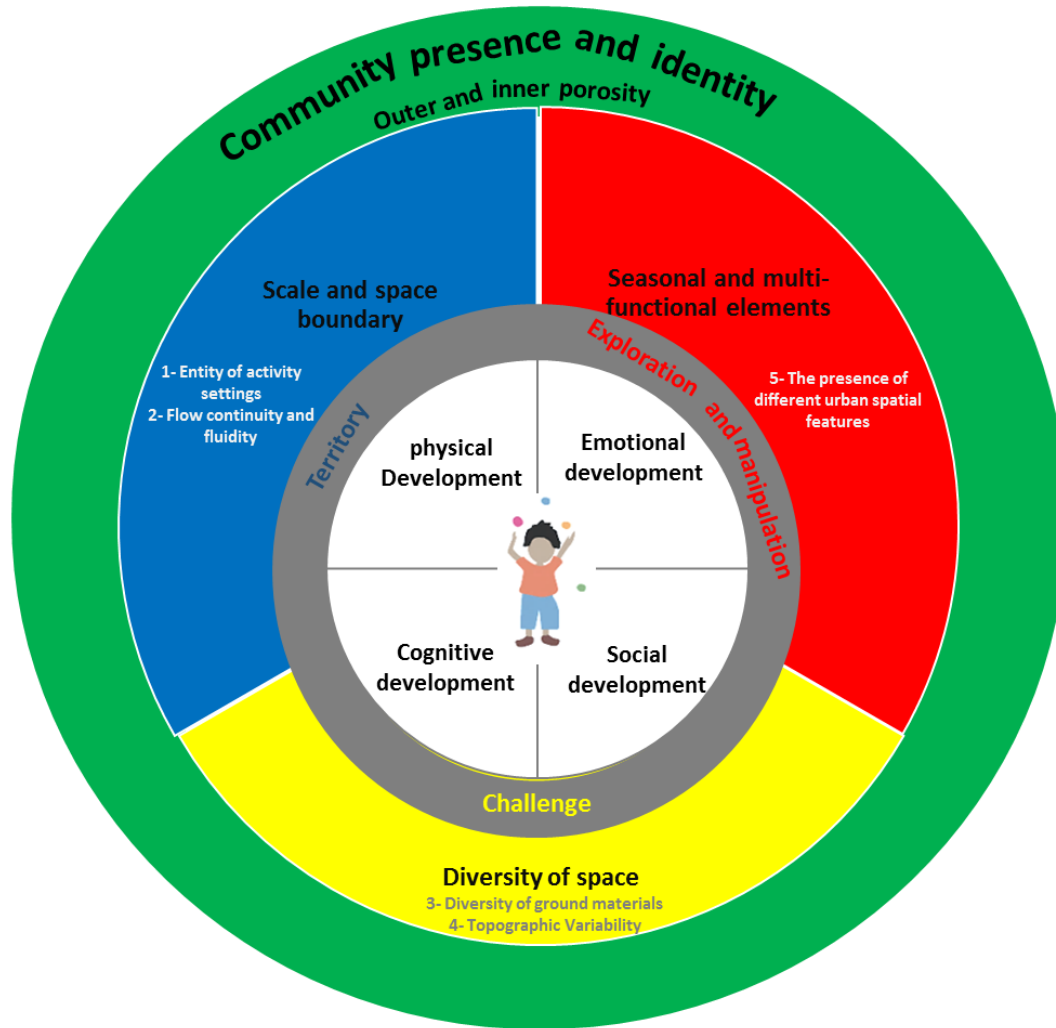


Figure 203: The main behavioral themes reposed on the different development aspects presented in terms of attractive engaging settings according to children’s priorities

The main behavioral themes, presented as community presence and identity, exploration and manipulation, challenge, and territory, seemed also to fit with the literature presented by Wohlwill and Heft (1987), Ackerley (2003), Corsaro (2005), Armitage (2011) and Richard Dattner (1969). Richard Dattner (1969) explained that the environment for

children must be, to a significant extent, under the control of the children themselves, (p.137). Furthermore, Wohlwill and Heft (1987), stressed on the importance of children's control over their environment, through object manipulation and environmental exploration. As for Corsaro (2005, p.134), who stated that "*children experience of control in play, felt in climbing or jumping (heights), in the meeting of challenge, and getting away in taking risks*". Moreover, Ackerley (2003), added that children have to feel that the space they play in, is owned by them, and thus, controlled by the children themselves.

Reposing on the above literature and the four introduced behavioral themes by the study, a scope might be opened in order to create an engaging settings within the cities for children, which could accommodate their priorities, needs, and diversity, through proposed guidelines and an introduced design approach.

5.3. Design approach

In this sense, based on the deduced conclusions, it was clear that children are one of the main members of daily urban spaces, who are exposed to more constraints and prohibition, due to the controls of adults and designers, who provide children with limited and static play opportunities. Thus, it is important to highlight that children have spatial rights in daily urban spaces, like adults. In accordance to Lynch (1987), who defined five basic dimensions of spatial rights, which he considered as essential for a good city conception that can also be, adapted to explain children's spatial rights, presented as, vitality, sense, fit, access, and control. These rights are based on the contents of the city image, referred as the physical forms conception, which Lynch (1960) further classified into five types of elements: paths, edges, districts, nodes, and landmarks, in order to allow individuals to form clearer perceived cognitive maps of the space, to facilitate information processing, to increase predictability, to enrich certain lived experiences, and to enhance perceptions of control.

In assumption, overlapping the study's fieldwork and previous literature, helped in elaborating the resulted ambient envelop from filling the gap in-between the three levels of space, conceived, perceived, and lived, and merging them together, through highlighting the above main behavioral themes or goals that might help in fulfilling children's needs during play by extracting some key spatial qualities and ingredients. These spatial qualities

seemed to be achieved by the presence of the different proposed spatial potentialities and the configurations, which tended to enhance some children’s notions linked to their different aspects of development.

Accordingly, a design approach is introduced through this study, which is innovative with the suggested spatial potentialities. These spatial potentialities are clustered to construct key spatial qualities in order to conclude a number of “Cs” environment/behavior affordances ideas (i.e. Compatibility, Context, Connectivity, Clarity, Chance, Competency, Change, Control, and Complexity). These nine “Cs” appeared to contribute in promoting the above stated main behavioral themes, through enhancing certain notions, based on provoked senses and experiences. This approach might further encourage different aspects of children development and might help in fulfilling their spatial rights, (Figure 204).

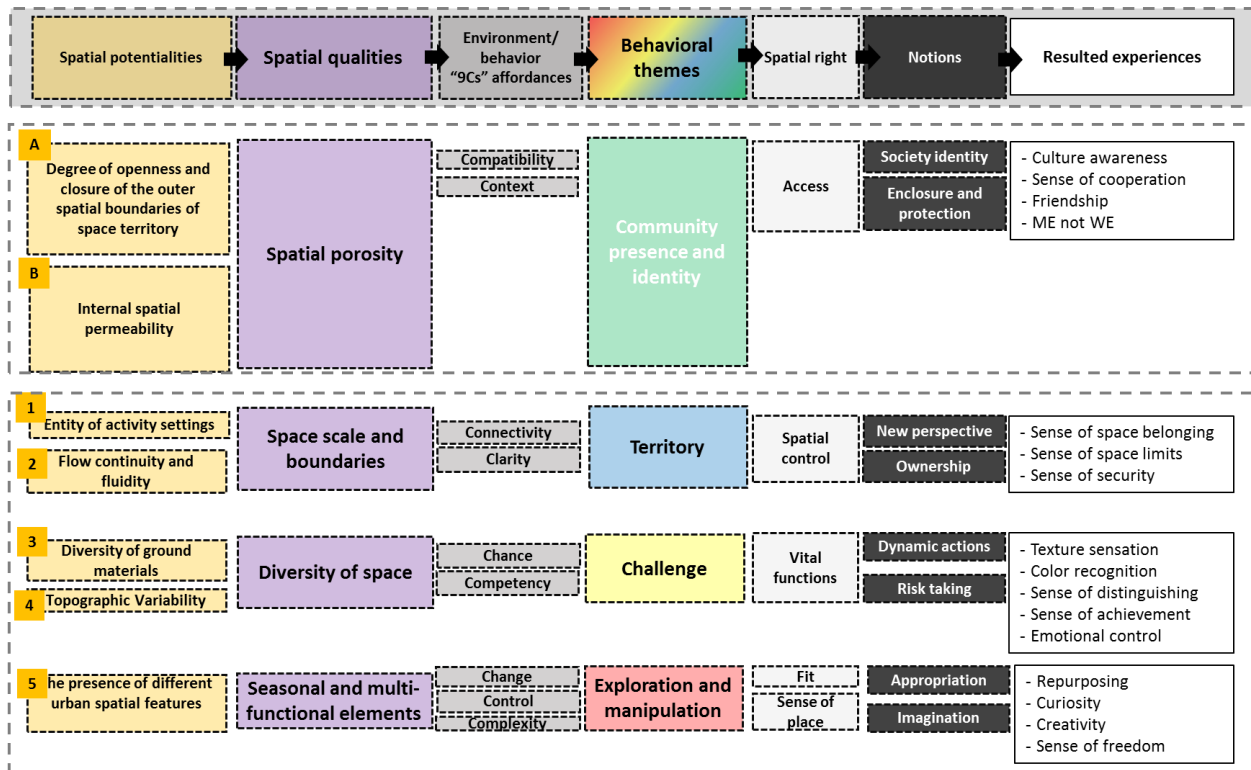


Figure 204: The extracted key ideas and qualities relying on children place preferences

5.3.1. Spatial porosity, community presence and identity

Spatial porosity as a spatial quality could be accomplished by both potential levels of the degree of closure and openness of the outer spatial boundaries of the space territory, or the inner degree of permeability between the included different spatial typologies, which

seemed to remain the best solution for children to perceive the “*compatibility*” and the “*context*” of the urban space. Accordingly, visually connected spatial typologies contribute to the sense place and to the interior ambiance of the urban space as whole. Children seemed also to appreciate views afforded by the location of the play space that adults might do not.

Since play is about participants wallowing in ideas, feelings, and relationships that involves reflecting on and becoming aware of what we know, or ‘metacognition’, therefore, the degree of closure and openness of the outer boundary of urban space territory, might help children to build the overall context character of the urban space, while playing, by linking the inside to the outside, such as, the surrounding architectural style, the sense of the surrounding district distinctiveness, and the urban fabric integration. The context character refers to the overall feel and design intent, explained as the degree of transparency between the urban space itself and the surroundings (Herrington and Lesmeister, 2006). The character of the context or “overall feel” of the urban space might contribute in forming memories, learning classification skills, identifying concepts of scale, and using a language to describe these experiences; even humor. In addition, according to Jacobs (1961), who explained that the quality of a space depends on its openness and the inside cones of visibility that open on and from the space, which permits accessibility to different users (children, parents and passers-by) and diversity in their possible uses. The porosities organized between «inside» and «outside» effect inducing a visibility of the activities from and towards the space, illustrated as multiplying “street eyes”. In addition, the sites are delimited by a fence enhance the sense segmentation and functionalization.

Thus, views of the city tended to captivate discussions among the children and to create a bond between the children’s play space and the surroundings. Consequently, these are developmental milestones that can be directly supported by the physical environment.

As for compatibility, it refers to the small world of the space itself, where high permeability between the included spatial typologies, seemed to enhance the feeling of inside breathe and visibility. There is a greater degree of freedom appeared to offer to the children, once they are able to move freely in different ways. It was clear that compatibility allowed children to enjoy observing, especially the adults. Accordingly, spatial porosity as a spatial

quality might be responsible for enhancing the behavioral theme that ensures the presence of the community and its identity (Shaw, 1987).

Behavioral theme A: Community presence and identity

As Lynch (1987) stated that the simplest form of space character and context is the strong sense of community presence through its ‘identity’, which was defined as the extent to which a person can recognize or recall a place as being distinct from other places. According to the study, children showed preference to places, where they can distinguish its identity, these places allow creation of society and culture awareness. This was consistent with the findings of Lynch (1987), who referred to this as ‘access right’ that encourage the presence of children in the outdoor environment. Moreover, according to Carr et.al. (1992), a simple way of conceptualizing access is in terms of its three major components; physical access, visual access, and symbolic access. These components help in enhancing the notions related to ‘enclosure and protection’.

Physical access, is where the space should be physically available to the public. Limits to physical access can be in different forms, such as, gates, signs, gatekeepers, and streets, it etc., which defines the outer boundaries of the space territory. Concerning the visual access is also important for children, in order to feel free to enter a space. As for the symbolic access, it is another type of access, which is about the presence of cues, in the form of people, or design elements. Both visual and symbolic, could define the inner permeability of space. Therefore, children’s restricted mobility, seemed to mean for them that they are locked in their play settings. Consequently, without the ability to move freely in the surrounding environment, children might not access new places to explore. In addition to their spaces that lack complexity and the activities are already predetermined by the playground and schoolyard design. Thus, according to Punch (2000), those children tend to experience a ‘protected childhood’. Furthermore, Karsten (2005) added that they experience their world from the window of the car, and named them the ‘back seat generation’.

5.3.2. Space scale, boundaries and territory

The environment and the behavioral aspect of “*clarity*”, concerning the space boundaries and scaling, as a spatial quality category, could be achieved by assembling the entity of space potentiality as well as the flow and the fluidity potentiality experienced within the

space. This spatial quality combines both physical legibility and perceptual image. It indicates to the physical, visual, and cognitive “connectivity” in the space itself. “Connectivity” is physical. However, it seemed to activate cognitive development, such as the way a hierarchy of pathways can orchestrate movement in a play space, which helped children to understand more the surrounding space. Therefore, according to observations, single whole spaces with clear entry and exit points, tended to prevent mental map confusion, since children appeared to have no difficult time maintaining play, involving movements, such as, tag or imitative play, because the space is not divided into disconnected peripheral spaces. Thus, unifying the urban space was suggested to unify the play experience, where early childhood educators noted that this type of configuration do not interrupt the view of the entire space (Branzi et al., 1998).

While variable sized defined sub-spaces seemed to accommodate different numbers of children with different uses, and thus were perceived by children as different intimate private spaces. These private spaces seemed to be crucial to development, since they allowed children to behave according to their mood; to provide children with opportunities to explore their feelings and their inner confusion they preferred not to reveal to others; and to significantly increase the time spent engaged with the play behavior in the sub-spaces. Consequently, included sub-spaces had been suggested to require some protection from unwelcome and uncontrolled external disturbances (Moore, G., 1986). In accordance to Moore and the observations, children seemed to need spaces to get away, to be on their own, or in pairs, or grouped together. These spaces that allow children to be alone appeared to be particularly important.

Moreover, during free flow of play, technical skills, mastery, and competence, seemed to be of concern. Activity routes were found to accommodate different forms of mobility and to achieve connectivity between the subspaces. A hierarchy of activity routes with dominant paths for multi-purposes seemed to give children the opportunity to explore more the space at different speeds, to clarify boundaries, to mark territories, and to define their decisions. Thus, according to Lynch (1960), he further explained stating: “*Transit lines are the channels along which the observer customarily, occasionally, or potentially moves. They may be streets, walkways, canals, railroads. For many users, these are the predominant elements in their image. Users observe the city while moving through it, and*

along these paths the other environmental elements are arranged and related” (p. 47). In this study, play was sometimes observed to be characterized by aggressiveness behaviors, especially, at sites that had no defined activity routes in their spatial typologies. Consequently, scaling of spaces through clear boundaries and organizing flow might highlight, for children, the territory, as behavioral theme.

Behavioral theme B: Territory:

Consistent with the findings of Lynch (1987), Chawla (1992), and Chatterjee (2005), during the held fieldwork, children showed preferences to places where they can mark up their boundaries and reveal the notion of ‘ownership’. These places seemed to allow creation of identifiable territories and to enhance the notion of ‘new perspectives’.

Lynch (1987) elaborated that the space and the behavior associated with it, must be regulated. While using the space to manage personal interchange and to assert rights over territory, in order to conserve resources, the users exercise controls over pieces of ground. He further explained that ‘spatial controls’ have strong psychological consequences, such as, feeling of anxiety, satisfaction, pride, or submission. The dominance and control of some groups on minorities or on other groups with special needs, may cause the feeling of exclusion.

Architectural entity of defined space, constituting of multiple behavior settings, seemed to be significantly related to specific behaviors, such as, the amount of engagement in developmentally supportive activities, for instant the “exploratory behavior”. Considerably, more engaged or immersed behaviors with little or no time spent watching other activities or being interrupted, appeared to occur in architecturally well-defined multiple behavior settings than in single behavior settings. Similarly, considerably more “exploratory behavior” tended to occur in multiple well-defined settings than single defined ones. In addition to cooperative behaviors, that were found to occur most often in well-defined multiple settings, as well as competitive behaviors that seemed also to be related. The fact that according to literature, single settings were named as 'resource poor settings', with a relative lack of materials as perceived by children (Smith and Connolly, 1980).

As for the degree of flow and fluidity, consistent to Lynch (1960) explanation of the transit lines, observations tended to identify the degree of mobility that seemed to have a direct

impact on children's experience of place and place preference. Children, who have freedom in encountering their space, appeared to create new affordances and multiple perspectives of the space. Therefore, each place that afforded certain qualities, had been suggested to enrich certain children's experiences and attract them to different play opportunities to get more engaged (Herrington and Lesmeister, 2006).

5.3.3. Space diversity and challenge

Grouping the topographic variability and the ground material diversity potentialities, might offer children, diversity in the surrounding environment, as a spatial quality, which had been suggested to be considered as a fertile environment to develop emotions of independence, pride, conquering fears, taking risks, and self-confidence (El-Husseiny, 2016). This spatial quality seemed also to provide a suitable environment for social interactions, discussing ideas with peers, playing in groups, negotiating, and taking turns. In addition, it seem to help practicing many cognitive skills, problem solving, decision-making, creativity, and getting familiar with measurements, relations, proportions, sorting, classifying, as well as differentiating.

According to the observational sessions, topographic variability and ground material diversity tended to act as catalysts for "*competence*" and "*chance*" aspects. For instance, ramps intended for wheelchairs, created opportunities for balance; tunnels in playgrounds that were designed to be crawled through, were eventually walked upon; and a sandbox containing driftwood could be adjusted to varying heights by the children themselves, allowing them to test a multitude of skills. The following incidents appeared to contribute in describing specific developmental benchmarks of children and correlates them with simple design elements.

Regardless of design intentions, children tended to test the surrounding to the limits of their abilities. Topographic variability and ground material diversity appeared to provide competing environments that might refer to the physical and cognitive encounters, provided by play spaces. Thus, challenging children might enhance the potential of taking risks, without being hazardous, that seemed to aide children learn to their full potential. Consequently, the difference between 'hazard' and 'challenge' should be highlighted, while creating play settings. Moreover, the design should consider the involvement of the presentation of several levels of difficulty for each activity and should enable each child to

find an optimal level of challenge. Thus, variation in topography, tended to incorporate changes in height, to challenge the mind to assess competencies, and to go beyond perceived limits, to develop body awareness in space, and to build gross motor skills. These spatial typologies that were characterized by topographic variability seemed to be energetic. They seemed to promote fitness and health. Therefore, designing the urban space with chances to play on different heights might provide children with an interesting play experience, to conquer their fears, and to comprehend physical as well as mathematical principles. In addition, elevated places in the form of man-made structures or hills might provide an environment to see the world from above, to play underneath, to exercise climbing as well as sliding, and to offer opportunities for fantasy pretend play. Likewise, in this study, it was found that environments which lack of challenging elements, had found to be the primary reason for the increase in aggressive interactions and impulsive movements.

Furthermore, getting creative with color, pattern, and texture diversity could increase the aesthetics and playfulness of any space. Therefore, designed spaces should be suggestive, not prescriptive. Flexibility of use seemed to be important. A varied palette of surface materials in the play space can be a strong stimulant to a children's creativity and curiosity that might provide an array of play options. In addition, providing such graduated levels of safe risk-taking for different ages, stages, and abilities, appeared to help children build their self-esteem and confidence. For example, by offering several levels of accomplishment for each activity, such as, high, higher, highest, children can test their abilities, develop better decision making skills, and nurture their confidence of "*Yes! I can do this*".

Therefore, "*Chance*" was found to involve an occasion that allowed opportunities for children to challenge their capabilities, and to leave certain impressions on the space. The opportunities to play with space characterized with high ground material diversity and topographic variability might allow children to invent. This seemed to be extremely important to young children, who were mastering fine motor skills, had increased mobility, and were capable of inventing games.

In conclusion, "*competence*" and "*chance*" aspects, appeared to involve in stimulating spontaneous explorations that might enhance perceptual motor functioning, gross motor, fine motor, spatial awareness activities, directional awareness, balance, integration, and

expressive activities (i.e. moving, climbing, rolling, jumping, leaping, riding, hopping, skipping, balancing, hanging, grasping, clinging, swinging, lifting, pushing, pulling, falling down, stretching, stacking, carrying, and pouring). These aspects tended also to expand the children's cognitive understanding of their play spaces. Hence, considering the physical height of children, by realizing what they can, as children, see from their height; the sense of mystery that can be created by plant material, low walls, or terrain; and thinking of adding stepping stones to the design in strategic parts; might also encourage specific play opportunities and understanding of the play space. Therefore, spatial diversity had been highly suggested to enrich the challenge behavioral theme (Cohen et al., 1999; Armitage, 2011; Tovey, 2007).

Behavioral theme C: Challenge:

Based on children's space perceptions deduced from the fieldwork, children seemed to be attracted to places that provided competitive challenges and wide opportunities for risk. Challenge had been suggested to be one of the themes behind children's place preferences that tended to allow multiple opportunities for 'risk taking' and 'dynamic actions' (Moore, R., 1992). Cohen et al. (1999), Armitage (2011) and Tovey (2007) agreed that children's environments, should provide them with high degree of challenge, which can be achieved through offering competitive experiences.

Moreover, Lynch (1987) referred to challenge behavioral theme, by the degree to which the form of the settlement supports 'vital functions' spatial right and capabilities. He further explained that individuals seek out risks, in order to test themselves and enjoy danger. In this sense, children appeared also to like challenging themselves by taking risks, while playing. This was consistent to Moore, R. (1987), who stated, "*A hazard is something a child does not see; a challenge is a risk the child can see and chooses to undertake or not. Children need to take risks to challenge their skills and courage. A risk free play area is neither possible nor desirable*" (P. 10).

5.3.4. Multi-functional or seasonal elements, exploration and manipulation

It had been proven through literature, fieldwork, and cross-reading of case studies that adding urban spatial features in daily urban spaces seemed to be a play fortune, which tended to offer a diverse environment spatial quality, by differing either through function

or season. This spatial quality helped children to use their endless physical, social, and cognitive skills. The different urban spatial features can be integrated in the design in many ways, such as, trees, vegetation elements, recessed or projected elements, water features, sand pits, mud basins, and rocks that appeared to provide children with endless play opportunities (Podolska, 2014). Consequently, according to Herrington and Lesmeister, (2006), the design should accommodate different elements in the spaces that actually “*change*” themselves. Space should not only be composed of functional elements, but also, to be flexible over time, easily manipulated, and modifiable by children’s processes of self-learning. Whereas, each feature had also been suggested to influence children’s developmental skills differently (Allen and Marotz, 2000).

For instant, physical elements as benches, other urban seats, posts, parapets, or stumps, seemed to be perceived by children as multi-functional elements, which can be climbed over, or can allow children to pass through. They are elements that seemed to contribute to children’s developing sense of “*self-control*”, by engaging an intricate process.

Moreover, sand, water features, mud, gravel, as well as vegetation elements, are materials that can be shaped and are advocated by most of the literature. These features provide children with thorough experiences. For, example, plants and animals index change with seasons. In this study, children appeared to be interested in how things grow and change, which helped them to understand the sequence of daily events. According to observations, it was obvious that children had shorter time spans of play, where changeable environments were limited. Children seemed to have a great time playing with wild, exciting, and interesting nature, where they can also learn, while playing. It was noticed that children, who had the opportunity to interact with living organism, whether plants or animals as cats or dogs, described what they were experiencing to each other and to their early childhood educators. This verbal venting considered to be one of the first steps to literacy, and should not be overlooked, while considering plants as a part of the play space (Fjørtoft, 2004). It was also noticed during the fieldwork that plants seemed not only to modify the climatic conditions and to provide light shade, but also the flowers, seeds, and leaves tended to provide open-ended changeable play opportunities. In addition to colors, smells, textures, and visual changes that helped to mark the seasons and the environmental “*complexity*”. A

play space full of leaves, seemed to be like a playground of snow, it appeared to be an engaging and delightful raw material for play.

Therefore, multi-functional or seasonal elements can stimulate an uncountable variety of imaginative experiences that require more explorative behavior of the complex surrounding environment through controlling fine skills and manipulating play.

Behavioral theme D:. Exploration and Manipulation:

Consequently, exploration and manipulation of children's places had been suggested to be a core behavioral theme behind children's place preferences (El-Husseiny, 2016). In accordance to this study, children showed preference to flexible places that accommodated different patterns of play. They preferred places that can be 'appropriated' and re-purposed in various ways. In addition, they were attracted to places that afforded them new perspectives of their surroundings and enhanced their sense of exploration. They were attracted to places and elements that did not offer them readymade ideas. While, they showed preferences to places that enhanced their curiosity and stimulated their "imagination". Such places seemed to be opened to a wide range of interpretations and can be manipulated by children to satisfy their needs. Those flexible environments allowed children to discover and to create experiences of their own and thus helped to provide them with opportunities to manipulate their environment and to allow for exploration.

The theme of manipulation and exploration of the environment was discussed in previous core relevant studies. According to literature, it is an important theme that is mostly found in diverse and flexible environments, with less existence in encapsulated settings, such as playgrounds and schoolyards (Blinkert, 2004; Johnson, 2004). Moreover, Hart (1979), Chawla (1990), and Blinkert (2004) highlighted that flexible environments provide endless possibilities, which enhance children's exploration and discovery. Others found out that flexible environments offered children the ability to transform their place to something different, which gives them the ability to manipulate their environment (Moore, R. 1986; Titman 1994; Cele, 2004).

As Krohe (1996) explained, manipulability of the environment is the essential property of play behavior, he further stated that "*if the play environment is fixed, children can't manipulate the environment and adapt it to their needs*". Krohe (1996) further elaborated that if the 'fit' of a play environment does not match the needs of children, they manipulate

the environment depending on their expectations, and prefer to establish their own play environments. Coherent to Krohe (1996) and in accordance to this research, children might want to play in any space, which did not seem to be designed for play purposes; such as: streets, sidewalks, backyards, front yards, school yards, or incidental spaces, such as, front step of home, building under construction, or any open fields.

In this sense, the 'fit' spatial right, proposed by Lynch (1987), can be defined as the match between action and form in its behavior settings and behavior circuits (P. 151). Depending on the expectations and needs of the users, places were modified to fit ways of behaving, or behavior appeared to be changed to fit a given place depending on the components and constraints in that place. Therefore, 'change' tended to be an important dimension of successful public spaces. As Lynch explained (1972) stating that "*the ability of a place to evolve and change over time is an important quality of good environments*" (cited in Carr et.al, 1992; 169).

Change has a complex meaning, because it can occur in many ways. Children may want to alter and to manipulate the public environments to fulfill their needs and purposes. Thus, manipulability of the environment is the essential property for children play behavior in creating a 'sense of place' spatial right, depending on their experience and perceptions in that place, that stimulate information with a range of choices and experiences. In accordance to Hart (1979), who stated that "*a rich, sensuous world, full of diverse meanings and characterized by an unfolding order, is a fine growing medium, if the child is free to explore it and can at times withdraw from it into some quiet and protected place*" (cited in Lynch 1987; P.144). 'Sense of place' is a spatial right that seemed to be provided through immediate sights and stimulations, offering children opportunities to put the stimuli with variety of experiences in different places. As further explained by Lynch (1987), children make a 'sense of play space', which is distinct from any other public spaces, therefore play spaces should stimulate children physically, perceptually, emotionally, socially, and intellectually.

In conclusion, this proposed design approach might be considered as efficient solution for the needs as well as the spatial rights of children. In addition, it seemed to contribute to the continuity of play and play provision of today rapidly changing urbanism. Such guidelines, can be recommended as universal keys, in order to help in the conception of today's urban

environment, for the benefits of not only children, but also other generations. Therefore, relying on the above guidelines, as keys of daily urban communities planning, might aid in creating child friendly cities.

As outlined throughout the study, children might want to play anywhere and anytime, depending on the variety of information that stimulates them physically, perceptually, emotionally, socially, and intellectually. Consequently, it seemed to be difficult for designers to establish a standard quality of play and play provision. In accordance to Lynch (1987), the spatial dimensions of rights were determined as: vitality, sense, fit, access and control, which simply specified that children should not only have access to a public space, but also have freedom to use, change, and even claim the space, as well as to transfer their rights of use and modification, like other individuals. In this sense, Lynch's spatial rights provide an effective measurement of how today's children's rights are restricted in the outdoor environment. Thus, in order to provide children with their spatial rights, there should be public awareness that fully understands the importance of play, in terms of making playful, as well as child-friendly cities. Moreover, the concept of 'play', should not be considered only, in terms of feeding children's needs in a spatially segregated and formally designed area; such as playgrounds.

Subsequently, this chapter is ended up with the quote mentioned by Ward (1978), which contributed in guiding architects and landscape designers, in order to better articulate their conception with the strategies, by stating:

“The daily community urban spaces must be viewed as a potential play environment for children, and be developed accordingly. Children need physical and social safe access to diverse and expanding environment, in our daily urban community, without the assurance of constant adult supervision. The diversity of surroundings accessible to children should include all aspects of daily life of the adult community, its natural as well as built surrounding. The process of planning, designing, and management of the environment should be one of participation by the total community, including children. Professionals should work on this level in order to encourage community self- reliance.”

Chapter 6	Discussion and Suggestions for Future Research
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Chapter 6: Discussion and Suggestions for Future Research

This chapter is based on the research results analysis that highlights the debates and the confrontation of arguments in the literature, not only as a succession of theoretical postures which overlap, but also as a dynamic contradictory exchanges. It is presented in a critical thesis form, where the debate is dialectic, through referring to realities about which interpretations can be divergent.

Hence, this concluding chapter of the thesis presents a discussion of the results in relation to the objectives of the study. In addition, based on this discussion and on the limitations of the study, the chapter outlines clear guidelines for needed future research.

6.1. Discussion of the results

The study cross-investigated two urban spatial categories; two residential neighborhoods (Cité jardins residential neighborhood and Abassia residential zone) and two recreational urban spaces (H.S.C and Châtelet- Les Halles recreational urban spaces) in terms of the occurrence of the different types of play behavior and children's sensible experiences. Every two urban spaces, of the same urban category, are similar in terms of the included spatial typologies, but are very different in terms of the spatial configuration of these typologies, the spatial permeability in-between, and the degrees of openness and closure of the outer spatial boundaries of the space territory.

It is important to stress that this causal comparative survey research design cannot permit to establish causality (Groat and Wang, 2013), but only a cross-reading analysis between the different urban categories, within the shadow of “Trialectic of Space Theory” (Lefebvre, 1992) and “Affordances Theory” (Gibson, 1977).

The first objective of the study was to investigate the potential impact of the spatial porosity of daily urban spaces, elaborated as the outer boundaries degree of closure and openness of different daily urban spaces' territory and inner spatial permeability between the included spatial typologies, on the children's presence and the occurrence of different play behavior types, promoting social, physical, and cognitive development. Indeed, the study strongly suggested that the spatial porosity seemed to influence children's presence and the occurrence of different play behavior types.

In particular, the analysis of the collected data yielded significant differences between the two residential neighborhoods in occurrence of different play types. Specifically, there

were significant differences between the two residential neighborhoods, in the occurrence of all cognitive play types except for “no play” and all social play types except for “parallel play”. Moreover, the analysis of the collected data from the two recreational urban spaces presented significant differences in the occurrence of different play types. Precisely, there were significant differences between the two recreational urban spaces, in the occurrence of all cognitive play types except for “constructive play”, “exploratory play”, and “no play”, in addition to all social play types except for “parallel play”. According to the literature these types of play tend to promote social, physical, emotional, and cognitive development of children (Reifel and Yeatman, 1993; Susa and Benedict, 1994; Sawyer, 1997; Wardle, 2000; Lillard et al., 2013; Zamani, 2013; Coplan et al., 2015). Furthermore, the cross-analysis of the collected data from the two urban categories (residential and recreational urban spaces) presented significant differences in occurrence of different play types. In particular, there were significant differences between the residential urban spaces and the recreational urban spaces in the occurrence of all cognitive play types, on the contrary, there were no significant differences between the urban categories in the occurrence of all social play types.

Additionally, the results tended to confirm that different included spatial typologies can contribute to the occurrence of different amount of play patterns, children’s preferences, so as their perception to the surrounding environment. For instance, across the two urban categories, the courtyards seemed to promote more “dramatic play” as well as “games-with-rules” in mostly “group play” social form. The pathways appeared to encourage more “functional play”, “games-with-rules”, and “no play” in different forms of social play. The assembly zones tended to afford more “functional play”, “exploratory play”, as well as “no play” in different forms of social play. The gardens contributed in promoting more “exploratory play” in mostly “group play” social form; while the playgrounds afforded more “functional play” in mostly “group play” social form. The block buffers and pockets encouraged more “constructive play” in mostly “group play” social form. As for the back streets and parking zones, they seemed to promote more “games-with-rules” in mostly “group play” social form.

Moreover, the study assumed that similar spatial typologies with different spatial configurations might offer different degree of potentiality and playability. Thus, the study

identifies and outlines a set of specific spatial potentialities aspects forming these different configurations, independently from the spatial typology itself. Likewise, the study further explored the potential role of these specific spatial potentialities that are associated to children's sensible experiences, resulted ambiance of children's lived spaces, and offered degree of freedom, as well as, variety of play opportunities. Additionally, the analysis revealed that the diversity and variation in different physical potentialities of the surrounding environment seemed to stimulate children, to attract them to play, so as to fulfil their needs, which might help in creating 'children's places'.

The differences across the four investigated urban spaces' spatial typologies, in terms of the spatial potentialities, can help proposing an interpretation for the variety of play opportunities and the degree of potentiality. Unlike the spatial typologies of Abassia residential zone, the assembly zones at Châtelet- Les Halles recreational urban space, and the garden as well as some of the assembly zones at H.S.C recreational urban space; all other spatial typologies in the above mentioned urban spaces and the spatial typologies of Cité jardins residential neighborhood, are characterized by a clearer definition of subdivided multiple activity settings. These multiple activity settings are spatially well-defined by separated multiple internal activity routes, variety in used ground materials, variability in topography, and by the presence of greater variety of different urban spatial features.

The multiple activity settings helped to create intimate spaces that appeared to give children the sense of privacy, security, and ownership, by attracting more social interactions and "dramatic play", while less random movements. However, other single settings were perceived as wide spaces that helped in affording a flexible spaces that can be used in various ways. Moreover, well-defined inner activity routes tended to highlight space boundaries that seemed to provide children with enclosed spaces, which provide them with the sense of security and allow them to mark up their boundaries, in addition to claim an ownership. Furthermore, the diversity in used ground material may be promoting a greater range of play behavior by offering children a greater number of affordances (Gibson, 1977). For example, a greater variety in used ground materials, contributed in affording a greater range of play behavior, creating space boundaries, encouraging children to interact with them physically, stimulating children's imagination, enhancing their curiosity, and

allowing for appropriation. Besides, soft materials, such as, natural grass tiles, might permit tumbling and acrobatic movements, while hard materials, such as, concrete pavement, might permit running, biking, and playing with wheeled toys. In addition, outdoor spaces that were comprised of primarily hard surfaces, little soft vegetation cover, and were close proximity to a busy street, were significantly louder in the noise than play spaces covered mostly with soft material, and were of distance from traffic noise. Accordingly, the noisier outdoor spaces seemed to create a general atmosphere of confusion, and stress.

Regarding topographic variability, it tended to stimulate children's imagination, to promote dynamic actions, to provide children with new perspectives of their surroundings, and to offer multiple opportunities for risk, complexity, as well as challenge. Thus, according to the study, steps and slopes, for example, afforded sitting, jumping, sliding, and rolling.

Moreover, the presence of different spatial features, as trees, fences, recesses, and parapets seemed to afford climbing. The shaded areas offered relaxing and conversing. In addition to the diversity in the presence of loose parts that encouraged children to create, invent, and reshape their places.

According to the study deduction, there were variations in place preferences among children, every play setting seemed to provide children different play activities and play preferences. It was observed that children needed spaces to jump, climb, and balance. Other times, they preferred quiet time to think, explore, relax, talk, hide, and gather. However, sometimes they preferred spaces for different emotional responses.

Furthermore, the above different spatial potentialities might promote the imagination and creativity in children's play. For example, variety of ground materials may help create a water surfaces in the middle of a desert, differences in levels may allow a child to mountain-dive, tree leaves and mud may help young experts prepare chemical experiments, activity routes may become the canal streams, and a well spatially defined multiple settings may become a citadel to protect, in the middle of the city districts. Therefore, diverse environments helped to enrich children's experience and to afford endless varieties of play opportunities, consequently, environmental diversity can attract the children's attention for longer time.

Based on the above analysis, several notions and lived experiences can be related to those diverse environments, such as, appropriation, curiosity, imagination, dynamic actions, new

perspectives, risk-taking, self-identity, enclosure, protection, and ownership. Those notions and lived experiences might give an insight to what sort of places that seemed to be most engaging and stimulating to children.

Accordingly, this thesis explored children's places and not places for children in the communities. A children place is any place that attracts a child for play, which is further stimulated by its qualities. The study findings revealed the possible reasons for specific place preferences by middle childhood. Children might get more engaged in places that are characterized by well-definition, diversity, inclusion of seasonal as well as multi-functional elements, and enhancement of the sense of community presence. These places seemed to enrich their experiences and to attract them to play through fulfilling their needs. In accordance to this study, the children were considered as the primary experts of their places, where their involvement in the process was a main pivot in the study and was presented by listening to their opinions. This was first clarified through the literature survey and then through the fieldwork that provided the chance to document children's words and experiences, concerning the places that stimulated their play. Moreover, through several data gathering methods that complimented one another giving a clear image and thorough understandings children's needs as well as their perceived ideas, which re-shaped the potential affordances of the surrounding environments.

According to children's expressing, they seemed to be connected to certain places emotionally and sometimes they preferred or disliked a place for how it made them feel, not only for its physical features and functional qualities. They showed preferences to places that evoked their feelings: feelings of freedom, privacy, security, intimacy, relaxation, happiness, and excitement. This was revealed through the interviews, when clear comments were mentioned during the conversations as a direct descriptive response to a specific place. Furthermore, children appeared to perceive the physical and social aspects as one entity. They showed preferences to places for its social value: meeting a friend or an event that might take place there. They sometimes disliked places based on negative preconceived ideas, such as the presence of strangers, scary stories, or adolescence gangs occupying these certain places.

Moreover, through the fieldwork, it was observed that children who had the freedom to encounter their environment seemed to be experts. They were aware of the exciting

landmarks in their environment: mosques, historic buildings, grocery stores, and schools. Their environmental exploration and spatial knowledge tended to be widened, due to the freedom in accessing and encountering their settings. They were the producers of their play places that are diverse and spread out in the environment, away from adult supervision. Those children might gain more interactions with complex real world. Their play experiences might prepare them towards integration into the adult's worlds. Therefore, children, who had freedom in encountering their environments, seemed to create new affordances and multiple new perspectives of the space. In addition, each place tended to afford certain qualities, which appeared to enrich children's experiences and to attract them to play by getting more engaged for longer time spans and with higher children's attention. Consequently, free mobility and independence might provide children with opportunities to develop a greater awareness of the surrounding physical as well as social environment that tended to widen the children's environmental capabilities.

Coherent to the above interpretations, this study was maintained, between France and Egypt, during the pandemic Covid19, when the children were banned from the public parks and playgrounds. However, their sound playing had been integrated, once more, into our daily environment. The children had time to discover their daily environment. Besides, the everyday environment allowed them to experience their five senses and skills. Furthermore, the absence of the daily constraints of the environment, highlighted the different resulted behaviors between the two countries, (Figure 205). In France, it was very evident that when the pace of life was slowed down, due to the imposed confinement by the government, many children were observed with their families, allowing them to freely explore and play without any time restriction. They were observed exploring the texture of the mud, the properties of water, the smell of tree leaves, and the sound of nature. Usually, they seemed to be deprived of extended free time of play. While in Egypt, children were observed to replace traffic in the streets, by playing freely during the imposed crew-few by the government. The traffic seemed to be the main reason threatening children's play activities in Egypt, and other countries having traffic conjunctions, where children, usually, do not have access to secured spaces to play freely, (e.g. football, bikes, scooters, and running without restrictions).



Figure 205: Different resulted children’s behaviors, in the absence of the daily constraints of the modern societies

On the other hand, other children showed preferences to screen-based electronic games, during their interpretations of their drawings. They appeared to construct sedentary new places in their minds, beyond reality ‘virtual places’, which seemed to provide them with exciting imaginary two dimensional worlds without having to move from their seats. Therefore, a setting that gives children the opportunity to explore the surroundings, to manipulate their environment, to meet their challenges, and to mark up their boundaries, might make them feel in control over their physical settings, by feeling free to explore, shape, and reshape their play places. This opportunity tended to provide children with a desire to master the surrounding environment, leading to one of the greatest attraction of play empowerment. The fieldwork further revealed that the degree of children’s mobility and adults’ restrictions seemed to have a direct impact on children’s experiences of place and place preferences. Thus, trapping children in particular encapsulated spaces, might prevent them from exploring, inventing and manipulating. However, even in those encapsulated play settings, they appeared to be still the creators of their play places. They manipulated it and appropriated it, in order to fulfil their needs.

Thus, children satisfaction of being in control and empowerment seemed to be fulfilled through free mobility in rich and diverse environments. The benefits of free play on children's developmental skills appeared to be uncountable. Moreover, children who play outdoors tended to be healthier physically, more independent, better in building social relations, more creative, and better behaved.

Consequently, this study was concerned with certain potentialities in the conceived daily urban spaces (e.g. entity of space, flow and fluidity, ground material diversity, topographic

variability, and the presence of different urban features), in addition to the spatial porosity, and their effects on children's physical, social, and cognitive development.

In conclusion, filling the gap, which was presented to be the main pillar of the research problem, in-between the three levels of space, conceived, perceived, as well as, lived, and merging them through the affordance theory, seemed to result in producing an ambient envelop that provides key spatial qualities and ideas, reposing on the main behavioral themes, which further helped in creating child-friendly attractive key-design approaches for engaging daily community play settings, (Figure 206).

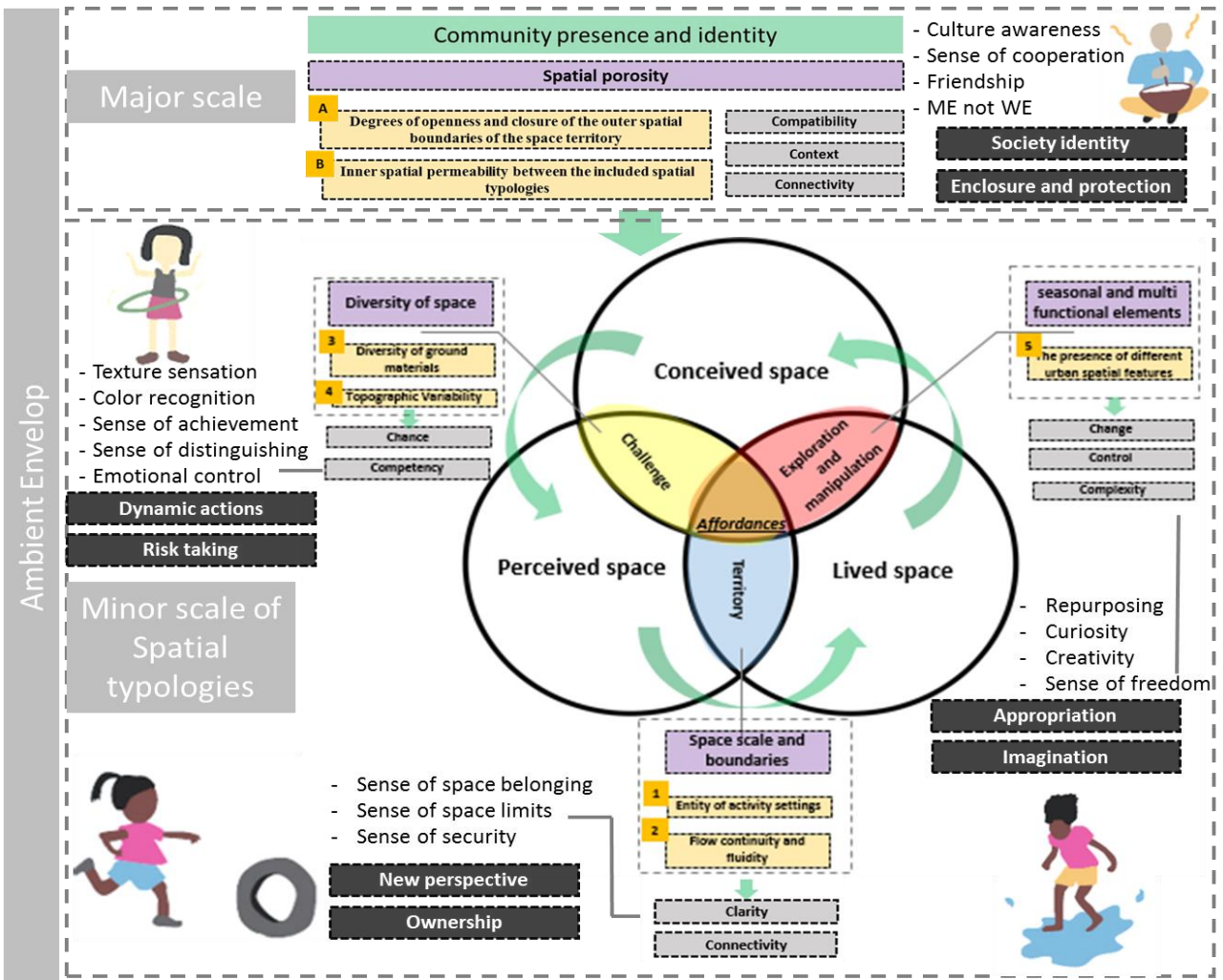


Figure 206: The relationship between spatial potentialities, key qualities, behavioral themes, and extracted notions

6.2. Limitations of the study

Although this study successfully emphasized on children's place experiences as multi-dimensional and each data collecting method was to produce a full image of understanding their place experiences, there were some limitations concerning approaching children. For instance, their volunteering participation in the study, in addition to the unrevealed observations, which were held by the researcher secretly, in order not to tear children's attention and influence their behavior after feeling judged or monitored, were considered as main study limitations.

Consequently, an ethnographic approach that is rooted in sociology and anthropology, seemed to provide a better elaboration of children's preferred places' ambience, everyday sensory experiences of these preferences, events, or activities that constitute their everyday life. Thus, this approach offered a comprehensive analysis of different terminologies. It allowed tracing the various conceptual issues through a theoretical framework, which was the main pillar of this study. Moreover, the data collection methods tended to provide children with the sense of power and control, where they decided what to draw, which photo to capture, and which route or place they would like to guide the researcher to. However, photography and drawings are task-based methods that are sometimes misleading, so they have to be followed by informal interviews for children's further interpretations. This was consistent to the held interviews in the study, where children were asked about their favorites and their responses have slightly differ from what they have previously drawn. Therefore, there could be slight changes in the order of their preferences. While, walks, photography, and participant observations are interactive techniques. They appeared to give the children and the researcher the ability to interact with the place simultaneously. Since, in accordance to literature, children's experiences regarding different objects identify its significance to them (Titman, 1994). Accordingly, walks, photographs, observations, interviews, and drawings helped children in representing their own views and experiences of play spaces.

Moreover, another point to be considered as notable constraint that affected this study, was the language as well as translation limitations, that were emphasized during the held interviews and the documentations. Therefore, children's responses, translations, and documentations might have been affected by languages shortages due the difficulty faced

by the children themselves, while expressing their feelings. In addition to the difficulty that faced the researcher, while further documenting the scripts in an academic English writings. Besides, the socio-economic and culture simulation that could slightly orient children's mind to the exact manner to use certain spatial elements and to express their impressions concerning it. Accordingly, this provided sometimes inaccurate responses, in general.

Furthermore, selecting two groups during the observational sessions, was due to several restrictions and limitations including; the length of the child-centered observational sessions that lasted for 40 minutes per child, where it is more probable that the child might leave after, or would feel fatigue to engage, and concentrate in a required task, as the drawing as well as the interviews. In addition to the sanitary situation “COVID-19” and the parental restrictions to strangers, since the fieldwork launched on March 2020. Consequently, “Group B” of every selected urban space, was approached in order to conduct the perceptual cognitive skill activities, in communities, which children were familiar to, in addition to their parents confirmations to the quite frequently visits of their children to the four urban spaces, correspondingly.

6.3. Suggestions for future research

A number of suggestions for future research could be provided. First, there is of course a need for research to confirm the findings of this study and investigate the interpretation of the results proposed above. It cannot be claimed that the evaluation of the cognitive skills through the drawing assessment, used in this study, provides a complete evaluation of cognitive development and future research will need to use more comprehensive assessments of children's cognitive capabilities. In addition, there is a need for research to investigate the generalizability of the current findings to other socio-economic contexts in Egypt and France, but also to other cultural contexts, in other countries. Studies need to be performed to include aspects of weather, like heavy snow loads and extreme heat conditions.

Moreover, it is suggested that listening to children should be approved as an approach that considers children thoughts and ideas, as a concept or schematic idea before design. It should be the adopted method to start designing for children’s places by considering them a client. In addition, governments as well as agencies should recognize children's right in

play and should accordingly provide them with the spaces that preserve practicing their rights. Accordingly, this thesis proposes some guidelines for designing children's spaces that might help planners and designers, in future designs, since it is essential to conceive a safe child-friendly city, in order that parents would be able to leave children to play without their supervision. However, the meaning of safe is sometimes mixed up with over protective and not giving children the opportunity to learn and experience life on their own way. Furthermore, modification of approaches to provide children with better play spaces, is recommended to change within time, depending on urban development, public awareness, and socio-economic structure of communities, since the nature of childhood and play habits may change, but the value of play does not change.

Accordingly, the implemented theoretical framework in this study "Trialectic of Space Theory" (Lefebvre, 1992) and "Affordances theories", (Gibson, 1979, Norman 1988, Bohme, 2017), aids in suggesting some recommendations concerning the space comprehension with the condition that designers should consider the culture of the users as explained by Norman (1988). Moreover, place design should achieve compatibility with users' wishes in accordance to their culture and behavior. Consequently, designers should modify the space according to the users' activities. As well as, standards must be considered for designing the spaces based on users' needs. More information about the role of spaces on human behavior and cultural activities are required in order to develop the public spaces. In this perspective, play is associated with conventional rules between different actors who implement strategies to achieve their goals, such as adults and designers (Crozier et al., 1981). This could be summed up around the idea that "The person who wears the shoe knows best if it hurts and where it hurts, even if the cobbler is the expert who is the best judge to know how to fix it "(Dewey, 2003, 1st ed., 1927, p. 207 quoted by Sintomer 2008 p.115). Finally, further research should be carried out in various fields as psychology, design of spaces, as well as social research ...etc. and specialists' contribution in the fields of psychology is needed.

Children seemed to be in need of enjoying in the city as whole. Hence, children are recommended to have freedom of action to discover and to establish social relations in the whole urban environment. Thus, future research will also need to extend the scope of this study to other spatial urban categories. Therefore, this approach should not only be

restricted to residential neighborhoods, home spaces, social clubs, and recreational parks, but also, it should be adopted in children's education daily urban spaces, as school yards or other outdoor spaces of educational institutes, and even the in-door children spaces on the interior design levels, which all should aim primarily to develop children's skills as a main function.

It is, also, recommended after the implemented study, the discussed literature, and the analyzed case studies, to give more attention to designing children's places and to reconsider the current design approach, based on the beneficial play experiences for children, through formulating the following questions:

- How to better design the urban spaces, while integrating the childhood issue?
- How to understand the environmental quality from children's perception?
- And finally, how children's presence permit thinking about the cities from the architectural and urbanism points of view?

In addition, it is mentioned to keep in consideration the spatial porosity, and the different proposed spatial potentialities, such as: entity of space, flow and fluidity, ground material diversity, topographic variability, and the presence of different urban features in design, in order to provide an engaging safe environment for children and parents, which might help in developing children's physical, social, emotional, and cognitive skills. Finally, there is a need for research to specifically investigate the potential impact of other spatial potentialities and various configurations, on play behavior and the resulted ambient envelops of children's places, in order to better inform designers, as well as, landscape architects, to conceive great child-friendly metropolitan cities that accommodate different children from different origins and with different cultures.

“A city where the child would be the prince and the father of Man” (Aillaud, 1972).

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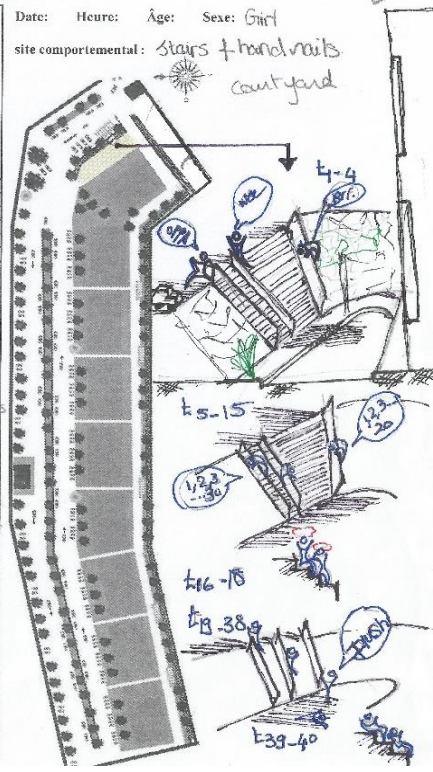
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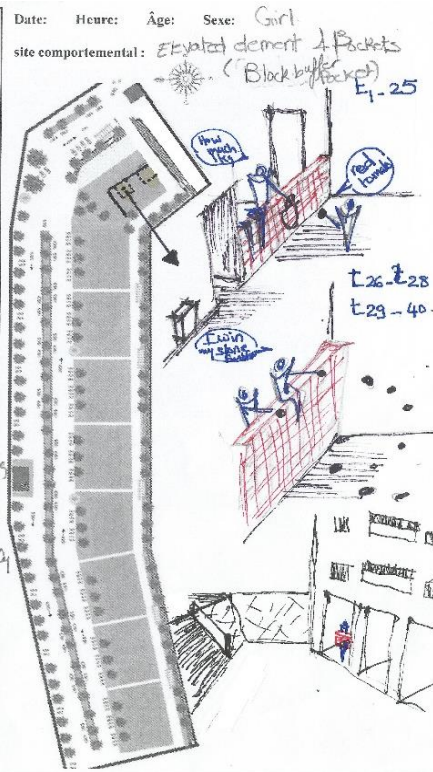
Appendices	Examples of observation data and children's drawings
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A.1 Samples of filled observation sheets during the observational sessions at Abassia Residential zone, Cairo, Egypt

Le numero de l'enfant G11	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											sitting /
2											on a bench
3											on a stool
4											hand rail
5											
6											
7											climbing
8											who will
9											make me
10											run with
11											out with
12											u
13											dizzy
14											
15											walking
16											wondering
17											sitting on top
18											to rest
19											
20											climbing
21											in side
22											
23											the stairs
24											hand rail
25											
26											rest that
27											are sitting
28											
29											down
30											
31											a pool
32											aqua park
33											
34											
35											rest on
36											stairs
37											
38											
39											
40											
Total	4	0	0	20	11	2	0	10	20		
percentage	10%	0%	0%	50%	27.5%	5%	0%	25%	50%		

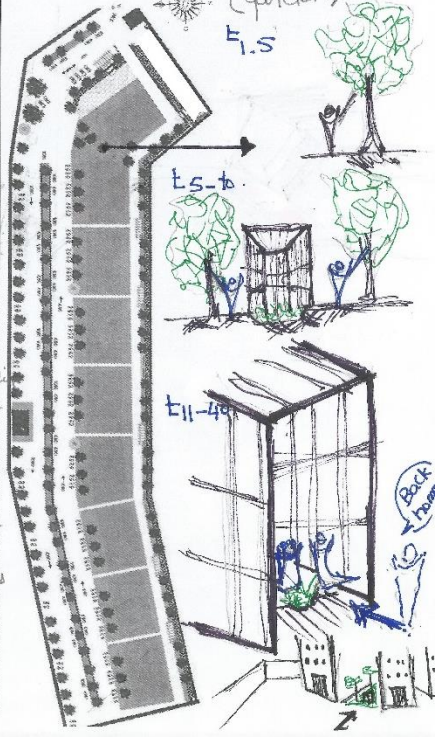


Le numero de l'enfant G12	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											pretending
2											(resembling)
3											the Egyptian
4											balcony is
5											there
6											women put
7											clothes back
8											
9											the boy active
10											is approaching
11											that making
12											together as
13											she is close
14											
15											some birds
16											(stones)
17											task (boy)
18											standing behind
19											stairs (rephrased)
20											
21											
22											
23											
24											
25											
26											
27											Complete
28											who will
29											through
30											water
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total	3	0	0	25	12	0	0	0	8	20	
percentage	7.5%	0%	0%	62.5%	30%	0%	0%	0%	20%	50%	



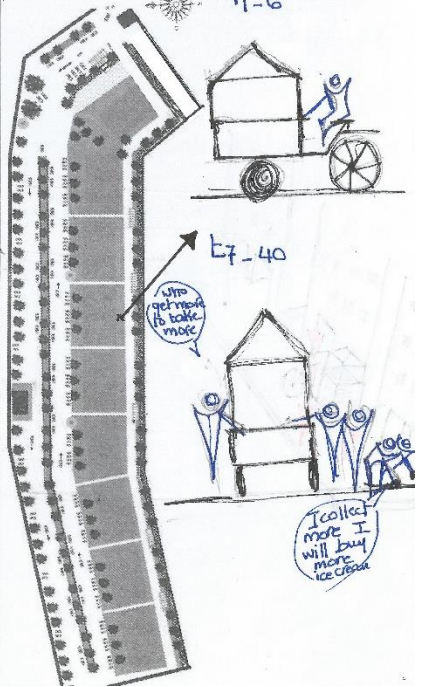
Le numero de l'enfant G13	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	10	0	0	25	5	0	5	0	0	0
percentages	25%	0	0	62.5	12.5	0	12.5	0	0	0

Date: Heure: Âge: Sexe: Girl
 site comportemental: wood shelter - mud & bowls (quiden)
 E.5

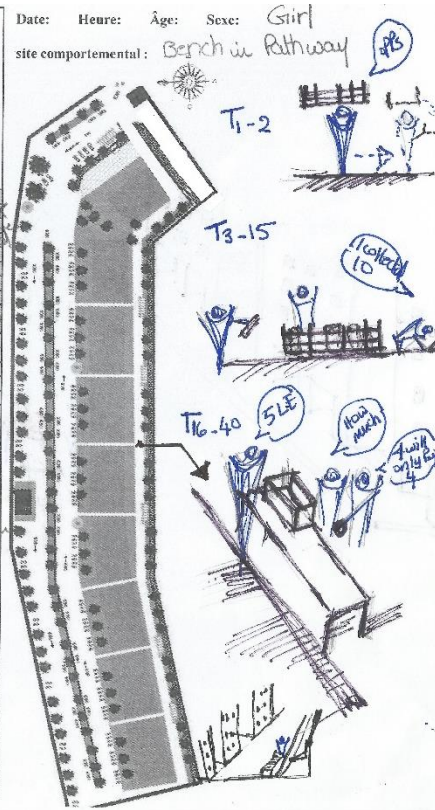


Le numero de l'enfant G15	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	15	0	0	31	10	0	5	0	0	0
percentages	37.5	0	0	77.5	25	0	12.5	0	0	0

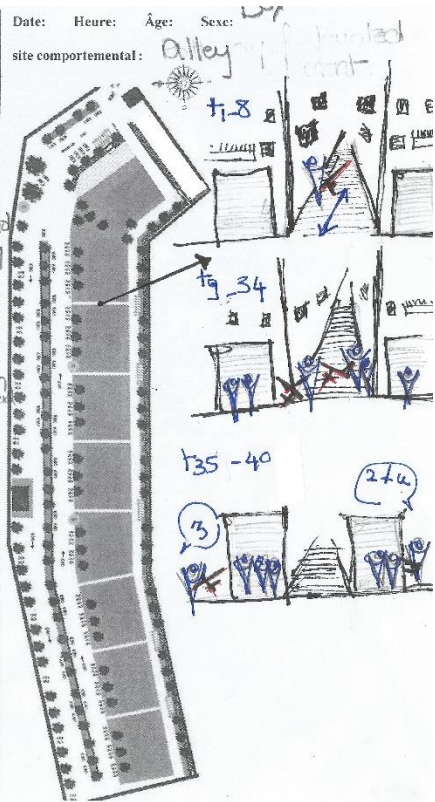
Date: Heure: Âge: Sexe: Girl
 site comportemental: Block Buffer
 E.6



Le numero de l'enfant <i>Gia</i>	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	10	0	0	17	13	0	2	0	0	26
percentage	25%	0	0	42.5	32.5	0	5%	0	0	65%

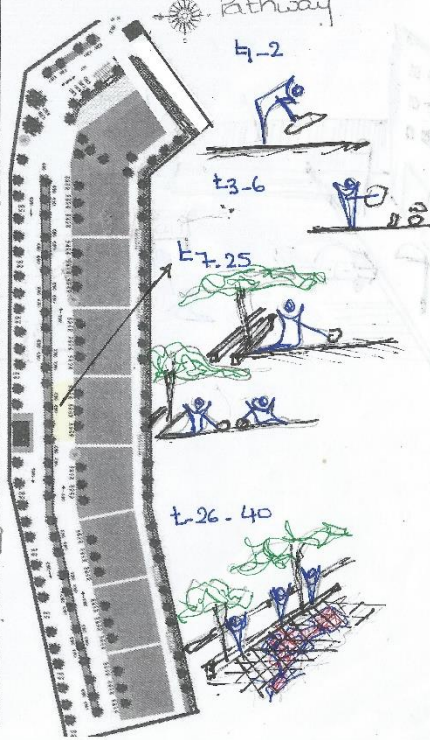


Le numero de l'enfant <i>Bl</i>	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	7	0	0	9	15	0	2	0	0	33
percentage	17.5%	0	0	22.5	37.5	0	5%	0	0	80%



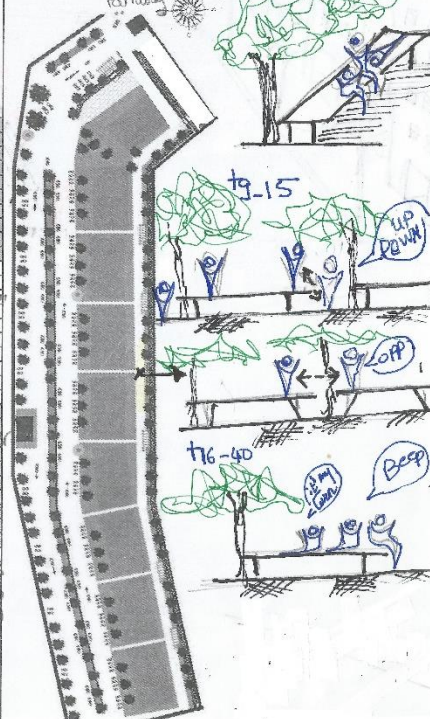
Le numero de l'enfant G4	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	4	19	0	15	0	0	6	10	24	
pourcentage	10%	47.5%	0%	37.5%	0%	0%	15%	25%	60%	

Date: Heure: Âge: Sexe: Girl
 site comportemental: Shaded Brickyard Pathway

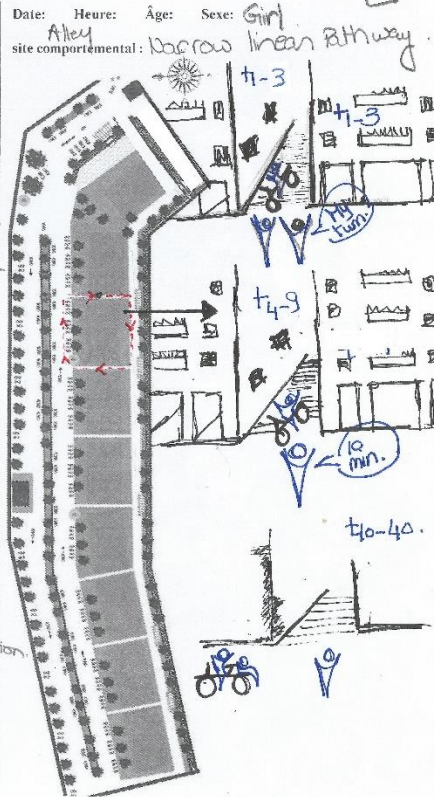


Le numero de l'enfant B2	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	7	0	0	25	0	8	5	10	25	
pourcentage	17.5%	0%	0%	62.5%	0%	20%	12.5%	25%	62.5%	

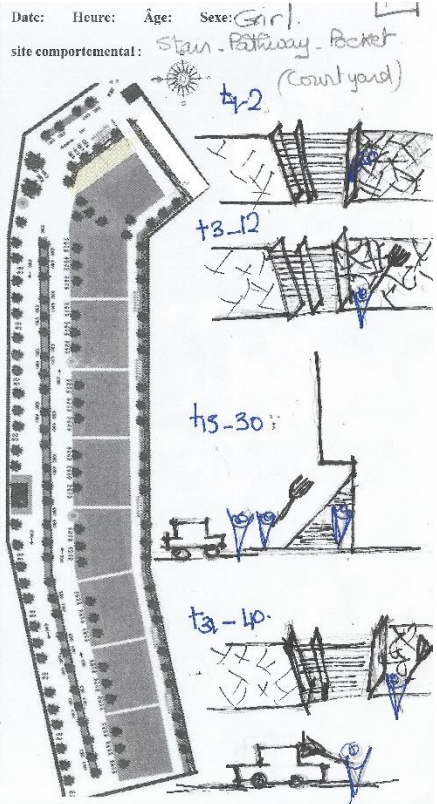
Date: Heure: Âge: Sexe: Boy
 site comportemental: Bench/shaded Pathway



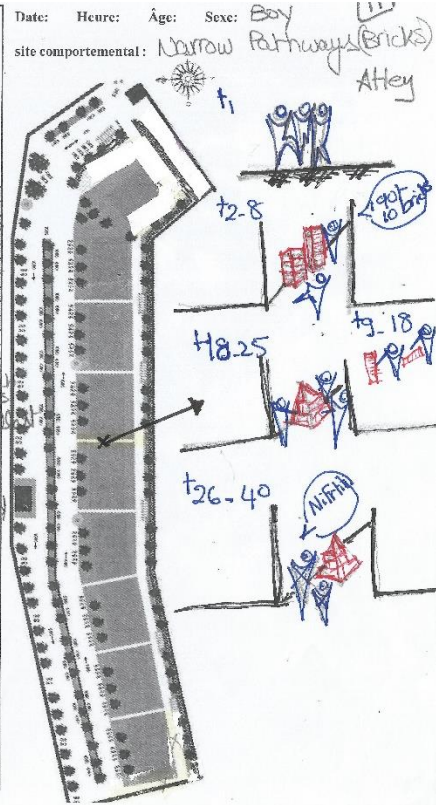
Le numero de l'enfant G9	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											Cycling on
2											contemp
3											Comptug
4											who is faster
5											
6											
7											
8											
9											
10											
11											pretendus
12											to be a
13											"tok tok"
14											chaises
15											l'opinion
16											by other
17											
18											to accept
19											visites
20											to reach
21											steam
22											action
23											destination
24											
25											
26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total											
percentages	75%	0%	0%	17%	25%	0%	0%	0%	0%	100%	



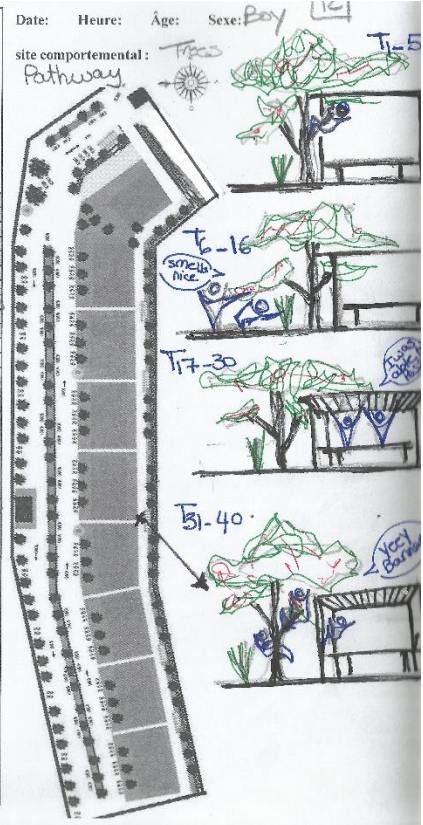
Le numero de l'enfant G10	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											l'opinion
2											boardball
3											
4											to play map
5											to pretend
6											to pretend
7											to pretend
8											(game) time
9											
10											
11											at building
12											
13											
14											
15											competing
16											to hide
17											to find
18											the map
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											continues
32											cleaning
33											wide
34											
35											
36											
37											the map
38											
39											
40											
Total											
percentages	51%	0%	0%	0%	20%	18%	0%	0%	0%	20%	45%



Le numero de l'enfant B3	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										climbing
3										climbing
4										up the tree
5										exploring
6										tree / flower
7										1 strength
8										wooden
9										bank of tengada
10										competitve
11										to climb
12										the border
13										base of tengada
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	1	5	0	5	29	0	0	18	22	33
percentage	2.5	12.5	0	12.5	72.5	0	0	45	55	82.5

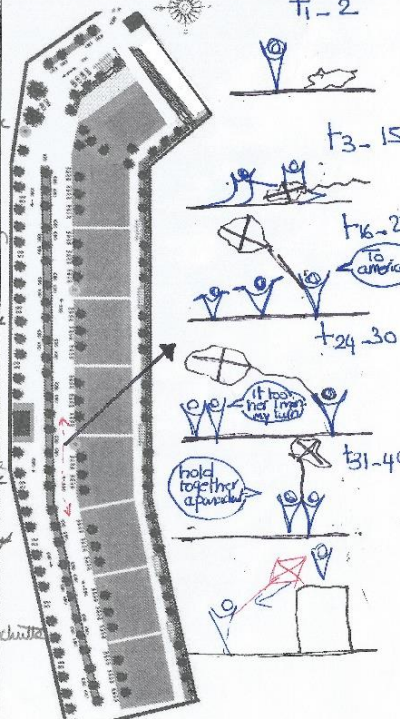


Le numero de l'enfant B6	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										climbing
3										up the tree
4										exploring
5										tree / flower
6										1 strength
7										wooden
8										bank of tengada
9										competitve
10										to climb
11										the border
12										base of tengada
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	1	0	11	10	14	0	7	0	8	25
percentage	2.5	0	27.5	25	35	0	17.5	0	20	62.5



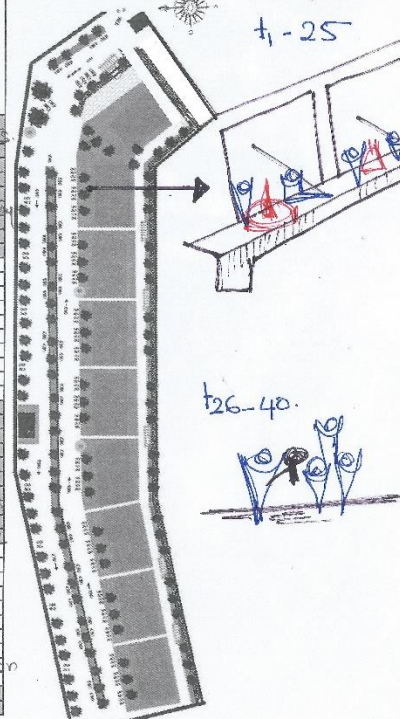
Le numero de l'enfant G6	Le jeu cognitif					Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire		Le jeu parallele
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	0	5	0	6	27	2	5	19	50	
percentage										

Date: Heure: Age: Sexe: Girl
 site comportemental: back sheet

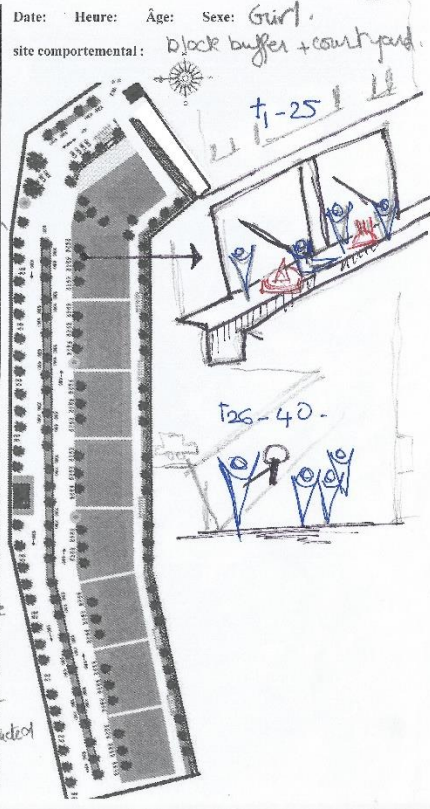


Le numero de l'enfant B4	Le jeu cognitif					Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire		Le jeu parallele
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	0	21	10	15	0	0	0	15	39	
percentage		52.5	25	37.5				37.5	85	

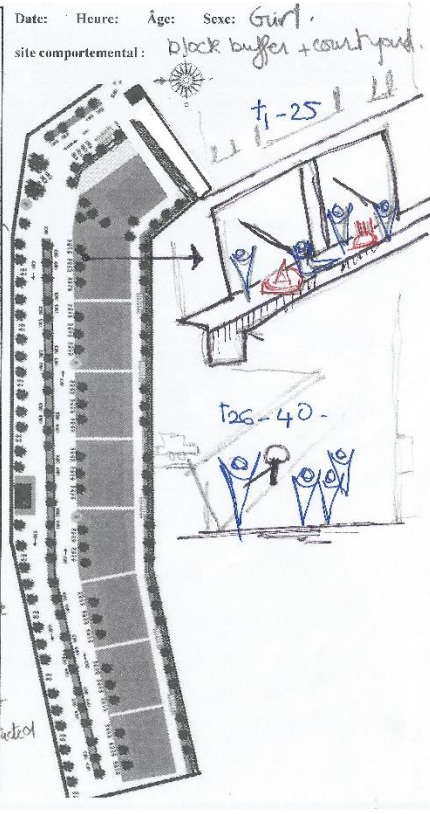
Date: Heure: Age: Sexe: Boy
 site comportemental: building buffer + courtyard



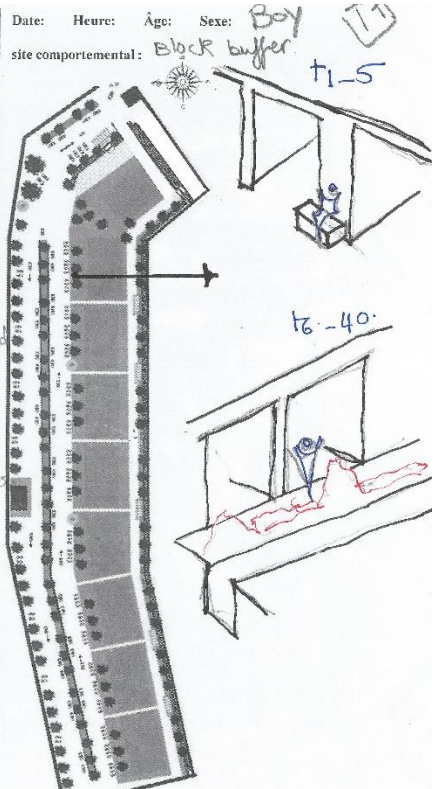
Le numero de l'enfant G11	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											explor
2											Sand play
3											subtiles
4											construct
5											a mound
6											
7											
8											
9											
10											
11											explor
12											sand
13											
14											
15											
16											construct
17											a sand
18											barrier
19											
20											
21											pretend
22											to be
23											a journal
24											and clay
25											a simple
26											about use
27											they construct
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total	0	16	9	13	0	0	5	0	35		
Percentage		40%	22.5	37.5			12.5	0	77.5		



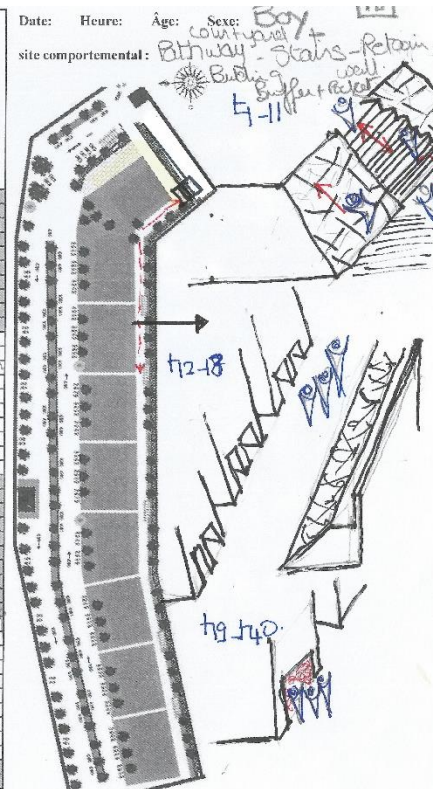
Le numero de l'enfant G11	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											explor
2											Sand play
3											subtiles
4											construct
5											a mound
6											
7											
8											
9											
10											
11											explor
12											sand
13											
14											
15											
16											construct
17											a sand
18											barrier
19											
20											
21											pretend
22											to be
23											a journal
24											and clay
25											a simple
26											about use
27											they construct
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total	0	16	9	13	0	0	5	0	35		
Percentage		40%	22.5	37.5			12.5	0	77.5		



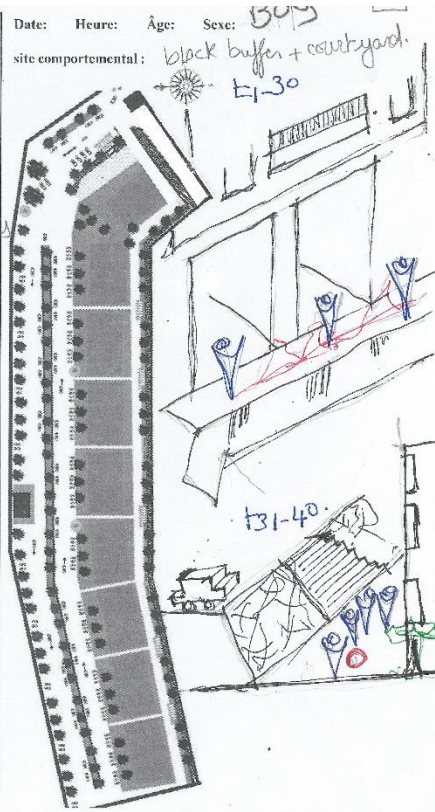
Le numero de l'enfant 85	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											Resting
2											Cont-Acrob
3											prop
4											comings
5											gait
6											
7											
8											
9											
10											exploring
11											solitaire
12											by labors
13											disc play
14											labors
15											
16											construct
17											and
18											and
19											construct
20											and
21											and
22											and
23											and
24											and
25											and
26											and
27											and
28											and
29											and
30											and
31											and
32											and
33											and
34											and
35											and
36											and
37											and
38											and
39											and
40											and
Total		0	17	8	0	0	5	5	6	24	
percentage			42.5	20			12.5	12.5	15	72.5	



Le numero de l'enfant 86	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											comings
2											and
3											and
4											and
5											and
6											and
7											and
8											and
9											and
10											and
11											and
12											and
13											and
14											and
15											and
16											and
17											and
18											and
19											and
20											and
21											and
22											and
23											and
24											and
25											and
26											and
27											and
28											and
29											and
30											and
31											and
32											and
33											and
34											and
35											and
36											and
37											and
38											and
39											and
40											and
Total		0	12	0	0	16	12	0	11	0	
percentage			30			40	30		27.5		



Le numero de l'enfant B58	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total		15	5	10		20	0	0	10	50



Le numero de l'enfant G14	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total		0	0	0	0	11	0	1	16	20



Le numero de l'enfant 88	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total						14			4	23

Date: Heure: Âge: Sexe: **Boy**

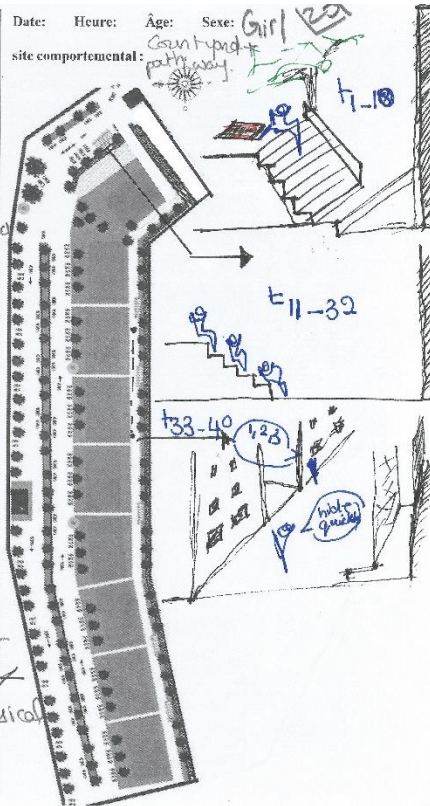
site comportemental: **Alley**

Le numero de l'enfant G12	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total		4	0	20		11		0	0	5

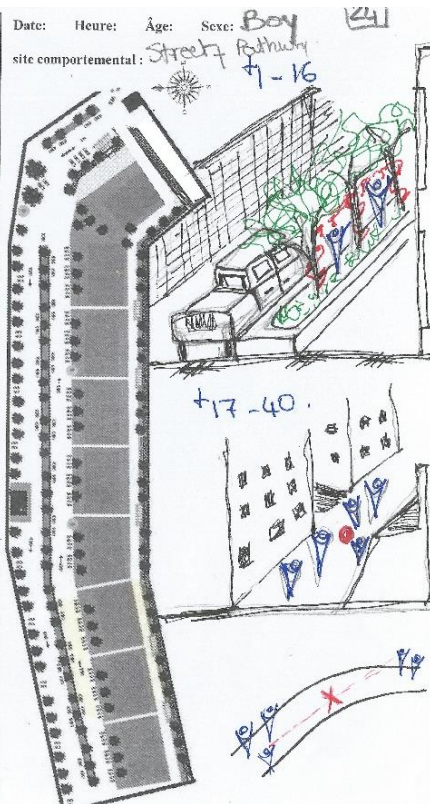
Date: Heure: Âge: Sexe: **Girl**

site comportemental: **Courtyard**

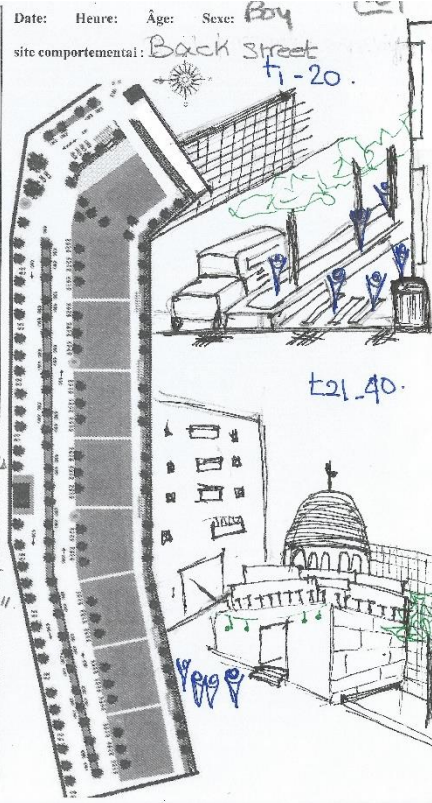
Le numero de l'enfant <i>(13)</i>	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
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26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total personnel	0	18	0	0	0	22	0	0	10	30



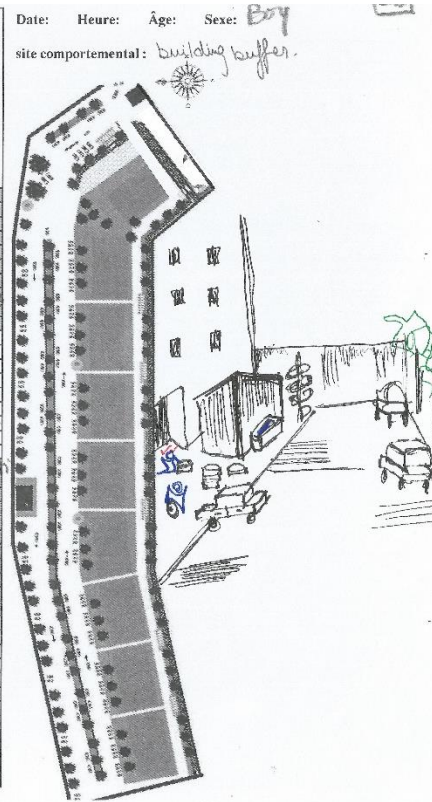
Le numero de l'enfant <i>B70</i>	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total personnel	0	16	0	0	0	24	0	4	16	20



Le numero de l'enfant 61	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total		0	0	0	20	20	0	0	20	20	
pourcentage											



Le numero de l'enfant 62	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total		0	0	10	0	0	0	0	10	20	0
pourcentage											



Le numero de l'enfant B32	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	0	17	0	0	23	0	0	0	0	40
pourcentage										

Date: _____ Heure: _____ Âge: _____ Sexe: Boy

site comportemental: Street

Le numero de l'enfant B14	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	0	19	0	0	21	0	0	15	25	
pourcentage										

Date: _____ Heure: _____ Âge: _____ Sexe: Boy

site comportemental: Alley

Le numero de l'enfant G8	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total	0	31	9	0	0	0	9	10	21		
pourcentage											

Date: _____ Heure: _____ Age: _____ Sexe: **Girl**

site comportemental :

Le numero de l'enfant G15	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total	0	15	0	24	0	0	1	1	15	24	
pourcentage											

Date: _____ Heure: _____ Age: _____ Sexe: _____

site comportemental : **Building buffer + courtyard**

t1-24

t25-40

A.2.I Samples of children's drawings from Abassia Residential zone, Cairo, Egypt (5 to 7 years aged group)



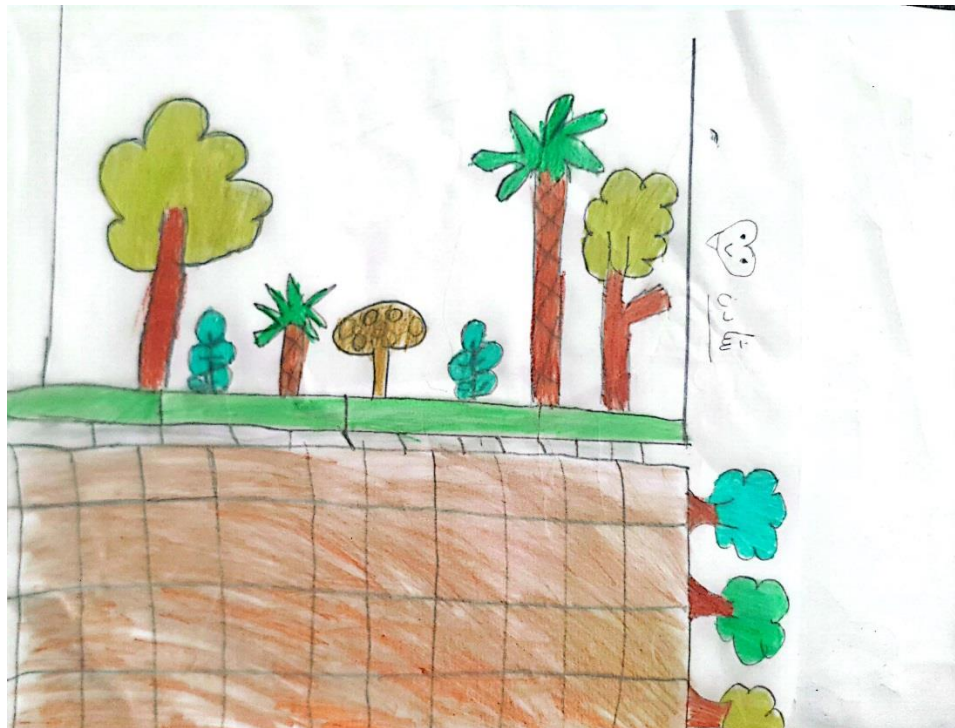
Comment: The drawing is characterized by high accuracy in the represented elements, with good amount of details.



Comment: The drawing is characterized by high accuracy in the represented elements and good amount of details in the represented elements.



Comment: The drawing is characterized by moderate accuracy in the represented elements, with good amount of details.



Comment: The drawing is characterized by moderate accuracy in the represented elements and good amount of details in the represented elements.



Comment: The drawing is characterized by few amount of details in the represented elements and moderate accuracy in the represented elements.



Comment: The drawing is characterized by poor amount of details in the represented elements and mild accuracy in the represented elements.



Comment: The drawing is characterized by poor amount of details in the represented elements and mild accuracy in the represented elements.



Comment: The drawing is characterized by few amount of details in the represented elements and mild accuracy in the represented elements.

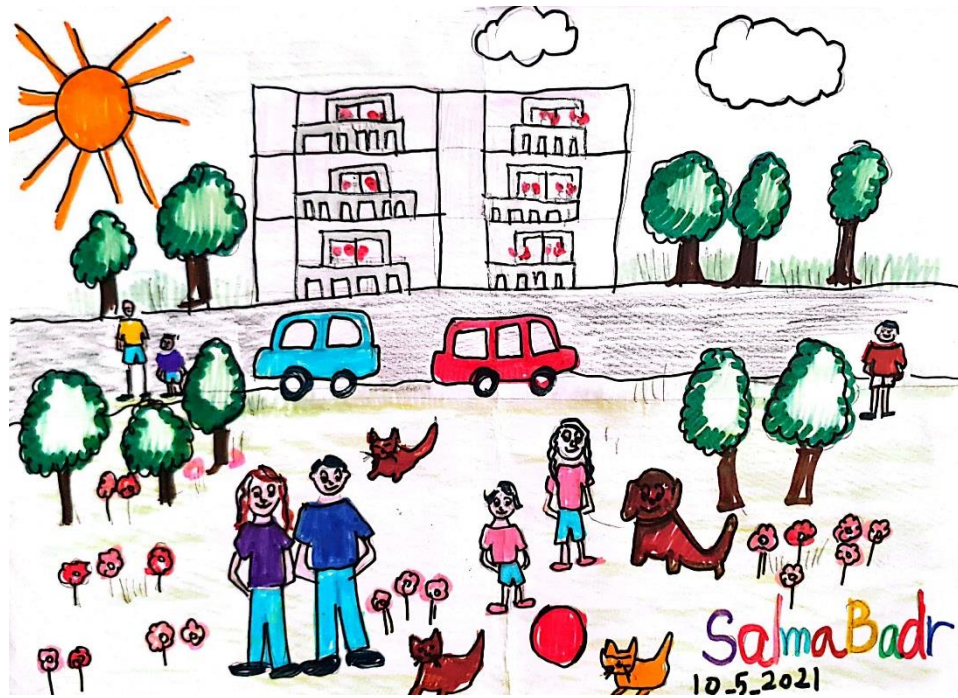
A.2.II Samples of children's drawings from Abassia Residential zone, Cairo, Egypt (above 7 years aged group)



Comment: The drawing is characterized by high accuracy in the represented elements with high amount of details. It tended to be of high accuracy of the overall scene with high amount of details of overall scene. Moreover, it achieved high visual realism in terms of accuracy of spatial relationships and detailed representation of the depth.



Comment: The drawing is characterized by high accuracy in the represented elements with high amount of details. It tended to be of high accuracy of the overall scene with high amount of details of overall scene. Moreover, it achieved high visual realism in terms of accuracy of spatial relationships and detailed representation of the depth.



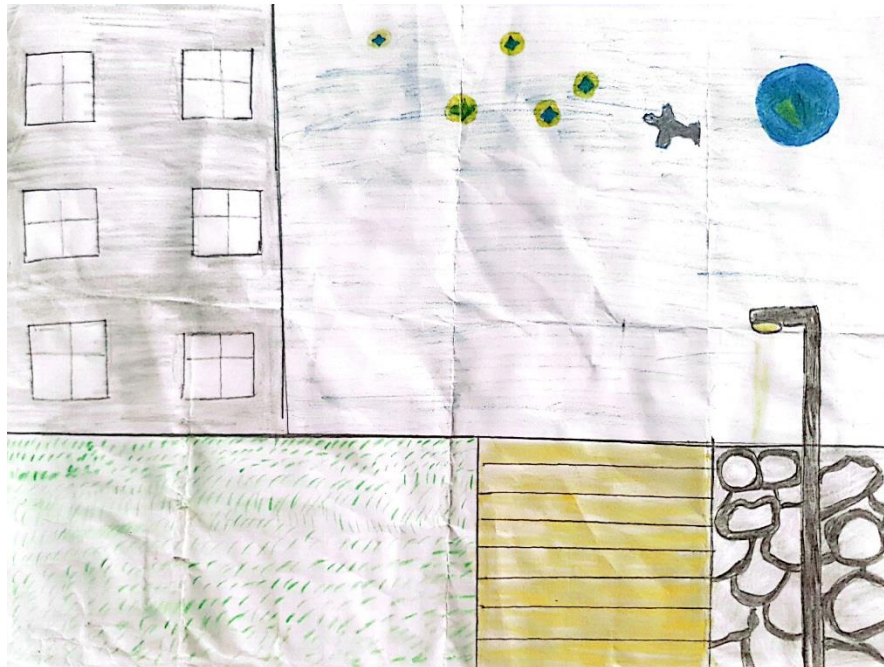
Comment: The drawing is characterized by moderate accuracy in the represented elements with high amount of details. It tended to be of moderate accuracy of the overall scene with high amount of details of overall scene. Moreover, it achieved moderate visual realism in terms of accuracy of spatial relationships and fine representation of the depth.



Comment: The drawing is characterized by moderate accuracy in the represented elements with fine amount of details. It tended to be of moderate accuracy of the overall scene with high amount of details of overall scene. Moreover, it achieved moderate visual realism in terms of accuracy of spatial relationships and fine representation of the depth.



Comment: The drawing is characterized by high accuracy in the represented elements with high amount of details. It tended to be of moderate accuracy of the overall scene with mild amount of details of overall scene. Moreover, it achieved moderate visual realism in terms of accuracy of spatial relationships and mild representation of the depth.



Comment: The drawing is characterized by moderate accuracy in the represented elements with fine amount of details. It tended to be of moderate accuracy of the overall scene with moderate amount of details of overall scene. Moreover, it achieved moderate visual realism in terms of accuracy of spatial relationships and mild representation of the depth.



Comment: The drawing is characterized by moderate accuracy in the represented elements with mild amount of details. It tended to be of mild accuracy of the overall scene with mild amount of details of overall scene. Moreover, it achieved moderate visual realism in terms of accuracy of spatial relationships and mild representation of the depth.



Comment: The drawing is characterized by mild accuracy in the represented elements with mild amount of details. It tended to be of mild accuracy of the overall scene with mild amount of details of overall scene. Moreover, it achieved mild visual realism in terms of accuracy of spatial relationships and representation of the depth.

B.1 Samples of filled observation sheets during the observational sessions at Cité jardins residential neighborhood, Paris suburbs, France

Le numéro de l'enfant B1	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'absence de jeu	Le jeu solitaire	Le jeu parallèle		Le jeu en groupe
1											cycling on
2											by the bridge on railway
3											leading the pipe
4											handcuffing non verbal
5											
6											
7											
8											
9											
10											
11											Exploring the mud
12											peels a tree the foliage
13											branches
14											with another
15											one out apart
16											
17											
18											starting to play as if they are
19											fighting with swords
20											explains mud with branches
Total	7	0	20	10	0	3	8	12	20		
pourcentage	17.5	0	50	25	0	7.5	20	30	50		

Date: Heure: Âge: Sexe: Boy
 site comportemental: Assembly zone (garden + pathway)

Le numéro de l'enfant B2	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'absence de jeu	Le jeu solitaire	Le jeu parallèle		Le jeu en groupe
1											throwing
2											wooden
3											strips in
4											table
5											mountain
6											
7											pretending
8											
9											
10											
11											wooden ships
12											islands
13											float in air
14											
15											exploring
16											searching
17											different
18											
19											
20											
21											material
22											by hand
23											long &
24											vertical
25											air and
26											it's different
27											in water
28											after they
29											see what will happen
30											hundred
Total	6	0	28	8	2	0	15	18	15		
pourcentage	15	0	70	20	5	0	37.5	45	37.5		

Date: Heure: Âge: Sexe: Boy
 site comportemental: Assembly zone

Le numero de l'enfant 80	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											exploring
2											the water
3											
4											
5											using
6											branches
7											of trees
8											and fern
9											trying
10											go in the
11											pond
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											striving
28											in fabric
29											around
30											the
31											
32											
33											
34											
35											tree as
36											a target
37											point
38											
39											
40											
Total		0	0	25	0	0	0	7	8	25	
percentage											

Date: Heure: Âge: Sexe: Boy

site comportemental: Courtyard

Le numero de l'enfant G1	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											Running
2											in behind
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											exploring
14											the water
15											& the
16											noise
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											pretending
28											to steal
29											fishing
30											with a
31											tree branch
32											
33											
34											
35											
36											
37											
38											to get
39											some fish
40											
Total		12.5	0	50	14	0	1.5	40	7	19	
percentage											

Date: Heure: Âge: Sexe: girl

site comportemental: Assembly point (Garden + courtyard)

Le numero de l'enfant B4	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total		10	0	18	15	0	0	5	15	32
percentage		25	0	45	30	0	0	12.5	37.5	80

Date: Heure: Âge: Sex: **Boy** ☀️

site comportemental: **Assembly (gardens)** Pathway

Playing
I pass up
the ball
in the
grass part
- lawn.

Exploring
the grass
- lawn
mud

Rolling
the ball
& pretend
to have
a walk
with baby
mummy
- daddy

Le numero de l'enfant B4	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total		4	7	27	0	0	0	10	10	20
percentage		10	17.5	67.5	0	0	0	25	25	50

Date: Heure: Âge: Sex: **Boy** ☀️

site comportemental: **Pathway (wooden)**

Running
in Pathway
and
on bridge

exploring
stone
types

Drawing
on wood

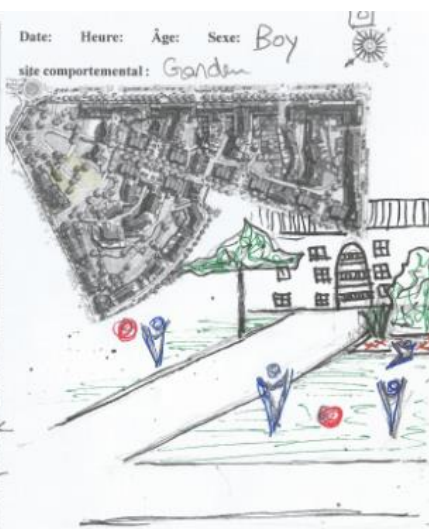
Pathway
with
stones
chalk

exploring
stones
wood
Plastic
ladders
in lake

Le numéro de l'enfant B5	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'aucun de jeu	Le jeu solitaire	Le jeu parallèle		Le jeu en groupe
1											siding
2											with a side
3											toy down
4											the badge
5											motuans
6											you could
7											picture
8											to shi
9											from a bp
10											at round
11											4 the court
12											top of map
13											going to
14											the bridge
15											in explore
16											water
17											works
18											prints
19											stone
20											knis
21											balance
22											as well
23											
24											
25											
26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total	6	0	23	11	0	0	15	9	15		
percentage											



Le numéro de l'enfant B6	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'aucun de jeu	Le jeu solitaire	Le jeu parallèle		Le jeu en groupe
1											rockball
2											Match
3											
4											
5											
6											
7											
8											
9											
10											
11											plung
12											along
13											with
14											ball
15											going
16											Physical
17											movement
18											
19											
20											
21											
22											
23											
24											exploring
25											mud
26											
27											
28											
29											wood
30											chips
31											trees
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total	8	0	19	0	15	0	19	0	21		
percentage											



Le numero de l'enfant B8	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	12	0	21	0	0	7	20	20	0	
percentage										

Date: Heure: Âge: Sexe: Boy
 site comportemental: garden + Pathway

jumped the rope
 lying down on the lawn
 explore on insect on wooden stick

Le numero de l'enfant B8	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
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7										
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9										
10										
11										
12										
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28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	0	0	17	5	0	7	2	22	15	
percentage										

Date: Heure: Âge: Sexe: Boy
 site comportemental: Courtyard (garden)

collecting woodchips
 sitting on wooden garden
 building a corner with sticks
 wooden sticks and a wooden

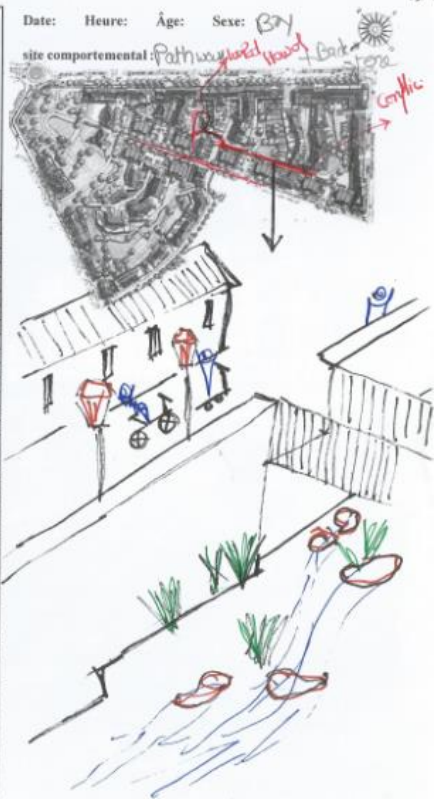
Le numero de l'enfant B ₁₀	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
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28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	14	0	17	0	0	9	0	15	15	
percentage										



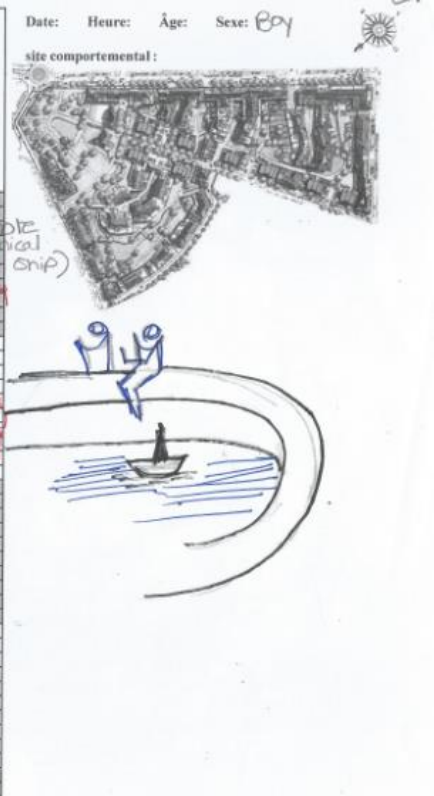
Le numero de l'enfant B ₁	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
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29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	7	0	19	0	0	14	36	6	0	
percentage										



Le numero de l'enfant B12	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
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28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total pourcentage	6	0	34	0	0	0	32	8	0	



Le numero de l'enfant B13	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
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30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total pourcentage	8	0	25	0	7	0	20	3	7	



Le numéro de l'enfant B14	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'absence de jeu	Le jeu solitaire	Le jeu parallèle	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
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30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	5	0	21	0	10	4	16	12	10	

Date: Heure: Âge: Sexe: Boy

site comportemental: Garden

play
with
group
play physical
competitive game
Transition
Exploring
a dog (or)
play
in water
pools
Manipulative
exploratory
Play

Le numéro de l'enfant B15	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'absence de jeu	Le jeu solitaire	Le jeu parallèle	
1										
2										
3										
4										
5										
6										
7										
8										
9										
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11										
12										
13										
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29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	4	0	27	0	8	0	21	6	0	

Date: Heure: Âge: Sexe: Boy

site comportemental: Court yard + Pathway

Runing
in path
way
rune
sockie
explains
found
the
area
and
and the
Dore

Le numéro de l'enfant 92	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'aucun de jeu	Le jeu solitaire	Le jeu parallèle		Le jeu en groupe
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
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29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total	10	0	25	0	0	5	21	18	0		
pourcentage											



Le numéro de l'enfant 93	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'aucun de jeu	Le jeu solitaire	Le jeu parallèle		Le jeu en groupe
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
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28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total	14	0	24	0	0	2	40				
pourcentage											



Le numero de l'enfant G4	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
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27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	2	0	24	0	0	3	24	10	0	

Date: Heure: Âge: Sexe:

site comportemental: Assembly zone

Le numero de l'enfant G5	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
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27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	4	0	23	0	2	0	30	10	0	

Date: Heure: Âge: Sexe:

site comportemental: Assembly zone/garden + pathway

Le numéro de l'enfant G16	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement et l'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'aucun de jeu	Le jeu solitaire	Le jeu parallèle	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
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24										
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26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total		0	8	22	0	10	0	31	4	0
pourcentage										

Date: Heure: Âge: Sexe:



exploring
shadows
grass
tree
branches
path
branches

competing
collecting
tree
branches

along
a construction
with
branches

Le numéro de l'enfant G17	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement et l'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'aucun de jeu	Le jeu solitaire	Le jeu parallèle	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
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25										
26										
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28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total		0	5	0	14	12	10	14	10	16
pourcentage										

Date: Heure: Âge: Sexe: Girl



playing
with a
ball &
friends
transition
pretending
to be
spout
instructor

transition
+ distance
instructor
drawing
with
chalk
on floor

Le numéro de l'enfant G18	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'absence de jeu	Le jeu solitaire	Le jeu parallèle		Le jeu en groupe
1											playing
2											hide & seek
3											playing
4											playing
5											playing
6											playing
7											playing
8											playing
9											playing
10											playing
11											playing
12											playing
13											playing
14											playing
15											playing
16											playing
17											playing
18											playing
19											playing
20											playing
21											playing
22											playing
23											playing
24											playing
25											playing
26											playing
27											playing
28											playing
29											playing
30											playing
31											playing
32											playing
33											playing
34											playing
35											playing
36											playing
37											playing
38											playing
39											playing
40											playing
Total		0	0	0	12	13	0	15	15	10	
percentage											

Date: _____ Heure: _____ Âge: _____ Sexe: Girl
 site comportemental: loped pathway

Le numéro de l'enfant G19	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'absence de jeu	Le jeu solitaire	Le jeu parallèle		Le jeu en groupe
1											Compelme
2											herself
3											spellers
4											to get
5											up to the
6											maximum
7											on boards
8											on boards
9											on boards
10											on boards
11											on boards
12											on boards
13											on boards
14											on boards
15											on boards
16											on boards
17											on boards
18											on boards
19											on boards
20											on boards
21											on boards
22											on boards
23											on boards
24											on boards
25											on boards
26											on boards
27											on boards
28											on boards
29											on boards
30											on boards
31											on boards
32											on boards
33											on boards
34											on boards
35											on boards
36											on boards
37											on boards
38											on boards
39											on boards
40											on boards
Total		0	10	0	20	10	0	30	10	0	to control the work
percentage											

Date: _____ Heure: _____ Âge: _____ Sexe: Girl
 site comportemental: the tree

Le numero de l'enfant G10	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
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27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total		0	17	0	0	0	15	0	16	25
pourcentage										

Date: Heure: Âge: Sexe:

site comportemental: Assembly

Le numero de l'enfant G11	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
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22										
23										
24										
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26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total		0	0	24	12	0	1	0	20	20
pourcentage										

Date: Heure: Âge: Sexe: Girl

site comportemental: Courtyard

Le numero de l'enfant G1V	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
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28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	0	0	15	0	11	0	30	20	0	
percentage										

Date: Heure: Âge: Sexe:

site comportemental: Granden 18th

Wearing rollers
competing
with a
running
guy who
is faster

exploring
in the
lake
the
water
strand
game

Le numero de l'enfant G2	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
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18										
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21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	0	0	15	0	2	2	15	25	0	
percentage										

Date: Heure: Âge: Sexe:

site comportemental: Granden

tennis ball
match

t15-40

sitting
/ talking
/ standing

exploring
grass

t1-8

t9-14

Le numero de l'enfant G114	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
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29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	0	0	29	0	0	0	15	15	10	0
pourcentage										

Date: Heure: Âge: Sexe:

site comportemental: Courtisard

Le numero de l'enfant G15	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
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26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	0	0	30	0	0	0	10	15	20	0
pourcentage										

Date: Heure: Âge: Sexe:

site comportemental:

B.2.I Samples of children's drawings from Cité jardins residential neighborhood, Paris suburbs, France (5 to 7 years aged group)



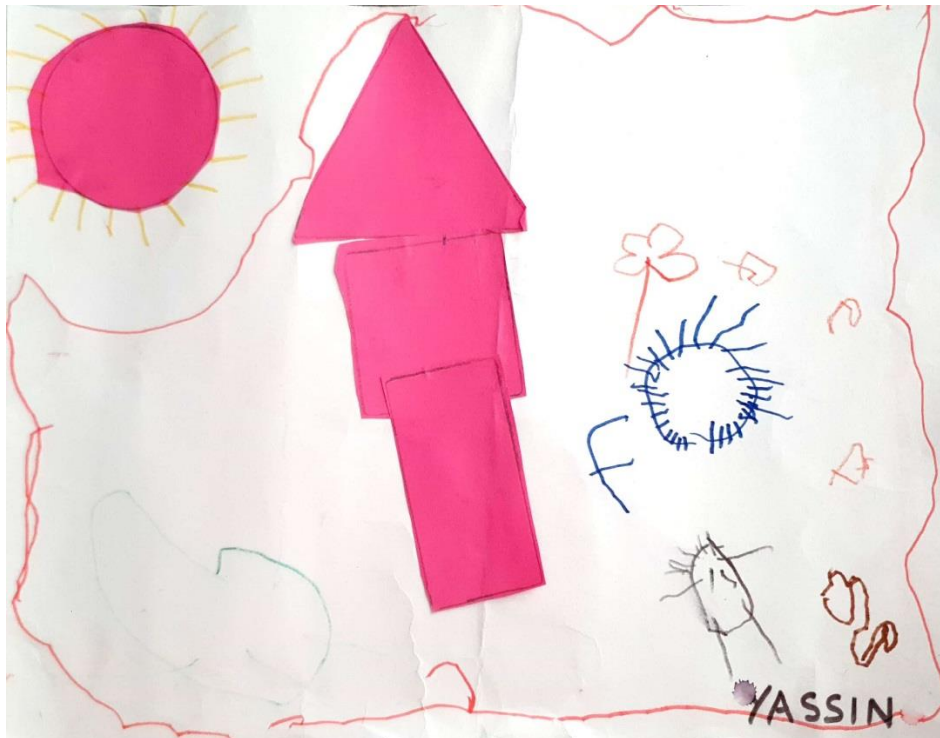
Comment: The drawing is characterized by high accuracy in the represented elements, with good amount of details.



Comment: The drawing is characterized by high accuracy in the represented elements, with good amount of details.



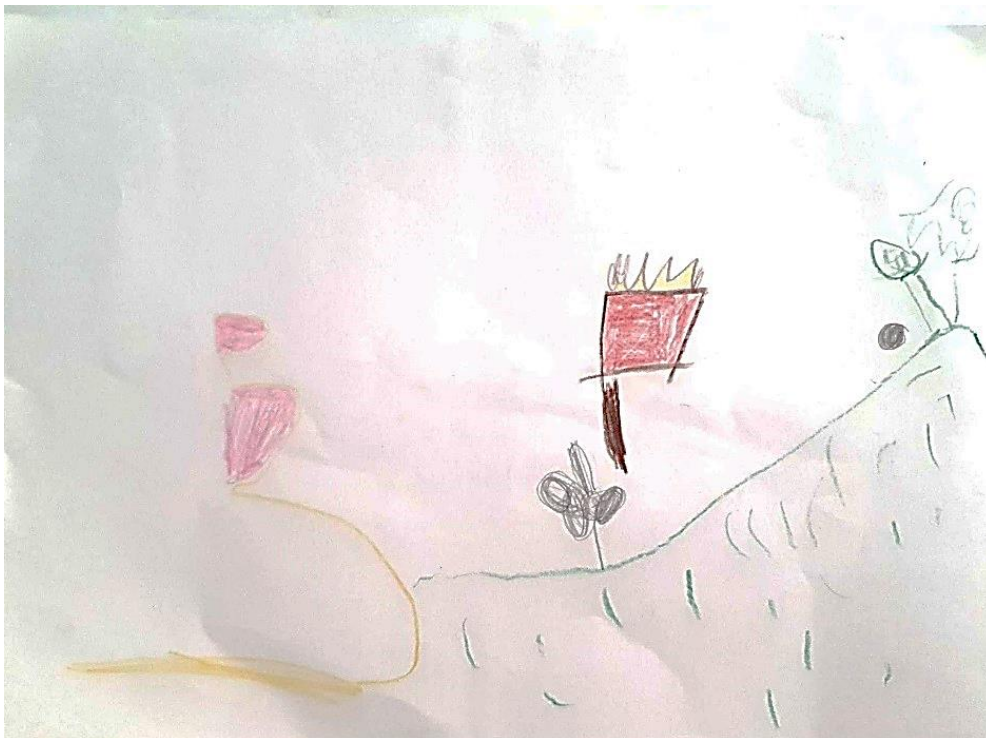
Comment: The drawing is characterized by high accuracy in the represented elements and good amount of details in the represented elements.



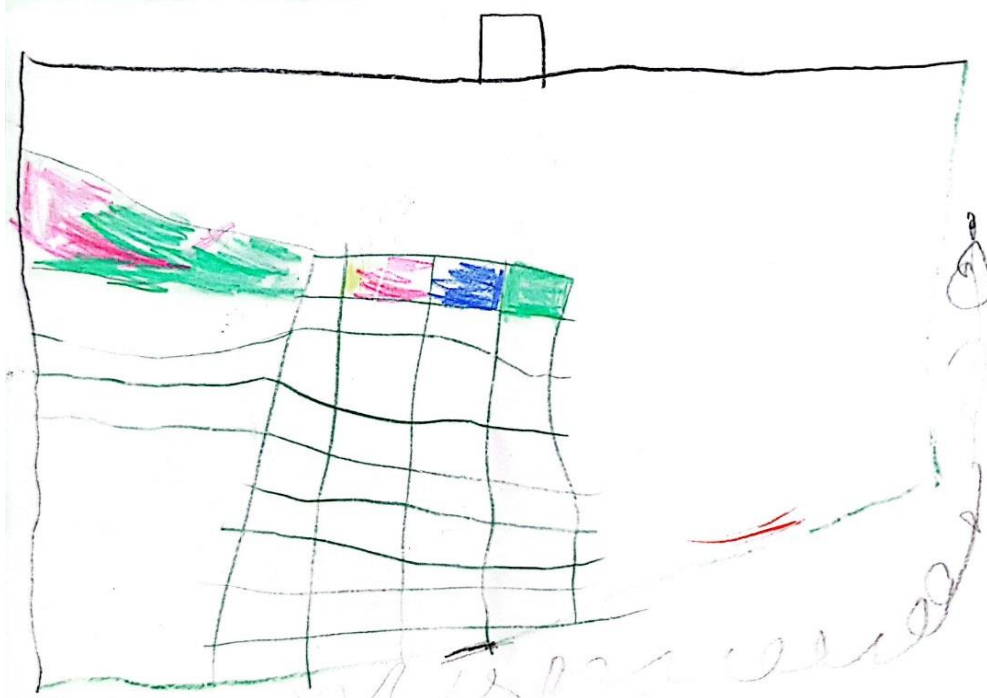
Comment: The drawing is characterized by high accuracy in the represented elements and fine amount of details in the represented elements.



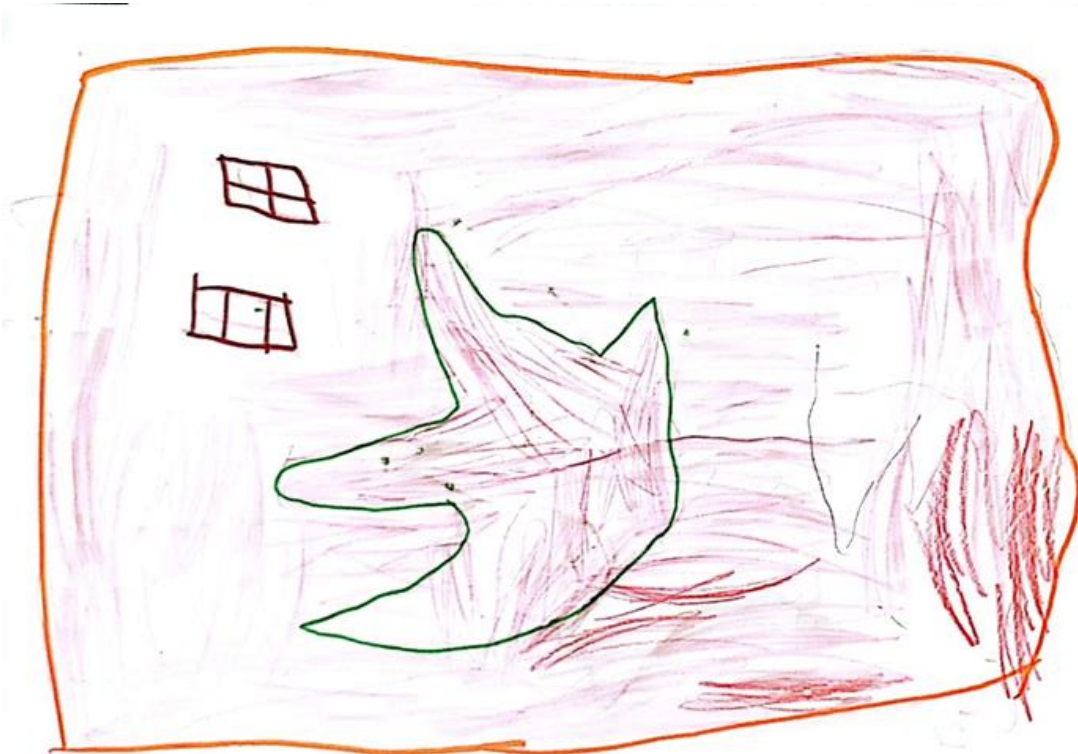
Comment: The drawing is characterized by moderate accuracy in the represented elements and fine amount of details in the represented elements.



Comment: The drawing is characterized by moderate accuracy in the represented elements and fine amount of details in the represented elements.

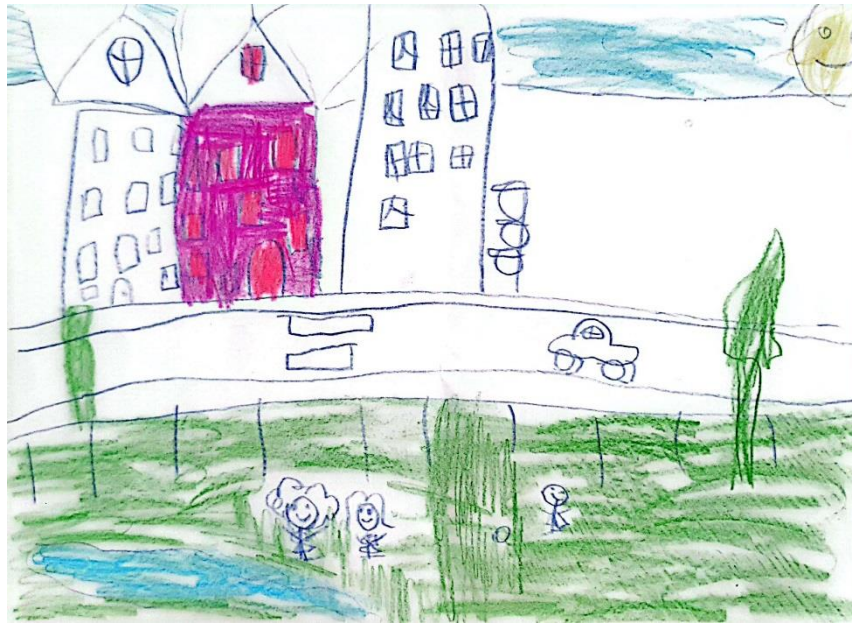


Comment: The drawing is characterized by moderate accuracy in the represented elements and mild amount of details in the represented elements.



Comment: The drawing is characterized by poor accuracy in the represented elements and mild amount of details in the represented elements.

B.2.II Samples of children's drawings from Cité jardins residential neighborhood, Paris suburbs, France (above 7 years aged group)



Comment: The drawing is characterized by high accuracy in the represented elements with high amount of details. It tended to be of high accuracy of the overall scene with high amount of details of overall scene. Moreover, it achieved high visual realism in terms of accuracy of spatial relationships and detailed representation of the depth.



Comment: The drawing is characterized by moderate accuracy in the represented elements with fine amount of details. It tended to be of moderate accuracy of the overall scene with mild amount of details of overall scene. Moreover, it achieved moderate visual realism in terms of accuracy of spatial relationships and moderate representation of the depth.



Comment: The drawing is characterized by moderate accuracy in the represented elements with fine amount of details. It tended to be of moderate accuracy of the overall scene with moderate amount of details of overall scene. Moreover, it achieved moderate visual realism in terms of accuracy of spatial relationships and moderate representation of the depth.



Comment: The drawing is characterized by moderate accuracy in the represented elements with mild amount of details. It tended to be of mild accuracy of the overall scene with moderate amount of details of overall scene. Moreover, it achieved mild visual realism in terms of accuracy of spatial relationships and representation of the depth.



Comment: The drawing is characterized by high accuracy in the represented elements with good amount of details. It tended to be of moderate accuracy of the overall scene with high amount of details of overall scene. Moreover, it achieved moderate visual realism in terms of accuracy of spatial relationships and fine representation of the depth.



Comment: The drawing is characterized by moderate accuracy in the represented elements with fine amount of details. It tended to be of poor accuracy of the overall scene with moderate amount of details of overall scene. Moreover, it achieved mild visual realism in terms of accuracy of spatial relationships and mild representation of the depth.



Comment: The drawing is characterized by moderate accuracy in the represented elements with fine amount of details. It tended to be of mild accuracy of the overall scene with mild amount of details of overall scene. Moreover, it achieved moderate visual realism in terms of accuracy of spatial relationships and mild representation of the depth.



Comment: The drawing is characterized by mild accuracy in the represented elements with mild amount of details. It tended to be of mild accuracy of the overall scene with mild amount of details of overall scene. Moreover, it achieved mild visual realism in terms of accuracy of spatial relationships and representation of the depth.

C.1 Samples of filled observation sheets during the observational sessions at H.S.C recreational urban space, Cairo, Egypt

Date: Heure: Âge: Sexe: Girl
 site comportemental: Pathway & Elevated Parapet

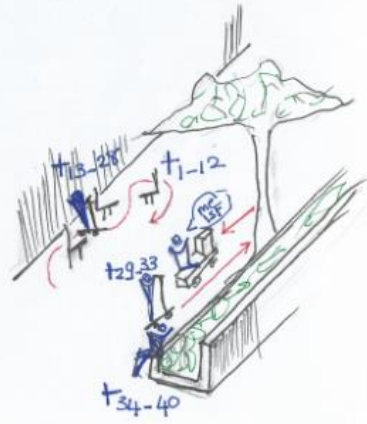
Le numéro de l'enfant G1	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'aucun de jeu	Le jeu solitaire	Le jeu parallèle	
1										collecting
2										chairs
3										to make
4										boundaries
5										
6										
7										
8										pretending
9										
10										
11										that behind
12										the parapet
13										is the
14										name of
15										name is
16										looking for
17										the parapet
18										is the
19										name of
20										name is
21										looking for
22										the parapet
23										is the
24										name of
25										name is
26										looking for
27										the parapet
28										is the
29										name of
30										name is
31										looking for
32										the parapet
33										is the
34										name of
35										name is
36										looking for
37										the parapet
38										is the
39										name of
40										name is
Total personnes	0	5	0	10	10	15	10	10	20	

No play

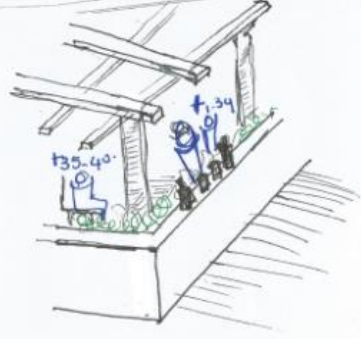
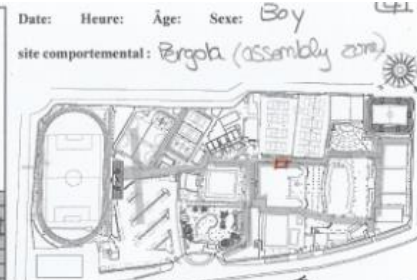
Date: Heure: Âge: Sexe: Girl
 site comportemental: Pergola (assembly zone)

Le numéro de l'enfant G2	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'aucun de jeu	Le jeu solitaire	Le jeu parallèle	
1										playing
2										with beads
3										and making
4										acc.
5										
6										
7										
8										
9										
10										with
11										stuff with
12										colors &
13										forms
14										
15										
16										
17										
18										Pretending
19										that they
20										are eating
21										them to
22										
23										
24										
25										
26										
27										pretending
28										that they
29										are eating
30										them to
31										
32										competing
33										who will
34										make bigger
35										number
36										in the table
37										
38										
39										
40										
Total personnes	0	6	0	8	9	11	13	6	21	

Le numero de l'enfant B1	Le jeu cognitif							Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'absence de jeu	Le jeu solitaire	Le jeu parallele	Le jeu en groupe	
1											Conducting an indirect path to roll through by their wheeled toy Linking the wheeled toy with back Competing who will reach the front (ladder race) Inster Resting on the plant covers
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
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16											
17											
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27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total percentage	16	12	0	0	5	7	8	0	32		

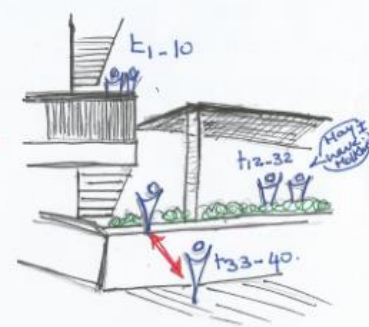


Le numero de l'enfant B2	Le jeu cognitif							Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'absence de jeu	Le jeu solitaire	Le jeu parallele	Le jeu en groupe	
1											pouring water out of several cups + bottles wandering to search plastic bottles / cups pouring water in colored cup to be equivalent in level pouring again in 2 different manners relaxed watching the pour around
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total percentage	21	10	0	0	0	3	4	13	23		



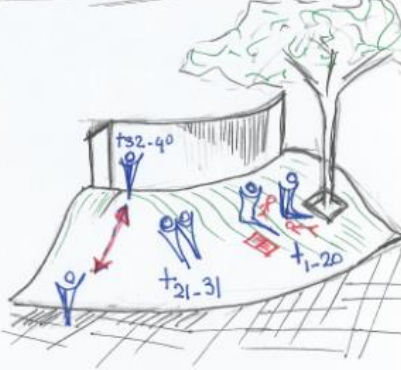
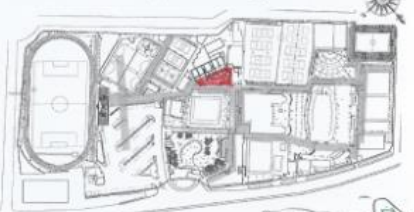
Le numéro de l'enfant	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'absence de jeu	Le jeu solitaire	Le jeu parallèle		Le jeu en groupe
1											Climbing
2											up &
3											down
4											
5											the slide
6											& handrail
7											
8											
9											
10											
11											transition
12											
13											
14											
15											collective
16											boxes from
17											plant box
18											collaborative
19											work
20											with
21											Parachelle
22											
23											parallel
24											
25											
26											they are
27											in the
28											with the
29											Parachelle
30											
31											
32											transition
33											
34											
35											
36											Parachelle
37											
38											
39											
40											
Total	10	9	0	10	0	0	0	14	26		Parachelle

Date: Heure: Âge: Sexe: Girl
 site comportemental: Pergola/Stairs/Balcony (assembly zone)



Le numéro de l'enfant	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'absence de jeu	Le jeu solitaire	Le jeu parallèle		Le jeu en groupe
1											playing
2											with dolls
3											
4											at the
5											original
6											town
7											and pretend
8											to be mother
9											
10											
11											Parachelle
12											
13											Parachelle
14											gathered
15											around with
16											
17											sticks
18											
19											Parachelle
20											
21											the public
22											space
23											Parachelle
24											
25											in front
26											the sign
27											in the
28											Parachelle
29											
30											
31											Parachelle
32											
33											on hand
34											Parachelle
35											
36											Parachelle
37											
38											Parachelle
39											
40											
Total	9	7	0	13	0	11	1	10	27		Parachelle

Date: Heure: Âge: Sexe: Girl
 site comportemental: (assembly zone)



Le numéro de l'enfant B7	Le jeu cognitif					Le jeu social			Les notes descriptives (ou site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'aucun de jeu	Le jeu solitaire		Le jeu parallèle
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total pourcentage	0	10	0	0	0	11	19	13	9	18

Date: Heure: Âge: Sexe: Boy.
 site comportemental: assembly zone

Sitting on the steps
 climbed
 walked
 trying
 to teach
 another
 kid a game
 with
 cards
 (backpack)
 starting
 to play
 with
 cards
 Resting
 on slope
 & looking
 at me

Le numéro de l'enfant B4	Le jeu cognitif					Le jeu social			Les notes descriptives (ou site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'aucun de jeu	Le jeu solitaire		Le jeu parallèle
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total pourcentage	12	4	0	0	0	24	2	12	20	



Date: Heure: Âge: Sexe: Boy
 site comportemental: Curved urban sitting pocket assembly zone

collecting
 coins
 to move
 a goal
 or target
 point (for
 ball)
 playing
 with
 the ball
 Resting
 on the
 curved
 hallway
 & observation
 Resting alone
 play on
 tablette

Le numéro de l'enfant B5	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'aucun de jeu	Le jeu solitaire	Le jeu parallèle	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
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26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total pourcentage		6	9	0	0	6	19	14	7	19

Date: Heure: Âge: Sexe: Boy

site comportemental: curved urban sitting Pocket
assembly + pathway


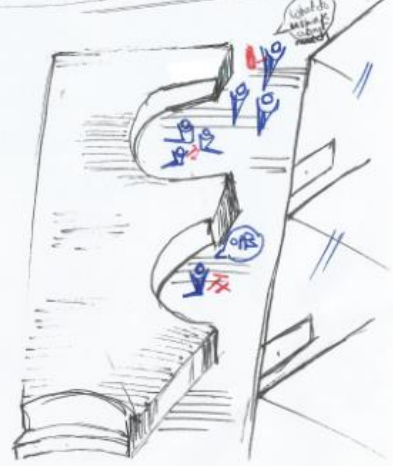
Notes descriptives (au site comportemental et le comportement d'interaction):

crossing on
tiles to
form a
square
to jump
within
the square
applied
found to
connect
together
Anxious
Behavior
Observed
crying noise
beat a rhythm
to make a song
Pehave bath
on the loop

Le numéro de l'enfant	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'aucun de jeu	Le jeu solitaire	Le jeu parallèle	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
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26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total pourcentage		0	5	0	3	8	15	14	9	17

Date: Heure: Âge: Sexe: Girl

site comportemental: curved urban sitting Pocket

Notes descriptives (au site comportemental et le comportement d'interaction):

pretending
that they
are playing
a sport
about the
squash
match
wardening
dumbbell
playing
spin the
bottle
in the
enclosed
pocket
trying to
conduct
a simple
conversation
with bottles
sitting dumbbell
resist a
set of rules

Le numero de l'enfant	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
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28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	0	0	5	8	6	21	9	6	25	
pourcentage										

Date: Heure: Âge: Sexe: Girl
 urban Palms
 site comportemental: Columns & Trees & Stairs
 (loose) elements (elevated elements)

explains trees and mud
 I pulled
 we bottles
 transition
 pretending to drink
 mud we bottles
 as coffee in the place of security
 playing hide & seek around columns place
 Hotel on stairs

Le numero de l'enfant	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
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28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	3	0	6	10	11	12	6	5	24	
pourcentage										

Date: Heure: Âge: Sexe: Girl
 site comportemental: cartel ver terrasse + assembly.
 (Tennis) stairs

jump on steps
 complete
 like will
 climb then faster
 conversation
 transition
 point of group up & down
 Exploring his own
 than coming out of the
 pretending as culture
 to make some jumps
 from veranda
 Kshira wacha

Le numéro de l'enfant	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'absence de jeu	Le jeu solitaire	Le jeu parallèle	
1										
2										explains
3										the chair
4										in ball
5										at night
6										not on
7										concrete
8										wall
9										
10										
11										competing
12										who will
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	0	0	3	0	10	23	5	8	27	
pourcentage										

Date: Heure: Âge: Sexe: Girl 15

site comportemental: cantaliver terrace
Assembly zone (tennis)

metal net

Le numéro de l'enfant	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'absence de jeu	Le jeu solitaire	Le jeu parallèle	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
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16										
17										
18										
19										
20										
21										
22										
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26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	10	0	6	13	6	5	6	34		
pourcentage										

Date: Heure: Âge: Sexe: Girl

site comportemental: bain boys / cantaliver terrace
Urban features (tennis) + columns


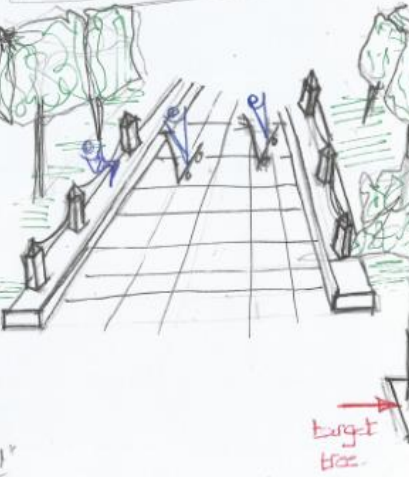
Transition
+ talking
conversation
explains the
text use
of the scene
to call
attention to
columns
of the
cantaliver
terrace
transition
pre-
text focus
on
one moment
of scene
situation
situation
low

t1-7
t13-18
t35-40
t19-34

Le numero de l'enfant G9	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
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11										
12										
13										
14										
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27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total		0	0	0	18	9	13	14	9	17
pourcentage										

Date: Heure: Age: Sexe: Girl


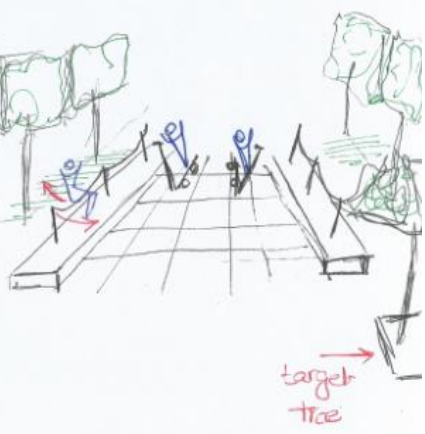
site comportemental: Pathway (linear)
~~* conflictive~~ to linear path

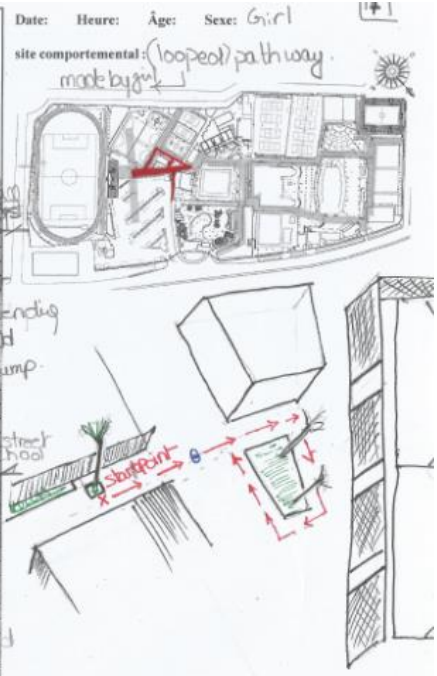
Le numero de l'enfant G10	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
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29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total		0	0	0	28	7	5	14	10	16
pourcentage										

Date: Heure: Age: Sexe: Girl

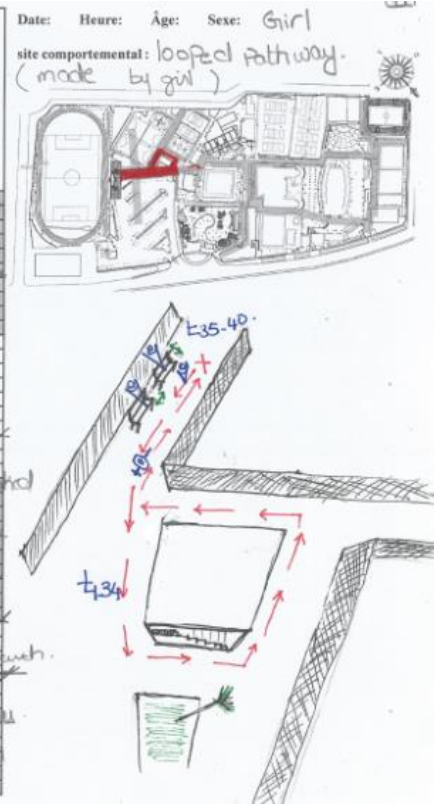
site comportemental: Pathway (linear)

Le numero de l'enfant G11	Le jeu cognitif					Le jeu social				Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											sitting on bench
2											with Phis
3											between legs
4											jumping
5											Driving
6											the base
7											ball pretending
8											to be arch
9											to be arch
10											to be arch
11											to be arch
12											to be arch
13											to be arch
14											to be arch
15											to be arch
16											to be arch
17											to be arch
18											to be arch
19											to be arch
20											to be arch
21											to be arch
22											to be arch
23											to be arch
24											to be arch
25											to be arch
26											to be arch
27											to be arch
28											to be arch
29											to be arch
30											to be arch
31											to be arch
32											to be arch
33											to be arch
34											to be arch
35											to be arch
36											to be arch
37											to be arch
38											to be arch
39											to be arch
40											to be arch
Total		0	0	0	30	5	5	5	15	50	1
pourcentage											

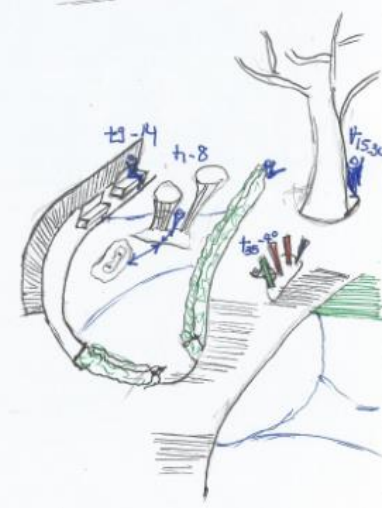


Le numero de l'enfant G12	Le jeu cognitif					Le jeu social				Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											play with
2											bits
3											and mats
4											toys
5											in a
6											designated
7											path by
8											her
9											joined
10											together
11											by other
12											children
13											others
14											because her
15											others
16											because her
17											others
18											because her
19											others
20											because her
21											others
22											because her
23											others
24											because her
25											others
26											because her
27											others
28											because her
29											others
30											because her
31											others
32											because her
33											others
34											because her
35											others
36											because her
37											others
38											because her
39											others
40											because her
Total		2	0	0	0	8	10	7	9	36	4
pourcentage											



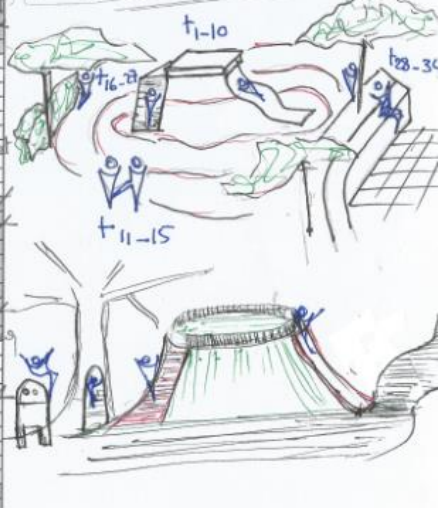
Le numero de l'enfant G18	Le jeu cognitif					Le jeu social				Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'absence de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											Running
2											Repetitive
3											Impulsivity
4											between
5											equipment
6											on a group
7											on a bench
8											Access
9											Instantio
10											a conversation
11											Physical
12											hand work
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total parcentage	24	0	0	0	0	11	5	8	10	22	

Date: Heure: Âge: Sexe: Boy
 site comportemental: Playground contemporary
 (Random play is observed)



Le numero de l'enfant Bx	Le jeu cognitif					Le jeu social				Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'absence de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											play
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
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26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total parcentage	16	0	0	0	0	12	12	6	7	27	

Date: Heure: Âge: Sexe: Boy
 site comportemental: Playground contemporary
 (Fight) -ve/gp



Le numero de l'enfant B8	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total						10	2	8	6	26
pourcentage	25	0	0	0	0	25	5	20	15	65

Date: Heure: Âge: Sexe: Boy
 site comportemental: Playground Contemporary

t1-11
 t13-29
 t31-40

playing on play equipment
 transition
 playing football match
 transition
 swinging

Le numero de l'enfant B9	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total						8	0	10	5	23
pourcentage	20	0	0	0	0	35	0	43	22	50

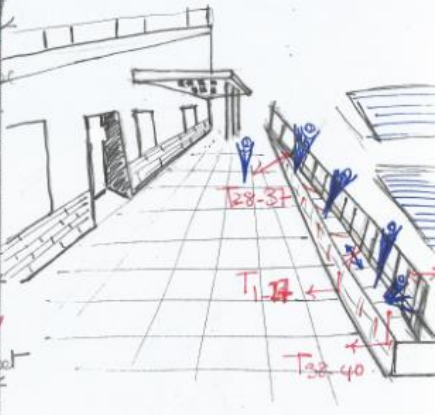
Date: Heure: Âge: Sexe: Boy
 site comportemental: Playground contemporary
 Random playground

t1-10
 t11-35
 t36-40

playing on a playground equipment
 playing group
 trying to jump
 slides of bridge
 and
 when
 man
 jump
 the bridge
 go the plant
 parapet
 why jump
 as as
 observe
 brown path

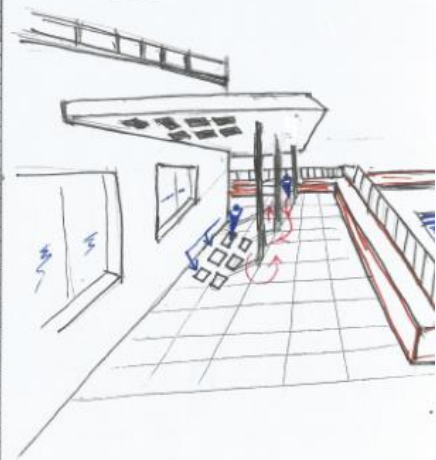
Le numero de l'enfant 879	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
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24										
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26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total		30	0	0	0	5	5	0	4	15
percentage		75	0	0	0	12.5	12.5	0	10	37.5

Date: Heure: Âge: Sexe: Boy
 aggression
 site comportemental: Panopet (urban feature)
 Conflict (elevated element)



Le numero de l'enfant 879	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total		20	0	10	0	0	0	6	3	23
percentage		50	0	25	0	0	0	15	7.5	57.5



Date: Heure: Âge: Sexe: Boy
 Columns (urban feature)
 (elevated element)



Le numero de l'enfant B2	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total personnage	22	0	0	0	0	15	0	15	7	18

Date: Heure: Âge: Sexe: Boy

site comportemental: Terrace (Ramp) Urban Festive


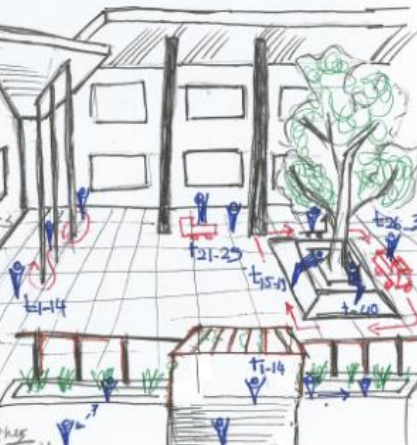



Twisting
on wall
rail
chairs
ranch etc
with
scholar
in loop
vertical
path
Ramp
going up
+ Down
Sliding
the ramp
by stairs
hump
off the ramp
porapel

Le numero de l'enfant D3	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
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28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total personnage	12	0	5	5	10	3	5	2	27	27

Date: Heure: Âge: Sexe: Boy

site comportemental: Terrace (urban element) / Street / Columns / Tree / Ramp

sun
air
columns
I going up
+ Down
conversations
chairs
other areas
columns
moving for
the low
point / tree
Explos
tree / ramp
leaves
transition
for next area
interior
to be low
passage
The other
ramp /
stairs /
ramp
Ramp
stairs
around
chairs
other
ramp

Date: _____ Heure: _____ Âge: _____ Sexe: **Boy**
 site comportemental: **Ramp/shrubs**
Ramp

Minutes (40)	Le jeu cognitif					Le jeu social				Les notes descriptives (sur site comportemental et le comportement d'interaction)	
	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'absence de jeu	Le jeu solitaire	Le jeu parallèle	Le jeu en groupe		
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
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16											
17											
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26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total	14	0	0	0	0	10	16	4	6	30	playing with scooter sliding down the ramp (noise) each other with water empty vicepho none. 1 hugup behind shrubs sitting on chair (noise) making water splash PLOM

Date: _____ Heure: _____ Âge: _____ Sexe: **Girl**
 site comportemental: **water fall & tree & garden**
(grass safe)

Minutes (40)	Le jeu cognitif					Le jeu social				Les notes descriptives (sur site comportemental et le comportement d'interaction)
	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'absence de jeu	Le jeu solitaire	Le jeu parallèle	Le jeu en groupe	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
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24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	12	0	5	0	10	13	10	5	25	running on the grass exploring sound of water climbing down waterfall running from water to sand to play with blocks (1) making conversation running physical jumping (1) conversation and close each other Reshwa + Reshwa + having conversation

Le numero de l'enfant B15	Le jeu cognitif					Le jeu social				Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
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18											
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26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total	15	0	0	0	14	11	12	5	23		

Date: Heure: Age: Sexe: Boy

site comportemental: looped Pathway Ramp / Stairs Start / End

Notes:
 1. ramp
 2. balance
 3. on ramp
 4. walking
 5. jumps
 6. down
 7. climbing
 8. the stairs
 9. climbing
 10. each
 11. other
 12. trying
 13. to catch
 14. each other
 15. in a loop
 16. pathway
 17. climbing
 18. around
 19. the
 20. ramp
 21. and
 22. stairs
 23. ramp
 24. and
 25. stairs
 26. ramp
 27. and
 28. stairs
 29. ramp
 30. and
 31. stairs
 32. ramp
 33. and
 34. stairs
 35. ramp
 36. and
 37. stairs
 38. ramp
 39. and
 40. stairs

Le numen de l'enfant G15	Le jeu cognitif					Le jeu social				Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
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29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total	20	0	0	0	10	10	1	4	35		

Date: Heure: Age: Sexe: Boy.

site comportemental: contemporary playground Tree / Shakes

Notes:
 1. playing
 2. on top
 3. conversation
 4. walking
 5. each
 6. other
 7. playing
 8. with
 9. each
 10. other
 11. using
 12. tree
 13. shakes
 14. climbing
 15. tree
 16. playing
 17. on top
 18. of
 19. structure
 20. and
 21. tree
 22. and
 23. shakes
 24. climbing
 25. tree
 26. playing
 27. on top
 28. of
 29. structure
 30. and
 31. tree
 32. and
 33. shakes
 34. climbing
 35. tree

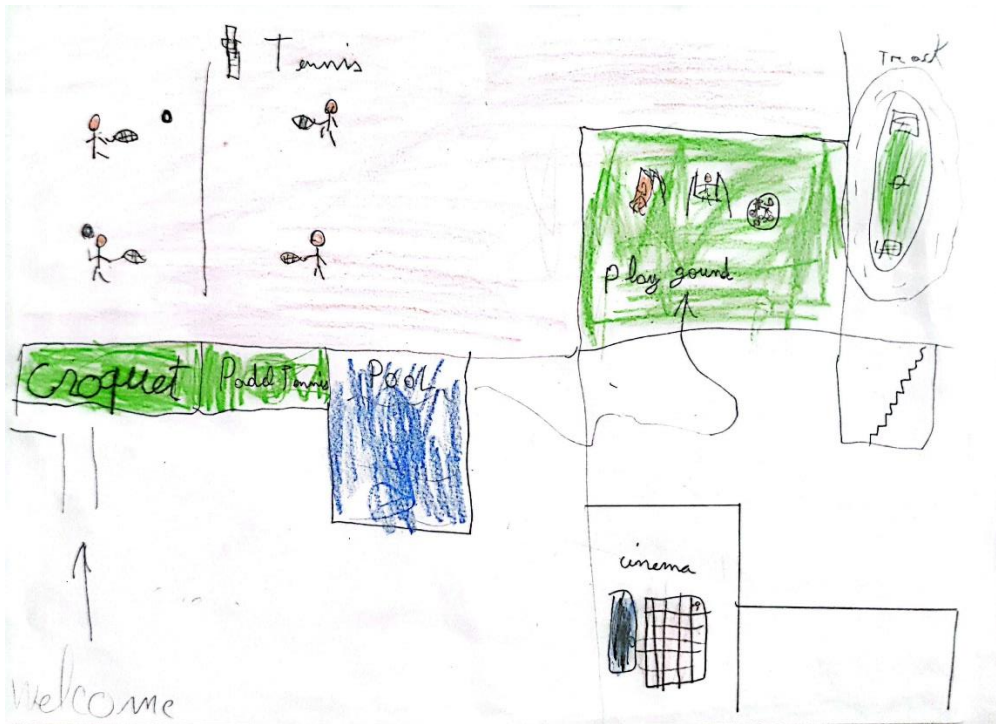
C.2.I Samples of children’s drawings from H.S.C recreational urban space, Cairo, Egypt (5 to 7 years aged group)



Comment: The drawing is characterized by high accuracy in the represented elements, with good amount of details.



Comment: The drawing is characterized by high accuracy in the represented elements and good amount of details in the represented elements.



Comment: The drawing is characterized by moderate accuracy in the represented elements, with good amount of details.



Comment: The drawing is characterized by moderate accuracy in the represented elements, with fine amount of details.



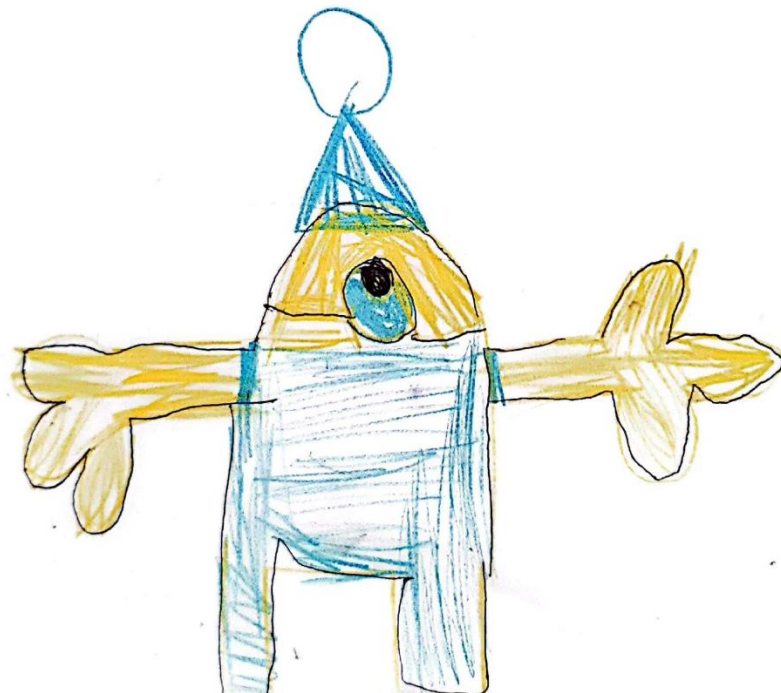
Comment: The drawing is characterized by few amount of details in the represented elements and moderate accuracy in the represented elements.



Comment: The drawing is characterized by moderate accuracy in the represented elements, with mild amount of details.



Comment: The drawing is characterized by few amount of details in the represented elements and mild accuracy in the represented elements.



Comment: The drawing is characterized by poor amount of details in the represented elements and mild accuracy in the represented elements.

C.2.II Samples of children's drawings from H.S.C recreational urban space, Cairo, Egypt (above 7 years aged group)



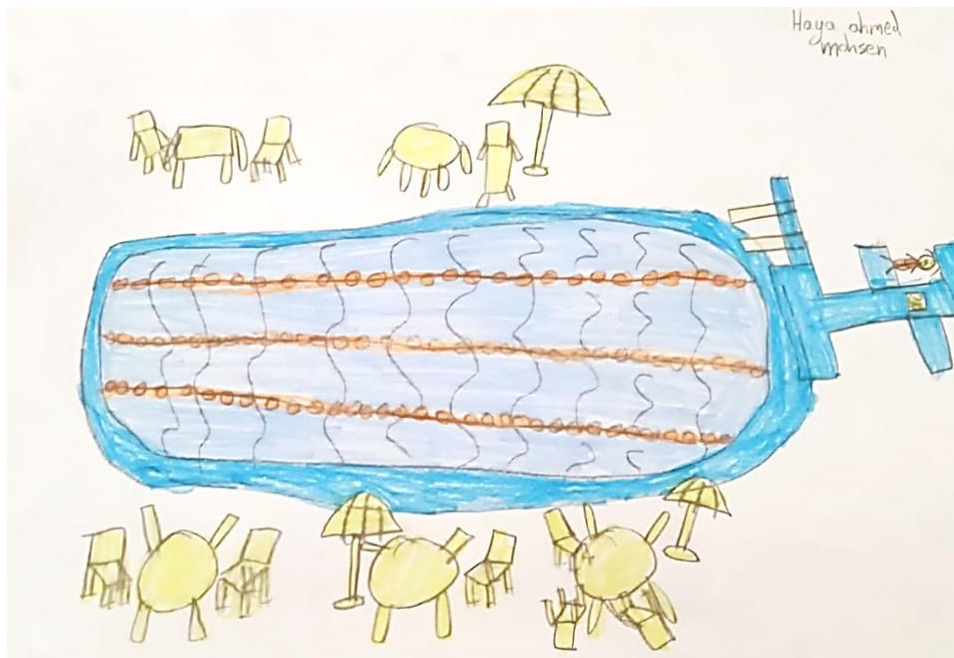
Comment: The drawing is characterized by high accuracy in the represented elements with high amount of details. It tended to be of high accuracy of the overall scene with high amount of details of overall scene. Moreover, it achieved high visual realism in terms of accuracy of spatial relationships and good representation of the depth.



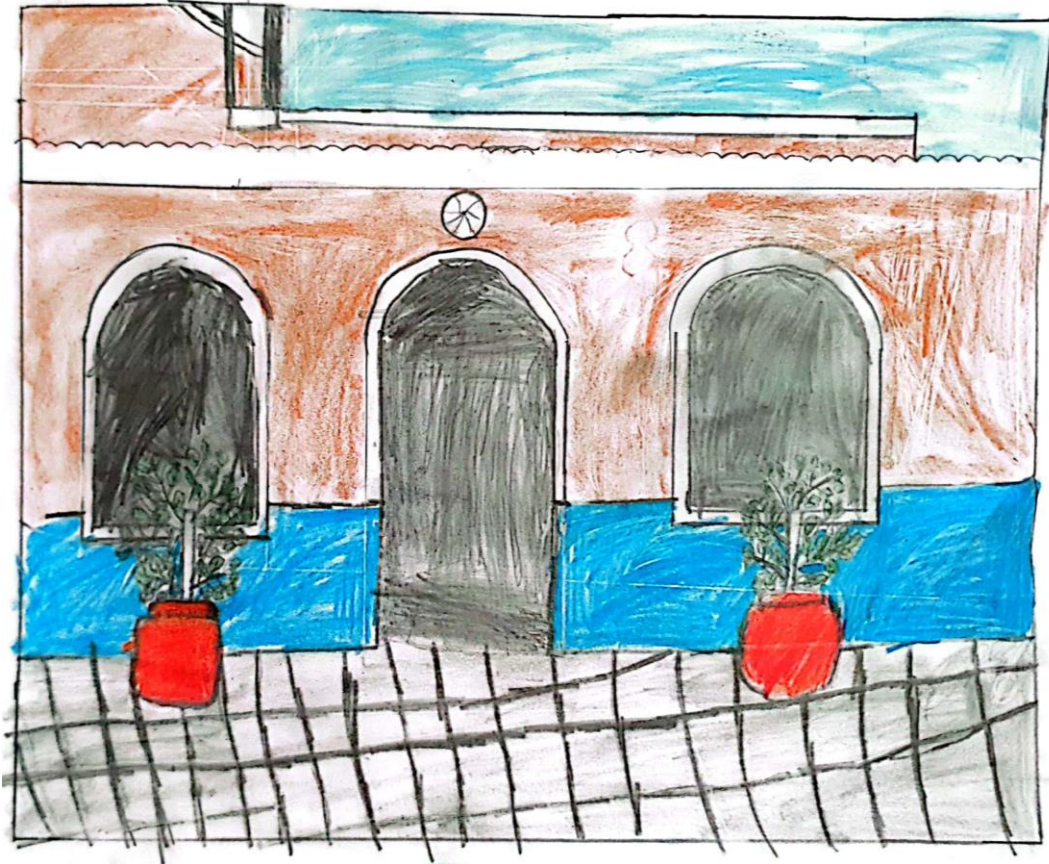
Comment: The drawing is characterized by high accuracy in the represented elements with high amount of details. It tended to be of high accuracy of the overall scene with high amount of details of overall scene. Moreover, it achieved high visual realism in terms of accuracy of spatial relationships and detailed representation of the depth.



Comment: The drawing is characterized by moderate accuracy in the represented elements with high amount of details. It tended to be of moderate accuracy of the overall scene with high amount of details of overall scene. Moreover, it achieved moderate visual realism in terms of accuracy of spatial relationships and fine representation of the depth.



Comment: The drawing is characterized by moderate accuracy in the represented elements with fine amount of details. It tended to be of moderate accuracy of the overall scene with fine amount of details of overall scene. Moreover, it achieved moderate visual realism in terms of accuracy of spatial relationships and fine representation of the depth.



Comment: The drawing is characterized by high accuracy in the represented elements with high amount of details. It tended to be of moderate accuracy of the overall scene with fine amount of details of overall scene. Moreover, it achieved mild visual realism in terms of accuracy of spatial relationships and fine representation of the depth.



Comment: The drawing is characterized by moderate accuracy in the represented elements with fine amount of details. It tended to be of moderate accuracy of the overall scene with moderate amount of details of overall scene. Moreover, it achieved mild visual realism in terms of accuracy of spatial relationships and representation of the depth.



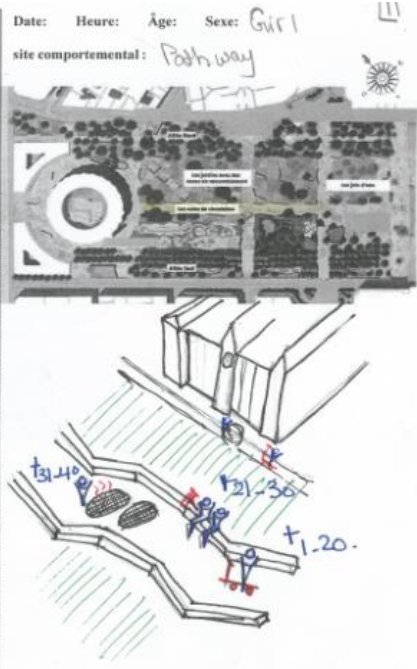
Comment: The drawing is characterized by high accuracy in the represented elements with good amount of details. It tended to be of moderate accuracy of the overall scene with fine amount of details of overall scene. Moreover, it achieved mild visual realism in terms of accuracy of spatial relationships and representation of the depth.



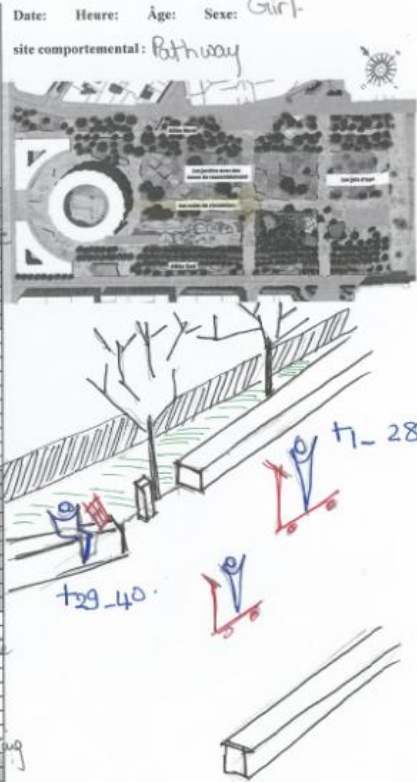
Comment: The drawing is characterized by mild accuracy in the represented elements with mild amount of details. It tended to be of moderate accuracy of the overall scene with fine amount of details of overall scene. Moreover, it achieved moderate visual realism in terms of accuracy of spatial relationships and mild representation of the depth.


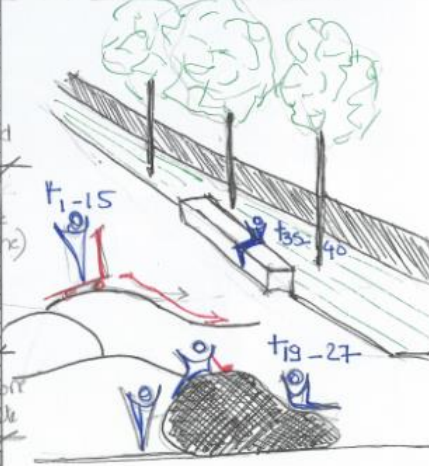
D.1 Samples of filled observation sheets during the observational sessions at Châtelet-Les Halles recreational urban space, Paris, France


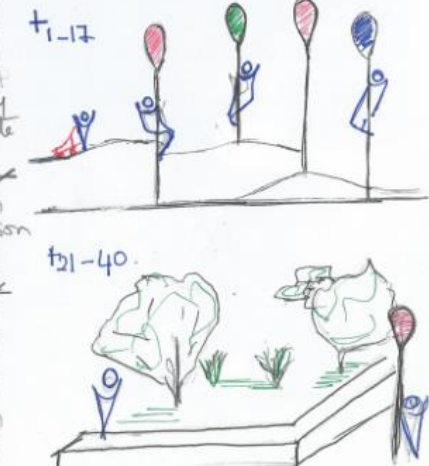
Le numéro de l'enfant G1	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'absence de jeu	Le jeu solitaire	Le jeu parallèle		Le jeu en groupe
1											Rolling
2											in the
3											pathway
4											
5											
6											
7											
8											
9											using
10											a scooter
11											
12											climbing
13											up the
14											steps
15											stairs
16											
17											
18											
19											
20											
21											working
22											on the
23											concrete
24											parapet
25											& benches
26											
27											
28											
29											
30											
31											looking into
32											a friend
33											
34											exploring
35											via concrete
36											steps
37											
38											
39											
40											verticality
Total	20	7	10	0	0	3	20	10	10		
percentage											



Le numéro de l'enfant G2	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'absence de jeu	Le jeu solitaire	Le jeu parallèle		Le jeu en groupe
1											playing
2											with a ball
3											
4											
5											
6											
7											
8											
9											
10											
11											having a
12											goal with
13											a ball
14											
15											
16											competing
17											who will
18											reach
19											a target
20											assembly
21											some first
22											level of
23											pathway
24											
25											
26											
27											resting on
28											the concrete
29											parapet &
30											across the
31											back &
32											the railing
33											
34											
35											
36											
37											
38											
39											
40											
Total	10	5	0	0	15	10	20	5	15		
percentage											



Le numero de l'enfant G3	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											Date: Heure: Age: Sexe: <i>adventure</i> site comportemental: <i>Playground</i>   climbing on the monkey bars up / down left the monkey bars getting on the monkey bars jumping by jump to jump down into a chalk story on monkey bars Rested
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total percentage	15	3	0	0	10	16	20	15	5		

Le numero de l'enfant G4	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											Date: Heure: Age: Sexe: site comportemental: <i>adventure playground / bushes</i>   climbing on the monkey bars the balance sticks pretend to have her baby with basket w. Park transition to construction in case of game with playground hide & seek running with ball
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
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28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total percentage	12	0	0	2	15	8	5	12	23		

Le numero de l'enfant G5	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											begin to climb
2											the wooden fence (stairs)
3											ladder
4											balance
5											exploring
6											to take
7											interaction with fence
8											complete
9											who will maintain
10											moir
11											balance
12											pretending
13											to
14											sup on sagan
15											watch
16											at hand
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total (percentage)	14	0	2	4	12	3	20	20	0		

Date: Heure: Âge: Sexe: Girl
 site comportemental: adventure playground

Le numero de l'enfant G6	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											playing with
2											bike
3											in the
4											sandy
5											pathway
6											
7											
8											
9											
10											
11											
12											
13											competitive
14											velocity
15											on sandy
16											pathway
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
32											resting
33											watching
34											others
35											play
36											
37											
38											
39											
40											
Total (percentage)	13	0	0	0	17	10	10	30	0		

Date: Heure: Âge: Sexe: Girl
 site comportemental: Sandy Pathway

Le numero de l'enfant G17	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
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21										
22										
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25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	18	0	0	6	0	16	15	25		
pourcentage										

Date: Heure: Âge: Sexe: Girl
 site comportemental: adventure playground

The site map shows an adventure playground with various structures. Hand-drawn sketches illustrate the child's activities: 'stopping between colored plates' (1-10), 'rolling a can toy on concrete parapet' (11-16), 'playing with can' (17-24), 'watching other children on the concrete parapet' (25-30), and 'rolling' (31-40).

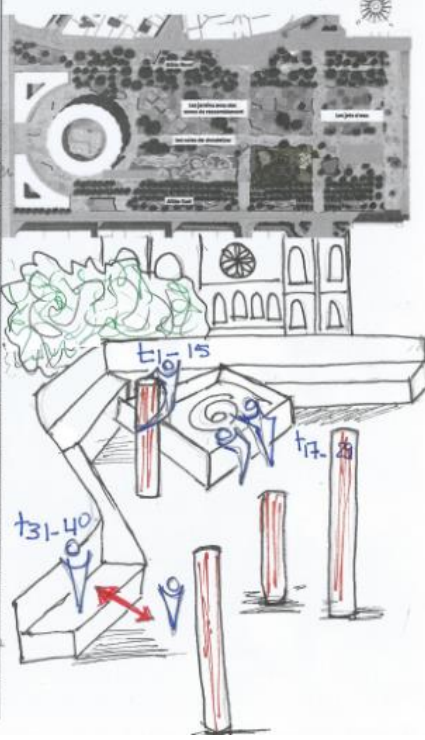
Le numero de l'enfant G18	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
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17										
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29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	13	0	8	5	0	10	15	25	0	
pourcentage										

Date: Heure: Âge: Sexe:
 site comportemental:

The site map shows the same adventure playground. Hand-drawn sketches illustrate the child's activities: 'exploring tree trunk' (1-10), 'transition watching people playing' (11-16), 'pretend to be a shark in a perforated' (17-20), 'transition to a table' (21-23), and 'playing in water pits' (24-40).

Le numéro de l'enfant G9	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'absence de jeu	Le jeu solitaire	Le jeu parallèle		Le jeu en groupe
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Totale pourcentage	25	0	13	0	0	2	10	20	10		

Date: Heure: Âge: Sexe: Girl
 site comportemental: adventure playground



Le numéro de l'enfant G10	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'absence de jeu	Le jeu solitaire	Le jeu parallèle		Le jeu en groupe
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Totale pourcentage	14	0	16	0	0	10	20	10	10		

Date: Heure: Âge: Sexe: Girl
 site comportemental: contemporary playground



Le numero de l'enfant G11	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
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23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	20	0	0	0	0	10	0	5	25	10

Date: Heure: Âge: Sexe: Girl

site comportemental: water jets

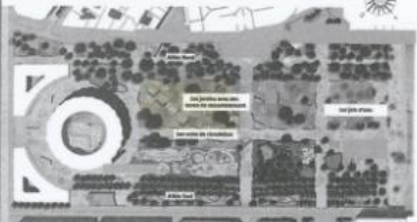
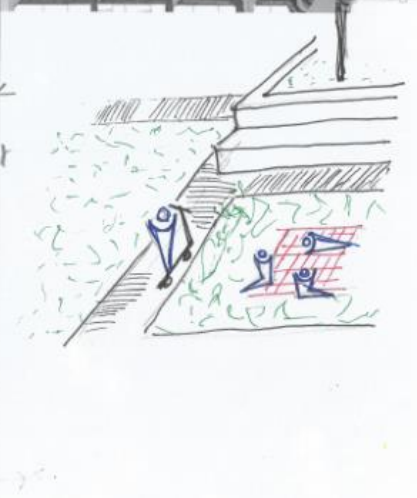



playing
with don
through
the
water
jets
complete
with
another
band
that will not
be used
later

Le numero de l'enfant G12	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
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17										
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29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	10	0	0	0	0	0	20	15	12	20

Date: Heure: Âge: Sexe: Girl

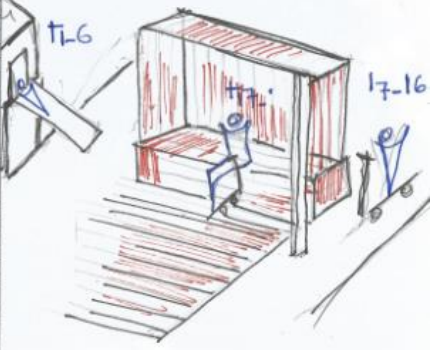
site comportemental: garden

playing
with water
toys in
path way
of the
garden
Relaxing
on bench
I'm using
pencil

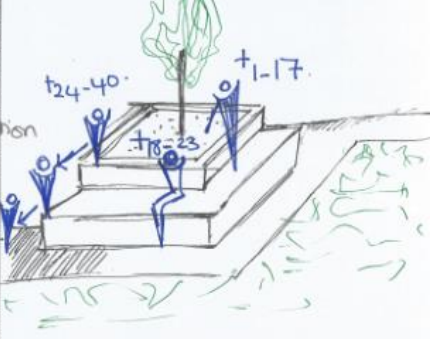
Le numero de l'enfant G10	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'absence de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
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16										
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29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total pourcentage	16	0	5	0	0	11	40	-	-	

Date: Heure: Âge: Sexe: Girl
 site comportemental: adventure playground




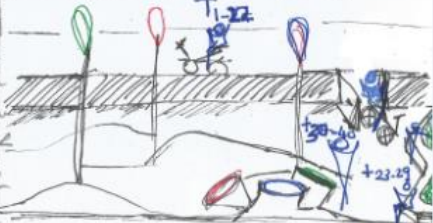

Le numero de l'enfant G114	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'absence de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
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27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total pourcentage	17	0	17	0	0	6	17	23		

Date: Heure: Âge: Sexe: Girl
 site comportemental: garden




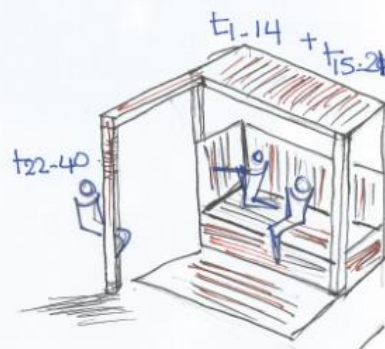
Le numero de l'enfant G15	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'absence de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
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18										
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25										
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27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	27	0	0	11	0	0	7	0	0	40

Date: Heure: Âge: Sexe: Girl.
 site comportemental: adventure playground + path way

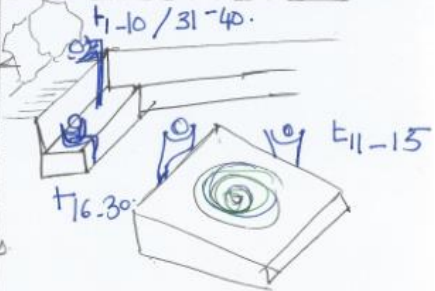
Le numero de l'enfant B1	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'absence de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
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18										
19										
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29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	19	0	0	11	0	0	7	0	0	35

Date: Heure: Âge: Sexe: Boy
 site comportemental: adventure playground

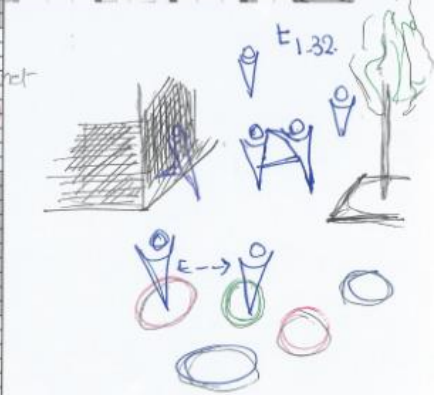
Le numero de l'enfant B4	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
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29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	20	0	5	0	0	15	20	0	20	

Date: Heure: Âge: Sexe: site comportemental: *adventure playground*



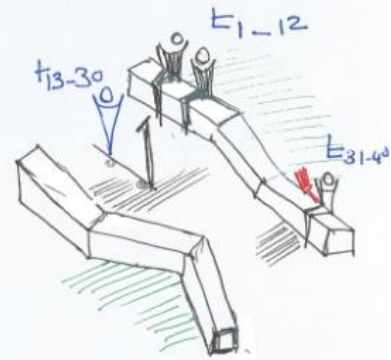
Le numero de l'enfant B5	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'aucun de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
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29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	5	0	0	0	0	8	12	0	0	30

Date: Heure: Âge: Sexe: *Boy* site comportemental: *adventure playground*



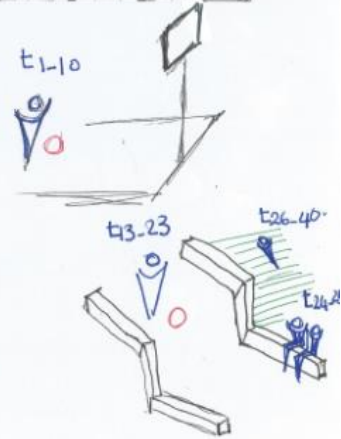
Le numéro de l'enfant 56	Le jeu cognitif						Le jeu social			Les notes descriptives (en site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'absence de jeu	Le jeu solitaire	Le jeu parallèle	
1										
2										
3										
4										
5										
6										
7										
8										
9										
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11										
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37										
38										
39										
40										
Total	18	0	0	0	0	0	26	27	0	12

Date: Heure: Âge: Sexe: Boy
 site comportemental: Pathway.



Le numéro de l'enfant 67	Le jeu cognitif						Le jeu social			Les notes descriptives (en site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'absence de jeu	Le jeu solitaire	Le jeu parallèle	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
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36										
37										
38										
39										
40										
Total	2	0	0	0	0	0	19	30	10	

Date: Heure: Âge: Sexe: Boy
 site comportemental: court & garden & pathway.



Le numero de l'enfant 88	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'absence de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
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34										
35										
36										
37										
38										
39										
40										
Total	30	0	0	0	0	5	5	25	0	15
pourcentage										

Date: Heure: Age: Sexe: Boy
 site comportemental: Contemporary Playground


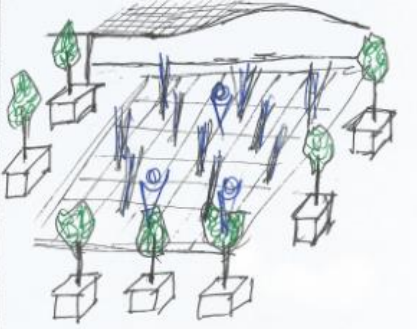
Le numero de l'enfant 89	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'absence de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
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39										
40										
Total	40	0	0	0	0	0	0	40	0	0
pourcentage										

Date: Heure: Age: Sexe: Boy
 site comportemental: Contemporary playground

Le numéro de l'enfant	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'aucun de jeu	Le jeu solitaire	Le jeu parallèle	
1										
2										
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4										
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31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total	40	0	0	0	0	0	0	30	10	0
pourcentage										

Date: Heure: Âge: Sexe: Boy
 site comportemental: water Jet

25


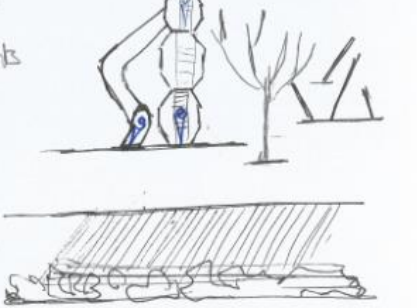



Playground
 water jets

Le numéro de l'enfant	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec règles	L'aucun de jeu	Le jeu solitaire	Le jeu parallèle	
1										
2										
3										
4										
5										
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32										
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34										
35										
36										
37										
38										
39										
40										
Total	40	0	0	0	0	0	0	30	20	0
pourcentage										

Date: Heure: Âge: Sexe: Boy
 site comportemental: Contemporary playground

20


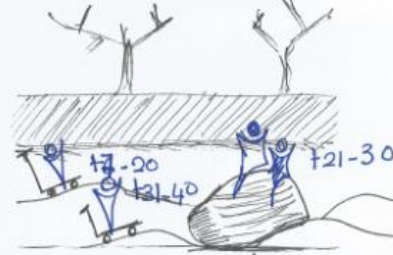




Playground
 on
 contemporary
 play
 equipments
 2 rings
 1
 vertical

Le numero de l'enfant B12	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'absence de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
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12										
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30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total										
pourcentage	50	0	0	0	0	10	15	15	10	

Date: Heure: Age: Sexe: Boy




site comportemental: adventure playground + pathway

Le numero de l'enfant B13	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'absence de jeu	Le jeu solitaire	Le jeu parallele	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
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29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total										
pourcentage	35	0	0	0	0	5	0	15	10	15

Date: Heure: Age: Sexe: Boy

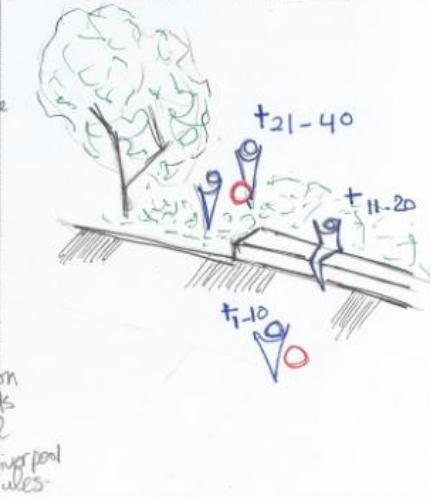
site comportemental: contemporary playground

Le numero de l'enfant B14	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'absence de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											
2											
3											
4											
5											
6											
7											
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34											
35											
36											
37											
38											
39											
40											
Total	15	0	0	0	5	20	0	5	15		

Date: Heure: Âge: Sexe:

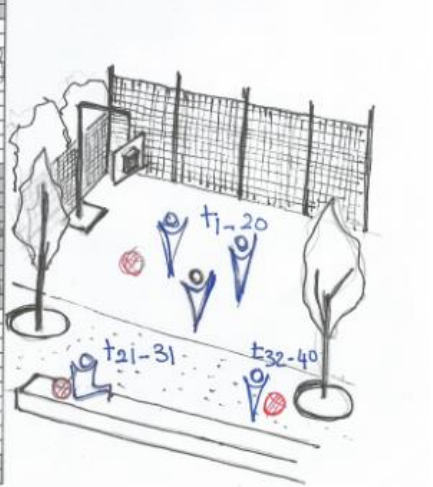
site comportemental: *garden*



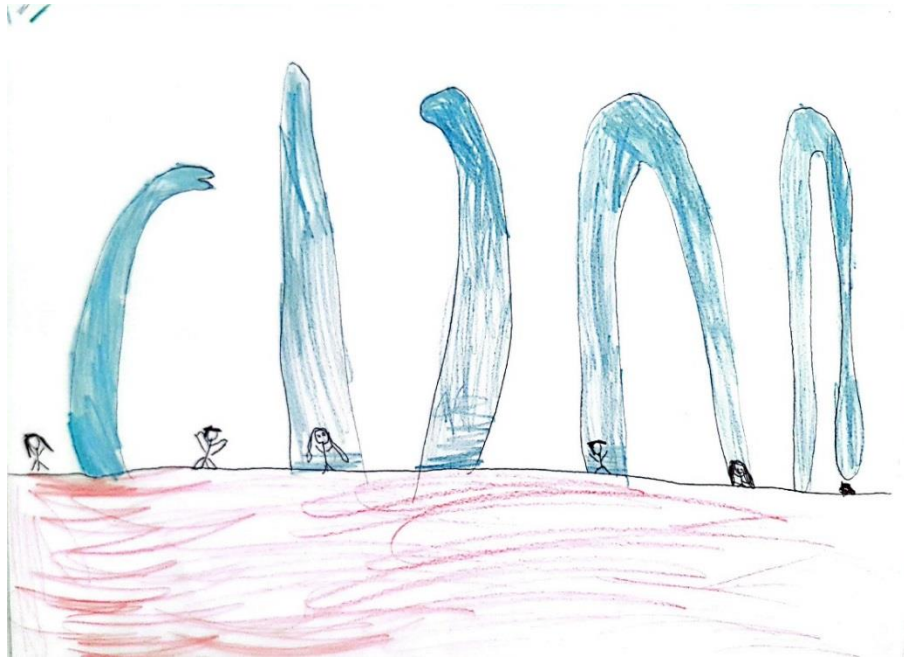
Le numero de l'enfant B15	Le jeu cognitif						Le jeu social			Les notes descriptives (au site comportemental et le comportement d'interaction)	
	Minutes (40)	Le jeu fonctionnel	Le jeu constructif	Le jeu exploratoire	Le jeu dramatique	Les jeux avec regles	L'absence de jeu	Le jeu solitaire	Le jeu parallele		Le jeu en groupe
1											
2											
3											
4											
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6											
7											
8											
9											
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29											
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31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
Total	15	0	0	0	0	8	15	5	20		

Date: Heure: Âge: Sexe:

site comportemental: *court*



D.2.I Samples of children's drawings from Châtelet-Les Halles recreational urban space, Paris, France (5 to 7 years aged group)



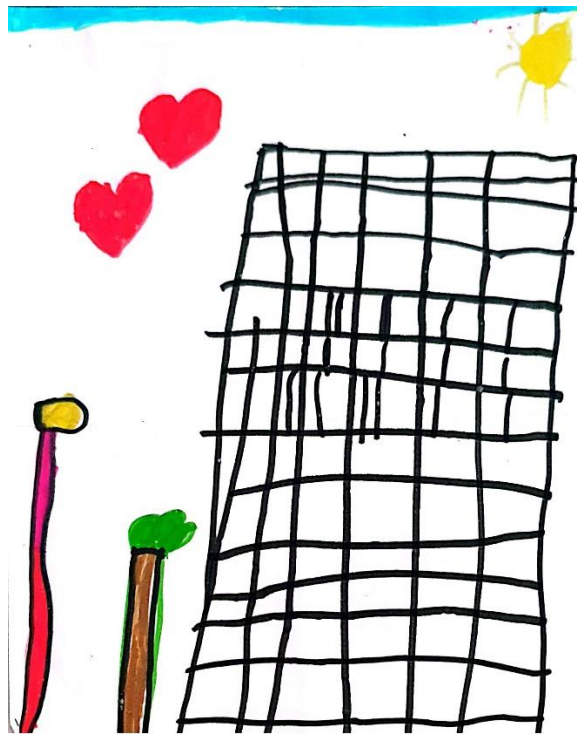
Comment: The drawing is characterized by high accuracy in the represented elements and good amount of details in the represented elements.



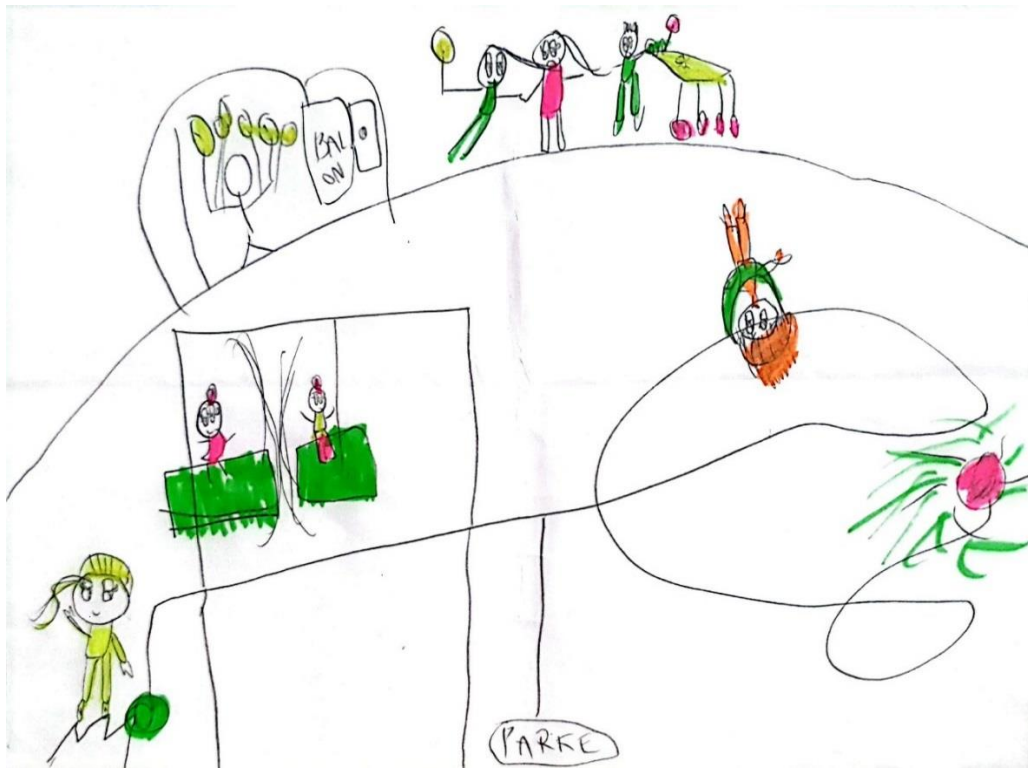
Comment: The drawing is characterized by moderate accuracy in the represented elements and fine amount of details in the represented elements.



Comment: The drawing is characterized by moderate accuracy in the represented elements and fine amount of details in the represented elements.



Comment: The drawing is characterized by moderate accuracy in the represented elements and mild amount of details in the represented elements.



Comment: The drawing is characterized by few amount of details in the represented elements and moderate accuracy in the represented elements.



Comment: The drawing is characterized by few amount of details in the represented elements and mild accuracy in the represented elements.



Comment: The drawing is characterized by few amount of details in the represented elements and mild accuracy in the represented elements.



Comment: The drawing is characterized by poor amount of details in the represented elements and mild accuracy in the represented elements.

D.2.II Samples of children's drawings from Châtelet-Les Halles recreational urban space, Paris, France (above 7 years aged group)



Comment: The drawing is characterized by high accuracy in the represented elements with high amount of details. It tended to be of high accuracy of the overall scene with high amount of details of overall scene. Moreover, it achieved high visual realism in terms of accuracy of spatial relationships and detailed representation of the depth.



Comment: The drawing is characterized by moderate accuracy in the represented elements with good amount of details. It tended to be of high accuracy of the overall scene with fine amount of details of overall scene. Moreover, it achieved moderate visual realism in terms of accuracy of spatial relationships and fine representation of the depth.



Comment: The drawing is characterized by moderate accuracy in the represented elements with mild amount of details. It tended to be of moderate accuracy of the overall scene with fine amount of details of overall scene. Moreover, it achieved moderate visual realism in terms of accuracy of spatial relationships and fine representation of the depth.



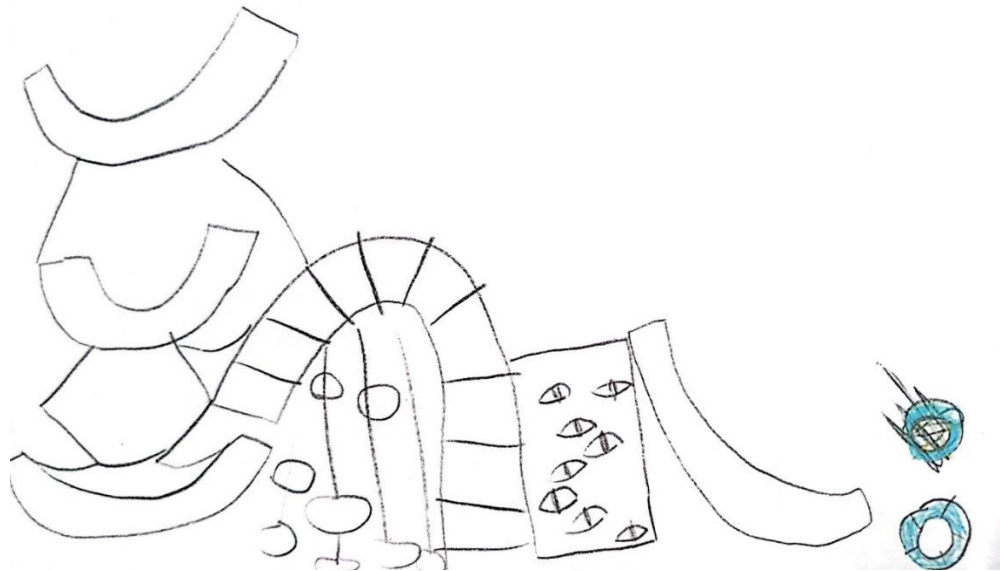
Comment: The drawing is characterized by moderate accuracy in the represented elements with fine amount of details. It tended to be of moderate accuracy of the overall scene with fine amount of details of overall scene. Moreover, it achieved moderate visual realism in terms of accuracy of spatial relationships and mild representation of the depth.



Comment: The drawing is characterized by moderate accuracy in the represented elements with fine amount of details. It tended to be of mild accuracy of the overall scene with few amount of details of overall scene. Moreover, it achieved mild visual realism in terms of accuracy of spatial relationships and moderate representation of the depth.



Comment: The drawing is characterized by moderate accuracy in the represented elements with few amount of details. It tended to be of moderate accuracy of the overall scene with mild amount of details of overall scene. Moreover, it achieved moderate visual realism in terms of accuracy of spatial relationships and mild representation of the depth.



Comment: The drawing is characterized by moderate accuracy in the represented elements with fine amount of details. It tended to be of mild accuracy of the overall scene with few amount of details of overall scene. Moreover, it achieved mild visual realism in terms of accuracy of spatial relationships and representation of the depth.



Comment: The drawing is characterized by mild accuracy in the represented elements with mild amount of details. It tended to be of poor accuracy of the overall scene with few amount of details of overall scene. Moreover, it achieved mild visual realism in terms of accuracy of spatial relationships and representation of the depth.