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Psychologie du Développement

Par **Alexia CARRIZALES**

**Le rôle des milieux de vie dans le développement
de l'empathie et des comportements prosociaux à
l'adolescence**

Sous la direction de Pr. Lyda LANNEGRAND-WILLEMS

Soutenue le 3 décembre 2018

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Le rôle des milieux de vie dans le développement de l'empathie et des comportements prosociaux à l'adolescence

L'adolescence est une période importante de la vie caractérisée par des changements majeurs psychologiques et comportementaux qui ont été théoriquement et empiriquement reliés aux changements dans l'environnement social. Les différents milieux de vie des adolescents leur offrent un «terrain de jeu» pour explorer, tester, développer et intégrer des compétences cruciales nécessaires à l'interaction sociale, comme les comportements prosociaux. À l'adolescence, les relations entre pairs deviennent plus saillantes et plus importantes qu'à toute autre période de la vie. Au-delà des contextes familial et scolaire, les adolescents consacrent beaucoup de temps à différentes activités avec des pairs. Parmi ces activités, nous nous sommes focalisées sur la participation à des activités extrascolaires qui sont considérés comme un milieu de vie important dans le développement positif des adolescents.

Le premier objectif de cette thèse était de mieux comprendre le rôle des milieux de vie dans l'empathie et les comportements prosociaux à l'adolescence. Nous avons développé et examiné un modèle théorique intégratif des relations entre les caractéristiques positives et négatives des milieux de vie (famille, classe et groupe de pairs extrascolaire), la perception par les adolescents des comportements prosociaux dans chacun de ces milieux de vie et de leurs propres comportements prosociaux, en tenant compte du rôle médiateur de l'empathie.

Le deuxième objectif était de mieux comprendre les relations longitudinales bidirectionnelles entre l'empathie et les comportements prosociaux à l'adolescence, en mettant un accent particulier sur les processus internes à la personne.

Enfin, le troisième objectif était de mieux comprendre les trajectoires de développement de l'empathie et des comportements prosociaux des adolescents en prenant en compte leur participation à des activités extrascolaires.

Nous avons conduit un recueil de données longitudinales à 3 vagues avec un intervalle d'un an. Les adolescents ont répondu à des questions concernant les caractéristiques des trois milieux de vie, les comportements prosociaux dans chacun d'eux, leur participation extrascolaire, ainsi que leur empathie et leurs comportements prosociaux.

Nos résultats suggèrent que les caractéristiques des groupes de pairs extrascolaires et de la famille (en particulier les plus négatives) et la perception de leurs comportements prosociaux jouent un rôle majeur dans les comportements prosociaux des adolescents via l'empathie à l'adolescence. Ils montrent également que l'empathie est un prédicteur des comportements prosociaux et que les trajectoires de développement de l'empathie et des comportements prosociaux à l'adolescence sont différentes chez ceux qui participent à des activités extrascolaires où on n'observe pas de trajectoire développementale décroissante comparé à ceux qui n'y participent pas.

En utilisant une seule approche théorique dans trois milieux de vie différents, nous avons pu saisir les caractéristiques communes et spécifiques de la famille, du groupe-classe et des groupes de pairs extrascolaires, qui ont une influence sur les comportements prosociaux des adolescents. De plus, prendre en compte les différences entre les individus et les processus de développement intra-individuels, l'hétérogénéité des trajectoires développementales concernant l'empathie et les comportements prosociaux à l'adolescence est essentiel pour saisir l'interaction complexe entre la famille, la classe, le groupe de pairs extrascolaire, l'empathie et le développement prosocial

Mots-clés: Adolescence, Empathie, Comportements prosociaux, Milieux de vie, Etude Longitudinale

The role of living environments in empathy and prosocial behaviour development in adolescence

Adolescence is a significant period in life that is characterized by major changes that have been theoretically and empirically related to changes in social environments. Adolescents different living environments offer the “playground” to explore, to test, to develop and integrate social cues and crucial abilities that are necessary for social interaction, such as prosocial behaviours. During adolescence, peer relationships become more salient and prominent than in any other period in life. Away from the family and the school context, adolescents spend a large amount of time in activities with peers. Among these activities we focused on extracurricular activity participation, that have been conceptualised as an important developmental context of adolescents’ lives

The first aim of this dissertation was to provide more insight into the role of living environments in relation to empathy and prosocial behaviours in adolescence. We developed and examined an integrative model of the relations between positive and negative living environment features, adolescents’ perceptions of prosocial behaviours across the three contexts (family, class and extracurricular peer group) and their own prosocial behaviours, taking into account the potential mediating role of empathy.

The second aim was to provide more insight into the bidirectional longitudinal relations between empathy and prosocial behaviours during adolescence, with a special focus on the within-person processes.

Finally, the third aim of this dissertation was to provide more insight into adolescents’ prosocial behaviours and empathy developmental trajectories considering extracurricular activity participation.

This dissertation used data from a 3-Wave longitudinal study gathered during the three years of the PhD with data collected at one-year intervals. Adolescents answered questions concerning the features of the living environment, their peer group’s and parents’ prosocial behaviours, extracurricular activity participation, and their own empathy and prosocial behaviour.

Our findings suggest that extracurricular peer group features, family features (particularly the negative ones) and extracurricular peer group and parents’ prosocial behaviours play a major role in adolescents’ prosocial behaviours via empathy in adolescence.

Therefore, we found that empathy is a driver of prosocial behaviours. We also identified that latent class growth for empathy and prosocial behaviour were different in the extracurricular activity group for which there was no downward trend trajectory over time compared to the non-extracurricular group.

Using one approach across three living environments allowed us to capture the common and specific features of the family, school and extracurricular peer group contexts that influence adolescents' prosocial behaviours. Furthermore, our results highlighted the need to acknowledge the between person differences and the within-person processes of development. Moreover, it is important to consider the heterogeneity of developmental trajectories concerning empathy and prosocial behaviours during adolescence if we want to capture the complex interplay between family, class, extracurricular peer group, empathy and prosocial development.

Keywords: Adolescence, Empathy, Prosocial Behaviours, Living Environments, Longitudinal design

Le rôle des milieux de vie dans le développement de l'empathie et des comportements prosociaux à l'adolescence

Introduction

L'adolescence est une période importante de la vie caractérisée par des changements majeurs physiologiques, psychologiques, cognitifs et émotionnels, et comportementaux qui ont été théoriquement et empiriquement reliés aux changements dans l'environnement social (par ex. : Blakemore, Burnett, & Dahl, 2010 ; Blakemore & Mills, 2014 ; Burnett, Thompson, Bird, & Blakemore, 2012 ; Lerner, Lerner, & Benson, 2011). Elle comprend l'acquisition des compétences sociales, émotionnelles et cognitives nécessaires pour nouer de nouvelles amitiés et développer des relations interpersonnelles, acquérir la confiance en soi, réussir académiquement et devenir un individu autonome et indépendant (Brown & Larson, 2009 ; Taylor, Barker, Heavey et McHale, 2013). Parmi tous les changements que vivent les adolescents, la réorientation sociale est l'une des préoccupations majeures (Collins et Steinberg, 2006; Overgaauw, 2015; Soenens, Deci et Vansteenkiste, 2017; Steinberg, 2005). Nous nous sommes centrée sur le développement de l'empathie et des comportements prosociaux en prenant en compte les milieux de vie majeurs de l'adolescent. Par empathie, nous entendons la capacité de partager et de comprendre les pensées et sentiments des autres (Batson, C. D., 2018 ; Eisenberg, Spinrad, & Morris, 2014). Les comportements prosociaux sont définis comme l'ensemble des comportements humains volontaires et intentionnels dirigés vers autrui ou un groupe dans le but de lui apporter un avantage (Eisenberg, Spinrad, & Knafo-Noam, 2015; Carlo & Randall, 2002).

Du point de vue du cadre théorique de référence, cette thèse s'appuie sur le développement positif des jeunes (Lerner, 2005), conception selon laquelle « la jeunesse est en train de développer des individus qui présentent des atouts considérables et qui peuvent être guidés pour devenir des acteurs positifs et constructifs dans la société » (p. 4). Cette conception appréhende l'adolescence à travers le prisme de théories des systèmes qui considèrent le développement tout au long de la vie comme un produit des relations entre les individus et leur milieu de vie. Un aspect fondamental est l'idée de plasticité selon laquelle les individus ont le potentiel de changer systématiquement au cours de la vie. Ce potentiel

signifie que les trajectoires de développement des adolescents ne sont pas immuables et peuvent être influencées par divers facteurs provenant de leurs milieux de vie (Lerner, 2006).

Les milieux de vie jouent un rôle majeur dans le développement psychosocial des enfants et des adolescents. Au cours de l'enfance, les parents jouent le rôle le plus important en tant qu'agents de socialisation à travers les expériences d'interaction sociale qui influencent le développement cognitif, affectif et psychosocial (Olsson, Hagekull, Giannotta et Åhlander, 2016; Steinberg, 2001). Un autre agent de socialisation important est constitué par le milieu de vie scolaire. La littérature suggère que les processus de socialisation émanant de ces milieux de vie peuvent soit favoriser soit entraver le développement des compétences sociales et émotionnelles. À l'adolescence, les relations entre pairs deviennent plus saillantes et importantes qu'à n'importe quelle autre période de la vie. Au-delà des contextes familial et scolaire, les adolescents consacrent beaucoup de temps à différentes activités avec des pairs. Parmi ces activités, nous nous sommes focalisée sur la participation des adolescents à des activités extrascolaires qui sont considérées comme un milieu de vie important dans le développement positif des adolescents (Bohnert et coll., 2010 ; Guèvremont et coll., 2014 ; Schaefer, Simpkins, Vest, & Price, 2011 ; Weiss et coll., 2012). Les différents milieux de vie des adolescents leur offrent un « terrain de jeu » pour explorer, tester, développer et intégrer des compétences cruciales nécessaires à l'interaction sociale, comme les comportements prosociaux.

Notre objectif général visait donc à étudier le rôle de trois milieux de vie (famille, école par le biais du groupe-classe, groupe d'activité extrascolaire) et particulièrement du rôle des relations au sein de ces trois groupes, dans le développement de l'empathie et des comportements prosociaux du début à la fin de l'adolescence. Cet objectif général comprend trois sous-objectifs complémentaires.

Le premier objectif de cette thèse était de mieux comprendre le rôle des milieux de vie dans l'empathie et les comportements prosociaux à l'adolescence. Nous avons développé et examiné un modèle théorique intégratif des relations entre les caractéristiques positives et négatives des milieux de vie (famille, classe et groupe de pairs extrascolaire), la perception par les adolescents des comportements prosociaux dans chacun de ces milieux de vie et de leurs propres comportements prosociaux, en tenant compte du rôle médiateur de l'empathie en utilisant une partie de la théorie « Self-System Model of Motivational Development »

(SSMMD, Skinner & Belmont, 1993 ; Skinner, Johnson, & Snyder, 2005) adaptée à chaque milieu de vie considéré.

Le deuxième objectif était de mieux comprendre les relations longitudinales bidirectionnelles entre l'empathie et les comportements prosociaux à l'adolescence, en mettant un accent particulier sur les processus internes à la personne.

Enfin, le troisième objectif était plus particulièrement focalisé sur le rôle peu étudié d'un des milieux de vie : la participation à un groupe d'activité extrascolaire. Il visait à mieux comprendre les trajectoires de développement de l'empathie et des comportements prosociaux des adolescents en prenant en compte leur participation ou non-participation à des activités extrascolaires. Particulièrement, deux dimensions dans la participation à des activités extrascolaires ont été étudiées : la diversité des types d'activités et l'intensité avec laquelle les adolescents sont investis dans ces activités.

Méthodologie

Nous avons conduit un recueil de données longitudinales à 3 vagues avec un intervalle d'un an. L'échantillon comprenait en T1 1640 adolescents, en T2 1500 adolescents et en T3 660 adolescents. Nous avons considéré des adolescents du début d'adolescence à la fin d'adolescence en créant deux groupes selon leur niveau éducatif : un groupe de collégiens (N= 867 ; moyenne d'âge en T1 : 13,11) et un groupe de lycéens (N= 773 ; moyenne d'âge en T1 : 16, 22). Les adolescents ont répondu à des questions concernant les caractéristiques des trois milieux de vie (questionnaires construits à partir de l'échelle « Parent as Social Context Questionnaire » (PASQ ; Skinner et coll., 2005), adaptés et validés dans le cadre de la thèse), les comportements prosociaux dans chacun d'eux ainsi que leurs comportements prosociaux (traduits et validés dans le cadre de cette thèse ; Carrizales, A., Perchec, C., & Lannegrand-Willems, L., 2017), leur empathie (BES ; Carré, A., Stefaniak, N., D'Ambrosio, F., Bensalah, L., & Besche-Richard, C., 2013) et leur participation extrascolaire (participation, et questions sur la diversité et l'intensité).

Procédure analytique et résultats

Concernant le premier objectif qui reposait sur un design transversal, des analyses en équations structurelles sur 1642 adolescents ont été utilisées pour analyser le modèle

intégratif, et pour examiner le rôle potentiel de l'empathie, des analyses utilisant la méthode de « the bias-corrected bootstrap confidence intervals » ont été réalisées. De plus, des analyses multigroupes en fonction du genre et du niveau éducatif des adolescents ont été réalisées pour voir s'il y avait des différences au sein de ces groupes.

Les résultats du modèle intégratif testé prenant en compte les trois environnements de vie (famille, classe, activités extrascolaires) suggèrent un bon ajustement du modèle : $\chi^2(161) = 824.300$, $p < .001$, RMSEA = .062 [0.058-0.067], CFI=.93, SRMR = .049. Une seule approche peut donc être utilisée à travers 3 milieux de vie différents et rendre compte des caractéristiques communes et spécifiques à chaque milieu de vie. De plus, les résultats révèlent que les caractéristiques des groupes de pairs extrascolaires et de la famille (en particulier les plus négatives) et la perception de leurs comportements prosociaux jouent un rôle majeur dans les comportements prosociaux des adolescents via l'empathie à l'adolescence.

Pour le deuxième objectif qui reposait sur un design longitudinal, une base de données de 610 adolescents a été utilisée pour tester les relations longitudinales bidirectionnelles entre l'empathie et les comportements prosociaux. Des analyses « Standard Cross-Lagged Panel Model » ont été mises en œuvre et, dans le but de séparer la variabilité interindividuelle de la variabilité intra-individuelle inhérente à ce type d'analyses, nous avons utilisé des analyses « Random-Intercept Cross-Lagged Panel Model ». Enfin, pour voir s'il y avait des différences selon le genre et le niveau éducatif des adolescents, des analyses multigroupes ont été utilisées.

Les résultats suggèrent qu'il n'y a pas de lien longitudinal bidirectionnel, mais montrent que l'empathie est un prédicteur des comportements prosociaux, que la variance intra-individuelle est beaucoup plus élevée que la variance interindividuelle et que la variance intra-individuelle de l'empathie est liée à la variance intra-individuelle des comportements prosociaux.

Pour le dernier objectif qui reposait également sur un design longitudinal, la base de données de 610 adolescents a été utilisée pour examiner la croissance dans le développement de l'empathie et des comportements prosociaux. Des analyses « Latent Growth Curve Models » ont d'abord été réalisées ; pour interroger l'existence de possibles groupes d'adolescents avec des trajectoires de développement d'empathie et comportements

prosociaux différents, des analyses utilisant des « Growth Mixture Models ont ensuite été conduites. Pour examiner s'il y avait des différences de trajectoire développementale au sein des groupes selon la participation à une activité extrascolaire ou non-participation, des analyses multigroupes ont été réalisées. Enfin, pour voir si la diversité d'activités extrascolaires et l'intensité de participation avaient un effet sur les trajectoires de développement de l'empathie et des comportements prosociaux, des analyses de régression multinomiale ont été mises en œuvre.

Les résultats mettent en évidence qu'il y a des trajectoires de développement différentes d'empathie et des comportements prosociaux entre ceux qui participent à des activités extrascolaires comparées à ceux qui n'y participent pas, la plus grande différence concerne le développement de l'empathie, où on n'observe pas de trajectoire développementale décroissante chez ceux qui participent à une activité extrascolaire comparés à ceux qui n'y participent pas.

En somme, en utilisant une seule approche théorique dans trois milieux de vie différents, nous avons pu saisir les caractéristiques communes et spécifiques de la famille, du groupe-classe et des groupes de pairs extrascolaires, qui ont une influence sur l'empathie et les comportements prosociaux des adolescents. De plus, prendre en compte les différences entre les individus et les processus de développement intra-individuels, l'hétérogénéité des trajectoires développementales concernant l'empathie et les comportements prosociaux à l'adolescence est essentiel pour saisir l'interaction complexe entre la famille, la classe, le groupe de pairs extrascolaire, l'empathie et le développement prosocial.

Implications et conclusions

Nos résultats ont des implications théoriques et scientifiques importantes, comme l'utilisation d'une partie de la théorie SSMD à travers trois milieux de vie différents qui nous a permis de capturer les aspects communs, mais aussi les spécificités propres à chaque milieu de vie. Ce qui souligne l'importance d'aller au-delà de l'objectif individuel et d'incorporer les facteurs communs, et de prendre en compte l'interaction entre les différents milieux de vie auxquels participent les adolescents (p. ex. Burke, Joseph, Pasick, & Barker, 2009; Caldwell & Witt, 2011; Smith, Osgood, Caldwell, Hynes, & Perkins, 2013). En outre, il est important de reconnaître les caractéristiques communes entre les milieux de vie, mais surtout de

reconnaître et d'examiner les spécificités de chacun d'eux qui pourraient avoir une influence unique sur le développement des adolescents (p. ex., Chen et coll., 2011; Dovidio, Piliavin, Schroeder, & Penner, 2006; Zito, Parcel, & Solebello, 2011). Ainsi, nos constatations suggèrent la pertinence de cette approche élargie et des recherches supplémentaires sont nécessaires pour évaluer la validité de notre modèle d'intégration théorique dans une perspective développementale et dynamique. Nous soulignons la nécessité de choisir avec soin les analyses statistiques en relation avec les objectifs de recherche, en énonçant clairement les différences concernant les processus inter et intra individuelles. Ceci peut être réalisé en appliquant l'approche statistique la mieux adaptée. Cela empêcherait de tirer des conclusions à partir de résultats interindividuels et de les présenter comme des résultats intra-individuels ; par exemple, l'utilisation d'analyses croisées décalées et les résultats qu'elles permettent d'obtenir ne représentent pas et ne capturent pas les relations intra-individuelles au cours du temps. Ne pas tenir compte de cette différence pourrait conduire à des conclusions erronées concernant la présence, la prédominance d'inférences causales parmi les variables à l'étude. Il s'agit de prendre en compte l'hétérogénéité dans le développement.

Les résultats dégagés dans le cadre de cette thèse ont également des implications pratiques, par exemple dans la mise en place de programmes d'intervention ou de prévention. Ils soulignent par exemple que, pour mettre en place un programme d'intervention ou prévention, il est nécessaire de considérer le contexte dans lequel va avoir lieu l'intervention ou prévention, car comme cela a été mis en évidence ici, chaque contexte ou milieu de vie a ses propres spécificités et il est primordial de respecter et prendre en compte ces spécificités pour répondre de la façon la plus adaptée à ce contexte. De plus, il s'agit de considérer d'autres aspects tels que la diversité et l'hétérogénéité dans le développement ; par exemple, si on s'intéresse au développement des comportements prosociaux, comme nos résultats suggèrent que l'empathie est un prédicteur de ceux-ci, il faudrait travailler sur les compétences individuelles des sujets au niveau de l'empathie pour développer les comportements prosociaux exprimés au sein d'un groupe (tout en prenant en compte d'autres aspects tels que le public envers qui sont dirigés ces comportements, la situation, etc.). Enfin et surtout, nos résultats soulignent l'importance pour les adolescents et leur développement psychosocial, d'investir d'autres contextes en dehors de la famille et du contexte scolaire, comme les activités extrascolaires.

*“Caminante, son tus huellas el camino, y nada más;
caminante, no hay camino, se hace camino al andar”*

*« Toi qui marches, ce sont tes traces qui font le chemin, rien d'autre;
toi qui marches, il n'existe pas de chemin le chemin se fait en marchant »*

*“Wayfarer, the only path is your footprints and no other;
Wayfarer, there is no path, make your path by going farther”*

Antonio Machado

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General introduction

Adolescence is a significant period in life that is characterised by major changes, not only at the physical, biological, neurodevelopmental and cognitive levels, but also at the emotional and behavioural ones. These changes have been related theoretically and empirically to changes in the social environment (e.g. Blakemore, Burnett, & Dahl, 2010; Blakemore & Mills, 2014; Burnett, Thompson, Bird, & Blakemore, 2012; Lerner, Lerner, & Benson, 2011). Therefore, adolescence is considered as the most important period for positive growth development, including acquiring social and cognitive skills necessary for building new friendships and interpersonal relationships, gaining self-confidence, academic achievement and becoming an autonomous and independent individual (Brown & Larson, 2009; Taylor, Barker, Heavey, & McHale, 2013). Among all the changes adolescents go through, one of the most prominent concern is social re-orientation (Collins & Steinberg, 2006; Overgaauw, 2015; Soenens, Deci, & Vansteenkiste, 2017; Steinberg, 2005).

During childhood, parents or caregivers play the most important role as socialisation agents through the social interactions experiences that will have an influence on adolescent cognitive, affective and psychosocial development (Olsson, Hagekull, Giannotta, & Åhlander, 2016; Steinberg, 2001). Concerning the effects of positive socialisation experiences during adolescence, research suggests, for example, the quality of relationships with parents, parental disciplinary behaviours and parental socialisation of emotion are related to empathy development (Eisenberg & Valiente, 2002; Knafo & Plomin, 2006; Strayer & Roberts, 2004; Taylor, Eisenberg, Spinrad, Eggum, & Sulik, 2013) and prosocial behaviour development (Bierman, 2009; Eisenberg, Spinrad, & Knafo-Noam, 2015; Hastings, Utendale, & Sullivan, 2007).

Another important socialisation agent concerns the school context. The literature suggests that socialisation processes could foster or impair the development of social and emotional skills. Studies have shown that individuals with these skills can maintain healthy interpersonal relationships with peers and adults and used a range of coping strategies to manage stress and difficult academic and social situations (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; Garibaldi & Josias, 2015; Hamre & Pianta, 2005).

During adolescence peer relationships become more salient and prominent than in any other period in life. The different contexts adolescents are involved in with their specificities

offer the “playground” to explore, test, develop and integrate social cues and crucial abilities that are necessary for social interaction. Additionally these peer relationships provide a positive psychosocial development leading to a state of independency and individuality, and also to meet socio-affective needs such as sense of belonging, competency and autonomy (Chen, Li, Chen, & Chen, 2011; Deci, La Guardia, Moller, Scheiner, & Ryan, 2006; Ryan & Deci, 2000). Studies have found that mutual influences of group members promote similarity among peer groups. For example, motivation, engagement and academic achievement are amongst the similarities that are seen within peer groups (Bowers et al., 2015; Bundick, 2011; Chase, Warren, & Lerner, 2015; Chen, Chang, & He, 2003). Moreover, for positive development to take place, adolescents need to be exposed to positive regulating forces (Blomfield & Barber, 2012; Carreres-Ponsoda, Carbonell, Cortell-Tormo, Fuster-Lloret, & Andreu-Cabrera, 2012; Dishion & Tipsord, 2009; Mason, Schmidt, Abraham, Walker, & Tercyak, 2009).

Studying the development in adolescence involves taking into account the living environments such as parents and/or peers, adolescents are present in the adolescent’s life. In this dissertation, we focused on three main living environments: 1) family, 2) school class and 3) extracurricular activity group. We examined their roles in two major aspects of psychosocial and socioemotional development in adolescence, which are empathy and prosocial behaviours.

Outline of the Thesis

This dissertation aimed to examine the role of living environments on empathy and prosocial development in adolescence. The first four chapters concern the literature review. Chapter 1 discusses research literature on adolescent psychosocial and socio-emotional development from a positive approach of development. We focused on a positive development and ecological perspective, with the idea that all contexts of the adolescent environment have influence on an adolescent’s life. Nonetheless, adolescents develop strengths from these environmental contexts. The inherent plasticity of the developmental system enables and promotes positive outcomes (Agans et al., 2014; Bowers et al., 2015; Felfe, Lechner, & Steinmayr, 2016; Lerner, Lerner, Bowers, & Geldhof, 2015; Martinez, Coker, McMahon, Cohen, & Thapa, 2016; Orkibi & Ronen, 2017). Beyond theories that are specific to the contexts of family, school, and interpersonal relationships, an integrative perspective across other contexts is suggested.

Socialisation is a multidimensional context that is not easily explained by the conjunction or the odds with each other in relation to influences on the adolescents' development. The adolescent development is conceived as arising from the multidirectional, reciprocal relationships among all aspects of the ecological system. Therefore, we discussed how the Self-System Model of Motivational Development (SSMMD, Skinner & Belmont, 1993; Skinner, Johnson, & Snyder, 2005) could provide a common approach to examine the features of the different living environments such as family, school and extracurricular activities.

In Chapter 2, we focused on an insight of the literature concerning extracurricular participation and psychosocial development in adolescence. We described the different types of activities; we considered different dimensions of participation such as breadth of participation, intensity, the relation between extracurricular activity participation, and adolescents' positive developmental outcomes. In Chapter 3, relevant research literature on empathy is provided. The evolution of the concept over time and the distinction between empathy and related concepts such as: personal distress, sympathy and compassion. The last literature review, Chapter 4, provides a brief background to the study of prosocial behaviours. We discuss the different types of prosocial behaviours, the differences with related concepts such as helping, altruism and cooperation as well as the development of prosocial behaviours during adolescence. And finish by the role of living environments and their influence on adolescents' prosocial behaviours development and positive outcomes (i.e., positive relationships, personal, and behavioural outcomes).

Chapter 5 presents the research aims and hypotheses that emerged from the background theory. Chapter 6 presents the sample and the methodology. The findings of the current dissertation were based on the three research aims that are presented in article format in Chapters 7 to 9. In Chapter 7, we examined an integrative model using the same theoretical approach across different contexts (family, class and extracurricular peer group) in order to analyse the role of living environments in adolescents' prosocial behaviour development, with empathy as a mediator. In Chapters 8 and 9, we used a longitudinal design. First we examine the bidirectional longitudinal relations between empathy and prosocial behaviours during adolescence. Second, we investigate heterogeneity in adolescents' patterns of prosocial behaviours and empathy across time during adolescence while taking into account group membership (i.e. extracurricular activity participation and non-extracurricular activity participation). We then explore if latent class trajectories of two dimensions of extracurricular

activity participation (i.e. breadth of participation and intensity) were related to class membership trajectory of prosocial behaviours and empathy. Finally, Chapter 10 integrates the previous chapters and discusses the contribution of the studies to existing literature by drawing attention to the possible theoretical and practical implications of this research. In Chapter 10, we also provide potential directions for future research on adolescent empathy and prosocial development while considering the different living environments.

CHAPTER I

Adolescent psychosocial and socio-emotional development: A positive approach of development in context.

Chapter I. Adolescent psychosocial and socio-emotional development: A positive approach of development in context

Before the twenty-first century, most of the studies on adolescence have focused on individual attributes as the hallmarks of psychosocial development and on parents as the most significant source of influence (Collins & Steinberg, 2006). This approach has gradually broadened to include relational processes in development. It has expanded from a near-exclusive focus on intra-individual processes to a concern with individual in an interpersonal context (Collins & Laursen, 2004). Researchers recognised that there are multiple, interrelated influences that operate in adolescents' close relationships and that adolescents' capacities as relationship partners and social contacts are different according to their age (e.g. Brown & Larson, 2009; Collins & Laursen, 2006).

In current research on adolescent interpersonal experience, there are three dominant conceptual perspectives: (a) ecological models, which consider individuals and relationships as features of larger contexts; (b) models of interpersonal interaction and influence, which emphasize on patterns of interactions and affects in social interactions and how close relationships exert pressure toward continuity and coherence; and (c) bio-social models, including evolutionary and behavioural genetic approaches focusing on intrapersonal biological and motivational pressure to engage in relationships (for a review see, Collins & Steinberg, 2006). In our view and in line with the aim of this dissertation, we considered that the ecological model was the most appropriate one because it takes into account the context and the relationships between the individuals and the context. This chapter is divided into three sections. The first one outlines the conceptual perspectives on adolescent development in interpersonal contexts, specifically, ecological models. The second section focuses on significant interpersonal relationships (parents, peers) during adolescence in three different environments (family, school and leisure). The third and final section highlights the features of adolescents' living environments and adolescent development.

I.1. Conceptual Perspectives on Adolescent Development in Interpersonal Contexts: Ecological Perspective and Positive Youth Development

Theories of adolescent development provide overlapping accounts of differences and changes in interpersonal contexts, but contrasting explanations of their significance for individual psychosocial development. Ecological perspective views individuals and relationships as components of larger contexts in which the elements are multi-layered and interconnected (Collins & Steinberg, 2006). As such, development does not occur as a result of the aggregation or additive interactions of various elements but, instead, development arises from the multidirectional, reciprocal relationships among all aspects of the ecological system (Lerner et al., 2015; Overton, 2010).

I.1.1. Ecological Perspective

The ecological perspective defines context as a series of nested environments, each level of which is embedded in a larger level (Bronfenbrenner & Morris, 1998). This perspective provides a conceptual framework for investigating more complex interactions between individuals and environments, particularly during adolescence, where adolescents should be studied as the product of the bidirectional relationships between the individual and his or her environment. The fundamental process of human development involves mutually influential relations between the developing individual and the multiple levels of the ecology of human development, represented as individual \leftrightarrow context relations (Lerner, Phelps, Forman, & Bowers, 2009; Mueller et al., 2011; Phelps et al., 2009). Ecological perspective contains various levels of systems, it is important to highlight that these systems do not operate in isolation but rather have continual reciprocal interactions occurring. According to Bronfenbrenner and Morris (1998), these include the micro-systems (directly experienced by the individuals: family, school environments and peer relationships), the meso-system (linking two or more micro-systems such as family and school), the exo-system (environments, social networks, and services having an indirect influence on children), the macro-system (societal and cultural norms and values, economic and working conditions), and finally, the chrono-system (the dimension of time). It is well established that adolescents are influenced not only by their family environment and school, but also by the other environments they are involved in, and as well by the transactions across contexts (Bean, Bush, McKenry, & Wilson, 2013; Ben-Arieh & Attar-Schwartz, 2013; Burnett, Bird, Moll, Frith, & Blakemore, 2009).

I.1.2. Positive Youth Development Perspective

In recent years, along with the growing popularity of the field of positive psychology and the notion of assets-based study of youth development, which “envisions young people as resources rather than as problems for society” and “emphasizes the manifest potentialities rather than supposed incapacity of young people” (Damon, 2004, p.15), there is a bulk of theoretical and empirical research that focuses on the positive outcomes and intervention programmes using these two fields of research. Specifically, the Positive Youth Development (PYD) approach is derived from relational developmental systems theory and is historically grounded in an ecological system perspective (Bronfenbrenner, 2005; Lerner, 2005) that emphasises the idea that systemic dynamics of individual-context relations provide the basis of behaviour and developmental change (Lerner, 2002). In this context, one important idea is the concept of relative plasticity, which provides the potential for systematic change across the lifespan and from the work of practitioners interested in promoting optimal outcomes for youth through programmes and policies (Bowers et al., 2012; Lerner, Phelps et al., 2009; Lerner, Roeser, & Phelps, 2008). This relational developmental system approach of PYD assumes that all youth has strengths, and all contexts have assets. Thus, understanding the pathways that enable positive outcomes, building responsibility and initiative through engaging and enriching activities, identifying and aligning youth strengths with contextual assets and mobilising internal and external assets are critical for promoting positive outcomes (Brown, 2009; Damon, 2004; King et al., 2005; Larson, 2000) along with plasticity inherent in the development system, which represents a fundamental strength of the adolescent period (Lerner, von Eye, Lerner, & Lewin-Bizan, 2009).

Current developmental research has been shaped by the innovations brought by these perspectives coupled with the PYD perspective. As such, researchers consider the integrated role of multiple contexts of adolescent development such as the family, peers, and schools in providing a space for developing and enhancing positive development.

I.2. Significant Interpersonal Relationship during Adolescence

The psychosocial challenges of adolescence arise in rapidly diversifying personal and social contexts. This section addresses the relationship processes and adolescent development, specifically, parents and peers as socialising forces in adolescent development. Particularly in the transition into adolescence, family and school play a critical role with regard to the development of positive developmental outcomes (Bauman, Carver, & Gleiter, 2001;

Karademas, Peppas, Fotiou, & Kokkevi, 2008). Research on development has focused on parents as the most significant source of influence. However, the transition from childhood to adolescence causes changes in the individual, social context and social norms that increase the importance of peers that become more salient and at the same time grow more complex. Adolescents have to negotiate peer relationships and issues in a broader set of levels and the expanding social world while taking into account not only the different types of relationships (e. g., friendship, romantic relationships) but also the importance of status (Brown & Larson, 2009; Collins & Laursen, 2004). Although familial relationships remain salient throughout adolescence, studies suggest that peers become a core influence in adolescent development (Harter, 2012), particularly, during middle adolescence, because peer groups become a more prominent context during this stage (Bukowski, Buhrmester, & Underwood, 2011; Rubin et al., 2004; Tomé, de Matos, Simões, Camacho, & AlvesDiniz, 2012; Van Ryzin, Gravely, & Roseth, 2009). Furthermore, there is an increase in the amount of time they spend with their peers relative to that spent with their parents or other adults (Lam, McHale, & Crouter, 2014) which gradually decline into later adolescence (Collins & Steinberg, 2006; Rubin, Bukowski, & Laursen, 2009). However, research shows that other social groups and their structured activities, including the follow-up of goals, the supervision of an adult as a leader, and the adherence to rules and schedules are microenvironments that also promote the development of abilities and the generation of new learning opportunities (Balsano, Phelps, Theokas, Lerner, & Lerner, 2009; Mahoney & Stattin, 2000; Ruvalcaba, Gallegos, Borges, & Gonzalez, 2017).

There is not a clear definition of peers, in part due to the varied usage of terminology, and the differences between characteristics considered in different disciplines. One reason is the inherent heterogeneity of peers, such as friends, neighbours, classmates. Another one is the fact that their characteristics and functions can change over the lifespan (Reitz, Zimmermann, Hutteman, Specht, & Neyer, 2014). The term of peer group has been applied to everything from interactions with best friends or crowds of adolescents (Brown, 1990).

In this chapter, we are going to focus on three different contexts, the family context, the school context (class) and the leisure activities context (extracurricular activity groups), and to concentrate on parents in the first context and peers in the other two ones. In this dissertation, the term peer group is used to refer to a large structure of linkages between individuals belonging to the same societal group based on the developmental stage (i.e. adolescents) who share a common setting (i.e. class group, extracurricular activity group).

I.2.1. Family Environment

In the field of adolescence, the role of the family in social development is arguably the most studied one (Steinberg & Morris, 2001). Socialisation is considered as a complex multidirectional process involving the family, as perhaps the most important source of influence, but also involving all the major institutions and social environments in which individuals (i.e. adolescents) have direct or indirect experiences (e.g. schools, neighbourhoods, political and governmental institutions).

Despite the growth of more complex theories of socialisation, some authors suggest that parental influence perspectives remain still dominant, among them: the social mould perspective (i.e. parental styles and parental behaviours) and two bidirectional process dimensions (i.e. parent-adolescent and inter-parental or marital conflict); the first one considers that parents shape the young (for a review see Peterson, 2005) and the second one has focused almost exclusively on adolescents' relationships with their parents, with two major and related questions. How do family relationships change over the course of adolescence (i.e. what is the influence of adolescence on the family)? How does adolescent adjustment vary as a function of variations in the parent-adolescent relationship (i.e. what is the influence of the family on the adolescent? (Collins & Laursen, 2006; Collins & Steinberg, 2006). A more accurate view of socialisation considers that adolescents are active participants in the parents-socialisation process. Moreover, adolescents influence and are influenced by many social agents in their interpersonal environment (e.g. family, school) and this environment cannot be isolated as unique factors that drive development (e.g. Bronfenbrenner & Morris, 2006; Lerner, 2002).

I.2.2. School Environment

The school micro-system has important implications for adolescent development as social context outside of the family context. Adolescents spend the majority of their days interacting with peers and adults outside their homes, specifically, they spend more time in school than in any other context (Roeser, Eccles, & Sameroff, 2000) which makes it a privileged context for involvement in protection from risk behaviours (Piko & Hamvai, 2010) and consequently, their relationships shift from being centred on family to peers and institutions (Barber & Olsen, 1997; Gaias, Lindstrom Johnson, White, Pettigrew, & Dumka, 2017). Moreover, adolescents' experiences increase autonomy and mobility to engage with

their schools and neighbourhoods at the time and manner of their choice. (Fuller & García Coll, 2010; Karabanova & Poskrebysheva, 2013; Zimmer-Gembeck & Collins, 2003).

Some researchers suggested that the school context represents a viable setting not only to teach competencies, to transmit behavioural norms and standards but also to promote interpersonal relations, given that it is the setting where adolescents are most accessible and schools inherently have mandates aimed at promoting education and development which are important for the personal and social development of adolescents (Danish, Forneris, & Wallace, 2005; Ruini et al., 2009). Moreover, studies highlight that the school constitutes a privileged space for meetings and interactions because it gathers different peer communities and promotes self-esteem and a harmonious development between adolescents (Karademas et al., 2008; Tomé et al., 2012; Van Ryzin et al., 2009).

I.2.3. Leisure Environment

In western societies, adolescents have time to devote to activities they choose. Although research on how this leisure environment influences adolescent development is recent (Holt, Sehn, Spence, Newton, & Ball, 2012; Larson, 2000; Mahoney & Stattin, 2000). Some studies have suggested that leisure occupied more waking hours (between 40% and 50%) than schools and work combined (between 35% and 40% ; Larson, 2000) and that there was heterogeneity in the use of free time among individuals (Shanahan & Flaherty, 2001; Tucker, McHale, & Crouter, 2008). Among the variety of leisure environments, in this dissertation, we focused on extracurricular activity participation (e.g. sport, performing and artistic activities). This type of leisure activities are structured and voluntary and have been shown to be the most positive way for adolescents to spend free time, in terms of their psychological development (Bartko & Eccles, 2003; Darling, 2005; Keresztes, Piko, Pluhar, & Page, 2008; Mahoney, Larson, & Eccles, 2005; McHale, Crouter, & Tucker, 2001; Morrissey & Werner-Wilson, 2005; Swanson, 2002; Weininger, Lareau, & Conley, 2015). This could be due to the fact that social networks created in the established groups promote the formation of a psychosocial support system, in which adolescents can share and express emotions and affections, have a sense of belonging to a set of values and ideologies (Akiva, Cortina, Eccles, & Smith, 2013; Knifsend & Graham, 2012; Mouratidis, 2009; Ruvalcaba et al., 2017).

I.2.4. Taking into account diverse interpersonal contexts

This section underscores the understanding of the extent, nature and significance of interrelated social processes in diverse interpersonal contexts, moving the field beyond the

descriptive level, simplistic notions of the distinctiveness and separateness of family and other interpersonal contexts (Collins & Laursen, 2004; Rubin et al., 2009) toward a more comprehensive understanding of adolescent functioning. This can be pursued by taking into account the dynamic interplay with proximal (e.g. interpersonal) and distal (e.g. institutional, societal, and cultural) environments in which adolescents encounter opportunities, demands, resources, and obstacles relevant to psychological maturation in a complex world (e.g. Bronfenbrenner & Morris, 2006; Brown, 2009; Buchmann & Steinhoff, 2017; Gaias et al., 2017). Therefore, the literature supports the idea that it is possible to optimise the relationship between individuals and their ecology by focusing on the learning of competencies through sustained adult-youth relationships, skill-building activities, and access to leadership roles (Eccles, Barber, Stone, & Hunt, 2003; Forneris, Camiré, & Williamson, 2015; Lerner, 2009; Lerner & Steinberg, 2009; Roth & Brooks-Gunn, 2003; Rusk et al., 2013; Weiss, Kipp, & Bolter, 2012).

Moreover, it is important to highlight the fact that among these environments, individuals' relationships differ, specifically, the relationships with peers compared to those with family members, particularly, in the distribution of power between participants and the permanence of the affiliation (Rubin et al., 2009). Adolescents freely initiate and dissolve these voluntary and transitory peer relationships which provide potentially important opportunities that differ from the socialisation experiences that families provide and that are key to mastering skills for both independence and interdependence (Collins & Laursen, 2004, 2006; Fabes, Martin, & Hanish, 2009). Relationships with parents, friends, and peers take place in a broader context of social institutions that also contributes to psychosocial development. These contributions are largely mediated through close relationships. Hence, it is important to take into account the relationships in the context. The next section outlines the relational context features in family (parents) and peer group that potentially transform and influence the development and interpersonal world of adolescents.

I.3. The Group as Social Context: Features of the Adolescents Living Environments

In the literature, there are different perspectives through which adolescent development in interpersonal context has been explained. In the family context, there are for example, two main theories such as parenting styles which refer to the overall emotional climate of the parent-child relationship; as indicated by variations in autonomy, harmony and conflict (Baumrind, 1991; Darling & Steinberg, 1993). And attachment theory posits that the child

who receives responsive and sensitive parenting from the primary caregiver forms an internal working model and develops a model of the self as someone worthy of such care (Bowlby, 1969, 1977) and through attachment organisation, reflected in characteristic strategies for processing affect and memories surrounding attachment experiences (Allen, Moore, Kuperminc, & Bell, 1998; Rubin et al., 2004). In the school context, theories such as the sense of belonging (Kiesner, Cadinu, Poulin, & Bucci, 2002; Mahar, Cobigo, & Stuart, 2013; Mouratidis, 2009) and sociometric status (e.g., Gest, Graham-Bermann, & Hartup, 2001; Newcomb, Bukowski, & Pattee, 1993; Vierimaa & Côté, 2016) are more informative about the relations between peer statuses and behaviour rather than about what characterises the peer group and how these characteristics influence positive development (Ryan, 2001).

From an ecological perspective, it is well-established that in addition to individual dispositions, family and peer groups represent the most proximate influence on development. One of the difficulties about it is the measure and approaches used. As stated before, each context has been studied through a particular approach, but could it be possible that among these different proximal contexts there are potentially similar features that could be captured by one approach? With the aim of filling this gap, the same approach among three proximal contexts (family, school, extracurricular activity) and two interpersonal relationships, relationships with parents and peers will be used.

We used one part (context) of the Self-System Model of Motivational Development (SSMMD) developed by Skinner and colleagues (Skinner & Belmont, 1993; Skinner, Furrer, Marchand, & Kindermann, 2008) based on the work of Connell and Wellborn (1991) and the self-determination theory (Deci, Eghrari, Patrick, & Leone, 1994; Deci & Ryan, 1985). The SSMMD integrates six core features of the social context (family, school): warmth, rejection, structure, chaos, autonomy support, and coercion. Previously in the literature, they have been typically represented as a series of bipolar dimensions (i.e. regarding three dimensions: warmth versus rejection, structure versus chaos, and autonomy support versus coercion). For instance, it has been assumed that parents who are high on one feature (e.g. autonomy support) will be low on its opposite (i.e. coercion). However, this simple and parsimonious conceptualization has been questioned and empirically tested against a conception of multiple unipolar dimensions (e.g. autonomy support and coercion). This implies that parents who are high on one feature (e.g. autonomy support) are not necessarily low on its conceptual opposite (i.e. coercion; Skinner et al., 2005). These features of social contexts have been a frequent target of research on the family (parents) and school contexts (teachers). However, they have

been far less applied and used in peers' relationships literature. Taking into account the sparse literature and interesting and informative results of the few studies that used part of the SSMMD approach to peer groups, we considered that it merited further insight in order to better understand how this approach could be applied to other contexts. This purpose has been pursued in this dissertation, the next section provides a more detailed view of the six features of the social context in relation to parents and peers relationships.

I.3.1. Warmth and Rejection

Warmth relationships refer to verbal and non-verbal behaviours that reflect overall acceptance, including expression of positive affect, involvement, responsiveness, and support (Carlo, Mestre, Samper, Tur, & Armenta, 2010a; Skinner et al., 2005).

Rejection refers to the verbal or physical behaviours that reflect indifference or neglect, disapproval, criticism, and other harsh behaviours indicative of negative feelings toward the individual (Epkins & Harper, 2016; Rowe, Gembeck, Rudolph, & Nesdale, 2015; Skinner et al., 2005).

I.3.1.1. Parental Warmth

Parental warmth has extensively been linked to children outcomes and is defined as behaviours that reflects parents' general tendency to convey support, encouragement, affection, acceptance (Baumrind, 1991; Carlo, Mestre, Samper, Tur, & Armenta, 2010b; Steinberg & Morris, 2001) and to express approval and direct positive emotions, behaviours toward the individual (Zhou et al., 2002). Parental warmth has a main effect not only on adolescent's positive outcomes such as better school performance and academic achievement (Fan & Chen, 2001; Fulton & Turner, 2008; Jeynes, 2003; Porumbu & Neçsoi, 2013; Wilder, 2014; Zahed Zahedani, Rezaee, Yazdani, Bagheri, & Nabeiei, 2016), social competence (Bowers et al., 2014; Dumka, Gonzales, Bonds, & Millsap, 2009; Taylor, Conger, Robins, & Widaman, 2015), willingness to disclose (Klevens & Hall, 2014), but also in emotion and behaviour self-regulation (Bowers et al., 2011; Morris, Silk, Steinberg, Myers, & Robinson, 2007; Walton & Flouri, 2010; Yap, Allen, & Sheeber, 2007), effortful control (Eisenberg, Zhou, et al., 2005; Etkin, Koss, Cummings, & Davies, 2014), understanding their own and others' emotions and needs (Malti & Krettenauer, 2013) and moral development (Zhou et al., 2002).

Furthermore, parental warmth can buffer negative effects such as anxiety (Quach, Epstein, Riley, Falconier, & Fang, 2015), stress (Etkin et al., 2014), externalising problems (Eisenberg, Zhou, et al., 2005; Pinquart, 2017), and attenuate the link between early peer victimisation and later antisocial outcomes for girls (Yang & McLoyd, 2015). Additionally, cross-sectional (Greenberger, Chen, Tally, & Qi, 2000) and longitudinal studies (Brendgen, Wanner, Morin, & Vitaro, 2005; Galambos, Barker, & Krahn, 2006) showed that parental warmth was linked to adolescent's amelioration of depressed mood and lower levels of problem behaviours (Lippold, Greenberg, & Collins, 2013).

I.3.1.2. Parental Rejection

Experiencing parental rejection which includes overt and covert displays of disliking, dismissing, criticism or negative emotional reactions (Skinner et al., 2005) have been associated with a series of indicators of psychosocial maladjustment. It can have detrimental effects on the child and adolescent socio-emotional functioning and an increased likelihood of mental health symptoms (e.g. Picard, Claes, Melançon, & Miranda, 2007; Rowe et al., 2015). In particular, it increases symptoms of depression, anxiety and problem behaviours (Campos, Besser, & Blatt, 2013; Marston, Hare, & Allen, 2010). Moreover, rejecting parental behaviours promote insecure parent-child attachment, which may conduct to the perceptions of others as unreliable and hostile, perception that could lead to norm breaking behaviours within social relationships (Michiels, Grietens, Onghena, & Kuppens, 2008). A longitudinal study showed that children who reported higher amounts of perceived parental rejection showed higher expectations of being rejected in social situations and reacted with heightened negative emotion when it was anticipated (i.e. rejection sensitivity) and increased loneliness (Rowe et al., 2015).

I.3.1.3. Peers' Warmth

Warmth relationships with peers within the school and extracurricular activities environments refer to acceptance, affection, caring for and respecting each other, spending time together and talking and listening to each other (Furrer, 2010; Oberle, Schonert-Reichl, & Thomson, 2010). Social experiences related to feeling of warmth are associated with increased self-esteem, happiness, quality of life; these relationships are likely to be complex and bidirectional (Sherman, Lansford, & Volling, 2006). Moreover, warmth peers' relationships promote a sense of relatedness : adolescents who have warmth peers interactions tend to perceive themselves as belonging, understood, care for and deserving of love (Bower

& Carroll, 2015; Fredricks, Hackett, & Bregman, 2010; Mouratidis, 2009). It also decreases vulnerability in early adolescents internalising and externalising problems (Sentse, Lindenberg, Omvlee, Ormel, & Veenstra, 2010).

I.3.1.4. Peers' Rejection

Adolescence is a period characterised by increased importance of peer relationship. Extensive developmental research has demonstrated the negative outcomes associated with peer rejection which has been associated with a series of indicators of emotional, behavioural and psychological maladjustment (Rowe et al., 2015). The patterns of rejection can range from outward hostility (e.g. bullying) to more subtle forms of neglect (e.g. indifference) and have been consistently associated with indicators of high rates of internalising aspects of mental health such as loneliness, social withdrawal; anxiety and depressive symptoms (Graham, Bellmore, & Juvonen, 2003; Rigby, 2003), losses in academic motivation and performance (Buhs, Ladd, & Herald, 2006). Moreover, peer rejection has been linked to victimisation in childhood and adolescence (Cook, Williams, Guerra, Kim, & Sadek, 2010; Hawker & Boulton, 2000), aggression (Fotti, Katz, Afifi, & Cox, 2006), higher levels of psychopathology in early adolescence (Buhs & Ladd, 2001; Rubin et al., 2004), specifically, externalising problems (Sentse et al., 2010) and antisocial behaviours (Trentacosta & Shaw, 2009).

Furthermore, some studies pointed out the enduring effect through later adolescence and adulthood (Lev-Wiesel, Nuttman-Shwartz, & Sternberg, 2006; Troop-Gordon, 2017). Some authors suggested that there is probably a transactional process: the relation between rejection and behaviour could be bidirectional with effects that reinforce each other over time (Fanti, Henrich, Brookmeyer, & Kuperminc, 2008).

I.3.2. Structure and Chaos

Structure refers to the provision of clear and consistent rules, guidelines and expectations, environmental contingencies, appropriate limit settings; from social and physical contexts, individuals get information concerning the pathways to achieve desired outcomes and avoid undesired ones and they receive support and guidance in order to follow those pathways (Grolnick & Farkas, 2002; Skinner et al., 2005).

Chaos does not only refer to the lack of structure but also to behaviours that are non-contingent, inconsistent, erratic, unpredictable, undependable, arbitrary, or, in general, interfere with the pathways from means to ends (Skinner et al., 2005).

I.3.2.1. Parental Structure

Parental structure is characterised by an environment that provides opportunities, resources and feedback in relation to the child's meeting expectations and set clear and appropriate limits which allow the child to anticipate outcomes and plan their behaviour accordingly. Parents who provide structure assist their children in building sense of competence, take into account individual differences and try to provide a level of support and help that is attuned to the child's developmental level and possibilities (Soenens, Deci, & Vansteenkiste, 2017). Therefore, it gives the adolescent a sense of how his/her actions are connected to important outcomes either of the successes and failures (Egeli, Rogers, Rinaldi, & Cui, 2015), and thus, facilitates the development of self-regulatory skills which allows the individual to act responsibly and competent which may foster cognitive and social competence (Skinner et al., 2005; Steinberg, 2001).

Moreover, parental structure has been associated with academic performance, engagement, perceived control and cognitive competence (Farkas & Grolnick, 2010; Grolnick, Raftery-Helmer, Flamm, Marbell, & Cardemil, 2015). However, some authors have suggested that the question of the directionality between parent structure and individual functioning should be taken into account, it might be possible that parents' provision of structure has an influence on children's feelings of motivation, success and competence or the other way around, children's levels of success, beliefs and motivation might influence parents' provision of structure (Farkas & Grolnick, 2010).

I.3.2.2. Parental Chaos

Parental chaos is a context where adolescents cannot predict how their parents will respond, because of inconsistent and unpredictable parenting which might interfere with the development of competency, psychological adjustment, well-being and satisfaction with the family (Fiese et al., 2002; Fiese & Winter, 2010; Repetti, Taylor, & Seeman, 2002). Additionally, parental chaos has been associated with outcomes including diminishing the child's ability to self-regulate, to manage his/her own behaviours and emotions and increasing learned helplessness (Evans, Gonnella, Marcynyszyn, Gentile, & Salpekar, 2005). Therefore, parental chaos has been linked to an increasing frequency of misbehaviour and low perceived

control and competence (Egeli et al., 2015). Moreover, within the framework of the bio-ecological model of development, parental chaos is extended to household chaos and it has been linked to adolescent's future beliefs, specifically it predicted adolescents' less positive beliefs about mastery, future obstacles, and having a successful career (Tucker, Sharp, Van Gundy, & Rebellon, 2017).

I.3.2.3. Peers' Structure

Peers structure refers to environmental contingencies, i.e. the degree to which a specific behaviour is consistently and discriminately followed by the same social reaction. Structured interactions with friends are characterised by consistency, reliability, trustworthy companionship and exchange of the necessary information for operating in a particular environment. Peers structure creates a sense of competence and control because they know what to expect from their peers and they have the information they need to function in their academic and social worlds (Furrer, Skinner, & Pitzer, 2014).

Adolescent's perception of peer structure in the academic domain has been associated with success in school (Pflaum & Bishop, 2004), specifically because it provides contextual affordances than can support academic competence (Wentzel, 2012). For example, predictable and instrumentally supportive interactions between classmates, such as clarifying teacher directions and providing information promote structure and therefore, feelings of competence, motivation and engagement in school (Altermatt, 2016; Kiefer, Alley, & Ellerbrock, 2015).

I.3.2.4. Peers' Chaos

Chaotic, confusing, disorganized or unpredictable interactions with peers are fostered through insufficient or careless communication (e.g. teasing, telling lies, keeping secrets from each other, spreading rumours, emotional outburst). Thereby, because there is a lack of a clear contingency between behaviour and its social reaction for the individuals of the group, this makes it difficult to predict the consequences of their own and their peers' behaviours (Dishion, Nelson, & Bullock, 2004). Additionally, it promotes feelings of helplessness, non-competence and non-control in social interactions (Furrer et al., 2014) that might promote the development of external locus of control which could further predict aggression (Jung, Krahe, & Busching, 2018).

I.3.3. Autonomy Support and Coercion

Autonomy support refers to relationships that allow freedom of expression and action and provide support. However, autonomy support goes beyond that, because the absence of psychological control not necessarily implies the absence of autonomy support and vice versa (Barber, Bean, & Erickson, 2002; Silk, Morris, Kanaya, & Steinberg, 2003). Therefore, autonomy support acknowledges the individual perspective, preferences and opinions which facilitate the individual experience as autonomous and interactions in which he/she is expected to express his/her views (Skinner et al., 2005).

Coercion refers to contexts or interactions that pressure, restrict, over control and exert psychological control on the individual who has little room for choice or initiative and may feel controlled and less autonomous (Boudreault-Bouchard et al., 2013; Snyder et al., 2008).

I.3.3.1. Parental Autonomy Support

Parent autonomy support involves communicating respect and encouraging the development of independence (Morris et al., 2007). Therefore, it encourages adolescents to behave based on self-endorsed interest, to actively discover, explore and articulate their own views, goals and preferences (Grolnick & Farkas, 2002; Karabanova & Poskrebysheva, 2013; Ryan & Deci, 2000; Skinner et al., 2005; Steinberg, 2001). This promotes adolescents' thoughts to be active agents in decision-making processes, internalisation of parental values, rules and cultural practices (Chirkov, Ryan, & Willness, 2005; Marbell & Grolnick, 2013; Vansteenkiste, Soenens, Van Petegem, & Duriez, 2014). It predicts feeling of choice, explorative, interest-focused engagement in the academic domain and achievement (Joussemet, Landry, & Koestner, 2008; Roth, Assor, Niemiec, Deci, & Ryan, 2009; Soenens & Vansteenkiste, 2005). Therefore, autonomy support fosters secure parent-child attachment relationships (Kerns, Brumariu, & Seibert, 2011; Yan, Han, Tang, & Zhang, 2017), open and honest communication (Vansteenkiste et al., 2014), close friendship competence (Allen, Porter, McFarland, McElhaney, & Marsh, 2007; Soenens & Vansteenkiste, 2005), emotion regulation (Brenning, Soenens, Van Petegem, & Vansteenkiste, 2015; Marbell & Grolnick, 2013), cognitive self-regulation (Bindman, Pomerantz, & Roisman, 2015), moral development (Gagné, 2003) and active coping adolescents' behaviours (Seiffge-Krenke & Pakalniskiene, 2011). A longitudinal and significant bidirectional relation has been found between parents' autonomy support and adolescents' depression; specifically, more parents' autonomy support significantly predicted fewer depressive symptoms while adolescents'

depressive symptoms significantly predicted fewer parents' autonomy support over time, the child effect was significantly stronger than the parent effect (Van der Giessen, Branje, & Meeus, 2014).

I.3.3.2. Parental Coercion

Parental coercion refers to parenting practices that are over-controlling and autonomy restricting. Some authors have suggested that it may be a more subtle form of rejection as they involve a constraint of individual self-development with the aim to communicate disapproval of the adolescents' psychological autonomy by demanding them obedience and conformity (Skinner et al., 2005; Zimmer-Gembeck & Collins, 2003). Parental coercion has been related to negative outcomes such as decreased autonomous motivation to learn, lower academic achievement and poorer emotional well-being (Barber, Stolz, & Olsen, 2005; Bean, Bush, McKenry, & Wilson, 2003; Soenens, Park, Vansteenkiste, & Mouratidis, 2012; Wang, Pomerantz, & Chen, 2007), secrecy in parent-child relationships (Tilton-Weaver et al., 2010), antisocial behaviours and delinquent problems (Pettit, Laird, Dodge, Bates, & Criss, 2001). Additionally, it has been longitudinally linked to adolescent depressive symptoms, anxiety, rejection sensitivity (Beyers, Soenens, Vansteenkiste, Luyckx, & Duriez, 2013; Borelli, Margolin, & Rasmussen, 2015; Rowe et al., 2015; Soenens et al., 2012) and low self-esteem (Soenens & Vansteenkiste, 2005). In particular, maternal coercive behaviours undermined self-esteem but only at ages 16 and 18 (Boudreault-Bouchard et al., 2013). Recent studies provide support for bidirectional associations between parental coercion (specifically, behavioural control, harsh control, psychological control) and externalising problems (Hoeve et al., 2009; Piquart, 2017; Soenens, Vansteenkiste, & Petegem, 2015). The same pattern was found for the bidirectional link between parental coercion and internalising behaviours; however, adolescents' internalising behaviours are more likely to increase parental psychological control than the reverse (Cui, Morris, Criss, Houlberg, & Silk, 2014). Moreover, psychologically controlling parents (particularly mother) has been associated with a greater susceptibility to peer pressure (Chan & Chan, 2013; Hare, Szewedo, Schad, & Allen, 2015).

I.3.3.3. Peers' Autonomy Support

Autonomy support refers to the feelings of encouragement of the self, provision of choice and expression of genuine preferences in the context of interpersonal interactions (Ryan & Deci, 2000; Van der Giessen et al., 2014). These autonomy related behaviours

displayed by significant others have been associated with levels of autonomous motivation (Reeve, 2002), behavioural persistence (Chirkov & Ryan, 2001) and relatedness motives (Edmunds, Ntoumanis, & Duda, 2007). In the classroom, peers can create an autonomy supportive context when they work together to negotiate activities, cooperate in group projects, examine and challenge their own beliefs and share their ideas (Beiswenger & Grolnick, 2010; Deci et al., 2006). Peers' autonomy support positively predicted autonomy, competence and relatedness need satisfaction (Furrer et al., 2014; Sicilia, Sáenz-Alvarez, González-Cutre, & Ferriz, 2015). This reinforces the idea that an environment that supports autonomy is a social factor that influences self-determined motivation through the satisfaction of psychological needs (Gagné, 2003; Patton, Deutsch, & Das, 2014).

Moreover, autonomy-supporting behaviours in close relationships have been shown to predict psychological health. Specifically, receiving autonomy support from a close friend led the recipient to experience the benefits of greater relationship quality (emotional reliance, dyadic adjustment, security of attachment), greater experience of positive affects and higher levels of well-being (Deci et al., 2006). Similarly, higher levels of autonomy support and closeness with best friends in girls have been related to low levels of depressive symptoms throughout adolescence (Selfhout, Branje, & Meeus, 2009). However, others found no concurrent and longitudinal associations between perceived autonomy support from best friend and adolescents' depressive symptoms when parental autonomy support was taken into account (Van der Giessen et al., 2014)

I.3.3.4. Peers' Coercion

Coercive peers interactions (e.g. manipulative, controlling, or enmeshed) devalue, belittle and diminish adolescent's genuine preferences, ideas, feelings and the sense of autonomy. Adolescents who feel controlled, pressured to think, behave or feel in a certain way showed higher levels of depressive symptoms (Soenens & Vansteenkiste, 2010). Adolescents involved in coercive peers context tend to use direct or hostile strategies to control each other and have extrinsic motivation toward friendship (Hawley, Little, & Pasupathi, 2002). Specifically, it seems that the relation between peer coercion (peers' aversive reactions to and negative treatment of the target child) and coercive behaviours are shaped by short term social contingencies such as stopping aversive events like teasing and attaining attention and accessing to desired activities and materials (Chen, Drabick, & Burgers, 2015). Within such coercive interactions, aggressive behaviours may be a functional

way to escape from or terminate the aversive, unpleasant behaviour from the peer (Jung et al., 2018; Snyder et al., 2005). Peer coercive interactions in the school context could involve pressure to cheat, not appear “too smart” which could diminish participation and could have an influence on the feeling of safety and acceptance (Furrer et al., 2014).

At the end of this section about the features of adolescents’ living environments, and more specifically about the relationships between parents and peers, we would like to emphasize the fact that the SSMMD theory has been mostly used in relation to adolescents’ motivation and academic outcomes and to some extent in family contexts. Moreover, considering the informative results coming from it further insight is needed in order to better understand how this approach could be applied to other contexts. Overall, research in the family and peer group revealed that environments characterised by greater warmth, structure, autonomy support and less rejection, chaos and coercion were associated with better socialised children and adolescents (e.g. Egeli et al., 2015; Grolnick et al., 2015; Pinquart, 2017).

The period of adolescence is particularly well-suited to examine the features of the contexts adolescents are involved in and the relations with their positive development. The most salient relational transformations in the family context during adolescence are autonomy-related changes, greater freedom to spend time outside of direct parental supervision (Brown & Larson, 2009; Larson, Moneta, Richards, & Wilson, 2002). During a period where autonomy is desired and explored, adolescents need parents who are supportive, without being intrusive or coercive, to develop individuality and autonomy (Aquilino & Supple, 2001; Zimmer-Gembeck & Collins, 2003).

Additionally, some studies, mostly among Dutch samples, have found that parental support decreases during adolescence (ages 12 to 19) as does the importance of its association with emotional adjustment (De Goede, Branje, & Meeus, 2009; Meeus, Iedema, Maassen, & Engels, 2005) and perceived support from peers increases, although, parental and peer support are related, during middle and late adolescence, parental and peer (friends) support seem to be relatively independent support systems (Helsen, Vollebergh, & Meeus, 2000; Scholte Ron, Van Lieshout Cornelis, & Van Aken Marcel, 2003). Therefore, some of the research results pointed out that the relationship between parenting and adolescent functioning could be bidirectional, although, a recent longitudinal review has shown that across countries, parental attitudes and behaviours drive and precede adolescent attitudes and behaviours in early to-middle adolescence (Meeus, 2016).

To conclude this chapter, we would like to highlight some important considerations. Even though family environment typically provides the primary source of socialisation and support for young people even into adulthood (e.g. Parker, Ludtke, Trautwein, & Roberts, 2012), peer environments (e.g. the same classroom, sport team community) constitute important and highly salient peer group contexts that have a considerable role on adolescent development (Parker et al., 2015). We emphasise the need for longitudinal studies which would enable us to assess the importance of timing, directionality and patterns of influence of parenting and peers across adolescence. Therefore, these considerations would not be complete if we would not take into account the complexity that involves examining how multiple contexts of socialisation operate either in conjunction or at odds with each other as influences on adolescent development. The development is not the result of the aggregation or additive interaction of various elements but, instead, development arises from the multidirectional, reciprocal relationships among all aspects of the ecological system (Lerner, Lerner, Bowers, & Geldhof, 2015; Overton, 2010). The ecological perspective provides to this aim a perfect conceptual framework for investigating more complex interactions between individuals and environments, particularly during adolescence, where a more comprehensive understanding of adolescents functioning taking into account the dynamic interplay with proximal (e.g. interpersonal) and distal (e.g. institutional, societal and cultural) environments in which opportunities, demands, resources and obstacles relevant to psychological maturation in a complex world should be studied (e.g. Bronfenbrenner & Morris, 2006; Brown, 2009; Buchmann & Steinhoff, 2017; Gaias et al., 2017). To summarize, our dissertation was inspired by the PYD perspective and the idea that all contexts have assets and adolescents' strengths and that there is inherent plasticity in the developmental system that enables and promotes positive outcomes (Brown, 2009; Damon, 2004; King et al., 2005; Larson, 2000; Lerner, von Eye et al., 2009). Among the different contexts adolescents are involved in besides family and school, in the next chapter we focus on extracurricular activity participation.

CHAPTER II

Extracurricular Activity Participation: Exploring the relationships with psychosocial development.

Chapter II. Extracurricular Activity Participation: Exploring the relationships with psychosocial development

During childhood and adolescence, one of the most studied contexts besides the family context is the school context, the bulk of literature not only in psychology but also in sociology and educational sciences, considered their importance and influence on adolescents' cognitive, social and emotional development (Aquilino & Supple, 2001; Bronfenbrenner & Morris, 1998; Hoggelund & Leadbeater, 2004; Luengo Kanacri et al., 2017; Morris et al., 2007; Olsson et al., 2016; Peterson, 2005; Repetti et al., 2002). However, taking into account the inherent social changes during the period of adolescence and the fact that their social world extent beyond these two contexts, among the different contexts they could be involved in, we focused on the extracurricular activity participation. Is rugby, football really making a difference in the life of an adolescent? Is playing in a band, dancing, just a nice activity for the adolescent or does it represent something more? Is doing different activities more than once a week beneficial? Is extracurricular activity participation, contrary to watching television or "hanging out" with peers providing better opportunity for adolescents' development? What exactly are the developmental benefits and consequences of being associated with extracurricular activity participation during adolescence?

Research on the role of extracurricular activities in child and adolescent development started in 1960 with sociologists and in the last couple of decades, different fields such as behavioural sciences, education, sport psychology, positive psychology got interested in the subject. Specifically, psychology has focused on the developmental aspects of activity participation and its role on individual functioning over time (Feldman & Matjasko, 2005) and on the relationship between participation in extracurricular activity and adolescent development (e.g. Barber, Abbott, Blomfield, & Eccles, 2009; Brown, 1999; Feldman & Matjasko, 2012; Mahoney & Cairns, 1997; Marsh & Kleitman, 2002; Swanson, 2002) .

More than half of American teenagers attending schools participate in some sort of organized activities (Gardner, Roth, & Brooks-Gunn, 2008). Some authors even suggested that approximately 83% of adolescents ages 12-17 participate in at least one extracurricular activity (Moore, Hatcher, Vandivere, & Brown, 2000). In France, data concerning extracurricular activities per se in adolescence is really sparse, the latest data concerning adolescents suggest that 77% of males and 60% of females from 12- 17 years participate in

organized activities (Sports, 2002). Data from 2017 revealed that 94 % of the 16-25 years old practiced a sport over the last twelve months, and over 53 % of them did a sport more than once a week at home, 36 % were involved in a sport club, and among the most practiced activities (at home and sport club), there were: body-building/fitness, running, group sports, swimming, dance, martial arts, etc. (Mignon, 2015; Muller, 2018).

This chapter aims, (1) to provide a theoretical perspective of extracurricular activity participation related to ecological systems theory (Ben-Arieh & Attar-Schwartz, 2013; Brown, 2008; Duerden & Witt, 2010) and PYD approach (Agans et al., 2014; Hatcher, 2016; Lerner et al., 2015); (2) to explore the different types of extracurricular activities, specifically, sports, performance and fine arts, academic clubs and organizations, community-other oriented activities and services activities; (3) to define different dimensions of participation, for instance, breadth of activity participation, intensity and duration; and finally, to examine the positive outcomes that have been linked to extracurricular activity participation.

II.1. Extracurricular Activity Participation as an Ecological Asset and Positive Development Approach

Extracurricular activity participation can be viewed as an ecological asset and positive development approach. The ecological perspective provides a conceptual framework for investigating complex interactions between persons and environments. Events that occur in one context often have implications for individual behaviours and development in another one. Additionally, these proximal settings are contained in broader institutional and community contexts that shape the structure of settings and influence what takes place in them (Maurizi, Ceballo, Epstein-Ngo, & Cortina, 2013).

The majority of studies about the context and interventions to support adolescent development have been deficit focused and designed to ameliorate problems such as risk behaviours, cognitive or emotional disorders, substance abuse, aggression, antisocial conduct (Damon, 2004; Larson, 2000). However, beyond this deficit-focused approach and with the willingness to develop programs to enhance youth development, the PYD approach considers development as a product of the mutually influential interrelations between diverse individuals and changing contexts (e.g. structure and function of their family, school, peer group, and community), as we mentioned in Chapter 1.

Among the different contexts taken into account, much of the adolescent literature has focused on the role of parents and school towards positive outcomes, it is often forgotten that

adolescents are engaged in activities outside the school context. Within leisure activities, we have chosen to take into account structured extracurricular activities that have been considered as a resource for adolescent development. This has been based on the relational developmental systems view of adaptive developmental regulations as resulting from mutually-beneficial *individual* \leftrightarrow *context relations* (Geldhof, Bowers, & Lerner, 2013). Moreover, it is considered particularly well suited to provide opportunities for positive development such as life skills (i.e. time management, leaderships, teamwork) and social benefits (i.e. making new friends, expanding their social network) among others (e.g. Barber et al., 2009; Barber, Stone, & Eccles, 2005; Eccles & Barber, 2001; Eccles, Barber, Stone, & Hunt, 2003; Forneris et al., 2015; Gilman, Meyers, & Perez, 2004). Thus, in our dissertation, we empathize and focus on the leisure context, specifically, extracurricular activities that have been conceptualized as one important developmental context of adolescent's lives (Agans et al., 2014; Duerden & Witt, 2010; Lerner et al., 2014; Martinez et al., 2016).

II.2. Types of Organized Activities

Organized activities may include clubs, athletic opportunities, dance lines, cheer teams, scouts, drama or theatre, youth groups, student council and club sports. There are different opinions on what is considered an extracurricular activity, for example, some societies have a long tradition of extracurricular activity involvement (e.g. U.S.) and its positive developmental significance is widely recognized (Mahoney et al., 2005; Mahoney & Vest, 2012). However, compared to the educational systems in some other countries, for instance, France, where even though extracurricular activity involvement has a long tradition, it is only in recent years that there is a growing interest in the developmental consequences of extracurricular and after-school programs for youth, which resulted in a macro-level shift in French societal norms and practices, that foregrounded organized activities in the social ecology of children and resulted in educational reform in France in 2013 (for a review see Ministère de la Ville de la Jeunesse et des Sports, 2014).

The extracurricular activities are embedded in other developmental contexts, for instance in the affordances provided by schools, local community centres and private ones. Some authors suggested that not all the out-of-school activities have the potential to contribute positively to the development of adolescents, only the structured ones, which are “*rule-bound or goal oriented, emphasize conventional skill building, feature adult supervision and guidance, and provide a context of belongingness and positive peer relationships*” (Mahoney, Stattin, & Lord, 2004, p. 553) and enable positive development. Theoretically,

activity types might represent distinct learning and social context, with their own norms, goals, task, roles and adult and peer cultures (Denault & Poulin, 2009; Lerner, 2002).

Consistent with this ecological perspective, research suggests different broad categories of organized activities, such as sport and arts (Hansen, Larson, & Dworkin, 2003; Larson, Hansen, & Moneta, 2006). In the research literature, six higher-order categories have been commonly used to classify adolescent organized activities: sports, arts, academics, community service and faith-based (for a review see Larson et al., 2006). However, empirical studies suggest considerable variation in the subgroups of organized activities within a higher-order category. Some authors proposed five categories of organized activities, including sports, performance and fine arts, academic clubs and organizations, service and community-oriented (Hansen & Larson, 2007). In this dissertation, we focused on sports and performance and fine arts, because among the different organized activities, these are the categories that are more represented among French adolescent (Muller, 2018), but we briefly describe the others.

II.2.1. Sports

Sports involvement is the domain activity that has been included in most of the participation-outcome studies (e.g. Felfe et al., 2016; Holt et al., 2017; Zarrett et al., 2009). Participation in organized sport has been considered as an unambiguous social context thanks to its rules of play. In France, 51 % of the 12-17 years old are involved in organized sport activities, with differences between gender and ages groups favouring the 12-14 year-old males (61%) compared to the 12-14 year-old females (49%) and the 15-17 year-old males (52%) and females (34%) respectively (Machard, 2003). Thus it is the most popular extracurricular activity among French adolescents. It is recognized as contributing to adolescent's social development, where adolescents learn to interact with peers, respect rules, cooperate with others and acquire other skills useful for everyday life (Armour, Sandford, & Duncombe, 2013). However, the literature of sports suggests that athletic participation is associated with both positive and negative developmental experiences (Merkel, 2013). On the positive effects, research suggests that adolescents involved in sports activities reported moderately high rates of personal development experiences such as goal-setting, emotion regulation time management, self-knowledge and interpersonal development experiences such as teamwork, leadership, social skills. Sport is considered the most popular and time-consuming organized activity and experiences of effort and perseverance are most prevalent in sport (Fraser-Thomas & Côté, 2009).

Some authors suggest that over the last two decades, there is a rise in specialization, more adolescents choose a single sport (Merkel, 2013). However, the literature highlights the benefits of diversification in the promotion of positive development through sport (J. Fraser-Thomas & Côté, 2009). It is important to mention that, “*by itself the act of sport participation among young people leads to no regularly identifiable development outcomes*” (Coakley, 2011, p. 309). Merely participating in sport does not necessarily produce positive outcomes; research suggests that the developmental benefits of sport participation are related to and dependent on social contextual factors, that are a combination of multiple factors such as the type of sport played (Bruner, Eys, Wilson, & Côté, 2014; Crissey & Honea, 2006; Eime, Young, Harvey, Charity, & Payne, 2013; Linver, Roth, & Brooks-Gunn, 2009), orientation and actions of peers, parents, coaches (Bohnert, Fredricks, & Randall, 2010; Fredricks & Eccles, 2005, 2006b; Kay & Spaaij, 2012), norms and culture associated with particular sports (Hartmann & Massoglia, 2007; Rütten, Abu-Omar, Frahsa, & Morgan, 2009; Rutten et al., 2011), social relationships formed in connection with sport participation (Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2007), and personal sport experience and meanings given to sport (Bradley & Conway, 2016; Holt, Black, Tamminen, Fox, & Mandigo, 2008; Holt & Neely, 2011; Holt et al., 2012; Petitpas, Cornelius, van Raalte, & Jones, 2005; Weiss, Bolter, & Kipp, 2016). In line with this and besides the structural aspects, new approaches highlight, on the one hand, the importance of accounting for the social features of sport and linking them with personal, social and physical outcomes and, on the other hand, empathize the critical importance of creating an appropriate social environment (based on relationship with peers, adults/coaches, and parents) for promoting positive development (Camiré, Trudel, & Forneris, 2014; Fraser-Thomas, Côté, & Deakin, 2005; Holt et al., 2017; Holt, Tink, Mandigo, & Fox, 2008; Koh, Ong, & Camiré, 2016; Weiss & Wiese-Bjornstal, 2009).

Moreover, studies suggest that in comparison to other organized activities, sport appears to provide unique experiences to positive development such as higher rates of experiences for the development of initiative, leadership, communication, emotional regulation and teamwork–social skills, learning to work with different types of people. Specifically, participation in team sports predicted increases in school attachment over the high school years and has been strongly linked to positive educational and occupational outcomes (Bradley & Conway, 2016; Codina, Pestana, Castillo, & Balaguer, 2016; Martinez et al., 2016). Therefore, studies showed that adolescents developed better mental health, motivation and values, in sport activities that empathized skill acquisition and mastery of motivation and

values rather than social comparison and winning (e.g. Agans et al., 2014; Bundick, 2011; Hansen et al., 2003; Hansen, Skorupski, & Arrington, 2010; Holt, Black, et al., 2008; Jones, Dunn, Holt, Sullivan, & Bloom, 2011; MacDonald, Côté, Eys, & Deakin, 2011).

II.2.2. Performance and Fine Arts

The adolescent experience of arts activities can be construed as an important developmental context, with the potential to influence developmental trajectories through organized activities. In France, 30 % of 11-17 years old are involved in arts activities such as music, singing, playing an instrument; however, this percentage includes practice in organized structures as well as unstructured ones (HCFEA, 2018), showing the little interest in the study of this category of activities. Some authors suggest that organized arts activities (e.g. music, dance, drama, arts clubs, performing arts) are a positive context for adolescent development (Barber, Stone, & Eccles, 2005; Bartko & Eccles, 2003; Mahoney et al., 2005). Consistent with this, studies have shown a positive link between arts activities and higher rates of initiative experiences, positive relationship and adult network experiences (Larson et al., 2006). The authors suggest that the dynamic properties of art activities are different from sport (Hansen et al., 2010). Among art activities, there are large differences between the subgroups of this category, for instance there is a unique contribution of each subgroup. For example, the performance of a skill, a movement in dance, may heighten attention to an individual's performance compared to other activities where individual's performance may get blended with other individuals' performances. In line with this, performing arts may be seen as an opportunity for the ultimate expression of individuality (Barber, Eccles, & Stone, 2001).

II.2.3. Academic Clubs and Organizations

Many schools and community organizations sponsor clubs for children and adolescents. These school-based clubs provide opportunities for adolescents to participate in activities, interact with peers in a supervised setting, and form relationships with adults. The activities that are proposed have different focuses such as educational, student government, leadership, cultural or social ones (Fredricks & Eccles, 2006b; Larson et al., 2006; Zarrett & Mahoney, 2011). In the French context, adolescents' participation in this type of activity is less than 10 % (HCFEA, 2018). In contrast, studies in the American context suggest that about 25 % of adolescents join music-oriented clubs, such as the choir or bands, and 20 % join academic or career-related clubs, such as a science club, a Spanish club (Hofferth & Jankuniene, 2001).

Demographic differences were observed among the groups of participants and non-participants in academic clubs and organizations. This suggests that there may be patterns in individuals' decisions about participation in these activities, such as adolescents from higher-socioeconomic status (SES) families may be more likely to participate in than lower-SES families (using maternal education as a proxy for SES). Moreover, adolescents who participate in a science club, for instance, are likely to have been more successful academically before joining (Eccles & Barber, 2001; Eccles et al., 2003; Mahoney et al., 2005).

II.2.4. Community-Oriented Activities

The purpose of these activities is to connect adolescents to community adults, institutions and careers. In the French context, there are no statistics available about community-oriented activities. The limited literature suggests that community-based organization that seeks to improve the psychological development of adolescents, encouraging them to become productive and responsive, can maximize the potential for sustained positive effect on adolescent participants (e.g. Armour et al., 2013; Hansen et al., 2003). In the US, authors include community-based youth programs (e.g. Boys Scouts and Girls Scouts, 4-H) (Balsano et al., 2009; Fredricks & Eccles, 2006a; Gestsdóttir & Lerner, 2007; Lerner, Alberts, Jelicic, & Smith, 2006; Lerner, von Eye, et al., 2009) and school-based career and technical clubs (e.g. Future Business Leaders of America, Family, Career, and Community Leaders of America), which are designed to enhance career and technical education programs in public middle and high schools (Hansen & Larson, 2007; Hansen et al., 2010; McNally & Harvey, 2001).

II.2.5. Service Activities

The purpose of service activities is to foster youth's development of altruistic and civic ideology. In this category, we find community service, volunteering, faith-based service, civic clubs, peer services such as tutoring, peer counselling or writing centre (Keeter, Jenkins, Zukin, & Andolina, 2005; Larson et al., 2006; Youniss, McLellan, & Mazer, 2001). In the French context, there are no statistics available about volunteering or adolescent service. Research suggests that it is important to make a difference between adolescents service/volunteering that is performed in the context of required schools programs (a practice well established in the American context) and the ones that desire to volunteer (Scales & Benson, 2005).

II.3. Positive Outcomes of Extracurricular Activity Participation

There is cross-sectional and longitudinal compelling evidence that suggests that extracurricular activity participation is related to a range of positive outcomes that we have grouped into three categories: personal, relational and behavioural.

Extracurricular activity participation has been linked to positive personal outcomes such as psychological, social and physical health (Eime et al., 2013; Fredricks & Eccles, 2008), emotional regulation (Larson et al., 2006), well-being and self-esteem (Busseri, Rose-Krasnor, Willoughby, & Chalmers, 2006; Kort-Butler & Hageman, 2011; Palen & Coatsworth, 2007; Trainor, Delfabbro, Anderson, & Winefield, 2010), specifically sport / dance participation (Bowker, 2006; Daniels & Leaper, 2006; Erkut & Tracy, 2002; Fox, 2000; Richman & Shaffer, 2000). Therefore, adolescents have a higher self-image (Guèvremont, Findlay, & Kohen, 2014), self-concept (Blomfield & Barber, 2009), particularly when adolescents are involved in team sport (Slutzky & Simpkins, 2009), self-competence and self-worth (Blomfield & Barber, 2011) and a positive influence on identity exploration (Blomfield & Barber, 2012). Moreover, studies suggested that extracurricular activity participation has an effect on the adolescent's ability to set and achieve short and long term goals (Duda & Ntoumimis, 2005; Larson et al., 2006). Extracurricular activity participation has been also associated with higher educational expectations and academic achievement (Anderson-Butcher, Newsome, & Ferrari, 2003; Balyer & Gunduz, 2012; Broh, 2002; Chambers & Schreiber, 2004; Lipscomb, 2007; Lleras, 2008; Troutman & Dufur, 2007; Zito, Parcel, & Solebello, 2011). Additionally, it is related to the development of a sense of morality and

diversity (Lerner & Steinberg, 2004; Zarrett & Eccles, 2006) and sense of belonging at school (Knifsend & Graham, 2012; Martinez et al., 2016).

Involvement in extracurricular activities is associated with positive relational outcomes such as promoting friendships and higher friendship quality, especially, high quality friendships predicted higher enjoyment and commitment in the activity (Bohnert et al., 2010; Schaefer, Simpkins, Vest, & Price, 2011; Weiss et al., 2012), positive peer interactions including prosocial norms and diverse relationships. For example, in a study among girls soccer teams over a season, researchers found benefits at two levels, first, at the interactional level, they integrated new members and learned to interact with different types of persons and second, at the relationship level, they managed peer conflict and group problem-solving (Blomfield & Barber, 2012; Holt, Black, et al., 2008). Moreover, extracurricular activities has been linked to social connectedness (Barber et al., 2009; Mahoney, Vandell, Simpkins, & Zarrett, 2009), development of adult networks and social capital (Holt & Neely, 2011) and higher rates of civic engagement (Fredricks, 2012; Fredricks & Eccles, 2006b; Gardner et al., 2008).

Furthermore, extracurricular activity participation has been related to several behavioural outcomes. Studies have shown that it reduces the likelihood of detrimental outcomes such as depression (Agans & Geldhof, 2012; Boone & Leadbeater, 2006; Guibord, Bell, Romano, & Rouillard, 2011; Mason, Schmidt, Abraham, Walker, & Tercyak, 2009), emotional anxiety (Guèvremont et al., 2014), risky behaviour (Adamczyk, 2012; Burton & Marshall, 2005; Gerstenblith et al., 2005; Luthar, Shoum, & Brown, 2006; Metzger, Dawes, Mermelstein, & Wakschlag, 2011), internalising problems (Abraczinskas, Kilmer, Haber, Cook, & Zarrett, 2016), externalising symptoms (Bohnert, Kane, & Garber, 2008), dropping out (Bartko & Eccles, 2003), substance use (Anderson-Butcher et al., 2003; Barnes et al., 2007; Darling, 2005; Guibord et al., 2011), sexual activity (Barnes et al., 2007), bullying victimisation (Peguero, 2008), delinquency, antisocial behaviour (Morris, Sallybanks, & Willis, 2003; Wong, 2005) and criminal arrest (Mahoney & Stattin, 2000). Moreover, extracurricular activity participation has been considered as a buffer between maladjustment cognitions and aggression and victimization; specifically, having high efficacy for activity participation (ability to meet expectations within activity) serves a buffer for both reactive aggression and reactive victimisation (Hall, 2016).

II.4. Participation in Extracurricular Activities: Considering Different Dimensions of Participation

Participation in extracurricular activities has been linked to a variety of positive outcomes in adolescence and hypothesized to constitute key ecological assets in the lives of adolescents (Chinkov & Holt, 2016; Denault & Poulin, 2009; Eccles & Gootman, 2002; Lerner et al., 2006; Zarrett et al., 2009). These contexts of participation share several features directly linked to positive development, among them: regular participation, direction by an adult leader, emphasis on skill development, involvement that requires sustained attention, opportunities for meaningful participation, and clear feedback (Eccles et al., 2003; Fredricks & Eccles, 2005, 2006b; Mahoney et al., 2009). Therefore, these activities offer a setting to adolescents to connect with other adults and receive additional support (Denault & Poulin, 2009).

Extracurricular activities constitute a setting to undertake the developmental tasks of adolescence, at both the personal and interpersonal levels (Feldman & Matjasko, 2005; Hansen & Larson, 2007; Hansen et al., 2010). They provide adolescents with a context for self-assessment outside the more restricted expectations of school and family settings (Barber, Stone, & Eccles, 2005; Darling, 2005; Khanlou, 2004). From a developmental approach, extracurricular activities together with family, peer group and school context offer individual and social experiences that are likely to promote positive adjustment (Denault & Poulin, 2009). However, some authors have suggested that it is difficult to assess the impact of activity participation without accounting for changes or patterns in activity participation over time. Adolescents have a multitude of opportunities to explore their abilities, talents through extracurricular activities and participation is not a static variable. Adolescents can change activity from year to year; there is also within-individual variability over time (Feldman & Matjasko, 2012; Mahoney, Cairns, & Farmer, 2003). Then, a simple comparison between participating and non-participating adolescents does not capture the complexity of adolescents' experiences (Feldman & Matjasko, 2012; Fredricks & Eccles, 2010; Mahoney & Stattin, 2000).

In order to capture this complexity and the patterns of the extracurricular activity participation, researchers have proposed multiple dimensions of activity participation to account for it, notably breadth, intensity and duration that we briefly describe below (for a review see Bohnert et al., 2010; Zarrett & Mahoney, 2011).

II.4.1. Breadth of Activity Participation

Breadth of participation is the number of different activity types or activity contexts to which an adolescent is exposed; it does not mean the total number of activities, but rather a variety of activities (Fredricks & Eccles, 2006a; Sharp, Tucker, Baril, Van Gundy, & Rebellon, 2015). Studies conducted mostly in North American societies and in Australia indicated that, on average, high school students participated in two to three activities (e.g. Bohnert, Aikins, & Edidin, 2007; Busseri et al., 2006; Fredricks & Eccles, 2010; Strachan, Côté, & Deakin, 2009; Zarrett et al., 2009). But, during adolescence, breadth of participation showed a linear decreasing trajectory over time (Busseri et al., 2011; Denault & Poulin, 2009). This decline has been explained by changes related to autonomy, identity exploration and involvement inherent to adolescent development (Barber, Stone, & Eccles, 2005; Barber, Stone, Hunt, et al., 2005).

Research has explored how adolescents' involvement in a broad range of activities (i.e. breadth of participation) may be associated with developmental outcomes that differ from outcomes associated with more intense and frequent participation in a select few programs (i.e. the intensity of participation). Some studies showed that adolescents involved in more than one type of activity have more positive outcomes, because by taking part in different activities they get involved in more contexts, have more opportunities for exploring a broad range of skills, interest and values, as well as exposure to a rich variety of people and experiences (Busseri & Rose-Krasnor, 2009; Busseri et al., 2006; Linver et al., 2009; Mays, DePadilla, Thompson, Kushner, & Windle, 2010). In these diverse contexts, the adolescent might form strong and supportive relationships and experience unique learning experiences proper to the activities context thereby, fostering academic performance and adjustment (e.g. Busseri et al., 2011; Busseri et al., 2006; Denault & Poulin, 2009; Dworkin, Larson, & Hansen, 2003; Knifsend & Graham, 2012; Peck, Roeser, Zarrett, & Eccles, 2008; Sharp et al., 2015; Zarrett & Mahoney, 2011). Participation in two to three activities generally related to better academic outcomes, but higher levels of involvement might no longer predict positive outcomes (Busseri et al., 2006; Fredricks & Eccles, 2006b; Mahoney, Harris, & Eccles, 2006; Melman, Littie, & Akin-Littie, 2007).

Studies examined curvilinear relationships to determine whether there was a threshold at which greater extracurricular involvement no longer related to more positive outcomes (Knifsend & Graham, 2012; Mahoney & Vest, 2012). Adolescents participating at a moderate level in a broad range of activities may be offered with a space that helps to equip adolescents

with a variety of skills to support their successful growth and adjustment and facilitate exposure to different contexts and experiences, such as identify with others and to foster relationships and promoting a greater sense of belonging (e.g. Busseri et al., 2006; Knifsend & Graham, 2012; Lerner, Freund, De Stefanis, & Habermas, 2001; Zarrett & Mahoney, 2011). And adolescents who are not involved in any activity may miss out these opportunities. In contrast, adolescents who take part in too many activities contexts may result in poor outcomes, because adolescents' resources may be spread across multiple domains (Lerner et al., 2001; Mahoney et al., 2009; Marsh & Kleitman, 2002; Zarrett et al., 2009). Moreover, adolescents may have difficulties figuring out where they fit and belong, which is one key of adolescents' development (Cillessen, Mayeux, Ha, Bruyn, & LaFontana, 2014; LaFontana & Cillessen, 2002; Mahoney & Vest, 2012; Marsh & Kleitman, 2002; Randall & Bohnert, 2009) and it may also isolate adolescents from family time (Luthar & Latendresse, 2005; Luthar et al., 2006).

To sum up, breadth of participation should be considered as an important component of the process of individual and context relations among adolescents and their extracurricular activity context. Research has shown that diversity of participation has different outcomes considering the variety of activities adolescents are involved in, it seems that participation in more than three different activities is no longer related to positive outcomes and that involvement in a range of different activities declines over time (Barnett, 2008; Bohnert et al., 2010; Collins & Steinberg, 2006; Fredricks, 2012; Fredricks & Eccles, 2010; Lerner et al., 2006; Lerner et al., 2001).

II.4.2. Intensity

The intensity of participation corresponds to the time the adolescent spends in activities; it refers to the frequency (e.g. once a month; four times a week) or number of hours of participation (e.g. 2 h a week or 3h each day (Feldman & Matjasko, 2012; Zarrett & Mahoney, 2011). Intensity has been operationalized as the average number of weekly or monthly hours of participation (Busseri et al., 2006; Rose-Krasnor, Busseri, Willoughby, & Chalmers, 2006) or as the total number of hours spent in activities over the school year (Darling, 2005; Denault & Poulin, 2009; Gardner et al., 2008). Some authors revealed that the more time adolescents spend in activities the greater opportunities to be exposed to factors that are likely to promote positive development outcomes (Gardner et al., 2008), such as strengthen their skills and knowledge, and to engage in interpersonal transactions with activity

peers (Busseri et al., 2006). It seems that intensity increases in early-to-mid-adolescence but then decreases steeply toward the end of high school (Denault & Poulin, 2009).

Intensity of involvement may afford developmental opportunities beyond those presented by breadth of participation (Busseri & Rose-Krasnor, 2009), the idea behind is that intensity may offer the opportunity to optimize performance and experience within giving activity context because of the time invested (Busseri & Rose-Krasnor, 2009; Lerner et al., 2001). However, some studies have found a positive curvilinear effect between intensity of participation and a variety of psychological (i.e. depressive symptoms, loneliness) and social outcomes (i.e. social competence; Bohnert et al., 2010; Mahoney et al., 2006; Randall & Bohnert, 2009, 2012). Specifically, these studies showed that spending a low (less than ten hours) or a high (more than ten hours) number of hours per week in organized activities was associated with higher levels of depressive symptoms (Randall & Bohnert, 2009), higher levels of loneliness for males and decreasing benefits in terms of their perceived social competence (Randall & Bohnert, 2012). These results go in line with the notion of the threshold effects: the benefits of extracurricular activity decrease among adolescents who are highly involved, there are diminishing outcomes associated with high intensity participation (Busseri et al., 2006; Fredricks & Eccles, 2006a; Mahoney et al., 2006; Marsh & Kleitman, 2002; Melman et al., 2007; Randall & Bohnert, 2009, 2012; Rose-Krasnor et al., 2006).

II.4.3. Duration

The duration of participation corresponds to the length of adolescents' attendance and participation in the activity over time (Feldman & Matjasko, 2012; Zarrett & Mahoney, 2011). Some studies have shown that adolescents who spent more years or were involved in activities for a longer duration experienced the lowest level of social isolation, loneliness and peer victimization (Randall & Bohnert, 2009). Longer attendance affords adolescents the time necessary to forge deep and meaningful connections with supportive adults and peers (Fredricks & Eccles, 2006a), to apprehend the experiences related to the activity context and to gain competency and comfort with their chosen activity (Bohnert et al., 2010; Fredricks & Eccles, 2006b).

To summarize, although these dimensions of participation (breadth, intensity and duration) are positively associated, they are conceptually distinct and uniquely predict outcomes. Differentiating them might allow us to capture unique aspects of adolescents' extracurricular activity participation, considering the possibility that each dimension might be

differently linked to categories of outcomes (Denault & Poulin, 2009; Rose-Krasnor et al., 2006). There is preliminary evidence for the separability and differential developmental significance of breadth and intensity. Although positively correlated, the majority of the variability in breadth was independent of intensity and vice versa (Busseri & Rose-Krasnor, 2009; Rose-Krasnor et al., 2006). Therefore, research suggests that short-term participation in one activity cannot foster the degree of activity-related gains that more sustained participation provides. For instance, adolescents who spend more time in an extracurricular activity benefit more than those who participate at lower rates. Additionally, there is a cumulative effect of multiple developmental contexts, whereby development that occurs in one context both reinforces and is reinforced by development in another context (e.g. Lerner et al., 2013; Lerner, Lerner, Bowers, & Lewin-Bizan, 2012; Zarrett & Mahoney, 2011).

To conclude this chapter, we would like to highlight some important aspects. First, there is empirical evidence that has shown that extracurricular activity context provides key information on adolescent development. These organized activities have been linked to a range of positive academic, behavioural, psychological and young adult outcomes. Second, it is primordial to analyse the nuanced differences in outcomes in light of diverse dimensions such as breadth, intensity and duration of participation, as well as the type of activity, especially, when comparing adolescents who participate in sports versus other activities. Both types of activity participation provide the opportunity to adolescents to interact with different types of people (peers, coaches, and other adults) and through these interactions adolescents acquire a range of skills, attitudes and behaviours that influence their development. Moreover, besides the type of activity, it is important to have a broader view of these activities taking into account their social and ecological context interrelations and then to investigate how the ecological context of specific activities influence the relationships between extracurricular participation and adolescent development.

Furthermore, more studies exploring the links between activity participation, peer groups' characteristics across a variety of samples and ecological contexts over extended periods of time are needed in order to understand how extracurricular activity participation may influence the positive development of adolescents. Longitudinal research can also

address the fact that extracurricular activity participation is not static; adolescents may move in and out of different activities over the course of the year and it would be interesting to examine how this could influence the positive development of adolescents. Regarding positive development, the next chapters are centred on empathy and prosocial behaviours.

CHAPTER III

Empathy: Definition, Development and Inter-individual differences.

Chapter III. Empathy: Definition, Development and Inter-individual differences

Empathy is most often associated with metaphors as “standing in someone else's shoes” or “seeing through someone else's eye”, but is it really what it is all about? What is the origin of the word “empathy” and what does it really mean? Why did this word (which did not exist in French before 1981) suddenly become so popular, not only in cognitive, social and developmental psychology but also in sociology, biology, social neuroscience, caregiving settings, business and even politics?. Empathy is regarded as central in social interactions relating to social emotions and social reasoning. The ability to empathize is an important part of social and emotional development that affects the individual’s behaviour toward others and thus the quality of social relationships (Batson, 2018; Overgaauw, Rieffe, Broekhof, Crone, & Güroğlu, 2017).

The concept we know today as empathy began as *Einfühlung* in the late 19th century German aesthetics and was translated as empathy at the beginning of the 20th century by the American experimental psychology. The concept was subsequently used by many theorists and fields, for example, personality theory of the 1930s, and then by Rogerian psychotherapists in the 1950s, and in social and developmental psychology with the increase in studies of positive forms of social behaviour in the 1960s. Empathy has been an important concept in contemporary developmental, social, personality, and clinical psychology (Wispé, 1987) and as Strayer and Eisenberg (1987) explained : “*because of its wide-ranging application, the notion of empathy is, and always has been, a broad somewhat slippery concept one that has provoked considerable speculation, excitement and confusion*” (p. 3). Some authors go even further to state that there are perhaps as many definitions as there are authors in the field (Cuff, Brown, Taylor, & Howat, 2016).

This chapter aims to first provide with a representative sampling of current, state-of-the-art knowledge about empathy that draws from contemporary work in different fields as for example: cognitive, social and developmental psychology, cognitive-affective neuroscience and neuropsychology; second state the dimensions of empathy and the differences between empathy and other related concepts, and finally look at empathy from a developmental point of view.

III.1. The Multidimensional Nature of Empathy

III.1.1. Definitions of Empathy

The nature and definition of empathy is a topic of ongoing debate. During the literature review process, we have been confronted by the fact that the term of empathy has been applied to many different phenomena. In order to capture some of this heterogeneity, we decided to summarise and present some of the definitions in Table 1 (for an extensive review, see Cuff et al., 2016).

Table 1. Definitions of empathy

Titchener (1915)	He borrowed Lipp’s notion of <i>Einfühlung</i> and coined the term empathy (1909), the idea behind was that one could know about the consciousness of another person by reasoning analogically from one’s own mental processes to those of another (Wispé, 1987). When Titchener published in 1915 <i>Beginner’s Psychology</i> , he wrote: <i>“We have a natural tendency to feel ourselves into what we perceive or imagine. As we read about the forest, we may, as it were, become the explorer; we feel for ourselves the gloom, the silence, the humidity, the oppression, the sense of lurking danger; everything is strange, but it is to us that the strange experience has come. We are told of a shocking accident, and we gasp and shrink and feel nauseated as we imagine it; we are told of some new and delightful fruit, and our mouth waters as if we were about to taste it. This tendency to feel oneself in a situation is called empathy, on the analogy of sympathy, which is feeling together with another; and empathic ideas are psychologically interesting, because they are the converse of perceptions: their core is imaginal, and their context is made up of sensations, the kinaesthetic and organic sensations that carry the empathic meaning. Like the feeling of strangeness, they are characteristic of imagination. In memory, their place is taken by the imitative experiences, which repeat over again certain phases of the original situation”</i> (p. 198).
Rogers (1957)	Roger’s theory of personality evolved out of his work as a clinical psychologist and developed as an offshoot of his theory of client-centred (later called person-centred) therapy. In <i>The Necessary and</i>

	<i>Sufficient Conditions of Therapeutic Personality Change</i> (1957), empathy is defined as “the ability to perceive the internal frame of reference of another with accuracy and with the emotional components and meanings which pertain there as if one were the person, but without ever losing the 'as if' condition” (p. 98).
Hogan (1969)	“The act of constructing for oneself another person's mental state” (p. 308).
Mehrabian and Epstein (1972)	“A vicarious emotional response to the perceived emotional experiences of others” (p. 525).
Davis (1983b)	“Set of constructs related in that all concern responsivity to others but are also clearly discriminable from each other [...].These sets of construct consist of four subscales. The perspective taking assesses the tendency to spontaneously adopt the psychological point of view of others; the Fantasy taps respondents' tendencies to transpose themselves imaginatively into the feelings and actions of fictitious characters in books, movies and plays. Empathic concern assesses “other-oriented” feelings of sympathy and concern for unfortunate others, and the Personal distress, measures “self-oriented” feelings of personal anxiety and unease intense interpersonal settings” (p. 114).
Hoffman (1987)	“An affective response more appropriate to someone else's situation than to one's own” (p. 48).
Strayer and Eisenberg (1987)	“An emotional response that stems from another's emotional state or condition and that is congruent with the other's emotional state or situation” (p. 5).
Batson, Fultz, and Schoenrade (1987)	“The other-focused, congruent emotion produced by witnessing another person's suffering involves such feelings as sympathy, compassion, softheartedness, and tenderness” (p. 20).
Cohen and Strayer (1996)	“The ability to understand and share in another's emotional state or context” (p. 988).
Eisenberg and Fabes (1998)	“An affective reaction that results from the apprehension or comprehension of another's emotional state or condition, and that is identical or very similar to what the other person is feeling or would be

	<i>expected to feel</i> ” (p.702).
Decety and Jackson (2004)	<i>“Three major functional components dynamically interact to produce the experience of empathy in humans: (a) affective sharing between the self and the other, based on perception-action coupling that leads to shared representations, (b) self-other awareness. Even when there is some temporary identification, there is no confusion between self and other, (c) mental flexibility to adopt the subjective perspective of the other and also regulatory processes” (p. 75).</i>
Batson (2009)	Noted eight conceptualisations: <i>“(a) knowing another’s emotional and cognitive state; (b) matching the posture or neural response of another; (c) feeling the same as another; (d) projecting oneself into another’s situation; (e) imagining how another is feeling and thinking; (f) imagining how one would think and feel in another’s situation; (g) feeling distress for the suffering of another; and (h) feeling for another person who is suffering” (pp. 1-8).</i>
Oliveira-Silva and Gonçalves (2011)	<i>“The capacities to resonate with another person’s emotions, understand his/her thoughts and feelings, separate our own thoughts and emotions from those of the observed and responding with the appropriate prosocial and helpful behaviour” (p. 201).</i>
Carré, Stefaniak, D'Ambrosio, Bensalah, and Besche-Richard (2013)	<i>“Is an active process based on functional and dynamic mechanisms that are involved in social context and account for the process involved in empathy [...] (a) emotional contagion by another person’s emotion (b) emotional disconnection and (c) cognitive empathy” (p. 686).</i>

The early theory came from Titchener who borrowed Lipp’s notion of *Einfühlung* and coined the term empathy in 1909 which was first used by phenomenologists in a perceptual context. Through the 50s, empathy took a more cognitive meaning in clinical discussions (Hogan, 1969; Rogers, 1957); then, by the 60s, it got a more emotional meaning, especially used by developmental and social psychologists. Thus, definitions of empathy shifted from cognition-based to emotion-based.

Contemporary theory of empathy from developmental psychology has evolved greatly since its early conception, empathy was increasingly viewed as a vicarious emotion, that is,

feeling either the same emotion as the other person, or an emotion congruent with (but not necessarily identical to the emotion of the other person (Batson et al., 1987; Mehrabian & Epstein, 1972). The term empathy has been used to refer to two related human abilities: mental perspective taking (cognitive empathy) and the vicarious sharing of emotion (emotional empathy). However, over the past 10 years, a new conceptualisation of empathy has emerged from the field of social cognitive neuroscience (Decety & Jackson, 2004).

Latter definitions integrated and highlighted the importance of taking into account the interaction between the different components of empathy and its new interdisciplinary path. In this line, empathy is considered and defined as an essential function for human social activity, as it helps us to recognise relationships between others and ourselves by understanding others' feelings, desires, ideas and actions (Batson, 2009; Oliveira-Silva & Gonçalves, 2011). Nevertheless, besides the definition of empathy, the most frequent discussion focuses on whether empathy is an emotional or a cognitive process (Batson, 2009; Decety & Jackson, 2004; Decety & Svetlova, 2012; Engelen & Röttger-Rössler, 2012; Hoffman, 2001; Jankowiak-Siuda, Rymarczyk, & Grabowska, 2011; Radenovic, 2011; Shamay-Tsoory, Aharon-Peretz, & Perry, 2008).

III.1.2. Empathy: A Plural Phenomenon

Many authors have made a distinction between different types of empathy. The most common distinction is between “cognitive” and “emotional” empathy. Whereas some scholars have considered empathy primarily as a cognitive phenomenon, namely the ability to understand another's feelings, related closely to theory of mind (Hogan, 1969; Wispé, 1987), others have defined it primarily as an affective phenomenon, the experience of emotion, elicited by an emotional stimulus (Batson et al., 1987; Hoffman, 1987). However many definitions include both (e.g. Batson, 2009; Cohen & Strayer, 1996; Eisenberg et al., 1998; Oliveira-Silva & Gonçalves, 2011).

Cognitive empathy refers to the perspective-taking processes that an individual uses to imagine the other's situation in order to understand what the other is feeling (Davis, 1983a; Decety, 2010). Affective empathy refers to an emotional response that stems from another's emotional state or condition and it is congruent with the other's emotional state or condition (Eisenberg, Shea, Carlo, & Knight, 1991). It implicates at least some differentiation between self and other (Eisenberg, 2002; Hoffman, 2008) and should be distinguished from pure emotional contagion, defined as the tendency to take on the sensory, motor, physiological, and

affective states of others, that is rather a primitive, automatic, implicit and uncontrollable form of empathy (Prochazkova & Kret, 2017).

Currently, it is important to mention that most scholars agree that empathy should be seen as a complex multidimensional construct. Taking into account developmental, neuroimaging and neuropsychological studies of empathy and regardless of the terminology used, there is broad agreement among scholars on three primary aspects: 1) an affective response to another person, which often, but not always, entails sharing that person's emotional state, 2) a cognitive capacity to take the perspective of the other person, and 3) some self-regulatory and monitoring mechanisms that modulate inner states (Archer, 1991; Batson & Shaw, 1991; Eisenberg & Morris, 2001; Eisenberg, Spinrad, & Morris, 2014).

In the dissertation, we decided to use the three-factor model comprising emotional contagion, cognitive empathy and emotional disconnection (Carré, Stefaniak, D'Ambrosio, Bensalah, & Besche-Richard, 2013) which is based on three primary aspects of empathy. This conception posits that three elements are gradually built into the construction of empathy (Decety, 2010, 2011; Decety & Moriguchi, 2007; Decety & Svetlova, 2012). From a developmental viewpoint, the emotional contagion processes are the first component to appear. Then, more cognitive (i.e. cognitive empathy) and regulatory (i.e. emotional disconnection) functions develop in parallel with cognitive and cerebral maturation (Zelazo, Carlson, & Kesek, 2008).

During infancy, specifically during the preverbal period, affective arousal emerges (Lamm, Decety, & Singer, 2011; Lamm, Meltzoff, & Decety, 2010) and is thought to be an unconscious process and involve an automatic component (bottom-up processing) that makes possible the rapid evaluation of the nature of the emotion and to distinguish between different emotional stimuli whether it is positive or negative, pleasant or aversive and to respond adequately, although there is no emotion regulation involved (Decety, 2010, 2011). This first element is emotional contagion and corresponds to the automatic replication of another person's emotions (Gallese, 2003; Iacoboni & Dapretto, 2006; Papousek, Harald Freudenthaler, & Schuler, 2011; Zaki, 2014; Zaki & Ochsner, 2012). Studies suggest that the observation of another person's emotional states automatically activates the same neural representation of that affective state in the observer, along with the automatic and somatic responses related to them (Anders, Heinzle, Weiskopf, Ethofer, & Haynes, 2011; Gazzola, Aziz-Zadeh, & Keysers, 2006; Goldman & Sripada, 2005; Keysers & Gazzola, 2009). Due to its automatic character, it involves subcortical structures such as the limbic lobe, which is

known to be involved in emotion processing (Derntl et al., 2010; Hariri, Tessitore, Mattay, Fera, & Weinberger, 2002; Phillips, Drevets, Rauch, & Lane, 2003).

From a neurological point of view, studies have shown that distinct brain regions are associated with cognitive and affective empathy (Shamay-Tsoory, Aharon-Peretz, & Perry, 2008). A review study suggested that cognitive components activated different neural processes compared to the affective components (Singer et al., 2006). Nevertheless, taking into account the extensive interaction between the two processes to treat them separately has been rejected (Baron-Cohen & Wheelwright, 2004; Chierchia & Singer, 2017; Gonzalez-Lienres, Shamay-Tsoory, & Brune, 2013; Singer & Klimecki, 2014).

The self / other awareness through emotional understanding associated with the development of theory-of-mind and executive abilities allows children to be able to dissociate and maintain two people's points of view (Decety, 2010, 2011). It is related to cognitive empathy which is defined as the ability to understand and mentalize other person's affects (Decety, 2011; Decety & Svetlova, 2012; Morelli, Ong, Makati, Jackson, & Zaki, 2017; Zaki, 2014; Zaki & Ochsner, 2012). As children enter the preschool and elementary school years, there are significant gains particularly in the area of cognitive empathy. This is partially because the children increased language capacities facilitate empathic reflection as well as the measurement of such empathic abilities (McDonald & Messinger, 201).

Cognitive empathy involves activation of the insular cortex, which promotes emotional awareness, as well as of the ventromedial and medial prefrontal cortex, which are responsible for the understanding of emotions (Carr, Iacoboni, Dubeaut, Mazziotta, & Lenzi, 2003; Decety, 2011). The mechanism of cognitive empathy is therefore thought to be distinct from emotional contagion and automatic identification (Hoffman, 1977; Hoffman, 2000; Prochazkova & Kret, 2017). Cognitive advancement is a crucial component of empathy development; empathy is a maturational process that must be understood in a developmental context (Batson, 2011).

Throughout childhood and adolescence, emotion regulation skills develop, which allows the gradual control of affects and motivations and make possible to regulate emotions through emotional disconnection, considered as a regulatory factor that involves self-protection against distress, pain and extreme emotional impact (Batson et al., 1987; Lamm et al., 2010; Lamm, Porges, Cacioppo, & Decety, 2008). It could be considered as a partially efficient way to react to emotional situations (Gross, 2002) when compared with complete emotional appraisal. This third element, emotional disconnection, appears to be related to executive

functions that are implemented in a top-down network based on the orbitofrontal cortex, medial and dorsolateral prefrontal cortex and the anterior cingulate cortex (Decety, 2011; Decety & Michalska, 2010).

This three-factor model is consistent with developmental and neuroimaging studies of empathy (Cowell & Decety, 2015; Decety, 2010; Decety & Jackson, 2004; Decety & Svetlova, 2012; Jackson, Brunet, Meltzoff, & Decety, 2006; Lamm et al., 2011) and allows us to see empathy as an active process based on functional and dynamic mechanisms that are involved in social contexts and account for the processes involved in empathy (Gerdes, Lietz, & Segal, 2011). Moreover, neurobiological studies suggested that empathy is a complex phenomenon, which can be described using a model that includes two modes of processing: bottom-up and top-down (Engelen & Röttger-Rössler, 2012; Gyurak, Goodkind, Kramer, Miller, & Levenson, 2011; Jankowiak-Siuda, Rymarczyk, & Grabowska, 2011; Preston & Hofelich, 2012; Prochazkova & Kret, 2017; Sze, Gyurak, Goodkind, & Levenson, 2012). According to this approach, the bottom-up component of empathy would be related to affective sharing or contagion, whereas the top-down process, where the feelings of others are fully imagined and understood, is based on control and inhibition mechanisms (Jankowiak-Siuda et al., 2011). The top-down process which involves the regulation of emotions and intentional mechanisms would modulate empathic experience (i.e. the cognitive empathy component) and could be regulated by emotional disconnection which could itself correspond to an emotional suppression (Gross, 2002; Lamm et al., 2011).

III.2. Distinction between Empathy and Related Concepts: Personal Distress, Sympathy or Empathic Concern, and Compassion

Since the 1980s, there have been already two lines of research that paid attention to the difference between personal distress and empathy. One of them considers these two concepts as emotions elicited in specific situations (Batson et al., 1987; Batson, Shannon, & Giovanni, 1997) and the other one as personal dispositions that transcend different contexts (Davis, 1983a; Davis, Hull, Young, & Warrem, 1987). Concerning the first one, empirical evidence has shown that feelings of empathy and personal distress are two distinct types of vicarious emotion; as a result, emotions are congruent with another person's state, in this case, a person in need. Specifically, research suggest that empathy is a neutral or relatively pleasant other-oriented emotion that evokes the altruistic motivation to reduce the other's need, whereas personal distress is an unpleasant self-oriented emotion that evokes the egoistic motivation to reduce one's own aversive arousal (Batson et al., 1987; Batson, Fultz, & Schoenrade, 1994;

Oceja, López-Pérez, Ambrona, & Fernández, 2009). The second line of research considers personal distress and empathy as personal dispositions that transcend different contexts. Personal distress refers to personal dispositions of feeling relatively negative and self-oriented emotion (personal anxiety, unease) whereas empathy refers to the personal dispositions of feeling relatively positive and other-oriented emotion (feeling concern, caring) toward a person in need (Davis, 1980, 1983a). In short, both lines of research consider personal distress is an aversive, self-focused emotional reaction to the apprehension or comprehension of another's emotional state or condition.

Moreover, empathy is distinguished from sympathy, it has been depicted as “*feeling as*” and “*feeling for the other*” respectively (Hein & Singer, 2008, p. 157). Sympathy has been described as the affective part of empathy (Baron-Cohen & Wheelwright, 2004; Davis, 1983b; Davis et al., 1987) or as being caused by empathy (Eisenberg & Fabes, 1990; Hein & Singer, 2008; Niezink, Siero, Dijkstra, Buunk, & Barelds, 2012; Singer et al., 2006). Specifically, it is defined as “*a vicarious emotional reaction based on the apprehension of another's emotional state or situation, which involves feelings of sorrow or concern for the other*” (Eisenberg, Shea, Carlon, & Knight, 1991; p. 459). Batson and colleagues, who used instead the term empathic concern and Davis (1980) who used the term sympathy, specified that for the observer to feel sympathy or empathic concern, the other must be suffering some sort of distress or misfortune and has to be in need (Batson et al., 1987; Batson et al., 1981; Davis, 1980; Niezink et al., 2012; Stocks, Lishner, Waits, & Downum, 2011). Recent neuroscience studies have given insights into brain regions related to empathy, in particular to empathy for the suffering of another person. They found that empathy with feelings of others, and self-experience of these feelings state recruit shared neural networks, which suggest a simulation of the other's state in the brain of the observer (Anders, Heinzle, Weiskopf, Ethofer, & Haynes, 2011; Hein & Singer, 2008). Thus, sympathy consists of feeling an emotion for the other person rather than feeling an emotion as the other feels it or is expected to feel.

Another important distinction to make is between empathy and compassion, the latter one is considered as a discrete emotional response focused on alleviating the suffering of others, it is a feeling arising from the witnessing of another individual's suffering that subsequently motivates and effort to help (Condon & Feldman Barrett, 2013; Goetz, Keltner, & Simon-Thomas, 2010; Lim & DeSteno, 2016). Compassion is modulated by the likelihood that the target will reciprocate; it can be promoted through nonconscious nudges and

meditation and it functions as a mechanism for self-regulation meant to build social capital (DeSteno, 2015). Sinclair and colleagues (2017) suggest that “*compassion differs from sympathy and empathy in its proactive approach, the selfless role of the responder, and its virtuous motivators aimed at ameliorating suffering*” (p. 438).

To sum up, the purpose of this section was to highlight the differences between empathy and related concepts that are often used interchangeably. To have a clearer vision of what studies are really measuring when they refer to empathy, it is important to state that related construct as personal distress, sympathy or empathic concern and compassion although related to empathy and used interchangeably, are not empathy per se, and because of it, they do not convey the same theoretical meaning and implications to the development and expression of it. Personal distress is an aversive, self-focused emotional reaction to the apprehension or comprehension of another’s emotional state or condition. By contrast, sympathy is the concern for another based on the apprehension or comprehension of the other’s emotional state or condition, and compassion is conceived as a feeling of concern for another person’s suffering which is accompanied by the urge to act to alleviate the observed suffering on top of the intellectual and emotional understanding of another’s suffering encompassed by empathy (Birnie, Speca, & Carlson, 2010). Furthermore, the distinction between empathy and related constructs should be taken into account not only at the psychological level but also at the neurological one. Research suggest that the strength of the empathic brain responses can be modulated by different factors considering the intensity of the displayed emotion, the contextual appraisal, the characteristics of the observer and of the target of empathy (Hein & Singer, 2008; Singer & Klimecki, 2014). Moreover, empathy should also be understood as a context-dependent response. Understanding the social context allows the sympathiser to reconstruct why others have a particular emotion, not only that they have an emotion (Hollan, 2012). Among the social contexts, we already mentioned the family context and different features of the parents-child relationship related to children’s empathy development; in the next section we focus on the adolescent period.

III.3. Empathy Development in Adolescence

Consistent with theoretical expectations (Hoffman, 2000), research on young children indicated that the capacity to empathise develops rapidly in the early years of life (Barrett, Lewis, & Haviland-Jones, 2016; Eisenberg, Spinrad, & Morris, 2014; Knafo, Zahn-Waxler, Van Hulle, Robinson, & Rhee, 2008; Stern & Cassidy, 2018; Van der Mark, Van Ijzendoorn, & Bakermans-Kranenburg, 2002). The ability to share feelings which are linked to the

affective component of empathy is already present in babies through emotion contagion that has been termed “motor empathy” or “empathic mimicry” (Decety & Meyer, 2008).

In a complete empathic experience, the observer must be able to separate himself from others and have some minimal mentalizing ability. The affective sharing must be modulated and monitored by the sense of whose feelings belong to whom (Decety & Jackson, 2004). This comes with cognitive empathy and Theory of Mind around age four or 5 (Preston & de Waal, 2002). However, not all the components of cognitive empathy are developed by then, more advance forms are still developing during adolescence (Crone & Dahl, 2012; Guroglu, van den Bos, & Crone, 2009).

Although the literature supports the claim that empathy is malleable across the entire lifespan (Helson, Jones, & Kwan, 2002) adolescence is an important developmental period that seems particularly relevant to study empathy development for several reasons. Adolescence has traditionally been conceived as a transitional period, characterised by a number of physical, cognitive, physiological and emotional changes combined with individual, social, and contextual transitions (Allemand, Steiger, & Fend, 2015; Blakemore & Mills, 2014; Blakemore, Burnett, & Dahl, 2010; Steinberg & Morris, 2001; Zarrett & Eccles, 2006).

Neuroimaging studies have shown that the social brain, i.e. the complex network of brain regions that participates in understanding and interacting with social agents, continues to develop during adolescence, the changes in functional brain activities go with emerging social cognitive proficiency and neuroanatomical development (Burnett, Bird, Moll, Frith, & Blakemore, 2009; Burnett, Thompson, Bird, & Blakemore, 2012). Moreover, a significant portion of brain growth and development occurring in adolescence is the construction and strengthening of regional neurocircuitry and pathways; in particular, the brain stem, cerebellum, occipital lobe, parietal lobe, frontal lobe and temporal lobe actively mature during adolescence. Several executive brain functions and overall regulatory skills are governed by the prefrontal cortex, which remains in a state of active maturation during adolescence (Arain et al., 2013). Specifically, brain regions involved in perspective taking (anterior medial prefrontal cortex) have been shown to become more active during adolescence, signalling increases in orientation toward others (Crone & Dahl, 2012) and regulatory skills continue to mature throughout this period (Keating, 2004; Zeman, Cassano, Perry-Parrish, & Stegall, 2006).

One of the most prominent changes in adolescence is related to the increased salience of social and peer interactions (Collins & Steinberg, 2006). The ability to be empathic is particularly important in adolescence because a lot of social reorientation (Blakemore & Mills, 2014) takes place and heightens the salience of peer relationships while enhancing the role of empathy for effective social interactions (Lamm et al., 2011; Singer & Lamm, 2009). Peers relationships take on new importance as adolescents spend more time with peers and place an increasing value on peer belonging (Brown & Larson, 2009).

High quality relationship with parents (Laible, Carlo, & Roesch, 2004) and peers (Rubin, Bukowski, & Laursen, 2009) might provide a unique opportunity to develop empathy (Eisenberg, Morris, McDaniel, & Spinrad, 2009). Furthermore, adolescents' emotional lives compared to children are faced with high change in a range of emotions, particularly, the experience of frequent and intense negative emotions in daily life (Larson, Moneta, Richards, & Wilson, 2002; Maciejewski, van Lier, Branje, Meeus, & Koot, 2015, 2016). This has been related to the immaturity in adolescents' emotion regulation abilities underpinned to the neural architecture that still under development (Casey, Duhoux, & Cohen, 2010). Moreover, mid-adolescence has been associated with a general intensification of affective processing, particularly for social stimuli, that involve both regions implicated in the coding of perceptual characteristics of social stimuli and social perception that includes thinking about another's mental state (Hare et al., 2008; Somerville, Hare, & Casey, 2011).

III.3.1. Age and Gender in the Development of Empathy

The empirical findings between age and empathy development yielded mixed and inconsistent results (Eisenberg, Cumberland, Guthrie, Murphy, & Shepard, 2005; Lockwood, Seara-Cardoso, & Viding, 2014; Zakriski, Wright, & Underwood, 2005). Some studies suggest an increase in empathy across adolescence (Allemand et al., 2015; Eisenberg, Spinrad, & Sadosky, 2006; Garaigordobil, 2009; Garaigordobil & Galdeano, 2006). Others have found an increase on affective empathy with females showing higher affective empathy compared to males (Knafo et al., 2008; Lam, Solmeyer, & McHale, 2012; Overgaauw et al., 2017; Van der Graaff et al., 2014; Van der Graaff, Carlo, Crocetti, Koot, & Branje, 2017). In contrast, some researchers showed stable levels of affective empathy over time for both genders (Eisenberg et al., 2005), while others revealed stable levels from ages 13 to 18 years old only for female adolescents, and temporary decrease followed by an increase from middle adolescence for male adolescents (Van der Graaff et al., 2014).

Conversely, the transition into adolescence appears to widen the differences in empathy between males and females however empirical findings regarding gender are mixed. The most common method of measuring empathy is self-report questionnaires. One of the most robust results obtained from these studies is a gender difference. Studies report that females report greater empathy than males (e.g. Barr & Higgins-D'Alessandro, 2007; Chow, Ruhl, & Buhrmester, 2013; Eisenberg et al., 2006; Garaigordobil, 2009, 2014; Rueckert & Naybar, 2008; Schieman & Gundy, 2000; Toussaint & Webb, 2005). However, other studies suggested that these gender differences are more important for affective empathy than for cognitive empathy (Albiero et al., 2009; Geng, Xia, & Qin, 2012; Jolliffe & Farrington, 2006; Lafferty, 2004; Lawrence, Campbell, & Skuse, 2015). Several reviews of the work on gender differences are available (Eisenberg & Lennon, 1983; Eisenberg & Miller, 1987; Hoffman, 1977; Lennon & Eisenberg, 1987). The review by Eisenberg and Lennon (1983) revealed that females scored higher than males but these gender differences appeared to be dependent on how empathy had been operationalised. Using some measures like paper-and-pencil self-reports, large differences were found compared to picture/ story indices methods, whereas no gender differences appeared when facial/gestural and physiological measures were used. Specifically, these differences favouring females were most evident when individuals were asked to rate themselves on empathic behaviours and affective responses. Weaker differences were found when individuals were asked to rate their emotional response in a hypothetical scenario. Moreover, studies suggest that gender differences are more variable and context-dependent than early suggested by studies using self-report (e.g. Rueckert & Naybar, 2008; De Vignemont & Singer, 2006).

Besides self-reports, gender differences in empathy have also been shown using functional neuroimaging (Christov-Moore et al., 2014), and another field of research, that it is becoming increasingly popular is the potential role of the neuromodulator *oxytocin* (*OT*) (Christ, Carlo, & Stoltenberg, 2016; Rilling et al., 2014). Studies using functional magnetic resonance imaging (fMRI) suggested that gender differences might be due to differences in the mirror neuron system. When individuals were asked to focus on either themselves or others oriented attentional focus when analysing a scene, females activated more the inferior frontal cortex compared to males (Schulte-Rüther, Markowitsch, Shah, Fink, & Piefke, 2008). It seems that females recruit more emotion-related regions, whereas males engage a different neural network, rather associated with cognitive evaluation, mentalizing and behaviour

anticipation (Derntl et al., 2010). However, a meta-analysis of fMRI studies found no evidence of gender differences (Lamm et al., 2011).

Despite all these inconsistencies and mixed results according to age and gender, most of the studies have shown that precursors of empathy appeared early in life in the form of simple emotional contagion (e.g. Hoffman, 1977; Hoffman, 2000; Singer et al., 2006) and develop through childhood and adolescence alongside with major cognitive and emotional development (Eisenberg, 2001). Therefore, as mentioned in the previous section, early socialisation plays a major part in how the ability to empathise is encouraged or muted. Concerning adolescence, and the context of peer relationships, it seems that some socialising behaviours illicit sex-typed relationship styles. This may be due to the increased significance of same-sex peers in middle childhood, which could help to explain in part increases in sex differences in adjustment at adolescence (Rose & Rudolph, 2006).

There are several developmental theories that can be applied to help explain these gender differences. The evolutionary theory states that because women are the caretakers they develop greater abilities to understand others, to act in a relational manner and display empathy whereas males are predisposed to be competitive, aggressive and provide to the offspring's (Archer, 1996). The socialisation theory posits that gender differences in social behaviours have been socially constructed and taught to the individual across development (Maccoby, 2002). The social cognitive theory of gender development integrates psychological components and socio-structural influences that interact to form gender conceptions and gender role behaviours (Bussey & Bandura, 1999). An extensive review of these three approaches is beyond the scope of this chapter.

Among the different theories and evidence that point to a multifactorial process that includes within-individual characteristics, such as genetics (Knafo & Uzefovsky, 2013; Knafo et al., 2009), neural development (Chierchia & Singer, 2017; Decety, Bartal, Uzefovsky, & Knafo-Noam, 2016; Gonzalez-Liencre, Shamay-Tsoory, & Brune, 2013; Paulus, 2018) and temperament (Beechler, 2012; Hilbig, Glöckner, & Zettler, 2014). In this dissertation, the focus will be on the socialisation theory. Research on early socialisation (Hastings, Utendale, & Sullivan, 2007; Hoffman, 1977) suggest that females' empathic behaviours may have a more affective basis than males (Derntl et al., 2010) and that these differences may increase in adolescence due to the biological and social changes inherent to this developmental period (Stuijzand et al., 2016). Some authors have shown that these changes lead peers socialisation to exert pressure on individuals to behave in a gender typed way and to conform to gender

specific behaviours (Miller, Lurye, Zosuls, & Ruble, 2009; Oransky & Marecek, 2009; Pettitt, 2004; Ruble et al., 2007) and that this sex-typed peer socialisation may be influenced by adult gender socialisation (e.g. Hastings, McShane, Parker, & Ladha, 2007; Perry & Pauletti, 2011; Rose & Rudolph, 2006). It has been suggested that because of cultural norms, parents' expectations for girls and boys differ and there are divergences in the rearing patterns of girls and boys. Parents tend to encourage the development of skills oriented towards warmth, empathy self-disclosure and physical proximity in interpersonal relationships among girls, thus, they are expected to be more nurturing, relationship oriented, express emotions that support relationships and have the capacity for understanding and sharing others' feeling and emotions (Chaplin, Cole, & Zahn-Waxler, 2005; Garaigordobil, 2009; Richaud, 2013). In contrast, parents enhance independence, goal-directed behaviour and physical competence among boys, thus they are expected to be more autonomous, have high sense of mastery and control (Letendre, 2007; Richaud, 2013), not expressing their emotions, sensitivity and loyalty (Holgado Tello, Delgado Egido, Carrasco Ortiz, & Del Barrio Gandara, 2013) that are considered as feminine characteristics (Pettitt, 2004; Rose & Rudolph, 2006).

Therefore, the gender role ideologies held by adolescents might add some insight into the different age trend found for boys and girls in empathy. According to the gender intensification hypothesis (Hill & Lynch, 1983), the transition into adolescence is a time in which gender role identities take on much greater significance in an adolescent's life and social interactions.

In brief, increasing levels of cognitive abilities and experience facilitates emotional functioning. Although there is some evidence for neurophysiological correlates of these gender differences in empathy, we cannot rule out the possibility that the different assessment methods employed in these studies were contributing to these gender and age differences. There is a clear need to consider the role of socialisation which constitutes an integral part of the system within which development occurs.

III.3.2. The Role of Living Environments and Empathy Development

It is worth mentioning that neurodevelopmental maturation is not confined solely to the brain maturation. The developmental forces of biology and environment do not work independently of each other. Individuals differ in their dispositional propensities or capacities to display empathy across age and at the same time differ in developmentally driven accomplishments that allow them to act empathically. Parents and other agents of

socialisation through how they respond and adjust to individual differences in the early-emerging emotional and social tendencies of infants and toddlers may foster or redirect dispositional traits. In turn, children vary in their responsiveness to a given socialisation event (Hastings et al., 2007; Nichols, Svetlova, & Brownell, 2009). Research highlighted the importance of socialisation experiences for empathy development. Many theoretical frameworks (e.g. psychoanalytic theory, social learning theory, and social cognition theory) with the purpose of understanding the ontogeny, socialisation and development of empathy put a primary emphasis on parents (Davis, 1980; Eisenberg & Fabes, 1998; Hastings et al., 2007; Shen, Carlo, & Knight, 2013; Strayer & Eisenberg, 1987).

Socialisation experiences, such as the quality of relationships with parents, the parental disciplinary behaviours and parental socialisation of emotion have been related to empathy development (Eisenberg & Valiente, 2002; Knafo & Plomin, 2006; Strayer & Roberts, 2004; Taylor et al., 2013). Children's empathy has been explained in terms of social learning theory that posits that supportive parents are role models for their children empathic skills (Litvack-Miller, McDougall, & Romney, 1997; Svetlova, Nichols, & Brownell, 2010; Volbrecht, Lemery-Chalfant, Aksan, Zahn-Waxler, & Goldsmith, 2007). Moreover, positive associations have been found between empathy and inductive practices such as the use of reasoning (Eisenberg, Spinrad, et al., 2006), empathic and sensitive parenting to the children's needs (Hoffman, 2000; Knafo et al., 2008), parental responsiveness to children's distress (Davidov & Grusec, 2006; Grusec, 2011; Taylor et al., 2013). Furthermore, studies have shown that parental behaviour is relevant to the experience and expression of emotion, i.e. the emotion-related parenting practises (e.g. parental expression of emotion, reactions to children's emotion), emotion coaching (e.g. Brophy-Herb et al., 2011), affective synchrony (i.e. parents match their children affect during interaction) and encouragement to take the perspective of others (e.g. Farrant, Devine, Maybery, & Fletcher, 2012) are positively related to empathy development. Attachment research is also relevant to considerations of empathy development. Studies revealed that a secure attachment to parents and caregivers is positively related to empathy development (Kochanska, 2002; Laible, Carlo, & Roesch, 2004; Mikulincer et al., 2001; Stern & Cassidy, 2018; Van der Mark et al., 2002).

Regarding the specific features of family context we investigated in Chapter 1, research has found that parental warmth can foster empathy (Guo & Feng, 2017; Kanat-Maymon & Assor, 2010; Lam et al., 2012; Miklikowska et al., 2011). A two-wave longitudinal study found that parental warmth and children's empathy was mediated by parental positive

expressiveness and that children's social abilities was partly mediated by children's empathy. Although it is likely that parental warmth affected children's empathy, it is also likely that children's empathy evoked parenting (Zhou et al., 2002). Higher levels of maternal warmth have been associated with stability and increases in empathic behaviours. Conversely, a study found that maternal warmth was associated with empathic behaviours only in boys, suggesting that girls and boys may be affected differently by parental warmth (Davidov & Grusec, 2006). Although a positive relation is found, it may not be sufficient in encouraging the development of empathy in all children (Eisenberg et al., 1992).

Moreover, parental autonomy support has been linked to the development of empathy (Soenens, Duriez, Vansteenkiste, & Goossens, 2007); specifically, maternal support had a unique and significant power predicting empathy-related dispositions (cognitive empathy in particular). This has been explained by the parent's rearing style and their modelling effects. For instance, children who perceive and experience parental support learn that their parents take their perspective and care about their needs and feelings, although, this could be the result of a more indirect mechanism (i.e. by fostering higher levels of attachment security and need satisfaction of interpersonal relationships (Allen et al., 2007; Davidov & Grusec, 2006). Conversely, negative behaviours such as harsh parental control and corporal punishment are negatively related to empathic responses (Eisenberg, Spinrad, et al., 2006), some authors showed that regardless of the specific type, parental psychological control has been negatively associated with adolescent empathy (Yoo et al., 2013).

Furthermore, besides the family context, researchers have argued that peer relationships can provide a unique setting where children can explore their interest in others, experience social exchanges and social learning and an opportunity in which to develop empathy (Eisenberg & Fabes, 1998; Nichols et al., 2009; Roth-Hanania, Davidov, & Zahn-Waxler, 2011). Peer relationship unlike parent-child relationship provides qualities such as unique equality, mutuality and reciprocity which offer rich opportunities for the development of empathy (Laible et al., 2004). Moreover, some studies have shown that secure attachment peer relationships were associated with higher levels of empathy (Carlo, McGinley, Hayes, & Martinez, 2012; Mikulincer, Shaver, Gillath, & Nitzberg, 2005). Similarly, the school's culture may influence the empathic capabilities of students due to the opportunities for adolescents to exercise empathic responsiveness; this relation could be bidirectional because it could be that student's empathic capabilities may influence their school context perception (Barr & Higgins-D'Alessandro, 2007).

Among the contextual variables that have been appointed to explain and understand empathy differences, we can mention: the familiarity of interaction partners (relatives, friends, neighbours), group size (Cialdini, Brown, Lewis, Luce, & Neuberg, 1997; Singer et al., 2006), public versus private settings (Hyde, 2005), emergency or day-to-day situations (Batson, 2011; Preston & de Waal, 2002; Preston & Hofelich, 2012), mixed sex versus single sex group (Stuijzand et al., 2016), specifically, there are more conflict and competition on all-boy groups and more nurturance and empathy in all-girl groups than in mixed-sex groups (Baron-Cohen & Wheelwright, 2004). Moreover, studies have shown that, similarity influences empathic responding, in fact, it seems that the observer has the tendency to identify more closely with others that appear to be more similar to him or herself (Lamm, Meltzoff, & Decety, 2010; Preston & de Waal, 2002) in features such as personality (Avenanti, Minio-Paluello, Bufalari, & Aglioti, 2009), appearance but also cultural likeness, sentience or social circumstances (Cheng et al., 2007; Forgiarini, Gallucci, & Maravita, 2011; Preston, Hofelich, & Stansfield, 2013; Xu, Zuo, Wang, & Han, 2009). According to the in-group empathy hypothesis, people showed exaggerated affective responses to more similar in-group members than to less similar out-group members (Brown, Bradley, & Lang, 2006; Farrant et al., 2012; Gutsell & Inzlicht, 2010, 2012).

Considering the type of extracurricular activity, research has shown that the need for individuals to work collaboratively encourages empathy (Moore, 2002). For example, children and adolescents that participate in performing arts (music, dance, theater) had higher levels of empathy compared to adolescents who did a sport activity, however, these tendencies are susceptible to factors such as duration and intensity (Sevdalis & Raab, 2014). Therefore, in the sport context, empathy has been negatively associated with antisocial behaviour and aggression (Kavussanu, Boardley, Sagar, & Ring, 2013; Stanger, Kavussanu, & Ring, 2012). Thus, empathy can reduce reactive aggression in sport by promoting consideration of others' feelings and perspective. Additionally, empathy enhances welfare during competitions by counteracting the arousal provoked by competition that could lead to aggression. However, the effect of empathy (suppression effect) on aggression was explained by guilt, especially in men (Cooke, Kavussanu, McIntyre, & Ring, 2013; Stanger, Kavussanu, McIntyre, & Ring, 2016). Moreover, adolescents who participated in extracurricular activity reported increased empathy, and considered it as an important social skill needed not only in the activity context but in multiple domains (e.g. relationships, school), a transferable skill needed for everyday life (Dworkin et al., 2003; Holt, Deal, & Smyth, 2016; Hudson-Flege &

Thompson, 2017; Johnston, Harwood, & Minniti, 2013; Jones & Lavallee, 2009; Zarrett et al., 2009).

To summarise, to understand the emergence and the development of empathy, there are different factors to take into account. Clearly, the adolescents' own contributions must be part of a full account, coupled with the brain and neurobiological maturation. Moreover, these various influences are likely to assemble differently as a function of other factors such as parental socialisation, parent-child relationships, and peer relationships. Similarly, the socialisation experiences among the different living environments, specifically, on the one hand, positive features such as warmth, structure and autonomy support have been related to empathy development, on the other hand, negative features such as rejection, chaos and coercion have been negatively related to empathy. Most of these features of living environments have been extensively studied in the family context, much less is known in the peers context.

III.4. Empathy and Positive Outcomes

In a society that revolves around interactions and important decisions, empathy may be more important than we think. The studies overviewed (cross-sectional, longitudinal design), though not nearly exhaustive, have shown that empathy is related to a range of outcomes that we have grouped into three categories: personal, relational and behavioural.

There are a set of personal outcomes that have been positively related to empathy, among them, people's psychological well-being, less depressive symptoms and less negative affect. Empathic individuals report more positive affect and tend to be more satisfied with their lives than less empathic individuals (Benita, Levkovitz, & Roth, 2017; Morelli et al., 2017; Telle & Pfister, 2016). Moreover, empathy plays an important role in personality and moral reasoning (Berthoz, Grèzes, Armony, Passingham, & Dolan, 2006; Hoffman, 2001).

Empathy benefits relationships, not only at the personal level but also relational one, in fact it may not be an exaggeration to say that any relationships would be enhanced with empathy. Studies have shown that empathy is a vital skill for fostering and widening social interaction (Eisenberg & Morris, 2001; Hoffman, 2000; Singer et al., 2006) and a sense of social connection (Gable & Impett, 2012; Gable, Reis, Impett, & Asher, 2004; Reis et al., 2010). It is essential for our comprehension of social behaviour (Decety & Lamm, 2006), and the regulation of our own social behaviour (Findlay, Girardi, & Coplan, 2006; Laible et al., 2004). There is a positive relationship between empathy and friendships quality (Overgaauw

et al., 2017; Overgaauw & Wetenschappen, 2015; Soenens, Duriez, Vansteenkiste, & Goossens, 2007). Moreover, it promotes forgiveness (Toussaint & Webb, 2005) and interpersonal competence in adolescent friendships (Chow et al., 2013). Individuals with high levels of empathy are more tolerant and accommodating of other people (Butrus & Witenberg, 2013).

Furthermore, empathic individuals are more interested in positive relations with others, value social interactions and tend to approach others; it seems that their positive self-esteem and warmth attract social interactions that further their empathic abilities (Grühn, Rebusch, Diehl, Lumley, & Labouvie-Vief, 2008). In conjunction with an enhanced social connection in close relationships (e.g. family, peers, friends and romantic relationships), these successes may enhance social relationship by increasing perception of social closeness and building relationships resources (Gable & Impett, 2012; Gable et al., 2004).

Empathy has been shown to be related to several behavioural outcomes, since it is considered as a protective factor against aggressive peer relations (Dallaire & Zeman, 2013), peer victimisation and bullying; particularly, among boys, higher levels of empathy are associated with fewer bullying behaviours (Bollmer, Milich, Harris, & Maras, 2005; Gini, Albiero, Benelli, & Altoe, 2007; Overgaauw et al., 2017; Stavrinides, Georgiou, & Theofanous, 2010). Empathy decreases antisocial and criminal behaviours (Broidy, Cauffman, Espelage, Mazerolle, & Piquero, 2003; Lovett & Sheffield, 2007), as well as aggressive and delinquent behaviours (de Kemp, Overbeek, de Wied, Engels, & Scholte, 2007) and externalising and internalising disorders (Gambin & Sharp, 2016). Specifically, a high level of affective empathy is suggested to be one protective factor against the development of conduct disorders in girls (Gambin & Sharp, 2016). In addition, substantial studies suggest that empathy decreases prejudice (Batson, Chang, Orr, & Rowland, 2002; Galinsky & Moskowitz, 2000; Finlay & Stephan, 2000; Miklikowska, 2017a, 2017b; Pettigrew & Tropp, 2008).

Adolescents with high levels of empathy use more compromising strategies and are more likely to discuss issues with friends and are less likely to become angry when managing conflicts with friends (de Wied, Branje, & Meeus, 2007), they showed more conflict management competence, more intimacy competence, which led to less conflict in the friendship, as perceived by the adolescent (Chow et al., 2013). These findings suggest that adolescents who demonstrate more empathy are more skilled in conflict resolution with friends, which may lead to perceptions of lower discord in their friendship.

Finally, empathy motivates prosocial behaviours - voluntary behaviours that are meant to benefit another individual and are considered as essential in order to achieve positive youth development (e.g. Eisenberg, Spinrad, & Knafo-Noam, 2015; Eisenberg, VanSchyndel, & Spinrad, 2016; Knafo & Israel, 2012; McMahon, Wernsman, & Parnes, 2006; Padilla-Walker & Carlo, 2014; Padilla-Walker, & Christensen 2011; Van der Graaff et al., 2014). Prosocial behaviours constitute the focus of the next chapter.

To sum up, there is considerable research on antecedents and correlates of adolescents' empathy development. In this chapter, we aimed to provide a condensed understanding of what empathy is and, although it has been related and used interchangeably with concepts as personal distress, sympathy and empathic concern, these terms are not the same. Empathy goes far beyond the idea of “standing in someone else's shoes” or “seeing through someone else's eye”. In this dissertation, in order to examine the concept of empathy, we considered empathy as an active process based on functional and dynamic mechanisms that are involved in social contexts and the three factor model (emotional contagion, cognitive empathy and emotional disconnection) which is consistent with an extended and more integrated vision of empathy providing a foundation understanding empathy in this research study.

We highlight the fact that in order to understand empathy, it is important to keep in mind that the expression of empathy falls on a continuum and is influenced not only by the adolescent developmental period (i.e. puberty, brain maturation) and its characteristics, but also by the environment and the context they are exposed to (i.e. the particular situation and recipient, as well as cultural features).

Taken together, the studies we reviewed have shown that empathy facilitates everyday social interactions and has often been linked to a variety of positive outcomes. Among these positive outcomes we focus on the link between empathy and prosocial behaviours. Next chapter reviews the concept and types of prosocial behaviours, followed by the differences between prosocial behaviours and related concepts such as altruism, helping and cooperation. Therefore, highlights considerations of prosocial behaviours from a developmental point of view during adolescence.

CHAPTER IV

Prosocial behaviours: Definition, Development and Inter-individual differences.

Chapter IV. Prosocial behaviours: Definition, Development and Inter-individual differences

Why do some people act prosocially and others do not? Why do people engage in helping behaviours that are beneficial to others, but sometimes costly to the individuals performing the action? Why would people do something that benefits someone else but offers no immediate benefit to the doer? What motivates us to do good for one another?

The term prosocial does not appear in most English dictionaries and does not even exist in French dictionaries. Attention to prosocial activities in psychology originated with McDougall (1908) who suggested that it is the result of “tender emotions” created by the parental instinct which were the basis of our concern for the need of the others, “...for from this emotion and its impulse to cherish and protect spring generosity, gratitude, love, pity, true benevolence, and altruistic conduct of every kind; in it they have their main and absolutely essential root, without which they would not be” (p. 71). According to Dovidio, Piliavin, Schroeder and Penner (2006) since the 60s, the understanding of prosocial behaviours was recognized as a key to harmonious interpersonal and group relations. Two important events in the American society, such as the Civil Rights movement and the 1964 fatal event, the murder of Kitty Genovese captivated the nation’s attention and raised the question of why people do or do not engage in prosocial behaviours. Batson (2011) and Penner, Dovidio, Piliavin and Schroeder (2005) posits that historically, the term prosocial behaviours originated during the 1970s and was introduced by social scientists as an antonym for the term “antisocial behaviours” in order to describe any “positive form of social behaviours” (Wispé, 1972, p. 3).

This chapter aims, first to provide a definition of prosocial behaviours, second to discuss their dimensions and to differentiate from related concepts and, finally to examine prosocial behaviours from a developmental point of view specifically during adolescence.

IV.1. The Multidimensional Nature of Prosocial Behaviours

IV.1.1. Definition of Prosocial Behaviours

Prosocial behaviours meant to benefit others have gained increased attention in recent years as a foundation of social competence and the development of morality during childhood and adolescence (Dunfield & Kuhlmeier, 2013; Eisenberg, Spinrad, & Knafo-Noam, 2015).

While some authors defined prosocial behaviours as a large class of voluntary behaviours that share the common intention to benefit another (e. g., Carlo, Fabes, Laible, & Kupanoff, 1999; Dunfield & Kuhlmeier, 2013; Eisenberg, Fabes, & Spinrad, 2006), others argued that this definition captures a variety of motivations and behaviours that are not explicitly included in the definition. These recent researchers focus on and urge others to focus on the multidimensionality of prosocial behaviours (Eisenberg & Spinrad, 2014; Padilla-Walker & Carlo, 2014). In order to have an overview regarding the different definitions proposed since the origin of the term “prosocial behaviours”, the most used definitions we came across during our literature review have been quoted in Table 2. In this first section, we addressed a portion of the large body of work concerning prosocial behaviours in general, but also the specificities linked to the different types of prosocial behaviours and the distinction between these behaviours and related constructs that are used interchangeably.

Table 2. Definitions of prosocial behaviours

Rosenhan (1972)	<i>“...While the bounds of prosocial behaviours are not rigidly delineated, they include these behaviours where the emphasis is ... upon “concern for others”. They include those acts of helpfulness, charitability, self-sacrifice, and courage where the possibility of reward from the recipient is presumed to be minimal or non-existent and where, on the face of it, the prosocial behaviours is engaged in for its own end and for no apparent other” (p. 153).</i>
Piliavin, Dovidio, Gaertner, and Clark (1981)	<i>“Broad category of actions that are defined by society as generally beneficial to other people and to the ongoing political system” (p. 4).</i>
Eisenberg and Fabes (1998)	<i>“Voluntary behaviours intended to benefit another, such as helping, donating, sharing and comforting” (p. 701).</i>
Grusec, Davidov, and Lundell (2002)	<i>“Any intentional action that produces a positive or beneficial outcome for the recipient regardless of whether that action is costly to the donor, neutral in its impact or beneficial” (p. 458).</i>
Carlo and Randall (2002)	<i>“...Different types of prosocial behaviours based on 4 types of prosocial behaviours: altruistic prosocial behaviours, compliant prosocial behaviours, emotional prosocial behaviours, and public prosocial behaviours [...] led to 6 types of prosocial behaviours: altruistic,</i>

	<i>compliant, emotional, dire, public, and anonymous” (p. 32).</i>
Batson and Powell (2003)	<i>“Broad range of actions intended to benefit one or more people other than oneself behaviours such as helping, comforting, sharing and cooperating” (p. 198).</i>
Padilla-Walker and Carlo (2014)	<i>“Tendency to perform voluntary behaviours regarded as beneficial to others, including helping, sharing, comforting, guiding, rescuing, and defending others” (p. 245).</i>

The term of prosocial behaviours has evolved over different periods. From the mid-1960s until the early 1980s, the evolution of conceptions from research focused on processes involved in the execution of prosocial behaviours in the context of social psychology with research studying people helping in emergency or non-emergency situations to a conception of prosocial behaviours as an interpersonal act that is defined by social and historical or political context in which the behaviours take place (Piliavin et al., 1981). This conception where prosocial behaviours are defined by society as beneficial to other people and/or to the general system implies that these behaviours are not universal to all societies, i.e. a certain behaviour that is valued and considered as prosocial by/in one system could be considered antisocial by/in another one. Later, in the 1990s, research and theory considered why people help, examining processes that motivated prosocial action (for a review, see Penner et al., 2005).

From a developmental perspective, considering the affective and behavioural dispositions, prosocial behaviours are considered as voluntary behaviours (e.g. helping, sharing, comforting) intended to benefit others (Eisenberg & Fabes, 1998; Grusec et al., 2002). The conceptions have moved from a rather strong environmental bias toward models that take into account the multifaceted role of development; a shift from the conceptualization of prosocial behaviours as a general and unidimensional construct to a conceptualization that acknowledge the multidimensional nature of this complex set of behaviours, for example, Carlo and Randall (2002) proposed a model taking into account the different types of motivation that lead to prosocial behaviours. Similarly, Batson and Powell (2003) identified four sources of prosocial behaviours, self-interest, altruism, principalism and collectivism, and considered the difference between dispositional and situational factors and the expression of prosocial behaviours.

Moreover, two important emerging approaches in prosocial behaviours proposed to examine and take into account different types of prosocial behaviours, like helping in response to a request or helping in dire circumstances (Carlo et al., 2014; Carlo & Randall, 2002), and to examine how prosocial behaviours differ as a function of the target of the behaviours, for example strangers, friends, and family (Fu, Padilla-Walker, & Brown, 2017; Padilla-Walker & Carlo, 2014; Padilla-Walker & Christensen, 2011; Padilla-Walker & Fraser, 2014). These new conceptions of prosocial behaviours take into account the interplay between biology and socialisation experiences and socio-cognitive/dispositional characteristics that are likely to affect one another and may produce individual differences (Eisenberg et al., 2015).

IV.1.2. Types of Prosocial Behaviours

Whereas earlier research often used composite measures of prosocial behaviours, that summarized or averaged across a variety of more specific behaviours, recent researchers conceive prosocial behaviours as a complex, multidimensional construct (Padilla-Walker & Carlo, 2014). A variety of prosocial behaviours has been identified, with many researchers focusing on helping, sharing, and comforting (Dunfield, 2011, 2014; Paulus, 2017). Some authors also include informing, defined as the transmission of information between individuals (Warneken & Tomasello, 2009) and cooperating (Brownell, Svetlova, & Nichols, 2009; Svetlova, Nichols, & Brownell, 2010; Warneken, Chen, & Tomasello, 2006).

However, some studies that compared multiple forms of prosocial behaviours found low but statistically significant relations (for a review, see Eisenberg et al., 2006) whereas others found no association (Dunfield, 2011). These differences could be explained by the fact that each behaviour is characterised by distinct neurophysiological correlates (Paulus, Kuhn-Popp, Licata, Sodian, & Meinhardt, 2013), parenting antecedents (Brownell et al., 2009; Pettygrove, Hammond, Karahuta, Waugh, & Brownell, 2013) and developmental trajectories (e.g. Dunfield, 2014; Eisenberg & Spinrad, 2014). Moreover, some authors suggest that the heterogeneity of the motivations next to the different and unique social-cognitive demands required for each behaviour, could explain the substantial number of findings or no relations between the different prosocial behaviours early in development (Paulus, 2017; Svetlova et al., 2010).

Helping addresses the instrumental need to complete a goal-directed action and is one of the most studied types of prosocial behaviours (Dunfield & Kuhlmeier, 2010; Warneken & Tomasello, 2006). However, some authors suggested that helping is less-other oriented than

other forms of prosocial behaviours, specifically, low-cost instrumental help that did not predict later prosocial behaviours (Paulus et al., 2013). There are different forms of helping that require understanding of subtle cues and take time to develop (Svetlova et al., 2010). Moreover, while there are cross-cultural differences in helping strangers between traditional and Westernized cultures, the former being more favourable than the latter (Knafo, Schwartz, & Levine, 2009; Levine, Norenzayan, & Philbrick, 2001), no significant cross-cultural differences were found when help was given to in-group members (Graziano, Habashi, Sheese, & Tobin, 2007).

Concerning the two other types of prosocial behaviours (sharing and comforting), it is important to highlight that most of the studies examining these two types of prosocial behaviours have been intensely investigated during childhood, one of the most commonly examined types of children's prosocial behaviours is sharing materials (e.g. Mussen & Eisenberg, 2001; Warneken & Tomasello, 2006, 2009), a behaviour a lot of less explored during adolescence. Sharing behaviours meet the material need to acquire a desired resource, among the sparse literature and studies available in adolescents. It is worthy to mention that these studies used a specific type of task and measures of sharing behaviours, for instance, economic exchange games, trust games, where sharing is indexed by a specific type of sharing behaviours. In the economic exchange games (e.g. the Dictator game), the players are asked to choose between a fair distribution of goods (e.g. coins) with equal pay-offs to both players and an alternative unfair distribution that might be advantageous or disadvantageous for the self, and in the trust game, a first player can trust a second player to divide a stake, and the second player's reciprocity is an index for returning the favour initiated by the first player. In this sense, the trust choice assesses the extent of willingness to share and reciprocity assesses giving back.

In these studies, the patterns of sharing behaviours are dependant of intentionality of unfair treatment and reputation based on previous interaction and differ between friends from all other peers (e.g., Gummerum, Keller, Takezawa, & Mata, 2008; Güroğlu, van den Bos, & Crone, 2009; Güroğlu, van den Bos, & Crone, 2014). Even, though both the economic exchange games and the trust game are tasks used to measure sharing and giving, there are some major differences among these two tasks. In the first one, for example the Dictator game, the receiver is anonymous, the self-interest of the dictator conflicts with the norm of fair sharing whereas the trust game is more about the trust and reciprocity among the players. Therefore, the motives and questionable conscious awareness behind these social negotiations

call into question the distinction of sharing as a definitively prosocial behaviour. For example, if sharing is motivated by expected reciprocity (i.e. trust game), this act instead might be better defined as turn-taking, which is not necessarily a prosocial act but rather a strategy that allows for continued collaboration (Melis, Grocke, Kalbitz, & Tomasello, 2016). By contrast, sharing as typically understood (a spontaneous sharing in contexts in which a person's actions of share are not based on rules, laws, or the dictates of authorities, e.g. sharing learning with classmates, sharing of resources) requires the sacrifice of a material for another's benefit (Kumru & Yağmurlu, 2014).

Comforting behaviours, defined as the emotional need to reduce an unpleasant affective state, is always considered to be a response to emotional distress, whether real or perceived, and the degree of negative emotion present in comforting situations is typically greater (Cowell & Decety, 2015; Paulus & Moore, 2012). Therefore, a growing number of studies support the role of attachment in children's comforting behaviours, researchers have found that a secure base predicts expectations regarding others' comforting (e.g. Gross, Stern, Brett, & Cassidy, 2017; Johnson, Dweck, & Chen, 2007).

Although these three types of behaviours can occur in emotional contexts (such as when a child shares a toy with a sad peer), it seems that they are not necessarily triggered or associated with the same processes. However, the literature suggested that sharing and comforting require the ability to represent another's negative emotional state, an aspect that has been related to the neurophysiological underpinnings of prosocial responding (Eisenberg, Fabes, et al., 2006). In summary, it seems that psychological approaches to the different types of prosocial behaviours focus on two distinct aspects: one that is based on conscious and cognitive considerations and another that is rooted in more implicit and affective experiences. The paucity of studies on sharing and comforting during adolescence compared to helping behaviours highlight the importance of future research concerning which types of behaviours are considered and measured as being prosocial behaviours.

In this dissertation, in line with Eisenberg and Spinrad (2014), we adhered to the idea that prosocial behaviours were voluntary behaviours intended to benefit another person and we took into account their multidimensionality; while the intention of benefiting others is a definitional component of prosocial responding, the majority of authors agree that the different aspects of prosocial behaviours are closely tied. Prosocial behaviours can follow a host of motives, such as: egoistic concerns (e.g. the desire for reciprocity, a concrete reward, or social approval, or the desire to alleviate one's own aversive emotional arousal), practical

concerns (e.g. the desire to prevent waste of goods), other-oriented concern (e.g. empathy), or moral values (e.g. the desire to uphold internalized moral values such as those related to the worth or equality of all people or a responsibility for others), that are believed to both motivate and define them (e.g. Decety et al., 2016; Eisenberg, Fabes, et al., 2006; Knafo & Israel, 2012; Mesurado & Richaud, 2016; Van der Graaff, et al., 2017).

IV.2. Distinction between Prosocial Behaviours and Related Concepts: Altruism, Helping, Cooperation

In the prosocial literature, there is a variety of behaviours that are overlapping and often confounded, among them are altruism, helping, and cooperation. Although these prosocial categories are used interchangeably and are related to each other, they are not the same, so we briefly highlight their differences and similarities.

The concept of altruism is sometimes used interchangeably with prosocial behaviours, but some experts suggest that these are actually different concepts. Even though the altruism question is as vast as the prosocial one, the differences among the numerous definitions of altruism are beyond the scope of this chapter. Nevertheless, we would like to briefly highlight the differences between these two related but, yet different constructs. Altruism has been defined as “*helping purely out of the desire to benefit someone else, with no benefit (and often a cost) to oneself*” (Aronson, Wilson and Akert, 2010, p. 382). Inherent to most definitions of altruism is the tenet that the helper must not benefit from the altruistic act. However, other authors have a different definition; for instance, Batson (e.g. 1991, 1998) proposed that instead of focusing on the consequences of the act, we should consider the motivation, the underlying reason for it. Thus, for Batson “*altruism is a motivational state with the ultimate goal of increasing another’s welfare*” (p. 6). According to this definition, altruistic acts are only those carried out solely for, the purpose of increasing the welfare of the other, in contrast, actions motivated by the desire to gain some kind of reward, either external (material or social) or internal, or to avoid some kind of punishment, either external or internal are fundamentally egoistic in their nature. Thus, altruism is a motivational state to increase another person’s welfare whereas prosocial behaviours refer to the consequences of a doer’s actions and can be motivated by diverse factors such as anticipating reciprocity, social desirability, or avoiding negative consequences (Chakroff & Young, 2014).

Differently, helping has been defined as “*an action that has the consequence of providing some benefit to or improving the well-being of another person*” (Dovidio, Piliavin,

Schroeder, & Penner, 2006). This is a unilateral and individual action, the act to assist another, regardless of whether the helper benefits from the act or not. It comprehends a great variety of actions, which can take forms of direct aid (e.g. doing something for the other) and indirect ones (e.g. donating money to charity); it can be short-term (e.g. contingent to a need or in an emergency situation) and long-term (e.g. volunteerism) helping. To sum up, helping implies beneficial intentions although certain forms of helping do not necessarily stipulate that the recipient benefits from such help whereas prosocial behaviours are voluntary behaviours intended to benefit another person.

By contrast, cooperation is considered as a “*humanizing experience [that]... transcends egocentric and objectifying postures, encourages trust, sensitivity, open communication, and, ultimately, prosocial activity*” (Kohn, 1990, p. 93, cited by Dovidio, et al., 2006). It involves mutual coordination and trust (Fehr & Rockenbach, 2003; Yamagishi & Kiyonari, 2000) and happens when individuals come together to achieve a common goal that will be beneficial to all (Dovidio et al., 2006). Some authors have suggested that there are different causes of cooperation, it can be enhanced by capitalizing on extrinsic gains (i.e. incentive structures) or internalized prosocial norms (i.e. concern for another’s well-being), but it can be hampered by generalized risk aversion (Declerck, Boone, & Emonds, 2013; Dunfield & Kuhlmeier, 2010; Emonds, Declerck, Boone, Vandervliet, & Parizel, 2012; Fehr & Rockenbach, 2003). To sum up, cooperation involves mutual coordination and trust, individuals come together to achieve a common goal; by contrast, prosocial behaviours are performed out of coordination and a common goal.

IV.3. Prosocial Behaviour Development in Adolescence

Early instances of prosocial behaviours, such as helping, sharing, or comforting, can already be found in the second year of life (Brownell, Svetlova, & Nichols, 2009; Dunfield & Kuhlmeier, 2010; Paulus & Moore, 2012; Svetlova et al., 2010; Warneken & Tomasello, 2006). For example, children as young as 13 to 15 months are able to respond to emotional distress by making attempts to provide comfort, other behavioural responses such as physical, verbal comfort, sharing are displayed by the time they are 18-24 months and these behaviours are observed in interactions with familiars and strangers, children and adults (Chaplin et al., 2005; Roth-Hanania et al., 2011). Moreover, besides responses to emotional distress, children also display sharing behaviours (showing and giving objects to others), instrumental helping, and cooperative behaviours (e.g., Dunfield & Kuhlmeier, 2013; Gross, Stern, Brett, & Cassidy, 2017; Warneken & Tomasello, 2006).

There are different views and empirical evidence concerning the developmental course of prosocial behaviours. Studies interested in the biological and social antecedents and correlates have provided insights into the hormonal and neuronal bases (Decety, 2011) and socio-cultural factors that affect prosocial behaviours (Paulus & Moore, 2012). Developmental changes such as cognitive (e.g. theory of mind, perspective taking, self-other differentiation, moral development) and self-regulatory domains (e.g. emotion regulation, delay of gratification) in conjunction to socialisation practices underlie prosocial behaviour development (for a review see, Eisenberg, Fabes, et al., 2006). Moreover, related to this is the ability to regulate one's own emotions, and it has been shown that ongoing brain development renders adolescents less able to successfully regulate their emotions (Ahmed, Bittencourt-Hewitt, & Sebastian, 2015), which may temporarily diminish adolescents' ability to direct their attention to others' emotional needs and therefore decrease prosocial tendencies (Okun, Shepard, & Eisenberg, 2000; Padilla-Walker & Christensen, 2011). However, there is also the idea that rather than increasing in frequency over time, prosocial behaviours become regulated and nuanced, there is heterogeneity in developmental patterns that could be attributable not only to individual differences but also to methodological factors (e.g. Nantel-Vivier et al., 2009; Warneken & Tomasello, 2009).

An increasing body of literature points out adolescence as a critical period of development and change. Research has shown that the transition from childhood to adolescence engenders physical, cognitive, socio-emotional and contextual changes (Steinberg & Morris, 2001) along with peer relations that become more salient (Brown & Larson, 2009; Donlan, Lynch, & Lerner, 2015).

First, studies suggest that there is a connection between brain maturation and changes in the brain structure and adolescents' behavioural and emotional development (Paus, 2005; Steinberg, 2005) that may allow adolescents to engage in a wider variety of prosocial behaviours (Carlo, McGinley, et al., 2012). Neuro-imaging studies have shown that changes in social cognition during adolescence are paralleled by changes in the social brain network (Blakemore & Mills, 2014; Crone & Dahl, 2012).

Second, prosocial behaviours are expected to increase as a result of advances in perspective taking (Galinsky & Moskowitz, 2000; Van der Graaff et al., 2014); information processing and expertise (Ahmed et al., 2015; Keating, 2004) and that may facilitate higher-stage moral reasoning and social understanding (Carlo, Mestre, et al., 2010a; Crone & Dahl,

2012; Eisenberg, Hofer, Sulik, & Liew, 2014; Kumru, Carlo, Mestre, & Samper, 2012; Luengo Kanacri et al., 2017).

Third, the frequency of time spent with peers coupled to an increase in social competence due to important changes in the processing of social and emotional information (Brown & Larson, 2009; Burnett, et al., 2009; Casey, Duhoux, & Cohen, 2010) may foster adolescents' other-oriented behaviours (Eisenberg et al., 1989; Fabes et al., 2009; Wentzel, 2014). However, some studies suggest that patterns of social cognitive development vary as a function of the content under consideration and the emotional and social context in which the reasoning occurs (Archer, 1991; Eisenberg, Spinrad, et al., 2014; Main, Zhou, Liew, & Lee, 2017; Steinberg, 2005).

Furthermore, extracurricular activity participation has been linked to higher prosocial behaviours. For example, a nationally representative and longitudinally U.S. study found that after controlling for individual, parent, peer, and school level variables, consistent extracurricular activity participation in at least one activity each year from 8th through 12th grades was related to prosocial behaviours (Zaff, Moore, Papillo, & Williams, 2003). Although participation in sport is beneficial, it seems that sport participation in conjunction with other activities has even better influence on adolescent prosocial behaviours. Sampling a variety of different extracurricular activities provides opportunities as adolescents have the chance to learn a variety of activities skills and are able to meet and interact with more models of positive behaviours among their teammates, coaches and advisors (Eccles et al., 2003; Feldman & Matjasko, 2005; Linver et al., 2009; Marsh & Kleitman, 2002). However, it seems that the level of adolescents' prosocial behaviours differs according to, on the one hand, the type of extracurricular activity (e.g. higher levels of prosocial behaviours are observed in adolescents who attended artistic groups compared to those who attended a sport activity), and on the other hand, the expression of it, taking into account the specific types of prosocial behaviours (e.g. public, anonymous, emotional). Studies found that provision of public assistance/ help was most common for adolescents in artistic groups rather than those who attended sport groups (Carlo & Randall, 2002; Hansen et al., 2010; Strachan et al., 2009).

In sum, it appears that the development of prosocial behaviours over this age period does not appear to reflect a single unfolding skill; rather it appears to reflect a complex confluence of developmental changes that are primordial to take into account (Parker et al., 2015).

IV.3.1. Age and Gender in the Development of Prosocial Behaviours

Often cited in support of an increase in prosocial behaviours frequencies with age is a meta-analysis conducted by Eisenberg and Fabes (1998). This increase is observed on some types of prosocial behaviours, for instance, adolescents engaged in more prosocial behaviours than children but only for measures of sharing or donating, not in instrumental help or comforting. However, it is important to mention that the vast majority of studies included in this meta-analysis relied on cross-sectional designs comparing children from different age cohorts. Therefore, differences are observed depending on the study design used, for instance, prosocial behaviours increase with age in experimental and structured studies but not in naturalistic or correlational designs (Flynn, Ehrenreich, Beron, & Underwood, 2015). However, some studies have suggested that these differences are due to the informant or social desirability (Kumru et al., 2012).

Results from longitudinal studies using self-report are mixed. Some studies found a decline from 12-13 years old and followed by a slight increase at 17-18 years old. Specifically, in a 5-year longitudinal study of rural adolescents in the US, researchers found that the frequency of self-reported prosocial behaviours decreased throughout junior high school to 11th grade and increased marginally in 12th grade (Carlo, Crockett, Randall, & Roesch, 2007). These results have been supported by similar results in recent studies (Carlo, Padilla-Walker, & Nielson, 2015; Flynn et al., 2015; Luengo Kanacri, Pastorelli, Eisenberg, Zuffianò, & Caprara, 2013; Zuffianò et al., 2014). Other studies found stable levels of prosocial behaviours until age 14 (Caprara, Luengo Kanacri, Zuffianò, Gerbino, & Pastorelli, 2015; Van der Graaff et al., 2017), followed by an increase until age 17 and a slight decrease thereafter. In contrast, other ones found age related increases in prosocial behaviours from 13 to 16 years old, but they specifically assessed self-report prosocial behaviours towards strangers (Carlo et al., 2015; Eisenberg et al., 2015). Then, the differences in the results could be related to the target. They could also be related to the informant since the associations between ratings by different informants are characterised as low to moderate (Nantel-Vivier et al., 2009; Nantel-Vivier, Pihl, Côté, & Tremblay, 2014). For instance, other longitudinal studies using mother-report and teacher-report in Canadian and Italian samples have shown that the majority of trajectory groups were characterised by stable levels between the ages of 10 and 15, only one trajectory, including 7% of children was characterised by increasing levels of prosociality over time, this specific trajectory was teacher-report.

It is important to mention that age-related changes in prosocial behaviours have been explained by the age-related changes in socio-moral cognitions such as perspective taking, moral reasoning (e.g. Eisenberg, et al., 2009), environmental factors such as parenting and peer-group affiliations (e.g.,Carlo et al., 2014; Carlo et al., 2015), biological factors including genetics, and highlight the importance to develop more comprehensive models of the genetic contribution to individual differences in the propensity to engage in such behaviours. Genetic studies suggest that there is empirical evidence that has shown that variation in oxytocin receptor (OXTR) plays a role in individual differences in prosocial tendencies and prosocial behaviours and that this relationship is moderated by gender (Christ, Carlo, & Stoltenberg, 2016; Poulin & Holman, 2013; Shang, Wu, & Su, 2017; Tost et al., 2010).

Regarding gender differences, the results are also inconclusive. In a large meta-analysis which found a modest gender difference favouring girls, the authors found that the differences were dependent on how prosocial behaviours were operationalized; they were greater for studies using self-report, other-reports, and indices reflecting kindness/consideration than studies using observational methods or indices reflecting instrumental help, comforting or sharing (Eisenberg & Fabes, 1998). Self-report studies have shown that girls scored higher than boys (Alessandri, Caprara, Eisenberg, & Steca, 2009; Barr & Higgins-D'Alessandro, 2007; Calvo, González, & Martorell, 2001; Caprara, Alessandri, & Eisenberg, 2012; Eagly, 2009; Eisenberg, et al., 2005; Eisenberg, Fabes, et al., 2006; Mestre, Carlo, Samper, Tur-Porcar, & Mestre, 2015; Pakaslahti, Karjalainen, & Keltikangas-Järvinen, 2002). Some studies have shown an overall decrease of prosocial behaviours among males (Carlo et al., 2007; Carlo, Fabes, Laible, & Kupanoff, 1999; Luengo Kanacri et al., 2013), while other studies suggest no significant gender differences, specifically, there was a cubic pattern of age related changes in prosocial behaviours for boys and girls (Carlo et al., 2015). Using experimental design in a large variety of experimental economics games (e.g. the Dictator Game, the Ultimatum Game, Public Good Game), recent studies have shown that females appear more prosocial as a result of the details of the experimental design used in these economic games, especially, females are more affected by social and emotional aspects, the social framing, whereas males are more affected by reflection-related manipulations (Espinosa & Kovářik, 2015).

Besides self-report and experimental design, some researchers used functional magnetic resonance imagining in an attempt to study the neural mechanisms of social interactions and the microfoundations of prosocial behaviours (Declerck et al., 2013; Fehr & Camerer, 2007;

Kuss et al., 2015; Lukinova & Myagkov, 2016). The gender differences found suggested that they might be associated with females' higher cross-module and inter-hemispherical connectivity that facilitates the integration of modular functions. It seems that prosocial behaviours might be motivated by encouraging automatic processing of socioemotional content by psychological processes supported by the left inferior frontal gyrus (Flournoy et al., 2016).

The literature suggests that from early childhood to adolescence and emerging adulthood (Caprara et al., 2012; Carlo et al., 2015), females are more prosocial than males. These differences have been explained in light of different approaches such as gender socialisation theory which posits that females are more relationally orientated than boys (Eagly, 2009; Rose & Rudolph, 2006) because they are socialized and encouraged showing concern for others, caring and nurturance contrary to males that inhibit them (Brody, 1999; Chaplin, 2015). Similarly, gender intensification theory (Hill & Lynch, 1983) suggested that the physical changes of puberty prompt socialisation agents to increase pressure for sex-typed behaviours (Priess, Lindberg, & Hyde, 2009). The newest approaches of prosocial behaviours acknowledge the situation, i.e. public, anonymous and the specific targets, such as family, friends, strangers (Miklikowska, 2017a; Padilla-Walker & Carlo, 2014; Padilla-Walker & Christensen, 2011; Padilla-Walker, Dyer, Yorgason, Fraser, & Coyne, 2015; Pakaslahti et al., 2002; Penner, Dovidio, Piliavin, & Schroeder, 2005). Also in neuroscience, using functional magnetic resonance imaging (fMRI) technology in combination with socialisation and well-known economic games (Lukinova & Myagkov, 2016), results suggest that depending of age and gender; different brain regions are implicated and activated (Flournoy et al., 2016).

IV.3.2. The Role of Living Environments and Prosocial Behaviours Development

To capture the complexity of prosocial behaviours development, it is important to consider the different contexts adolescents are involved in as well as the different socializers they interact with (family members, friends, peers, and strangers).

Most studies have focused on the family context, and have shown that parental warmth promotes prosocial behaviours: a child whose parents employ warmth displays more prosocial behaviours because it gives the child feelings of security, control and trust in the environment and thus the child is able to respond to others' feelings (Domitrovich & Bierman, 2001; Eisenberg, Spinrad, & Knafo-Noam, 2015; Hastings et al., 2007). However, parental warmth

may show less direct influence on children's behaviours over time (Lee, Padilla-Walker, & Memmott-Elison, 2016; Padilla-Walker, et al., 2015) and may be indicative of increasing indirect effects of parenting, but also attributable to the relative stability of adolescent prosocial behaviours since adolescent prosocial behaviours in the context of warm parenting is relatively stable (Padilla-Walker, Nielson, & Day, 2016; Padilla-Walker, Carlo, Christensen, & Yorgason, 2012). Specifically, mother warmth was directly and longitudinally associated with adolescents' prosocial behaviours toward families and mothers, while father warmth was associated with prosocial behaviours toward friends and fathers (Padilla-Walker et al., 2016). Similarly, analyses of bidirectional effects showed supportive evidence that early prosocial behaviours promote later parenting and prosocial development, especially, prosocial behaviours in earlier adolescence predicted maternal warmth (Carlo, Mestre, et al., 2010b).

Moreover, autonomy support was modestly related to engagement in prosocial behaviours, this relation was fully mediated by the satisfaction of the psychological need for autonomy (Gagné, 2003). Additionally, parental control might mitigate other-oriented prosocial traits; the conceptual link between parental control and prosocial behaviours is complex and depend upon the rigidity of control, harshness, and strict parenting practices (Carlo, Mestre, et al., 2010b; Hoffman, 2000).

Among the environments adolescents are involved in, beyond the socialisation in the family and the school context, adolescents spend a large amount of their free time in leisure activities. Peer interactions may provide a context that is conducive to the development of prosocial behaviours motivated by other-oriented concerns rather than compliance, particularly for prosocial actions directed toward individuals outside the family (e.g. Fu, Padilla-Walker, & Brown, 2017; Padilla-Walker, Dyer, et al., 2015). However, the literature review highlighted the scarcity of studies considering the role of peers. For instance, peer rejection has been linked to a lack of skills to be prosocial both at the cognitive level and at the behavioural level (Pakaslahti et al., 2002).

IV.4. Prosocial Behaviours and Positive Outcomes

Prosocial behaviours are related to a range of positive personal, relational and behavioural outcomes. Although the studies overviewed in this dissertation (cross-sectional, longitudinal design) are not nearly exhaustive, they offer an overview of recent findings concerning these positive outcomes.

A range of personal outcomes has been positively related to prosocial behaviours such as agreeableness, academic achievement (Caprara et al., 2012; Gerbino et al., 2017; Laible, McGinley, Carlo, Augustine, & Murphy, 2014; Mesurado et al., 2014; Richaud, 2013), well-being and social competence (Caprara & Steca, 2005, 2007; Carlo, Crockett, Wolff, & Beal, 2012; Kumru et al., 2012; Layous, Nelson, Oberle, Schonert-Reichl, & Lyubomirsky, 2013), high self-esteem, self-efficacy, self-concept clarity and other indices of self and identity stability (Fu et al., 2017; Kisling & Jason, 2009; Laible et al., 2004; Padilla-Walker, Barry, Carroll, Madsen, & Nelson, 2007; Weinstein & Ryan, 2010; Zuffianò et al., 2014).

Prosocial behaviours benefit relationships not only at the personal level but also at the relational one. Studies have shown that adolescents who engage in prosocial behaviours are more likely to have positive peer relationships, are more attractive to peers, have high friendship quality. They are capable of managing social challenges, are more socially competent and have a high sense of community and are engaged in more continued positive peer interactions (Eisenberg, Fabes, et al., 2006; Hardjono, Munawir, & Hardjono, 2017; LaFontana & Cillessen, 2002; Laible et al., 2014; Shin, 2017; Wentzel, 2014). However, these results could be related to a cyclical process that may occur when socially competent children elicit more positive peer reactions for prosocial behaviours, which in turn increases their prosocial behaviours. Thus, when preschool children had been more exposed to prosocial peers at the beginning of the school year, their degree of positive peer interactions was greater at the end of the school year (e.g. Fabes, Hanish, Martin, Moss, & Reesing, 2012; Padilla-Walker & Carlo, 2014). It is possible that prosocial skills are necessary for appropriate peer functioning (Andrade, Browne, & Tannock, 2014)

Furthermore, prosocial behaviours have been linked to a range of behavioural outcomes. For instance, several studies have identified prosocial behaviours as a protective factor against various psychosocial behaviours: externalising problems such as aggression and delinquency (Card, Stucky, Sawalani, & Little, 2008; Carlo, Mestre, et al., 2012; Carlo et al., 2014; Carlo, Mestre, et al., 2010a; Kokko, Tremblay, Lacourse, Nagin, & Vitaro, 2006; Llorca-Mestre, Malonda-Vidal, & Samper-García, 2017; McDonald, Wang, Menzer, Rubin, & Booth-LaForceb, 2011); internalizing problems, among them, depressive symptoms, anxiety and suicidal ideation (Cáceda et al., 2014; Flynn et al., 2015a; Guéguen & De Gail, 2003; Haroz, et al., 2013; Nantel-Vivier et al., 2014; Padilla-Walker, Carlo, & Nielson, 2015; Qin et al., 2016; Wentzel, Filisetti, & Looney, 2007), substance use (Carlo, Crockett, Wilkinson, & Beal, 2010); and relational problems, such as discrimination, loneliness, association with

deviant peers and relational victimization (Davis et al., 2016; Griese & Buhs, 2014; Lam, 2013; Storch, Nock, Masia-Warner, & Barlas, 2003).

In short, there is considerable research that has shown that prosocial behaviours are related to a range of positive outcomes at the personal and relational levels such as well-being, academic achievement and high friendship quality and it also functions as a buffer against detrimental outcomes such as delinquency, internal and external symptoms, loneliness and depression.

Taken together, we started this chapter by asking a few questions, “Why some people act prosocially and others do not? What motivates them?” Through our brief literature review, it seems that answering these questions is not quite as simple as we believed. Prosocial behaviours thereby encompass several areas, including biological, motivational, cognitive, situational and social processes (Penner et al., 2005). Although girls appear to be more prosocial than boys, the question is far from resolved; it is also unclear whether the gender differences change with age. Moreover, prosocial behaviours have been associated with a number of positive outcomes across adolescence and it appears as a protective factor against risk behaviours.

However, this literature review highlights the need to account for new approaches of prosocial behaviours at different and complementary levels such as methodological, conceptual, to understand it better. From a methodological point of view, most of the studies reviewed are correlational. To be able to better examine not only issues of causality, possible mediators and moderators of prosocial behaviours but also directionality of the effects, more longitudinal designs are clearly needed. Moreover, from a conceptual point of view, when discussing the origins and consequence of prosocial behaviours, it is important to take into account the multifaceted nature of it and acknowledge the diversity of prosocial responses (Eisenberg & Spinrad, 2014).

Additionally, and inherent to the question of the origins of prosocial behaviours, a bulk of theoretical literature and empirical studies suggest that prosocial behaviours are motivated by empathy (e.g. Eisenberg & Miller, 1987; Knafo & Israel, 2012; Litvack-Miller et al., 1997; Lockwood, Seara-Cardoso, & Viding, 2014). There has been considerable debate among

social and developmental psychologists as to whether empathy is a mediator of prosocial behaviours. Thus, in recent years, researchers emphasize that is essential to differentiate empathy related emotional reactions like sympathy and personal distress because these are related differently to prosocial behaviours. Empathy and sympathy have been positively related to prosocial behaviours whereas personal distress has been negatively related (Eisenberg, Eggum, & Di Giunta, 2010). Another related question implying methodological issues is about the directionality. Is experiencing empathy leading to prosocial behaviours, or are prosocial experiences leading to more empathy? (e.g. Barr & Higgins-D'Alessandro, 2007; Batson, 2011; Chakroff & Young, 2014; Davis, 2015; Eisenberg & Spinrad, 2014; Hastings & Miller, 2014; Hastings, Zahn-Waxler, & McShane, 2006; Hoffman, 2001, 2008; Masten, Eisenberger, Pfeifer, Colich, & Dapretto, 2013; Pavey, Greitemeyer, & Sparks, 2012).

Concerning the conceptual connection between empathy and prosocial behaviours, empirical research and extensive literature place the processes of empathy in a central position with regard to their contribution to social cognition, especially concerning the relationships between actions, emotions, sensations and their perception (Decety, 2010). For instance, research has shown a correlation between empathy and prosocial behaviours (Eisenberg, 2002; Eisenberg & Eggum, 2008; Engelen & Röttger-Rössler, 2012; Hoffman, 2008). In particular, prosocial behaviours illustrate the development of empathy (Barr & Higgins-D'Alessandro, 2007; Eisenberg et al., 2006) and the way how the experience of empathy is thought to be related to the development of moral behaviours (Carlo, Mestre, Samper, Tur, & Armenta, 2010a).

Research on empathy and prosocial behaviours in early adolescence is critical because adolescence has been conceived as a transitional period that it is characterised not only by a number of physical and physiological changes, but also by individual, social and contextual transitions (Rosenblum & Lewis, 2003; Zarrett & Eccles, 2006) combined with the development of higher order emotional and cognitive reasoning abilities (Rosenblum & Lewis, 2003). Although an important basis is established in childhood, several cognitive, relational and physical changes that take place during adolescence might affect the capacity or tendency to show empathy (Hoffman, 2001; Van der Graaff et al., 2016). In addition, adolescents also gain increased opportunities to participate in prosocial behaviours due to change in social contexts and interpersonal relationships (Allemand, Steiger, & Fend, 2015).

The literature review highlighted the scarcity of studies taking into account the role of living environments and the development of prosocial behaviours during adolescence, specifically, the role of peers.

CHAPTER V

Research Aims and Hypotheses

Chapter V. Research aims and Hypothesis.

The psychosocial challenges of adolescence arise in rapidly diversifying personal and social contexts and there is a widespread agreement in social psychology that group membership shapes people's social behaviours in a large variety of contexts (Barford, Pope, Harlow, & Hudson, 2014; Bruner, Eys, Wilson, & Côté, 2014; Flynn, Ehrenreich, Beron, & Underwood, 2015; Sturmer, Snyder, & Omoto, 2005). The ecological perspectives view individuals and relationships as features of larger contexts in which the elements are multilayered and interconnected (Bronfenbrenner, 2005; Collins & Steinberg, 2006), and this provides the perfect conceptual framework for investigating complex interactions between individuals and environments. This is particularly relevant during the adolescence period, where a broader approach to understand adolescent functioning considering the dynamic interplay with proximal (e.g. interpersonal) and distal (e.g. institutional, societal and cultural) environments should be considered. Indeed, these different environments provide opportunities, resources and obstacles that are relevant to adolescents' development in a complex world that may have assets, which coupled with adolescents' strengths and inherent plasticity in the developmental system, may enable and promote positive outcomes (Bronfenbrenner & Morris, 2006; Hatcher, 2016; Hazel, 2016; Lerner et al., 2015).

We were interested in empathy and prosocial behaviour development that have been related to a range of adolescents' positive outcomes including well-being, self-esteem, self-confidence, academic achievement, social connectedness, civil engagement, emotion regulation and moral development. (Decety, Bartal, Uzefovsky, & Knafo-Noam, 2016; Fu, Padilla-Walker, & Brown, 2017; Manczak, DeLongis, & Chen, 2016; Morelli, Ong, Makati, Jackson, & Zaki, 2017; Scales & Benson, 2005). Moreover, research has shown that empathy and prosocial behaviours are protective factors against, for example, depression, suicidal ideation, aggression, delinquency, prejudice and victimization (Cáceda et al., 2014; Fung, Gerstein, Chan, & Engebretson, 2015; Miklikowska, 2017; Nantel-Vivier, Pihl, Côté, & Tremblay, 2014; Laura M. Padilla-Walker, Carlo, & Nielson, 2015; Shin, 2017).

However, the links between living environments, empathy and prosocial behaviours have been neglected, particularly in the study of adolescents and their relationships beyond the family and school contexts. Even though the family context typically provides the primary source of socialisation and support for the individual (e.g. Parker, Ludtke, Trautwein, & Roberts, 2012; Soenens et al., 2017), a growing body of research supports the idea that peers

environments (e.g. same classroom) constitute important and highly salient contexts that have a considerable influence on adolescent development (e.g. Donlan, Lynch, & Lerner, 2015; Olsson et al., 2016; Parker et al., 2015). Thus, apart the family and the school context, adolescents spend a large amount of time in activities, and among the different activities adolescents are involved in, we focused on organised activities, particularly, extracurricular activity participation, that have been conceptualised as an important developmental context of adolescents' lives (Agans et al., 2014; Martinez et al., 2016). Extracurricular activity participation has been related to a range of positive outcomes such as, sense of morality and diversity, higher educational expectations, higher friendship quality, positive peer interactions, development of adult networks and social capital (Holt & Neely, 2011; Weiss, Bolter, & Kipp, 2016; Zarrett & Eccles, 2006). Furthermore, it has been associated as a protective factor against outcomes including emotional anxiety, internalising and externalising problems, sexual activity and criminal arrest (Abraczinskas, Kilmer, Haber, Cook, & Zarrett, 2016; Gerstenblith et al., 2005; Guèvremont, Findlay, & Kohen, 2014). The remaining question concern what aspects of these living environments should we consider to better understand adolescents' empathy and prosocial behaviour development.

Research aims

The aim of our dissertation attempts to bridge several gaps in the current literature concerning the role of living environments on adolescents' empathy development and prosocial behaviours.

The first aim of this dissertation was to provide more insight into the role of living environments in empathy and prosocial behaviours in adolescence. This was achieved by developing and examining an integrative model of the relations between positive and negative living environment features, adolescents' perceptions of prosocial behaviours across three contexts (family, class and extracurricular peer group) and their own prosocial behaviours, considering the potential mediating role of empathy.

The second aim of this dissertation was to provide more insight into the bidirectional longitudinal relations between empathy and prosocial behaviours during adolescence, with a special focus on the within-person processes. For this purpose, using a longitudinal design, we examined the unique effects and direction of the effects between empathy and prosocial behaviours.

Finally, the third aim of this dissertation was to provide more insight into adolescents' prosocial behaviours and empathy developmental trajectories considering extracurricular activity participation. This was achieved using a longitudinal design and examining prosocial behaviours and empathy latent class trajectories over time during adolescence across two groups (i.e. extracurricular group participation and non-extracurricular group participation) and with a special focus in two dimensions of extracurricular activity participation (i.e. breadth of participation and intensity). These three research questions and subsequent hypotheses were built on the theoretical and empirical literature review that is further developed and reported on the following three articles.

Research hypothesis

Aim 1: Develop and examine an integrative model of adolescents' prosocial behaviours

The first objective was to develop and examine an integrative model of the relation between living environment features (group as social context positive and negative) and adolescents' perception of group prosocial behaviours across three contexts (family, class and extracurricular peer group), and adolescents' own prosocial behaviour perception, considering the mediating role of empathy. This goal includes (1) testing the contribution of each living environment adolescents are involved in, considering the features of the context and adolescents' perception of group prosocial behaviours, to prosocial behaviours through empathy (2) evaluating the integrative model according to the living environment and (3) testing the integrative model across gender and age.

Question 1.1: Does empathy mediate the links between living environment features, group prosocial behaviours and adolescents' prosocial behaviours?

Examining the integrative model is an important step in establishing the relationships between the different variables and adolescents' prosocial behaviours. We hypothesised that the positive features of living environments (warmth, structure and autonomy support) and adolescents' perceptions of prosocial behaviours within the living environments (i.e. group prosocial behaviours) were positively associated with adolescents' prosocial behaviours (e.g. Carlo, Mestre, Samper, Tur, & Armenta, 2010; Carlo, Mestre, Samper, Tur, & Armenta, 2011; Chien-Ti, Padilla-Walker, & Memmott-Elison, 2017; Padilla-Walker, Nielson, & Day, 2016). Conversely, the negative features of living environments (rejection, chaos, and

coercion) were expected to be negatively related to prosocial behaviours (e.g., Carlo et al., 2011; Michalik et al., 2007; Richaud, 2013; Yoo, Feng, & Day, 2013). Moreover, we hypothesised that empathy would mediate the relations between the features of living environments and group prosocial behaviours, and adolescents' prosocial behaviours (e.g. Carlo, McGinley, Hayes, & Martinez, 2012; Padilla-Walker & Christensen, 2011).

Question 1.2: Are there specificities with respect to the living environment adolescents are involved in?

We hypothesised that the different living environments would each contribute in a different manner to adolescents' prosocial behaviours. Among the peer environments, we expected that extracurricular activity would contribute more specifically and importantly than class group to adolescent prosocial behaviours (e.g. Blomfield & Barber, 2012; Bundick, 2011; Feldman & Matjasko, 2012; Martinez et al., 2016). In line with this, we hypothesised that for adolescents belonging to three different environments (i.e. family, class and extracurricular peer group), extracurricular activity group would predict adolescents' prosocial behaviours and would have a more important and specific effect compared to the class peer group. By contrast, for adolescents that do not participate in an extracurricular activity, we expected that family variables would be the main predictors of prosocial behaviours.

Question 1.3: Are there differences with respect to gender and age?

Given prior evidence of gender and age differences in empathy and prosocial behaviours across adolescence (e.g. Eisenberg et al., 2015; Van der Graaff, Carlo, Crocetti, Koot, & Branje, 2017), we explored whether the hypothesised integrative models differed for females and males and for early adolescence and late adolescence.

Aim 2: Examine the longitudinal bidirectional relations between empathy and prosocial behaviours during adolescence

This aim concerns the question of directionality of the effects between empathy and prosocial behaviours since little is known concerning which of the construct led to the other: is it experiencing empathy which leads to more prosocial behaviours or is it the other way around? This second aim includes exploring (1) the longitudinal bidirectional relations between empathy and prosocial behaviours during adolescence (2) gender and age differences

and (3) within-person processes related to the longitudinal bidirectional relation between empathy and prosocial behaviours.

Question 2.1: Is there a longitudinal bidirectional relation between empathy and prosocial behaviours during adolescence?

To disentangle the direction of effects between empathy and prosocial behaviours, we explored cross-lagged relations, thereby controlling for concurrent associations and stability of empathy and prosocial behaviours when estimating bidirectional effects over time. We expected that empathy would be associated longitudinally with subsequent prosocial behaviours, and that earlier prosocial behaviours would also promote future empathy.

Question 2.2: Does this longitudinal bidirectional relation between empathy and prosocial behaviours differ across gender and age?

Considering the somewhat mixed results related to gender and age trends in empathy and prosocial behaviour development, we examined whether gender and age would affect these relations. We expected that the bidirectional relations between empathy and prosocial behaviours would be stronger for females than males. Similarly, we expected that the bidirectional relationships between empathy and prosocial behaviours would be stronger for middle-to-late adolescents than for early-to-middle adolescence (e.g. Mestre, Samper, Frías, & Tur, 2009; Van der Graaff et al., 2017).

Question 2.3: Are these longitudinal bidirectional relations between empathy and prosocial behaviours different at the within-person level?

Most of the studies are based on between- person effects; this implies that mean-levels changes or aggregated within and between-person effects are used when explaining individual development. To disentangle the between and within-person processes, we sought to explore within-person development, examining whether adolescents' empathy would predict within-person changes in their prosocial behaviours and whether adolescents' prosocial behaviours would predict within-person changes in empathy.

Aim 3: Explore adolescents' empathy and prosocial behaviours latent class growth: Does participating in extracurricular activities make a difference?

The aim was to investigate heterogeneity in adolescents' patterns of prosocial behaviours and empathy development across time during adolescence considering group membership (i.e. extracurricular activity participation group and non-extracurricular activity

participation group). And to explore if latent class trajectories of two dimensions of extracurricular activity participation (breadth of participation and intensity) were related to class membership trajectory of prosocial behaviours and empathy. We investigated (1) how many different prosocial behaviours and empathy trajectory groups across time during adolescence would be identified taking into account extracurricular activity participation vs. non-participation; and (2) in the extracurricular activity group, whether breadth of participation and intensity would be predictors of prosocial behaviours and empathy trajectory groups.

Question 3.1: How many different prosocial behaviours and empathy trajectory groups across time during adolescence would be identified taking into account extracurricular activity participation vs. non-participation?

We assumed that different trajectories of prosocial behaviours and empathy could be identified across extracurricular activity group and non-extracurricular activity group. Although there are no previous studies concerning this link, based on theoretical literature about extracurricular activity, adolescent development and positive outcomes (e.g. Abraczinskas et al., 2016; Guèvremont et al., 2014; Hall, 2017; Park, 2011), we posit that adolescents who participate in an extracurricular activity, regardless of school educational level, would have higher levels of prosocial behaviours and empathy than the ones that do not participate in an extracurricular activity.

Question 3.2: In the extracurricular activity group, are breadth of participation and intensity of participation predictors of prosocial behaviours and empathy trajectory groups?

Considering the complex patterns of extracurricular participation practises beyond the participating and non-participating groups, we reasoned that breadth of participation and intensity (e.g. Bathgate & Schunn, 2016; Denault & Poulin, 2009; Gardner, Roth, & Brooks-Gunn, 2008; Sharp, Tucker, Baril, Van Gundy, & Rebellon, 2015) might be especially likely to predict the probability of belonging to high and / or increasing trajectory groups of prosocial behaviours and empathy.

CHAPTER VI

Method

Chapter VI. Method

This dissertation used data from a 3-Wave longitudinal study gathered during the three years of the PhD with data collected at one-year intervals, each was labelled W1, W2 and W3 (or T1, T2, T3) respectively.

VI.1. Participants

Adolescents were recruited from private and public junior and high schools in the northwest and southwest region of France. The data are a nationally representative sample of adolescents in secondary school: 84.39% were from public schools and 15.61% from private schools, 47.07% were from High School including 21.35% in vocational education. Adolescents reported on the highest education level obtained by either parent, these were as follows: 34% Master level, 26% Bachelor's level, 18% upper secondary general education, 14% upper secondary vocational education, 3% lower secondary education, and 5% primary education. At the first wave the sample consisted of 1640 French adolescents. The sample was divided into two groups based on educational grades. The first comprised 867 junior high school adolescents (grades 6–9, 51% of females, $M_{age} = 13.11$; $SD = 1.17$), referred as early adolescence. The second group included 773 high school adolescents (grades 10–12, 43% of females, $M_{age} = 16.22$; $SD = .93$) and is referred to as late adolescence. At the last wave, only 660 adolescents were still participating in the study. This high attrition was the result of two larger high schools (one with 27 classrooms with up to 25 students in each class, and the other with 11 classrooms with up to 20 students in each class). This high decline in participation resulted from the change in the administration of the two larger high schools. The new headmasters decided to abandon the project mainly due to the many organisational changes they had to face in their new post.

VI.2. Procedure

Private and public junior and high schools in the northwest and southwest region of France received written information about the study and were solicited to participate. Once they agreed to participate, parents received written information about the research prior to the study; the possibility of not participating was explained in this letter. Written consent was obtained from the schools each year. Adolescents were informed that participation was voluntary and their responses were anonymous and confidentiality was guaranteed explicitly,

they did not receive any compensation for their participation during the study. Annual assessments using the same protocol across waves were conducted after school hours. Research assistants gave verbal instructions to the adolescents to complement the written instructions printed above each questionnaire and ensured that the battery of paper questionnaires (See Appendices Questionnaires, p. 294) was completed individually and confidentially. Completing the questionnaires lasted for an hour.

VI.3. Measures

VI.3.1. Group as Social Context Questionnaires (Family, Class Peer Group, and Extracurricular Peer Group)

In order to assess adolescents' perceptions of the characteristics of their interactions across different contexts (family, class and extracurricular peer group), we adopted the short form of the Parent as Social Context Questionnaire (PASCQ; Skinner et al., 2005), a 20-item questionnaire designed to assess six main dimensions of parent context identified by the motivational theory: Warmth (affection, appreciation), Rejection (aversion, hostility), Structure (clear expectations, contingent), Chaos (inconsistent, unpredictable), Autonomy Support (freedom of expression and action) and Coercion (psychological control, restrictiveness). Adolescents answered on a 5-point Likert scale (from *not at all true* to *very true*). Regarding the family, the questionnaire was translated from English to French by three independent researchers according to the recommendations of the International Test Commission (Hambleton, 2001). Adolescents responded to 20 items depicting their perceptions of their interactions with their family members (as an aggregate). Here is an example of items by dimensions: warmth (5 items, e.g. "My family enjoy being with me"), rejection (3 items, e.g. "I cannot count on my family when I need them"), structure (2 items, "If I ever have a problem, my family helps me to figure out what to do about it"), chaos (4 items, "My family keep changing the rules on me"), autonomy support (2 items, "My family let me do the things I think are important") and coercion (4 items, "My family think there is only one right way to do things—their way"). For the other two living environments, we adapted the same questionnaire using the six dimensions. Regarding the class peer group as social context, we replaced the words "family members" by "classmates". Adolescents responded to 20 items depicting their perceptions of their interactions with their class peer group across the six dimensions, for example: "My classmates enjoy being with me", "My classmates let me do the things I think are important". Finally, regarding the extracurricular

peer group as social context, we replaced the word “classmates” by “extracurricular activity peers”. Adolescents who participated in an extracurricular activity responded to 20 items depicting their perceptions of their interactions with their extracurricular peer group across the six dimensions. For example: “If I ever have a problem, my extracurricular activity peers help me to figure out what to do about it”.

For all the adapted questionnaires, the analyses were conducted on data from Wave 1, mean and standard deviations across general population, gender and age (See Appendices Table 1, p. 283) were examined before three sets of analyses were performed (1) EFA to test the factor structure (2) CFA to test the six-factor solution obtained by the EFA, and (3) MGCFA Measurement Invariance across gender and age. In order to account for the ordered-categorical nature of the scale items, Weighted Least Square Means-Variance (WLSMV) and theta parameterisation (for multi-group models) were performed using Mplus Version 8 (Muthén & Muthén, 2017). We also tested the traditional model of bipolar dimensions and multiple (unipolar) dimensions.

For the three contexts, the EFA and subsequent analyses supported a six-factor model. We also tested a 3-bipolar solution but, the six unipolar dimensions provided a significantly better fit. Thus, models of multiple dimensions provided a significantly better fit than the bipolar models in all contexts (See Appendices Table 6, p. 288 and Table 7, p. 289). Moreover, measurement invariance (Full scalar invariance) across gender and age was excellent (See Appendices Table 8, p. 290).

VI.3.2. Prosocial Behaviour Scales (Self, Parents, Class Peer Group, and Extracurricular Peer Group)

In order to assess adolescents’ perceptions of their own prosocial behaviours, and those of parents, class and extracurricular peer group prosocial behaviours, we adapted and validated the prosociality scale, a 16-item questionnaire designed to assess four types of prosocial behaviours (sharing, helping, taking care of, and feeling empathic; 4 items per dimension) (Caprara, Steca, Zelli, & Capanna, 2005). Specifically, a validated French adaptation (Carrizales, Perchec, & Lannegrand-Willems, 2017) of the prosociality scale, which consists of 14 items and a 5-point Likert scale ranging from 1 (*Never/ almost never*) to 5 (*almost always/always*) and assesses two types of prosocial behaviours: helping (6 items, e.g. “I try to help others”) and caring (8 items, e.g. “I try to console people who are sad”) was

used (See Appendices Article, p. 304). Moreover, longitudinal full scalar measurement invariance was excellent (See Appendices Table 11, p. 293).

For the three living environments (i.e. parents, class and extracurricular peer group), the same questionnaire using the two dimensions was adapted; however, to avoid possible overlap among items for the caring dimension and the empathy scale, only four items for the caring dimension were used. Regarding parents' prosocial behaviours, we replaced the word "I" by "My parents". Adolescents responded to the 10 items depicting their perceptions concerning their parents' prosocial behaviours across the two dimensions, for example: "My parents try to help others"; "My parents try to console people who are sad". Concerning the class peer group, we replaced the word "I" by the word "classmates". Adolescents answered the items depicting their perceptions regarding their classmates' prosocial behaviours across the two dimensions. For example: "My classmates try to help others." Finally, for the extracurricular group, we replaced the word "classmates" by 'extracurricular activity peers'. Adolescents who participated in extracurricular activities responded to the items regarding their perceptions of their extracurricular activity peer group's prosocial behaviours across the two dimensions. The data from Wave 1 was used and descriptive statistics (See Appendices Table 2, p. 284) were examined before using the same procedure described for the Group as Social Context questionnaire. Thus, confirmatory factor analyses support the two-factor model across the three contexts (See Appendices Table 3, p. 285). Moreover, model fit of multigroup analyses across age and gender were good (See Appendices Table 4, p. 286). And full scalar invariance across age and gender was found (See Appendices Table 5, p. 287).

VI.3.3. The Basic Empathy Scale (BES)

In order to assess adolescents' perception of their own empathy, the BES was used, which is a 20-item questionnaire rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) developed by Jolliffe and Farrington (2006) and adapted in French by Carré, Stefaniak, D'Ambrosio, Bensalah, and Besche-Richard (2013). It includes three dimensions: emotional contagion (6 items, e.g. "I get caught up in other people's feelings easily"), cognitive empathy (8 items, e.g. "I can understand my friend's happiness when she/he does well at something") and emotional disconnection (6 items, "I am not usually aware of my friend's feelings"). In order to assess the psychometric validity of the three-factor structure on our sample, for this first analyses data from the first wave was used, after examination of descriptive statistics (See Appendices Table 2, p. 284), a CFA was performed. The three-factor structure was supported but three items were deleted (item 15

from emotional contagion with factor loading lower than .30, and items 6 and 20 from cognitive empathy that cross loaded on more than one dimension). This three-factor model and multigroup analyses across age and gender had a good fit (See Appendices Table 9, p. 291). In addition, partial scalar measurement invariance across gender and age was good (See Appendices Table 10, p. 292) and longitudinal full scalar measurement invariance was excellent (See Appendices Table 11, p. 293).

VI.3.4. Activity participation assessment

Extracurricular Activity Participation

To capture adolescents' participation in extracurricular activity, they had to answer "yes" or "no" to the following question: "*Do you participate in an extracurricular activity?*" If their answer was positive, they responded to a variety of questions, including the number of extracurricular activities, type of activity and frequency of participation per week and, for those who had more than one extracurricular activity, which one was the most important to them (See Appendices Questionnaires, p. 294). With this information, two groups were created. The extracurricular activity participation group with 292 adolescents and the group of non-extracurricular activity participation made up of 269 adolescents.

Dimensions of Participation in Extracurricular Activities.

Breadth of Participation (BoP). First, the extracurricular activities identified from grades 6 to 12 were classified into four categories: (1) team sports (2) individual sports (3) team performance and fine arts and (4) individual performance and fine arts. This classification was based on previous research (e.g. Barber, Abbott, Blomfield, & Eccles, 2009; Barber, Eccles, & Stone, 2001; Eccles & Barber, 2001; Fredricks & Eccles, 2006; Larson, Hansen, & Moneta, 2006). Second, the number of different extracurricular activities across the two age groups was calculated each year. Breadth of participation represented the number of different extracurricular activities adolescents participated in and could vary from 1 to 3. For example, if an adolescent reported participating in a soccer team, group dance and a swimming activity, the adolescent was given a score of three, i.e. one for being in a team sport, one for being in a performing and fine arts activity and one for being in an individual sport (Denault & Poulin, 2009). Two hundred and ninety-two adolescents reported on their different types of extracurricular activity participation, but it is worthy of mention that although the responses ranged from 1 to 3, there were only few adolescents in our sample that had three different

types of extracurricular activities; across the waves, the means were as follows: W1 (M = 1.23, SD = 0.19), W2 (M = 1.21, SD = 0.18) and W3 (M = 1.34, SD = 0.27).

Intensity of Participation (IoP). To calculate participation intensity, the number of hours of participation per week was multiplied by the number of weeks of participation for each activity within the school year (10 months, thus 40 weeks). The sum of the number of hours of all activities across the school year was calculated. To lower the dependency with breadth of participation, the total number of hours per year was divided by the number of activities the adolescents were involved in during that year and divided by ten in order to facilitate model estimation. For example, if an adolescent reported playing soccer for 3h, group dance for 2 h and swimming for 1 h per week, this was calculated as 120 h, 80 h and 40 h, respectively, thus 240 h of extracurricular activity participation over the school year divided by the number of activities (3), i.e. 80 h and then divided by ten (Denault & Poulin, 2009). Two hundred and ninety adolescents reported on the intensity of participation and the intensity of participation per month in our sample ranged from 4 to 24 hours, with stable means across waves: W1 (M = 8.03, SD = 4.20), W2 (M = 8.38, SD = 4.13) and W3 (M = 8.20, SD = 4.19).

In the next three chapters, the results are reported in article format. Table 3 below presents an overview of the three articles: the research questions, sample, design, measures and predictors, correlates and outcomes.

Table 3. Overview of research questions, sample, design, measures and predictors, correlates and outcomes.

Chapter	Research Question	Sample & Design	Measures	Predictors, correlates, & Outcomes
Ch. 7	The role of living environments in empathy and prosocial behaviours in adolescence: Do empathy mediate the link between living environment features and adolescents' prosocial behaviours?	Cross-sectional (First Wave) Ages 10.37 - 18 N = 1640 Divided into two groups based on educational grade Early-to-middle adolescence n= 867 (51% Females, $M_{age} = 13.11$) Middle-to-late adolescence n= 773 (43% Females, $M_{age} = 16.22$)	20-item Self-Report (CPGaSC) 20-item Self-Report (EPGaSC) 20-item Self-Report (FaSC) 10-item Self-Report (CPB) 10-item Self-Report (EPB) 10-item Self-Report (PPB) 17-item Self-Report (BES) 10-item Self-Report (PBS) 1 item Extracurricular activity participation	Group as social context positive and negative across class, extracurricular peer group and family Group prosocial behaviours across parents, class, extracurricular peer group Empathy Prosocial Behaviours Gender / Age
Ch. 8	Is there a bidirectional longitudinal relation between empathy and prosocial behaviours during adolescence?	Longitudinal 3 Waves Ages 10.37 – 18 N = 610 Divided into two groups based on educational grade Early-to-middle adolescence n= 383 (51% Females, $M_{age} = 12.14$) Middle-to-late adolescence n= 227 (43% Females, $M_{age} = 14.70$)	17-item Self Report (BES) 10-item Self Report (PBS)	Empathy Prosocial Behaviours Gender / Age
Ch. 9	Adolescents' empathy and prosocial behaviours Latent Class Growth: Does participating in extracurricular activities make a difference?	Longitudinal 3 Waves Ages 10.37 – 17.47 N = 610 for LGM and n = 561 for GMM Divided into two groups based on extracurricular activity participation Extracurricular group n= 292 (45% Females, $M_{age} = 13.82$) Non-extracurricular group n= 269 (67% Females, $M_{age} = 13.48$)	17-item Self Report (BES) 10-item Self Report (PBS) 1 item Extracurricular activity participation Breadth of Participation Intensity of Participation	Empathy Prosocial Behaviours Breadth of Participation Intensity Gender / Age

CHAPTER VII

The role of living environments in empathy and prosocial behaviours in adolescence

The role of living environments in empathy and prosocial behaviours in adolescence: does empathy mediate the links between living environment features and adolescents' prosocial behaviours?

Abstract

Understanding which factors influence prosocial behaviours has gained increased attention in recent years across a range of disciplines. The purpose of this study was to examine an integrative model using the same theoretical approach across different contexts (family, class and extracurricular peer group). Thus we tested: (a) the relation between living environment features, group prosocial behaviours and adolescents' prosocial behaviours through empathy; (b) a combination of different models across contexts from the most complex to the most specific; and (c) multigroup analyses across gender and age.

French adolescents (N=1640) completed questionnaires about living environment features, group prosocial behaviours, self-empathy and prosocial behaviours. Indirect effects suggest that extracurricular peer group and family as social context negative were negatively related to adolescents' prosocial behaviours. Moreover, parents, class and extracurricular peer group prosocial behaviours and class as social context positive were positively linked to adolescents' prosocial behaviours. These same patterns were found across gender and age, except for some specificities across age. Discussion focuses on the implications of these findings and suggestions for future research are presented.

Keywords: Prosocial behaviours - Empathy - Living environment features - Positive development - Structural Equation Model – Mediation.

1. Introduction

Prosocial behaviours, defined as actions intended to benefit others, have gained increased attention in recent years across a wide range of disciplines (Eisenberg, Spinrad, & Morris, 2014; Padilla-Walker & Carlo, 2014). A variety of prosocial behaviours have been identified, with most concerning either helping, sharing and comforting, and these have been associated with a number of positive personal outcomes (e.g. well-being, high self-esteem, academic achievement), relational outcomes (e.g. positive peer relationships, social competence) and behavioural outcomes (protective factors against delinquency, depression, for example) (e.g. Dunfield, 2014; Gerbino et al., 2017; Llorca-Mestre, Malonda-Vidal, & Samper, 2017; Luengo Kanacri et al., 2017; Paulus, 2017).

Recent studies highlight the need to investigate the influence of socialisation predictors of prosocial behaviours (Carlo, Streit, & Crockett, 2018; Davis, 2015), with an increasing body of literature pointing to adolescence as a critical period of development and change. Research has shown that the transition from childhood to adolescence engenders physical, cognitive, socio-emotional and contextual changes (Steinberg & Morris, 2001) along with peer relations that become more salient (Brown & Larson, 2009; Donlan, Lynch, & Lerner, 2015). There is theoretical and empirical support for the fact that frequency of time spent with peers coupled with an increase in social competence due to important changes in the processing of social and emotional information (Burnett, Bird, Moll, Frith, & Blakemore, 2009; Casey, Duhoux, & Cohen, 2010) may foster other-oriented behaviours in adolescents (Eisenberg, Spinrad, & Knafo-Noam, 2015; Fabes, Martin, & Hanish, 2009; Wentzel, 2014). However, some studies suggest that patterns of social cognitive development vary as a function of the content under consideration and the emotional and social context in which the reasoning occurs (Eisenberg, Spinrad, et al., 2014; Main, Zhou, Liew, & Lee, 2017; Steinberg, 2005). Furthermore, the bulk of theoretical literature and empirical studies suggest that, in addition to the influence of socialising agents such as parents and peers, prosocial behaviours are motivated by empathy, a fundamental social skill that underlies important capabilities and behaviours. It thus plays a pivotal role in moral development and prosocial behaviours (Hoffman, 2000) with regard to the contribution to social cognition, especially relationships between actions, emotions, sensations and their perceptions (e.g. Knafo & Israel, 2012; Knafo & Uzefovsky, 2013; Lockwood, Seara-Cardoso, & Viding, 2014; Sinclair et al., 2017; Stern & Cassidy, 2018).

Although the literature supports the claim that empathy is malleable across the entire lifespan, adolescence is an important developmental period that seems particularly relevant to the study of empathy and prosocial behaviour development for several reasons. Adolescence has traditionally been conceived as a transitional period, characterised by a number of physical, cognitive, physiological and emotional changes combined with individual, social, and contextual transitions (Allemand, Steiger, & Fend, 2015; Blakemore et al., 2010; Blakemore & Mills, 2014; Burnett, Thompson, Bird, & Blakemore, 2012; Peck, Roeser, Zarret, & Eccles, 2008). The psychological challenges of adolescence arise in rapidly diversifying personal and social contexts. Ecological perspectives view individuals and relationships as features of larger contexts in which the elements are multilayered and interconnected (Collins & Steinberg, 2006). There is widespread agreement in social psychology that group memberships shape people's social behaviours in a wide variety of contexts (e.g. Brown, 2009; Lerner, Lerner, Bowers & Geldhof, 2015; Sturmer, Synder, & Omoto, 2005). With this in mind, researchers have devoted considerable attention to the study of group memberships in a wide variety of contexts with respect to negative and aversive behaviours. However, little attention has been paid to the link between features of living environments and prosocial behaviour development beyond the family and school contexts. In order to capture the complexity of prosocial behaviour development, it is important to consider the different contexts adolescents are involved in as well as the different socializers they interact with (family members, friends, peers, and strangers).

Even though, adolescent development in interpersonal contexts has been extensively explained in the literature, most studies use different approaches across contexts. For example, in family studies, theories such as parenting styles (Baumrind, 1991; Darling, 2005) and attachment theory are among the most popular (Bowlby, 1969, 1977) and in the school context, the sense of belonging (Mahar, Cobigo, & Stuart, 2013; Mouratidis, & Sideridis 2009; Van Ryzin, Gravely, & Roseth, 2009) and sociometric status theories are the most cited (Gest, Graham-Berann, & Hartup, 2001; Jiang & Cillessen, 2005; Wentzel, 2003). However, little is known, for example, about the possibility of common features across these different proximal contexts: is it possible that among these contexts, there are similar features that could be captured by one approach?

This need can be addressed by exploring and using the same theory approach in three proximal contexts (family, school at the class level and leisure activity at the extracurricular activity level) and two interpersonal relationships (parents and peers). The leisure activity

context through extracurricular activity was chosen as a peer group context in addition to the school context. This choice was made, on the one hand, taking into account that these structured activities have common features with the school context, for instance, adult supervision, adherence to rules and schedules, and on the other hand, by the fact that, as suggested by some studies, they occupy more waking hours than school and work combined and are associated with a range of positive psychological development. For this purpose, we used part (context) of the Self-System Model of Motivational Development (SSMMD) developed by Skinner and colleagues (Skinner & Belmont, 1993; Skinner, Furrer, Marchand, & Kindermann, 2008) based on the work of Connell and Wellborn (1991) and the self-determination theory (Deci, Eghrari, Patrick, & Leone, 1994). The SSMMD comprises six core features of the social context (family, school), three positive ones (warmth, structure, and autonomy support) and three negative ones (rejection chaos, and coercion). These features of social contexts have been a frequent target of research on the family (parents) and school (teachers) contexts. However, they have been applied and used far less in peer relationship literature. Considering the sparse literature and the interesting and informative results of the few studies that have used part of the SSMMD approach to peer groups, this approach could be appropriately applied to other contexts, thus enabling researchers to explore and evaluate the influence of different contexts in adolescent development, taking into account the same features across contexts.

Socialisation experiences, such as the quality of relationships with parents, parental disciplinary behaviours and parental socialisation of emotion, have been related to empathy development (Eisenberg & Valiente, 2002; Knafo & Plomin, 2006; Strayer & Roberts, 2004; Taylor, Eisenberg, Spinrad, Eggum, & Sulik., 2013), specifically, positive features such as warmth and autonomy support (Guo & Feng, 2017; Kanat-Maymon & Assor, 2010; Lam, Solmeyer, & McHale, 2012; Miklikowska, Duriez, & Soenens, 2011). Conversely, negative features such as parental coercion have been negatively related to empathy (Eisenberg, et al., 2005; Yoo, Feng, & Day, 2013). Similarly, prosocial behaviours studies have shown that parental warmth and autonomy support promote prosocial behaviours (Bierman, et al., 2009; Eisenberg et al., 2015; Hastings et al., 2007). In contrast, rejection and parental control mitigate other-oriented prosocial traits (Carlo, Mestre, Samper, Tur, & Armenta, 2010; Hoffman, 2000).

Besides the family context, a growing body of research supports the idea that peers may be important socialisers of prosocial behaviours (Laible, Carlo, & Roesch, 2004;

Wentzel, 2014; Wentzel, Filisetti, & Looney, 2007). Researchers have argued that peer relationships can provide a unique setting where adolescents can explore their interest in others, experience social exchanges and social learning and an opportunity in which to develop empathy and prosocial behaviour competencies (Eisenberg & Fabes, 1998; Nichols, Svetlove, & Brownell, 2009; Roth-Hanania, Davidov, & Zahn-Waxler 2011). Peer relationships, unlike parent-child relationships, provide qualities such as unique equality, mutuality and reciprocity, which offer rich opportunities for the development of empathy and prosocial behaviours (Laible et al., 2004). Regarding the environments adolescents are involved in, apart from socialisation in the family and the school contexts, they spend a large amount of their free time in leisure activities. Peer interactions may provide a context that is conducive to the development of prosocial behaviours motivated by other-oriented concerns rather than compliance, particularly for prosocial actions directed toward individuals outside the family (Fu, Padilla-Walker, & Brown, 2017; Padilla-Walker, Dyer, Yorgason, Fraser, & Coyne, 2015). However, the literature review highlighted the scarcity of studies focusing on the role of peers, and taking into account peer group features such as warmth, rejection and coercion. Only peer rejection has been linked to a lack of ability to be prosocial both at the cognitive level and the behavioural level (Pakaslahti, Karjalainen, & Keltikangas-Jarvinen, 2002).

Although the bioecological systems theory recognises the primacy of certain developmental niches like family and school, it also emphasises multiple influences and developmental effects within and across the different spheres in which adolescents live. Most importantly, this theory emphasizes the central role of proximal processes—the reciprocal and ever-changing interactions between an individual’s unique and intrinsic developmental assets and the individual’s subjective experiences, across different environmental contexts and times (Bronfenbrenner & Morris, 2006). To further explore the role of proximal processes with regard to adolescent prosocial behaviour development, we included adolescents’ perceptions of group prosocial behaviours (parents, class, and extracurricular peer group) in order to capture the possible influence of adolescents’ perceptions of prosocial behaviours across the different contexts and their own prosocial behaviours.

2. The current study

The primary goal of the current study was to develop and examine an integrative model of the relations between the positive and negative features of living environments, adolescents’ perceptions of group prosocial behaviours across three contexts (family, class, and

extracurricular peer group) and their own prosocial behaviours, considering the potential mediating role of empathy.

The study was designed to examine the following hypothesis. (1) The positive features of living environments (warmth, structure and autonomy support) and adolescents' perceptions of prosocial behaviours within living environments (group prosocial behaviours) were expected to be positively associated with adolescents' prosocial behaviours. Conversely, we hypothesized that the negative features of living environments (rejection, chaos, and coercion) would be negatively related to prosocial behaviours. Moreover, we hypothesized that empathy would mediate the relation between the features of living environments and group prosocial behaviours, and adolescents' prosocial behaviours. (2) We hypothesized that different living environments would contribute differently to adolescents' prosocial behaviours. Among peer environments, we expected that extracurricular activity would contribute more specifically and importantly than class group. In line with this, we hypothesized that for adolescents belonging to three different environments (i.e. family, class and extracurricular peer group), the extracurricular activity group would predict their prosocial behaviours and would have a more important and specific effect compared to the class peer group. By contrast, for adolescents that do not participate in an extracurricular activity, we expected that family variables would be the main predictors of prosocial behaviours. And (3) given prior evidence of gender and age differences in empathy and prosocial behaviours across adolescence (e.g. Eisenberg et al., 2015a; Van der Graaff et al., 2017), we explored whether the hypothesized integrative models differed for females and males and for early adolescence and late adolescence.

3. Method

3.1. Sample and procedure

Participants were drawn from a longitudinal study. For our study we used the total data available at T1 (N = 1640). The sample was divided into two groups based on educational grades. The first comprised 867 junior high school adolescents (grades 6–9, 51% of females, $M_{\text{age}} = 13.11$; $SD = 1.17$), of whom 606 participated in an extracurricular activity. This group is referred to as early adolescence. The second group comprised 773 high school adolescents (grades 10–12, 43% of females, $M_{\text{age}} = 16.22$; $SD = .93$), of whom 471 participated in an extracurricular activity, and is referred to as late adolescence. Thus, out of 1640 adolescents, 1057 participated in an extracurricular activity. The data are a nationally representative sample of adolescents in secondary school: 84.39% were from public schools

and 15.61% from private schools, 47.07% were from High School including 21.35% vocational education. Adolescents reported on the highest education level obtained by either parent, these were as follows: 34% Master level, 26% Bachelor's level, 18% upper secondary general education, 14% upper secondary vocational education, 3% lower secondary education, and 5% primary education. Parents were informed of the study and provided consent. Students completed self-report questionnaires during lesson time, with one hour reserved for completion. They were informed that participation was voluntary and that their responses were anonymous.

3.2. Measures

3.2.1. Group as Social Context Questionnaires (Family, Class Peer Group, and Extracurricular Peer Group)

In order to assess adolescents' perceptions of the characteristics of their interactions across different contexts (family, class and extracurricular peer group), we adopted the short form of the Parent as Social Context Questionnaire (PASCQ; Skinner, Johnson, & Synder, 2005), a 20-item questionnaire designed to assess six main dimensions of parent context identified by the motivational theory: Warmth (affection, appreciation), Rejection (aversion, hostility), Structure (clear expectations, contingent), Chaos (inconsistent, unpredictable), Autonomy Support (freedom of expression and action) and Coercion (psychological control, restrictiveness). Adolescents answered on a 5-point Likert scale (from not at all true to very true). Regarding the family, the questionnaire was translated from English to French by three independent researchers according to the recommendations of the International Test Commission (Hambleton, 2001). Adolescents responded to 20 items depicting their perceptions of their interactions with their family members (as an aggregate). Here is an example of items by dimension: warmth (5 items, e.g. "My family enjoy being with me"), rejection (3 items, e.g. "I cannot count on my family when I need them"), structure (2 items, "If I ever have a problem, my family helps me to figure out what to do about it"), chaos (4 items, "My family keep changing the rules on me"), autonomy support (2 items, "My family let me do the things I think are important") and coercion (4 items, "My family think there is only one right way to do things—their way"). For the other two living environments, we adapted the same questionnaire using the six dimensions. Regarding the class peer group as social context, we replaced the words "family members" by "classmates". Adolescents responded to 20 items depicting their perceptions of their interactions with their class peer group across the six dimensions, for example: "My classmates enjoy being with me", "My

classmates let me do the things I think are important”. Finally, regarding the extracurricular peer group as social context, we replaced the word “classmates” by “extracurricular activity peers”. Adolescents who participated in an extracurricular activity responded to 20 items depicting their perceptions of their interactions with their extracurricular peer group across the six dimensions. For example: “If I ever have a problem, my extracurricular activity peers help me to figure out what to do about it”.

For all the adapted questionnaires, three sets of analyses were performed, (1) EFA to test the factor structure, (2) CFA to test the six-factor solution obtained by the EFA, and (3) MGCFA Measurement Invariance across gender and age. In order to account for the ordered-categorical nature of the scale items, Weighted Least Square Means-Variance (WLSMV) and theta parameterization (for multi-group models) were performed using Mplus Version 8 (Muthén & Muthén, 2017). We also tested the traditional model of bipolar dimensions and multiple (unipolar) dimensions.

For the three contexts, the EFA and subsequent analyses supported a six-factor model. We also tested a 3-bipolar solution but, the six unipolar dimensions provided a significantly better fit. Thus, models of multiple dimensions provided a significantly better fit than the bipolar models in all contexts; specifically, we obtained a six unipolar model + 2 Cov. Error¹ (Family: χ^2 (153, N = 1605) = 1037.19, $p < .001$, RMSEA = .060 [0.057-0.063], CFI=.98, WRMR = 1.54; Class peer group : χ^2 (153, N = 1634) = 1205.68, $p < .001$, RMSEA = .065 [0.062-0.068], CFI=.96, WRMR = 1.75; Extracurricular peer group: χ^2 (153, N = 1038) = 848.60, $p < .001$, RMSEA = .066 [0.062-0.071], CFI=.97, WRMR = 1.45). Moreover, measurement invariance (Full scalar invariance) across gender and age was excellent: Family: χ^2 (374, N = 1605) = 1179.433, $p < .001$, RMSEA = .052, CFI=.98, WRMR = 1.75, Δ CFI = .001, Δ RMSEA = -.005 and χ^2 (374, N = 1605) = 1167.82, $p < .001$, RMSEA = .051, CFI=.98, WRMR = 1.72, Δ CFI = .001, Δ RMSEA = -.005 respectively ; Class peer group: χ^2 (374, N = 1634) = 1454.98, $p < .001$, RMSEA = .059, CFI=.96, WRMR = 2.04, Δ CFI = .002, Δ RMSEA = -.006 and χ^2 (374, N = 1634) = 1403.19, $p < .001$, RMSEA = .058, CFI=.96, WRMR = 2.01, Δ CFI = -.001, Δ RMSEA = -.004 respectively; Extracurricular peer group: χ^2 (374, N = 1038) = 1147.15, $p < .001$, RMSEA = .063, CFI=.97, WRMR = 1.75, Δ CFI = .000, Δ RMSEA = -.005 and χ^2 (374, N = 1038) = 1066.97, $p < .001$, RMSEA = .060, CFI=.97, WRMR = 1.64, Δ CFI = .000, Δ RMSEA = -.005 respectively.

¹ One of the two covariance errors is not the same in the extracurricular peer group (error in items 7 and 8, and items 2 and 6) as in the class peer group and family (errors in items 7 and 8 and items 17 and 18)

3.2.2. Prosocial Behaviour Scales (Self, Parents, Class Peer Group, and Extracurricular Peer Group)

In order to assess adolescents' perceptions of their own prosocial behaviours, and those of parents, class and extracurricular peer group, we adapted and validated the prosociality scale, a 16-item questionnaire designed to assess four types of prosocial behaviours (sharing, helping, taking care of, and feeling empathic; 4 items per dimension) (Caprara, Steca, Zelli, & Capanna, 2005). Specifically, a validated French adaptation (Carrizales et al., 2017) of the prosociality scale, which consists of 14 items and a 5-point Likert scale ranging from 1 (*Never/ almost never*) to 5 (*almost always/always*) and assesses two types of prosocial behaviours: helping (6 items, e.g. "I try to help others") and caring (8 items, e.g. "I try to console people who are sad") was used.

For the three living environments (i.e. parents, class and extracurricular peer group), the same questionnaire using the two dimensions was adapted; however, in order to avoid possible overlap among items for the caring dimension and the empathy scale, only four items for the caring dimension were used. Regarding parents' prosocial behaviours, we replaced the word "I" by "my parents". Adolescents responded to the 10 items depicting their perceptions concerning their parents' prosocial behaviours across the two dimensions, for example: "My parents try to help others"; "My parents try to console people who are sad". Concerning the class peer group, we replaced the word 'I' by the word 'classmates'. Adolescents answered the items depicting their perceptions regarding their classmates' prosocial behaviours across the two dimensions. For example: "My classmates try to help others". Finally, for the extracurricular group, we replaced the word "classmates" by "extracurricular activity peers". Adolescents who participated in extracurricular activities responded to the items regarding their perceptions of their extracurricular activity peer group's prosocial behaviours across the two dimensions.

For all the adapted questionnaires, the same procedure was used as described for the Group as Social Context questionnaire. The self-prosocial scale (PB) yielded a good model fit, $\chi^2(73, N = 1640) = 505.39, p < .001, RMSEA = .060 [0.055-0.065], CFI = .97, WRMR = 1.46$. Moreover, partial scalar measurement invariance across gender and age was attested $\chi^2(182, N = 1640) = 571.90, p < .001, RMSEA = .051, CFI = .97, WRMR = 1.73, \Delta CFI = .003, \Delta RMSEA = .006$ and $\chi^2(180, N = 1640) = 569.29, p < .001, RMSEA = .051, CFI = .96, WRMR = 1.72, \Delta CFI = .000, \Delta RMSEA = .006$, respectively. For the parents' prosocial behaviours, factor analyses showed that the model had a moderate model fit, $\chi^2(31, N =$

1599) = 331.84, $p < .001$, RMSEA = .078 [0.070-0.086], CFI=.98, WRMR = 1.25. Moreover, full scalar measurement invariance across gender and age was attested χ^2 (98, N = 1599) = 318.81, $p < .001$, RMSEA = .053, CFI=.99, WRMR = 1.54, Δ CFI = .001, Δ RMSEA = -.013 and χ^2 (98, N = 1599) = 334.47, $p < .001$, RMSEA = .055, CFI=.99, WRMR = 1.59, Δ CFI = .002, Δ RMSEA = -.016, respectively. For class peer group prosocial behaviours, results suggested a good model fit, χ^2 (33, N = 1631) = 182.19, $p < .001$, RMSEA = .053 [0.045-0.060], CFI=.99, WRMR = 0.99. Moreover, scalar measurement invariance across gender and age was attested χ^2 (102, N = 1631) = 318.64, $p < .001$, RMSEA = .051, CFI=.98, WRMR = 1.56, Δ CFI = .002, Δ RMSEA = -.005 and χ^2 (102, N = 1631) = 286.60, $p < .001$, RMSEA = .047, CFI=.99, WRMR = 1.56, Δ CFI = -.001, Δ RMSEA = -.006, respectively. And finally, for extracurricular peer group prosocial behaviours, results suggested a good model fit, χ^2 (32, N = 1042) = 155.56, $p < .001$, RMSEA = .061 [0.051-0.071], CFI=.99, WRMR = 0.81. Moreover, full scalar measurement invariance across gender and age was attested χ^2 (100, N = 10421) = 272.67, $p < .001$, RMSEA = .058, CFI=.99, WRMR = 1.33, Δ CFI = -.002, Δ RMSEA = -.004 and χ^2 (100, N = 1042) = 250.93, $p < .001$, RMSEA = .054, CFI=.99, WRMR = 1.29, Δ CFI = -.001, Δ RMSEA = -.005, respectively.

3.2.3. The Basic Empathy Scale (BES)

In order to assess adolescents' perception of their own empathy, the BES was used, which is a 20-item questionnaire rated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) developed by Jolliffe and Farrington (2006) and adapted in French by Carré et al. (2013). It includes three dimensions: emotional contagion (6 items, e.g. "I get caught up in other people's feeling easily"), cognitive empathy (8 items, e.g. "I can understand my friend's happiness when she/he does well at something") and emotional disconnection (6 items, "I am not usually aware of my friend's feelings"). In order to assess the psychometric validity of the three-factor structure on our sample, a CFA was performed. The three-factor structure was supported but three items were deleted (item 15 from emotional contagion with factor loading lower than .30, and items 6 and 20 from cognitive empathy that cross loaded on more than one dimension). This three-factor model had a good fit, χ^2 (116, N = 1545) = 879.25, $p < .001$, RMSEA = .065 [0.061-0.069], CFI=.95, WRMR = 1.81. In addition, partial scalar measurement invariance across gender and age was attested χ^2 (284, N = 1545) = 1062.41, $p < .001$, RMSEA = .060, CFI=.94, WRMR = 2.189, Δ CFI = .002, Δ RMSEA = -.005 and χ^2 (278, N = 1545) = 930.93, $p < .001$, RMSEA = .055, CFI=.96, WRMR = 1.98, Δ CFI = .005, Δ RMSEA = -.004 respectively.

3.3. Plan of analysis

To test the predicted relationships in the hypothesized integrative conceptual model, a series of statistical analyses were performed, e.g. path analyses with latent variables using maximum likelihood estimation in *Mplus* Version 8 (Muthén & Muthén, 2017) and multigroup analyses across gender and age. Using path analyses, a combination of different models were performed across contexts, from the most complex model to more specific ones. First, we tested a three-context model (family, class peer group and extracurricular peer group).

Next, we analysed the role of the two peer contexts specifically (i.e. extracurricular peer group and class peer group). To achieve this, we tested two context models, including family and class peer group, in two separate groups of adolescents: those who participated in an extracurricular activity and those who did not. We then tested a two-context model of class peer group and extracurricular peer group in the group who participated in an extracurricular activity. For all the models, model fit is considered good if the comparative fit index (CFI) is greater than or equal to .95 (adequate if greater than or equal to .90), the root mean square error of approximation (RMSEA) is less than or equal to .06 (adequate if less than or equal to .08), and the standardized root mean squared residual (SRMR) is less than or equal to .08 (Hu & Bentler, 1999).

Within all the models, indirect effects and multigroup analyses were performed. Regarding indirect effects, follow-up tests were used to examine their significance (Fairchild, & MacKinnon, 2009; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002), specifically, we used bias-corrected bootstrap confidence intervals² (Hayes, 2013). Next, multigroup analyses were performed to examine whether the pattern of associations differed between males and females and between early and late adolescence. A chi-square difference test was conducted to examine significant change in the chi-square statistic for the constrained model compared to the unconstrained model (Muthén & Muthén, 2017).

4. Results

4.1. Path Analyses within the three-context model

An initial path was examined using latent variables related to three contexts (i.e. family, class and extracurricular activity) was examined, including paths between each of the

² Bias-corrected bootstrap confidence intervals, are like percentile confidence intervals but the endpoints are adjusted as a function of the proportion of k values of ab . that are less than ab , the point estimate of the indirect effect calculated in the original data (Hayes, 2013).

main study variables. Empathy (EM) was specified as a mediator of associations from family as social context positive (FaSCP), family as social context negative (FaSCN), class peer group as social context positive (CPGaSCP), class peer group as social context negative (CPGaSCN), extracurricular peer group as social context positive (EPGaSCP), extracurricular peer group as social context negative (EPGaSCN), and adolescents' perception of parents' prosocial behaviours, labelled parents' prosocial behaviours (PPB), adolescents' perception of the class peer group prosocial behaviours, labelled class peer group prosocial behaviours (CPGPB), adolescents' perception of extracurricular peer group prosocial behaviours, labelled extracurricular peer group prosocial behaviours (EPGPB), to adolescents' self-prosocial behaviours (PB). This first hypothesized model fit the data well: $\chi^2(322) = 1374.37, p < 0.001$, RMSEA = .056 [0.053-0.059], CFI=.92, SRMR = .05 (only significant paths are depicted in Figure 1).

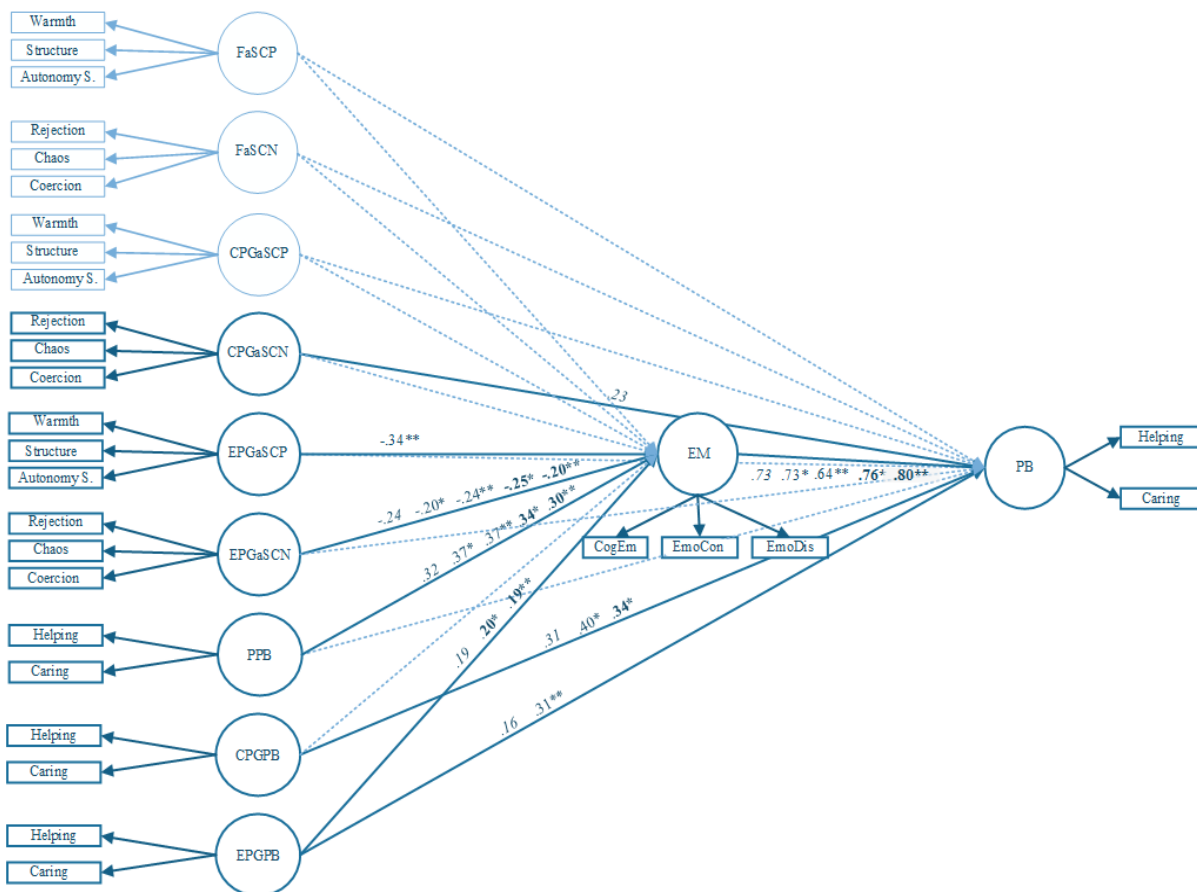


Figure 1. SEM theoretical three-context model in extracurricular group and multigroup across gender and age group.

Note: Significant direct effects are indicated in bold and include standardized coefficients. Indirect Effects: in extracurricular peer group = EPaSCN ($\beta = -.172, p < .01$); EPGPB ($\beta = .139, p < .01$); PPB ($\beta = .231, p < .001$). Across Gender: males = EPaSCN ($\beta = -.152, p < .05$); PPB ($\beta = .240, p < .001$); females = EPaSCN ($\beta = -.148, p < .01$); PPB ($\beta = .270, p < .001$). Across age: early adolescence = EPGPB ($\beta = .184, p < .05$); PPB ($\beta = .249, p < .01$); late adolescence = PPB ($\beta = .231, p < .05$). General population in Italic. Gender: female = Normal*, male = Normal**, Age: Early = Bold*, Late= Bold**.The values for all the dimensions across the groups and covariances among latent variables are omitted for parsimony.

As shown in Figure 1, empathy ($\beta = .828$, $SE = .091$, $\beta^* = .727$, $p < .001$), class peer group as social context negative ($\beta = .172$, $SE = .055$, $\beta^* = .225$, $p < .01$), class peer group prosocial behaviours ($\beta = .244$, $SE = .040$, $\beta^* = .315$, $p < .001$) and extracurricular peer group prosocial behaviours ($\beta = .110$, $SE = .042$, $\beta^* = .164$, $p < .01$) significantly predicted adolescents' prosocial behaviours. Moreover, only extracurricular peer group as social context negative ($\beta = -.0137$, $SE = .042$, $\beta^* = -.0236$, $p < .001$), extracurricular peer group prosocial behaviours ($\beta = .113$, $SE = .044$, $\beta^* = .192$, $p < .01$), and parents' prosocial behaviours ($\beta = .215$, $SE = .037$, $\beta^* = .318$, $p < .001$) were significantly related to empathy.

Indirect effects.

The indirect effects tested in all the models are reported in Table 1. A 95% bias-corrected bootstrap confidence interval showed that there were significant indirect effects from extracurricular peer group as social context negative ($\beta = -.113$; 95% CI [-.216, -.028]; $\beta^* = -.172$), extracurricular peer group prosocial behaviours ($\beta = .094$; 95% CI [.008, .182]; $\beta^* = .139$) and parents' prosocial behaviours ($\beta = .178$; 95% CI [.119, .264]; $\beta^* = .231$) to adolescents' prosocial behaviours through empathy. Because the confidence intervals for $\tau_{a \rightarrow b}$ do not straddle zero, we can claim with 95% confidence that the indirect effects are positive. No other indirect effects to prosocial behaviours were found.

Table 1. Indirect effects from the living environments features and groups prosocial behaviours' to adolescents' prosocial behaviours via empathy

Predictor		Mediator		Outcome	β	CI ₉₅
Three contexts model (extracurricular, class peer group and family)						
Extracurricular peer group as social context negative	→	EM	→	PB	-.172**	-.216 to -.028
Extracurricular peer group prosocial behaviours	→	EM	→	PB	.139**	.008 to .182
Parents' prosocial behaviours	→	EM	→	PB	.231***	.119 to .264
Two contexts model (class peer group and family - in extracurricular group)						
Family as social context negative	→	EM	→	PB	.169*	-.210 to .231
Parents' prosocial behaviours	→	EM	→	PB	.281***	.148 to .299
Two contexts model (class peer group and family - in no extracurricular group)						
Parents' prosocial behaviours	→	EM	→	PB	.253***	.105 to .284
Two contexts model (extracurricular peer group and class peer group)						
Extracurricular peer group as social context negative	→	EM	→	PB	-.228**	-.254 to -.067
Extracurricular peer group prosocial behaviours	→	EM	→	PB	.183**	.044 to .207
Class peer group as social context positive	→	EM	→	PB	.139*	.007 to .226

Note: Empathy (EM). Prosocial Behaviours (PB). β = standardized indirect effect. *** $p < .001$, ** $p < .01$, * $p < .05$. CI95 = 95 % confidence interval with bootstrap of 10000

Multigroup Analyses by gender and age.

Multigroup analyses by gender and age of the indirect effects tested in all the models are reported in Table 2.

First, we examined moderation by gender. The unconstrained model, $\chi^2(680) = 1884.79$, $p < 0.001$, RMSEA = .058 [0.055-0.061], CFI=.91, SRMR = .056, and the constrained model, $\chi^2(690) = 1898.44$, $p < 0.001$, RMSEA = .058 [0.056-0.061], CFI=.91, SRMR = .056, were not significantly different as determined by a chi-square difference test $\Delta\chi^2(10) = 13.65$, $p = .49$, suggesting that the model did not differ based on adolescent gender.

In the male group, only empathy ($\beta = .841$, SE = .150, $\beta^* = .642$, $p < .01$), extracurricular peer group as social context positive ($\beta = -.243$, SE = .121, $\beta^* = -.344$, $p < .05$) and extracurricular peer group prosocial behaviours ($\beta = .202$, SE = .082, $\beta^* = .309$, $p < .01$) significantly predicted adolescents' prosocial behaviours. Moreover, only extracurricular peer group as social context negative ($\beta = -.112$, SE = .046, $\beta^* = -.237$, $p < .01$), class peer group as social context positive ($\beta = .134$, SE = .058, $\beta^* = .217$, $p < .05$) and parents' prosocial behaviours ($\beta = .214$, SE = .040, $\beta^* = .374$, $p < .001$) were significantly related to empathy. Indirect test results showed there were indirect effects from extracurricular peer group as social context negative ($\beta = -.094$; 95% CI [-.194, -.018]; $\beta^* = -.152$), and from parents' prosocial behaviours ($\beta = .179$; 95% CI [.011, .281]; $\beta^* = .240$), to adolescents' prosocial behaviours via empathy (see Table 2).

In the female group, only empathy ($\beta = .841$, SE = .150, $\beta^* = .733$, $p < .001$) and class peer group prosocial behaviours ($\beta = .264$, SE = .076, $\beta^* = .398$, $p < .001$) significantly predicted adolescents' prosocial behaviours. Moreover, only extracurricular peer group as social context negative ($\beta = -.112$, SE = .046, $\beta^* = -.202$, $p < .01$), and parents' prosocial behaviours ($\beta = .214$, SE = .040, $\beta^* = .369$, $p < .001$) were significantly related to empathy. Indirect test results showed there were the same indirect effects from extracurricular peer group as social context negative ($\beta = -.094$; 95% CI [-.194, -.018]; $\beta^* = -.148$) and from parents' prosocial behaviours ($\beta = .179$; 95% CI [.110, .273]; $\beta^* = .270$) to adolescents' prosocial behaviours via empathy (see Table 2).

Second, we examined moderation by age. The unconstrained model, $\chi^2(680) = 1957.66$, $p < 0.001$, RMSEA = .060 [0.057-0.063], CFI=.91, SRMR = .054, and the constrained model, $\chi^2(690) = 1968.25$, $p < 0.001$, RMSEA = .059 [0.056-0.062], CFI=.91,

SRMR = .054, were not significantly different as determined by a chi-square difference test $\Delta \chi^2(10) = 10.59, p = .39$ suggesting that the model did not differ based on adolescent age.

In the early adolescent group, only empathy ($\beta = .892, SE = .129, \beta^* = .762, p < .001$) and class peer group prosocial behaviours ($\beta = .251, SE = .0734, \beta^* = .338, p < .001$) significantly predicted prosocial behaviours. Moreover, only extracurricular peer group as social context negative ($\beta = -.131, SE = .048, \beta^* = -.248, p < .01$), extracurricular peer group prosocial behaviours ($\beta = .111, SE = .055, \beta^* = .200, p < .05$) and parents' prosocial behaviours ($\beta = .214, SE = .044, \beta^* = .340, p < .001$) were significantly related to empathy. Indirect test results showed there were indirect effects from extracurricular peer group prosocial behaviours ($\beta = .119; 95\% CI [.028, .234]; \beta^* = .184$) and from parents' prosocial behaviours ($\beta = .183; 95\% CI [.089, .328]; \beta^* = .249$) to adolescents' prosocial behaviours via empathy (see Table 2).

In the late adolescent group, only empathy ($\beta = .892, SE = .123, \beta^* = .803, p < .001$) significantly predicted prosocial behaviours. Moreover, as in early adolescence, only extracurricular peer group as social context negative ($\beta = -.131, SE = .048, \beta^* = -.196, p < .01$), extracurricular peer group prosocial behaviours ($\beta = .111, SE = .055, \beta^* = .188, p < .05$) and parents' prosocial behaviours ($\beta = .214, SE = .044, \beta^* = .298, p < .001$) were significantly related to empathy. Indirect test results showed there was only an indirect effect from parents' prosocial behaviours to adolescents' prosocial behaviours ($\beta = .185; 95\% CI [.025, .371]; \beta^* = .231$) via empathy (see Table 2).

Table 2. Multigroup analysis by gender and age of the indirect effects from living environments features and groups prosocial behaviours to adolescents' prosocial behaviours via empathy

Predictors	Groups		Mediator		Outcome	B	CI ₉₅
Three contexts model (family, class and extracurricular, peer group)							
Extracurricular peer group as social context negative	Males	→	EM	→	PB	-.152*	-.194 to -.018
	Females	→	EM	→	PB	-.148*	-.194 to -.018
Parents' prosocial behaviours	Males	→	EM	→	PB	.240***	.110 to .281
	Females	→	EM	→	PB	.270***	.110 to .273
	Early adolescence	→	EM	→	PB	.249**	.089 to .328
	Late adolescence	→	EM	→	PB	.231*	.025 to .371
Extracurricular peer group prosocial behaviours	Early adolescence	→	EM	→	PB	.184*	.028 to .234
Two contexts model (family and class peer group)- in extracurricular group							
Family as social context negative	Males	→	EM	→	PB	-.159*	-.185 to -.007
	Females	→	EM	→	PB	-.142*	-.185 to -.007
	Early adolescence	→	EM	→	PB	-.200***	-.229 to -.023
	Late adolescence	→	EM	→	PB	-.183*	-.229 to -.023
Parents' prosocial behaviours	Males	→	EM	→	PB	.271***	.136 to .293
	Females	→	EM	→	PB	.305***	.136 to .293
	Early adolescence	→	EM	→	PB	.319***	.162 to .323
	Late adolescence	→	EM	→	PB	.297***	.162 to .323
Two contexts model (family and class peer group) in non-extracurricular group)							
Family as social context negative	Early adolescence	→	EM	→	PB	-.249**	-.156 to .058
Parents' prosocial behaviours	Males	→	EM	→	PB	.220***	.073 to .235
	Females	→	EM	→	PB	.196***	.073 to .235
	Early adolescence	→	EM	→	PB	.261***	.113 to .307
	Late adolescence	→	EM	→	PB	.274***	.113 to .307
Two contexts model (class peer group and extracurricular peer group)							
Extracurricular peer group as social context negative	Males	→	EM	→	PB	-.207**	-.227 to -.055
	Females	→	EM	→	PB	-.204**	-.227 to -.055
	Early adolescence	→	EM	→	PB	-.247***	-.246 to -.069
	Late adolescence	→	EM	→	PB	-.208***	-.246 to -.069
Extracurricular peer group prosocial behaviours	Males	→	EM	→	PB	.138*	.019 to .169
	Females	→	EM	→	PB	.148*	.019 to .169
	Early adolescence	→	EM	→	PB	.196**	.046 to .219
	Late adolescence	→	EM	→	PB	.155*	.046 to .219
Class peer group as social context positive	Males	→	EM	→	PB	.163**	.038 to .253
	Females	→	EM	→	PB	.205**	.038 to .253
	Early adolescence	→	EM	→	PB	.159*	.007 to .246
	Late adolescence	→	EM	→	PB	.155*	.007 to .246

Note: Empathy (EM). Prosocial Behaviours (PB). β = standardized indirect effect. *** $p < .001$, ** $p < .01$, * $p < .05$. CI₉₅ = 95 % confidence interval with bootstrap of 10000

4.2. Path analysis within the two-context model : Family and class peer group

The two context model of family and class peer group taking into account adolescents' participation or non-participation in extracurricular activity was performed separately. We examined whether family as social context positive (FaSCP), family as social context negative (FaSCN), class peer group as social context positive (CPGaSCP), class peer group as social context negative (CPGaSCN), parents' prosocial behaviours (PPB) and class peer group prosocial behaviours (CPGPB) were related to adolescents' self-prosocial behaviours (PB), and tested the mediating role of empathy in these relationships.

4.2.1. Within the group of adolescents who participated in an extracurricular activity

We tested this model in the group of adolescents who participated in an extracurricular activity. This hypothesized model fit the data well: $\chi^2(161) = 824.300, p < .001, RMSEA = .062 [0.058-0.067], CFI = .93, SRMR = .049$ (only significant paths are depicted in Figure 2). Results indicated that empathy ($\beta = .805, SE = .117, \beta^* = .723, p < .001$), class peer group as social context negative ($\beta = .160, SE = .061, \beta^* = .219, p < .01$), and class peer group prosocial behaviours ($\beta = .270, SE = .048, \beta^* = .350, p < .001$) significantly predicted adolescents' prosocial behaviours. Moreover, only family as social context negative ($\beta = -.129, SE = .051, \beta^* = -.234, p < .01$), and parents' prosocial behaviours ($\beta = .267, SE = .045, \beta^* = .389, p < .001$) were significantly related to empathy.

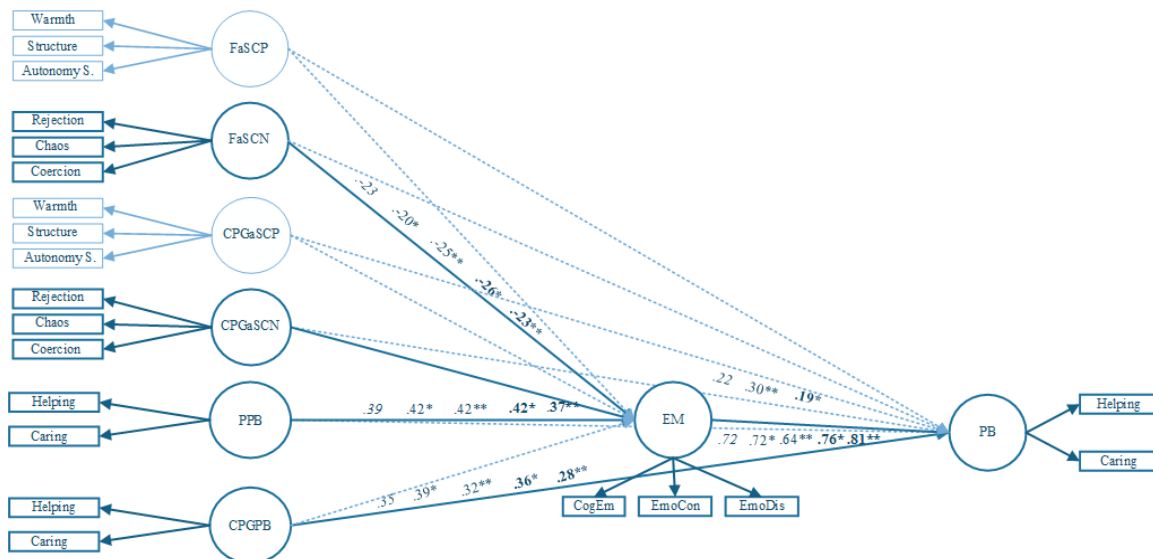


Figure 2. SEM theoretical two-context model (family and class) in the extracurricular group in general population and multigroup across gender and age group.

Note: Significant direct effects are indicated in bold and include standardized coefficients. Indirect Effects: in extracurricular peer group = FaSCN ($\beta = -.169, p < .05$); PPB ($\beta = .281, p < .001$). Across Gender: males = FaSCN ($\beta = -.159, p < .05$); PPB ($\beta = .271, p < .001$); females = FaSCN ($\beta = -.142, p < .05$); PPB ($\beta = .305, p < .001$). Across age: early adolescence = FaSCN ($\beta = -.200, p < .001$); PPB ($\beta = .319, p < .001$). = late adolescence = FaSCN ($\beta = -.183, p < .05$); PPB ($\beta = .297, p < .001$). General population in *Italic*. Gender: female = Normal*, male = Normal**, Age: Early = Bold*, Late = Bold**. The values for all the dimensions across the groups and covariances among latent variables are omitted for parsimony.

Indirect effects.

There were significant indirect effects from family as social context negative ($\beta = -.104$; 95% CI [-.210, .231]; $\beta^* = -.169$) and parents' prosocial behaviours ($\beta = .215$; 95% CI [.148, .299]; $\beta^* = .281$) to adolescents' prosocial behaviours via empathy (see Table 1).

Multigroup analysis by gender and age.

Analyses of moderation by gender were performed, the unconstrained model, $\chi^2(348) = 1098.826, p < 0.001$, RMSEA = .064 [0.060-0.068, CFI=.92, SRMR = .058, and the constrained model, $\chi^2(355) = 1107.019, p < 0.001$, RMSEA = .063 [0.059-0.068], CFI=.92, SRMR = .059, were not significantly different as determined by a chi-square difference test $\Delta \chi^2(7) = 8.19, p = .32$ suggesting that the model did not differ based on adolescent gender.

In the male group, empathy ($\beta = .820$, SE = .125, $\beta^* = .644, p < .001$), class peer group as social context negative ($\beta = .218$, SE = .098, $\beta^* = .303, p < .01$), and class peer group prosocial behaviours ($\beta = .246$, SE = .065, $\beta^* = .320, p < .001$) significantly predicted adolescents' prosocial behaviours. Moreover, only family as social context negative ($\beta = -.107$, SE = .047, $\beta^* = -.247, p < .05$), and parents' prosocial behaviours ($\beta = .245$, SE = .004, $\beta^* = .421, p < .001$) were significantly related to empathy. Indirect test results showed there were indirect effects from family as social context negative ($\beta = -.088$; 95% CI [-.185, -.007]; $\beta^* = -.159$), and parents' prosocial behaviours ($\beta = .201$; 95% CI [.136, .293]; $\beta^* = .271$) to adolescents' prosocial behaviours via empathy (see Table 2).

In the female group, empathy ($\beta = .820$, SE = .125, $\beta^* = .722, p < .001$) and class peer group prosocial behaviours ($\beta = .258$, SE = .064, $\beta^* = .392, p < .001$) significantly predicted prosocial behaviours. Moreover, as for males, family as social context negative ($\beta = -.107$, SE = .047, $\beta^* = -.197, p < .05$), and parents' prosocial behaviours ($\beta = .245$, SE = .040, $\beta^* = .421, p < .001$) were significantly related to empathy. Also, indirect test results showed as for males there were indirect effects from family as social context negative ($\beta = -.088$; 95% CI [-.185, -.007]; $\beta^* = -.142$), and parents' prosocial behaviours ($\beta = .201$; 95% CI [.136, .293]; $\beta^* = .305$) to adolescents' prosocial behaviours via empathy (see Table 2).

Moderation by age was performed, the unconstrained model, $\chi^2(348) = 1148.231, p < .001$, RMSEA = .066 [0.062-0.070, CFI=.91, SRMR = .057 and the constrained model, $\chi^2(355) = 1154.435, p < .001$, RMSEA = .065 [0.061-0.069], CFI=.91, SRMR = .058, were not significantly different as determined by a chi-square difference test $\Delta \chi^2(7) = 6.20, p = .52$ suggesting that the model did not differ based on adolescent age.

In the early adolescent group, empathy ($\beta = .881$, $SE = .115$, $\beta^* = .762$, $p < .001$), class peer group as social context negative ($\beta = .135$, $SE = .070$, $\beta^* = .195$, $p < .05$) and class peer group prosocial behaviours ($\beta = .267$, $SE = .064$, $\beta^* = .361$, $p < .001$) significantly predicted adolescents' prosocial behaviours. Moreover, only family as social context negative ($\beta = -.133$, $SE = .051$, $\beta^* = -.262$, $p < .01$) and parents' prosocial behaviours ($\beta = .265$, $SE = .045$, $\beta^* = .418$, $p < .001$) were significantly related to empathy. Indirect test results showed there were indirect effects from the family as social context negative ($\beta = -.117$; 95% CI [-.229, -.023]; $\beta^* = -.200$) and from parents' prosocial behaviours ($\beta = .234$; 95% CI [.162, .323]; $\beta^* = .319$) to adolescents' prosocial behaviours via empathy (see Table 2).

In the late adolescent group, empathy ($\beta = .881$, $SE = .115$, $\beta^* = .806$, $p < .001$), and class peer group prosocial behaviours ($\beta = .221$, $SE = .063$, $\beta^* = .276$, $p < .001$) significantly predicted adolescents' prosocial behaviours. Moreover, as in early adolescence, only family as social context negative ($\beta = -.133$, $SE = .051$, $\beta^* = -.227$, $p < .01$) and parents' prosocial behaviours ($\beta = .265$, $SE = .045$, $\beta^* = .368$, $p < .001$) were significantly related to empathy. Indirect test results showed there were the same indirect effects: from the family as social context negative ($\beta = -.117$; 95% CI [-.229 -.023]; $\beta^* = -.183$), and from parents' prosocial behaviours ($\beta = .234$; 95% CI [.162, .323]; $\beta^* = .297$) to adolescents' prosocial behaviours via empathy (see Table 2).

4.2.2. Within the group of adolescents who did not participate in an extracurricular activity

We tested this model in the group of adolescents who did not participate in an extracurricular activity. This hypothesized model fit the data well: $\chi^2(161) = 453.498$, $p < .001$, $RMSEA = .056$ [0.050-0.062], $CFI = .94$, $SRMR = .048$ (only significant paths are depicted in Figure 3). Results indicated that few variables in the model significantly predicted adolescents' prosocial behaviours, empathy ($\beta = .763$, $SE = .154$, $\beta^* = .641$, $p < .001$), family as social context positive ($\beta = -.170$, $SE = .065$, $\beta^* = -.229$, $p < .01$), and parents' prosocial behaviours ($\beta = .209$, $SE = .062$, $\beta^* = .289$, $p < .001$). Moreover, only parents' prosocial behaviours ($\beta = .240$, $SE = .063$, $\beta^* = .396$, $p < .001$) were significantly related to empathy.

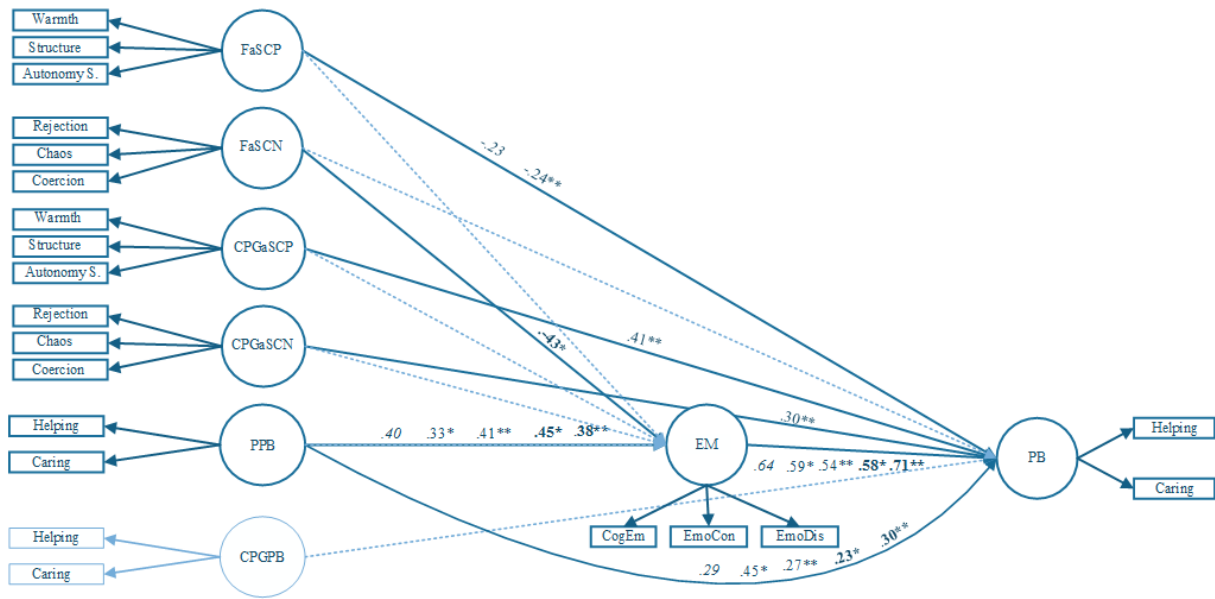


Figure 3. SEM theoretical two contexts model (family and class) in the non-extracurricular group across general population, gender and age group

Note: Significant direct effects are indicated in bold and include standardized coefficients. Indirect Effects: in the non-extracurricular group = PPB ($\beta = .253, p < .001$). Across Gender: males = PPB ($\beta = .220, p < .001$); females = PPB ($\beta = .196, p < .001$). Across age: early adolescence = FaSCN ($\beta = -.249, p < .01$); PPB ($\beta = .261, p < .001$). = late adolescence = FaSCN ($\beta = -.183, p < .05$); PPB ($\beta = .297, p < .001$). General population in *Italic*. Gender: female = Normal*, male = Normal**, Age: Early = Bold*, Late= Bold**. The values for all the dimensions across the groups and covariances among latent variables are omitted for parsimony.

Indirect effects. A 95% bias-corrected bootstrap confidence interval suggested that there was a significant indirect effect from parents' prosocial behaviours ($\beta = .183$; 95% CI [.105, .284]; $\beta^* = .253$) to adolescents' prosocial behaviours via empathy (see Table 1).

Multigroup analysis by gender and age.

We first examined moderation by gender, the unconstrained model, $\chi^2(348) = 718.239, p < .001, RMSEA = .060 [0.054-0.067], CFI=.93, SRMR = .061$, and the constrained model, $\chi^2(355) = 727.998, p < .001, RMSEA = .060 [0.054-0.066], CFI=.93, SRMR = .064$, were not significantly different as determined by a chi-square difference test $\Delta \chi^2(7) = 9.76, p = .20$ suggesting that the model did not differ based on adolescent gender, and acceptable model fit was obtained.

In the male group, empathy ($\beta = .741, SE = .162, \beta^* = .540, p < .001$), class peer group as social context positive ($\beta = .265, SE = .106, \beta^* = .415, p < .01$) and class peer group as social context negative ($\beta = .208, SE = .095, \beta^* = .301, p < .05$), family as social context positive ($\beta = -.180, SE = .082, \beta^* = -.242, p < .05$), and parents' prosocial behaviours ($\beta = .178, SE = .079, \beta^* = .269, p < .05$) significantly predicted adolescents' prosocial behaviours. Moreover, only parents' prosocial behaviours ($\beta = .196, SE = .053, \beta^* = .407, p < .001$) were

significantly related to empathy. Indirect test results showed that there was an indirect effect from parents' prosocial behaviours to adolescents' prosocial behaviours ($\beta = .145$; 95% CI [.073 .235]; $\beta^* = .220$) (see Table 2).

In the female group, empathy ($\beta = .741$, SE = .162, $\beta^* = .587$, $p < .001$) and parents' prosocial behaviours ($\beta = .332$, SE = .087, $\beta^* = .448$, $p < .001$) significantly predicted adolescents' prosocial behaviours. Moreover, as for males, only parents' prosocial behaviours ($\beta = .196$, SE = .053, $\beta^* = .335$, $p < .001$) were significantly related to empathy. Indirect test results showed there was the same indirect effect as for males: from parents' prosocial behaviours to adolescents' prosocial behaviours ($\beta = .145$; 95% CI [.073 .235]; $\beta^* = .196$) via empathy (see Table 2).

Second, we examined moderation by age, the unconstrained model, $\chi^2(348) = 761.954$, $p < .001$, RMSEA = .064 [0.058-0.070], CFI=.92, SRMR = .065, and the constrained model, $\chi^2(355) = 780.477$, $p < .001$, RMSEA = .064 [0.058-0.070], CFI=.92, SRMR = .068, were significantly different as determined by a chi-square difference test $\Delta \chi^2(7) = 18.52$, $p = .010$ suggesting that the model differed based on adolescent age. The path that could not be constrained across age groups was the path from the family as social context negative, the model fit of this model was $\chi^2(354) = 770.87$, $p < .001$, RMSEA = .064 [0.060-0.068], CFI=.92, SRMR = .061, the chi-square difference test $\Delta \chi^2(6) = 8.916$, $p = .18$ suggested that the model did not differ based on adolescent age. In the early adolescent group, empathy ($\beta = .755$, SE = .143, $\beta^* = .580$, $p < .001$) and parents' prosocial behaviours ($\beta = .174$, SE = .081, $\beta^* = .234$, $p < .05$) significantly predicted adolescents' prosocial behaviours. Moreover, only family as social context negative ($\beta = -.175$, SE = .0643, $\beta^* = -.430$, $p < .01$), and parents' prosocial behaviours ($\beta = .257$, SE = .061, $\beta^* = .451$, $p < .001$) were significantly related to empathy. Indirect test results showed there were indirect effects from family as social context negative to prosocial behaviours ($\beta = -.132$; 95% CI [-.156, .058]; $\beta^* = -.249$) and from parents' prosocial behaviours ($\beta = .194$; 95% CI [.113, .307]; $\beta^* = .261$) to adolescents' prosocial behaviours via empathy (see Table 2).

In the late adolescent group, empathy ($\beta = .755$, SE = .1430, $\beta^* = .715$, $p < .001$) and parents' prosocial behaviours ($\beta = .215$, SE = .081, $\beta^* = .304$, $p < .01$) significantly predicted adolescents' prosocial behaviours. Moreover, only parents' prosocial behaviours ($\beta = .257$, SE = .061, $\beta^* = .383$, $p < .001$) were significantly related to empathy. Indirect test results showed there was only an indirect effect from parents' prosocial behaviours to adolescents' prosocial behaviours ($\beta = .194$; 95% CI [.113, .307]; $\beta^* = .274$) via empathy (see Table 2).

4.3. Path analysis within the two-context model: class peer group and extracurricular peer group

In this model, empathy was specified as a mediator of associations from class peer group as social context positive (CPGaSCP), class peer group as social context negative (CPGaSCN), extracurricular peer group as social context positive (EPGaSCP), extracurricular peer group as social context negative (EPGaSCN) and class peer group prosocial behaviours (CPGPB), extracurricular peer group prosocial behaviours (EPGPB) to adolescents' self-prosocial behaviours (PBS). The two-context model of class and extracurricular activity peer group fit the data well: $\chi^2(161) = 895.171, p < .001, RMSEA = .066 [0.062-0.070], CFI = .93, SRMR = .052$ (only significant paths are depicted in Figure 4). Results indicated that empathy ($\beta = .789, SE = .120, \beta^* = .694, p < .001$), class peer group as social context negative ($\beta = .171, SE = .063, \beta^* = .223, p < .01$), class peer group prosocial behaviours ($\beta = .235, SE = .052, \beta^* = .305, p < .001$) and extracurricular peer group prosocial behaviours ($\beta = .106, SE = .050, \beta^* = .160, p < .05$) significantly predicted adolescents' prosocial behaviours. Moreover, only class peer group as social context positive ($\beta = .139, SE = .070, \beta^* = .201, p < .05$), extracurricular peer group as social context negative ($\beta = -.188, SE = .045, \beta^* = -.329, p < .001$) and extracurricular peer group prosocial behaviours ($\beta = .155, SE = .055, \beta^* = .264, p < .01$) were significantly related to empathy.

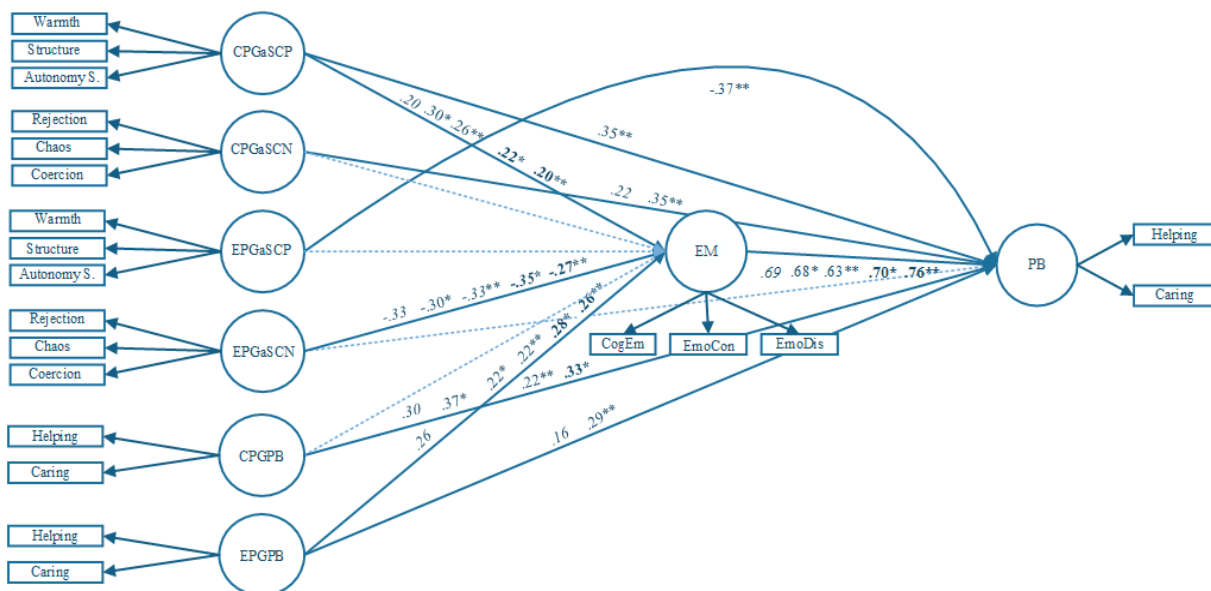


Figure 4. SEM theoretical two contexts model (class and extracurricular peer group) in the extracurricular group and multigroup across gender and age group.

Note: Significant direct effects are indicated in bold and include standardized coefficients. Indirect Effects: in the non-extracurricular group = EPGaSCN ($\beta = -.228, p < .01$). EPGPB ($\beta = .183, p < .01$). CPGaSCP ($\beta = .139, p < .05$). Across Gender: males = EPGaSCN ($\beta = -.207, p < .01$). EPGPB ($\beta = .138, p < .05$). CPGaSCP ($\beta = .163, p < .001$); females = EPGaSCN ($\beta = -.204, p < .01$). EPGPB ($\beta = .148, p < .05$). CPGaSCP ($\beta = .205, p < .001$). Across age: early adolescence = EPGaSCN ($\beta = -.247, p < .001$). EPGPB ($\beta = .196, p < .01$). CPGaSCP ($\beta = .159, p < .05$); late adolescence = EPGaSCN ($\beta = -.208, p < .001$). EPGPB ($\beta = .155, p < .05$). CPGaSCP ($\beta = .155, p < .05$). General population in *italic*. Gender: female = Normal*, male = Normal**, Age: Early = Bold*, Late = Bold**. The values for all the dimensions across the groups and covariances among latent variables are omitted for parsimony.

Indirect effects.

There were significant indirect effects from class peer group as social context positive ($\beta = .110$, 95% CI [.007, .226]; $\beta^* = .139$), extracurricular peer group as social context negative ($\beta = -.148$, 95% CI [-.254, -.067]; $\beta^* = -.228$) and extracurricular peer group prosocial behaviours ($\beta = .122$; 95% CI [.044, .207]; $\beta^* = .183$) to adolescents' prosocial behaviours via empathy (see Table 1).

Multigroup analysis by gender and age.

We first examined moderation by gender, the unconstrained model, $\chi^2(348) = 1177.810$, $p < .001$, RMSEA = .067 [0.063-0.071], CFI=.91, SRMR = .061, and the constrained model, $\chi^2(355) = 1192.723$, $p < .001$, RMSEA = .067 [0.063-0.071], CFI=.91, SRMR = .063, were significantly different as determined by a chi-square difference test $\Delta \chi^2(7) = 14.913$, $p = 0.37$ suggesting that the model differ based on adolescent gender. The path that could not be constrained across genders was the path of extracurricular peer group as social context positive, the model fit of this model was $\chi^2(354) = 1185.246$, $p < .001$, RMSEA = .067 [0.062-0.071], CFI=.91, SRMR = .062, the chi-square difference test $\Delta \chi^2(6) = 7.433$, $p = .28$ suggested that this model did not differ based on adolescent gender.

In the male group, empathy ($\beta = .800$, SE = .122, $\beta^* = .629$, $p < .001$), class peer group as social context positive ($\beta = .284$, SE = .133, $\beta^* = .349$, $p < .05$), class peer group as social context negative ($\beta = .265$, SE = .11, $\beta^* = .351$, $p < .05$), extracurricular peer group as social context positive ($\beta = -.226$, SE = .102, $\beta^* = -.372$, $p < .05$), class peer group prosocial behaviours ($\beta = .173$, SE = .077, $\beta^* = .224$, $p < .05$), and extracurricular peer group prosocial behaviours ($\beta = .191$, SE = .068, $\beta^* = .293$, $p < .01$) significantly predicted adolescents' prosocial behaviours. Moreover, only class peer group as social context positive ($\beta = .166$, SE = .066, $\beta^* = .259$, $p < .01$), extracurricular peer group as social context negative ($\beta = -.159$, SE = .102, $\beta^* = -.330$, $p < .05$), and extracurricular peer group prosocial behaviours ($\beta = .113$, SE = .048, $\beta^* = .220$, $p < .01$) were significantly related to empathy. Indirect test results showed there were indirect effects from class peer group as social context positive ($\beta = .133$; 95% CI [.038, .253]; $\beta^* = .163$), extracurricular peer group as social context negative ($\beta = -.127$; 95% CI [-.227, -.0055]; $\beta^* = -.207$), and extracurricular peer group prosocial behaviours ($\beta = .090$; 95% CI [.019, .169]; $\beta^* = .138$) to adolescents' prosocial behaviours via empathy (see Table 2).

In the female group, empathy ($\beta = .800$, $SE = .122$, $\beta^* = .680$, $p < .001$) and class peer group prosocial behaviours ($\beta = .244$, $SE = .072$, $\beta^* = .373$, $p < .001$) significantly predicted adolescents' prosocial behaviours. Moreover, as for males, class peer group as social context positive ($\beta = .166$, $SE = .066$, $\beta^* = .302$, $p < .01$), extracurricular peer group as social context negative ($\beta = -.159$, $SE = .043$, $\beta^* = -.300$, $p < .001$), and extracurricular peer group prosocial behaviours ($\beta = .113$, $SE = .048$, $\beta^* = .218$, $p < .01$) were significantly related to empathy. Indirect test results showed that as for males, there were indirect effects from class peer group as social context positive ($\beta = .133$; 95% CI [.038, .253]; $\beta^* = .205$), extracurricular peer group as social context negative ($\beta = -.127$; 95% CI [-.227, -.055]; $\beta^* = -.204$) and extracurricular peer group prosocial behaviours ($\beta = .090$; 95% CI [.019, -.169]; $\beta^* = .148$) to adolescents' prosocial behaviours via empathy (see Table 2).

Second, we examined moderation by age, the unconstrained model, $\chi^2(348) = \chi^2(348) = 1197.376$, $p < .001$, $RMSEA = .068$ [0.064-0.072], $CFI = .91$, $SRMR = .059$, and the constrained model, $\chi^2(355) = 1206.795$, $p < .001$, $RMSEA = .067$ [0.063-0.072], $CFI = .91$, $SRMR = .060$, were not significantly different as determined by a chi-square difference test $\Delta \chi^2(7) = 9.419$, $p = 0.22$ suggesting that the model did not differ based on adolescent age group.

In the early adolescent group, empathy ($\beta = .833$, $SE = .108$, $\beta^* = .705$, $p < .001$) and class peer group prosocial behaviours ($\beta = .247$, $SE = .071$, $\beta^* = .331$, $p < .001$) significantly predicted adolescents' prosocial behaviours. Moreover, only class peer group as social context positive ($\beta = .145$, $SE = .075$, $\beta^* = .225$, $p < .05$), extracurricular peer group as social context negative ($\beta = -.183$, $SE = .044$, $\beta^* = -.350$, $p < .001$), and extracurricular peer group prosocial behaviours ($\beta = .154$, $SE = .055$, $\beta^* = .278$, $p < .01$) were significantly related to empathy. Indirect test results showed there were still the same indirect effects: from class peer group as social context positive ($\beta = .121$; 95% CI [.007, .246]; $\beta^* = .159$), extracurricular peer group as social context negative ($\beta = -.152$; 95% CI [-.099, .125]; $\beta^* = -.247$) and extracurricular peer group prosocial behaviours ($\beta = .128$; 95% CI [.046, .219]; $\beta^* = .196$) to adolescents' prosocial behaviours via empathy (see Table 2).

In the late adolescent group, there was only empathy ($\beta = .833$, $SE = .108$, $\beta^* = .756$, $p < .001$) that significantly predicted prosocial behaviours. Moreover, as in early adolescence, class peer group as social context positive ($\beta = .145$, $SE = .075$, $\beta^* = .205$, $p < .05$), extracurricular peer group as social context negative ($\beta = -.183$, $SE = .044$, $\beta^* = -.275$, $p < .001$), and extracurricular peer group prosocial behaviours ($\beta = .154$, $SE = .055$, $\beta^* = .262$, p

<.01) were significantly related to empathy. Indirect test results showed the same indirect effects: from class peer group as social context positive ($\beta = .121$; 95% CI [.007, .246]; $\beta^* = .155$), extracurricular peer group as social context negative ($\beta = -.152$; 95% CI [-.246, -.069]; $\beta^* = -.208$), and extracurricular peer group prosocial behaviours ($\beta = .128$; 95% CI [.046, .219]; $\beta^* = .196$) to adolescents' prosocial behaviours via empathy (see Table 2).

5. Discussion

The current investigation developed and tested a conceptual model that examined the links between living environment features (group as social context positive and negative features across family, class and extracurricular peer group), group prosocial behaviours (parents, class and extracurricular peer group) and adolescents' prosocial behaviours through empathy. This attempt to establish an empirical link between context features using the same approach across different contexts and a positive developmental outcome such as prosocial behaviours is particularly significant, given the need for more evidence to enable researchers to capture not only common features across contexts but also specific features that might influence adolescents' prosocial behaviours. With these considerations in mind, we examined adolescents' perceptions of living environment features, including positive features such as warmth, structure and autonomy support and negative features such as rejection, chaos and coercion, across three different contexts (family, class and extracurricular peer group) and adolescents' perceptions of group prosocial behaviours (parents, class and extracurricular peer group) that might foster or undermine adolescents' prosocial behaviours through the mediating effect of empathy.

The findings showed that many of the individual pathways suggested by our data validate and build on the complex relationships between multiple social contexts; there were both common and specific features across living environments that influenced adolescents' prosocial behaviours. Our results revealed the predictive role of some specific features of living environments and groups' prosocial behaviours and also suggested the mediating role of empathy. In other words, as expected, empathy in adolescence mediates the effects of different living environments and adolescents' prosocial behaviours. Interestingly, regardless of the contexts included in the models, when family context was included, a constant effect predictive of adolescents' prosocial behaviours was the indirect effect of parents' prosocial behaviours through empathy; and when the extracurricular peer group context was included, another constant effect was that of extracurricular peer group as negative social context.

Concerning the specific contributions of the different contexts, results from the model across three contexts (family, class and extracurricular peer group) showed that besides parents' prosocial behaviours, extracurricular peer group characterised by rejection, no structure and controlling peers were negatively indirectly associated with adolescents' prosocial behaviours and extracurricular peer group prosocial behaviours were positively related to adolescents' prosocial behaviours via empathy. In the two contexts model of class peer group and family independent of extracurricular participation or non-participation, only family context predicted adolescents' prosocial behaviours; specifically, parents' prosocial behaviours positively predicted adolescents' prosocial behaviours. In the same model of the extracurricular peer group, family as social context negative, for instance, a family where adolescents perceived rejection, chaos and coercion, negatively influenced adolescents' prosocial behaviours via empathy. Finally, in the two-context model across peer groups (class peer group and extracurricular peer group), the only effect from the class context was a positive effect from a class group characterised by warmth, structured and autonomy supportive interactions that significantly predicted adolescents' prosocial behaviours via empathy, while the effects from the extracurricular group context comprised the negative features of extracurricular peer group which were negatively indirectly linked to adolescents' prosocial behaviours, and extracurricular peer group prosocial behaviours that positively predicted adolescents' prosocial behaviours via empathy. These contrasted findings, including effects from positive and negative features of two living environments, support the idea of applying the same theoretical model to analyse the role of living environments including both positive and negative dimensions (Skinner & Belmont, 1993; Skinner et al., 2008). Overall, these patterns were consistent across multigroup analyses by gender and age, even though some specificities appeared by age group.

Links between group as social context and adolescents' prosocial behaviours

The pattern of direct and indirect paths from the group as social context (family, class, and extracurricular peer group) to prosocial behaviours via empathy is particularly important as it takes into account the socialising role of family and peers for adolescents. Testing different models, from the most complex to the most specific³, our results showed a number of direct relations that were common across the models, such as family as social context positive, extracurricular and class peer group as social context negative with prosocial

³ A total of seven general models were tested across gender and age; we retained and presented four of them based on the fact that the others showed no main differences in statistical results.

behaviours. Interestingly, the path from family as social context positive was negatively linked to prosocial behaviours, this could be explained by the presence of a suppression effect (MacKinnon, Krull, & Lockwood, 2000) or it could be in part explained by the fact that warmth, structure and autonomy support from parents do not, in and of themselves, necessarily provide moral values to predict prosocial behaviours; these results are in line with recent study results that found that parental support were negatively related to altruistic forms of prosocial behaviours (Carlo, Streit, & Crockett, 2018). Thus, it seems that this pattern is not specific to the U.S. Latina/o samples they used.

In accordance with our first hypothesis, positive features of living environments showed an indirect positive link to adolescents' prosocial behaviours, and negative features of living environments showed an indirect negative link to adolescents' prosocial behaviours. However, in line with the second hypothesis, our findings highlighted the specific contribution of each context to adolescents' prosocial behaviours. Specifically, the three-context model results were in line with our second hypothesis since extracurricular context features were the only predictors among the different living environments of adolescents' prosocial behaviours. An extracurricular peer group that is perceived as rejecting, chaotic and coercive negatively influences adolescents' prosocial behaviours. This pattern was also found in the two-context model of class and extracurricular peer group, where the positive features of the class peer group indirectly and positively predicted adolescents' prosocial behaviours. In line with our hypothesis too, when considering adolescents who did not participate in an extracurricular peer group, family context features predicted adolescents' prosocial behaviours. Specifically, a family context perceived as rejecting, unpredictable and that overcontrolling was indirectly and negatively related to adolescents' prosocial behaviours; this study is in line with other findings that found that negative social interactions can have serious consequences (Arseneault, Bowes, & Shakoor, 2010; Zwierzyńska, Wolke, & Lereya, 2013). Overall, as expected, extracurricular peer group features (particularly the negative ones) play a major role in prosocial behaviours via empathy in adolescence. These results highlight the importance of considering the relations between contexts and adolescents psychosocial development (Brown, 2008; Collins & Laursen, 2004, Overton, 2010).

Links between adolescents' perceptions of group prosocial behaviours and adolescents' prosocial behaviours

Taking into account the socializing role of family and peers in adolescence, we also analysed the pattern of direct and indirect paths from group prosocial behaviours (class, extracurricular peer group and parents) to adolescents' prosocial behaviours and empathy. Our results showed a number of direct relations that were common across the models, such as significant positive direct relations from parents, class and extracurricular peer group prosocial behaviours with adolescents' prosocial behaviours. Concerning the indirect effects, in all the models where parents' dimensions were included, there were positive indirect effects from parents' prosocial behaviours to adolescents' prosocial behaviours via empathy. Similarly, in all the models tested across extracurricular peer group, there was a significant positive direct effect from extracurricular peer group prosocial behaviours to adolescents' prosocial behaviours via empathy.

The literature about extracurricular activity participation suggests that it is associated with an increase in positive outcomes (Maurizi, Ceballo, Epstein-Ngo, & Cortina, 2013, Geldhof, Bowers, & Lerner, 2013). Besides the family and school contexts, we were particularly interested in this context and its influence on a specific positive outcome such as adolescents' prosocial behaviours. Our findings yielded important significant results concerning the specificities and strengths of each context and particularly of the extracurricular context as we hypothesized.

Limitations, Strengths and Implications

Although we proposed a directional influence of living environment features and group prosocial behaviours on adolescents' prosocial behaviours via empathy, the current cross-sectional nature of the study has precluded us from making strong causal inferences about the constructs. A longitudinal design is needed to better infer causality and ascertain the direction of causal relations. It is possible, for example, that there are bidirectional relations between features of living environments and empathy. Moreover, the data were gathered with self-report questionnaires; including other reporters might increase the validity of our findings. In addition, questions regarding parents' prosocial behaviours concerned parents as a single unit, while adolescents' perceptions of mothers' and fathers' prosocial behaviours may have been significantly different and may influence adolescents' prosocial behaviours differently.

Nevertheless, the current research provides new insights into how features of different contexts could be studied simultaneously using the same approach with the purpose of capturing not only common features across contexts but also the specificities of each context. Our study highlights that fact that it is not the same features of the contexts that influence adolescents' prosocial behaviours; the presence and the strength of the relationship between the features of the context and adolescents' prosocial behaviours depend on the context being studied (Driessens, 2015). For instance, when adolescents do extracurricular activity, the negative features negatively influence their prosocial behaviours, in contrast to their class group who have a positive influence on them. Further research should consider the differences between these two contexts, in order to understand the underlying process; is there an influence concerning the liberty adolescents have to choose the group/ extracurricular activity they are included in? In any case, our findings point out the relevance in considering both positive and negative features of different living environments and their effects on adolescent psychosocial development. Our study explored new features applied to different contexts and uncovered new patterns of relations among these contexts and their influence on adolescents' prosocial behaviours, which necessarily require replication.

Although, the results suggest that the relations between contexts may be complex, our findings have important implications for future research and intervention efforts. The results increase our understanding and provide information by identifying living environment features across contexts that are important for adolescents' prosocial behaviour development. Specifically, prosocial behaviour development cannot be related to only one context because each context has a unique role. In crafting interventions, it is important to consider the context targeted and its specific features. Considering the influence that the peer context exerts on adolescents' prosocial development (Berger, Batanova & Duncan Cance, 2015), preventive efforts might highlight expanding adolescents' behavioural repertoires by conducting interventions focused in this case on developing prosocial behaviours, taking empathy into consideration but also the specific features of the context under study. For example, they could focus on peer interactions, perhaps through school-based intervention programmes that emphasize the importance of strengthening individual capacities (i.e. empathy) to foster students' prosocial behaviours by strengthening contextual social interaction (i.e. positive features of the context), pointing out the importance of having a positive atmosphere within the classroom through features in the classroom environment. In extracurricular groups, efforts should be focused on including models conducive to positive, prosocial exchange that

could promote prosocial behaviours and redirect the tendency of the context's negative features with their negative effect on adolescents' prosocial behaviours (Dodge, Coie, & Lynam, 2006). Finally, these applications have to be adapted to each living environment taking into account its features and its specific effects on adolescent prosocial behaviours, and sustained by a positive development- in-context approach.

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CHAPTER VIII

Bidirectional Longitudinal Relations between Empathy and Prosocial Behaviours during Adolescence

Bidirectional Longitudinal Relations between Empathy and Prosocial Behaviours during Adolescence

Abstract

Although research has shown the effects of empathy on prosocial behaviours, little is known about the longitudinal bidirectional relations between empathy and prosocial behaviours, the direction of the effect and the possible moderating role of gender and age. Moreover, longitudinal research on the development of empathy and prosocial behaviours in adolescence remains relatively scarce. Research has not examined within-person processes; hence, its practical implications are unclear. This three-wave study of adolescents (N = 610) examined a longitudinal, within-person relation between empathy and prosocial behaviours.

The standard cross-lagged model showed that only empathy predicted changes in prosocial behaviours, and that these relationships were moderated by age and gender. Specifically, they were stronger for females and middle-to-late adolescents than for males and early-to-middle adolescents. Similarly, the Random-Intercept Cross-Lagged Panel Model showed that only empathy predicted within-person changes. The relations between empathy and prosocial behaviours were significant at the between levels. In addition, empathy at T1 significantly predicted prosocial behaviours at T2, and within-person changes in empathy are related to within-person changes in prosocial behaviours over time. The findings suggest that it is important to take into account within-person changes in order to draw more specific conclusions about the longitudinal relations between empathy and prosocial behaviours.

Keywords: Prosocial behaviours - Empathy - Adolescence - Longitudinal bidirectional relations- Within-person level.

Prosocial behaviours have been defined as voluntary, intentional actions that result in benefits for another individual or group (e.g. Caprara, Alessandri, & Eisenberg, 2012; Carlo, Fabes, Laible, & Kupanoff, 1999; Eisenberg, Spinrad, & Knafo-Noam, 2015). These behaviours have garnered increased attention in recent years and are considered as fundamental to the development of social competence and morality during childhood and adolescence (Dunfield & Kuhlmeier, 2013; Eisenberg et al., 2015). A large body of empirical research has shown the beneficial role of prosocial behaviours for the actor and the target (e.g. Eisenberg, Fabes, & Spinrad, 2006). Prosocial behaviours have been positively linked to a range of personal outcomes such as self-esteem, self-efficacy, self-concept clarity, well-being (Fu, Padilla-Walker, Brown, 2017; Weinstein & Ryan, 2010; Zuffianò et al., 2014), agreeableness (Hilbig, Glöckner, & Zettler, 2014) and academic achievement (Gerbino et al., 2017). At the relational level, adolescents who engage in prosocial behaviours are more likely to have positive peer relationships and high friendship quality, are capable of managing social challenges, are more socially competent and have a high sense of community and civic engagement (Hardjono, Munawir, & Hardjono, 2017; Luengo Kanacri, et al., 2014; Shin, 2017; Wentzel, 2014). Moreover, prosocial behaviours have been linked to a range of behavioural outcomes, and are considered as a protective factor against externalizing (e.g. aggression, delinquency), internalizing (e.g. depressive symptoms, suicidal ideation), and relational problems (loneliness, discrimination, peer victimization) (Cáceda et al., 2014; Davis et al., 2016; Griese & Buhs, 2014; Llorca-Mestre, Malonda-Vidal, & Samper, 2017; McDonald, Wang, Menzer, Rubin, & Booth-LaForce, 2011). Prosocial behaviours thus encompass several areas, including biological, motivational, cognitive, situational and social processes (Penner, Dovidio, Piliavin, & Schroeder, 2005). Additionally, and inherent to the question of the origins of prosocial behaviours, the bulk of theoretical literature and empirical studies suggest that prosocial behaviours are motivated by empathy (e.g. Batson & Powell, 2003; Eisenberg & Miller, 1987; Hoffman, 2008; Knafo & Israel, 2012; Litvack-Miller, McDougall, & Romney, 1997; Lockwood, Seara-Cardoso, & Viding, 2014).

Many authors have differentiated between different types of empathy. The most common distinction is between “cognitive” and “emotional” empathy (Eisenberg & Fabes, 1998; Oliveira-Silva & Gonçalves, 2011; Spinrad & Eisenberg, 2009) and most scholars agree that empathy should be seen as a complex multidimensional construct. Considering developmental, neuroimaging and neuropsychological studies of empathy and regardless of the terminology used, there is broad agreement among scholars on three primary aspects: 1)

an affective response to another person, which often, but not always, entails sharing that person's emotional state, 2) a cognitive capacity to take the perspective of the other person, and 3) some self-regulatory and monitoring mechanisms that modulate inner states (Archer, 1991; Batson & Shaw, 1991; Decety, Bartal, Uzefovsky, & Knafo-Noam, 2016; Eisenberg, Spinrad, & Morris, 2014).

In this study, we decided to use the three-factor model comprising emotional contagion, cognitive empathy and emotional disconnection (Carré, Stefaniak, D'Ambrosio, Bensalah, & Besche-Richard, 2013), which is based on three primary aspects of empathy. This conception posits that three elements are gradually built into the construction of empathy (Decety, 2010, 2011; Decety & Svetlova, 2012). From a developmental viewpoint, emotional contagion processes are the first to appear. Then, more cognitive (i.e. cognitive empathy) and regulatory (i.e. emotional disconnection) functions develop in parallel with cognitive and cerebral maturation (Zelazo, Carlson, & Kesek, 2008). This three-factor model is consistent with developmental and neuroimaging studies of empathy (Cowell & Decety, 2015; Decety & Michalska, 2010; Lamm, Decety, & Singer, 2011) and allows us to see empathy as an active process based on functional and dynamic mechanisms that are involved in social contexts and account for the processes involved in empathy (Gerdes, Lietz, & Segal, 2011).

Concerning the conceptual connection between empathy and prosocial behaviours, empirical research and an extensive literature place the processes of empathy in a central position with regard to their contribution to social cognition, especially concerning the relationships between actions, emotions, sensations and their perception (Decety, 2010). For instance, research has shown a correlation between empathy and prosocial behaviours (Eisenberg, 2002; Eisenberg & Eggum, 2008; Engelen & Röttger-Rössler, 2012; Hoffman, 2008) and some authors consider that prosocial behaviours illustrate the development of empathy (Barr & Higgins-D'Alessandro, 2007; Eisenberg, Fabes, & Spinrad, 2006).

As mentioned above and consistent with theory and empirical support for the relation between empathy and prosocial behaviours in childhood and adolescence (Clark & Giacomantonio, 2015; Eisenberg & Eggum, 2008), some studies have focused on empathy as a predictor of prosocial behaviours (Decety et al., 2016; Siu, Shek, & Lai, 2013). However, social cognitive theory posits that exhibiting prosocial behaviours may also influence sociocognitive and socioemotive tendencies, including empathy (Kim & Kou, 2014; Van der Graaff et al., 2017).

To the best of our knowledge, few studies have examined the bidirectional relations between empathy and prosocial behaviours during adolescence (Caprara et al., 2012; Carlo, Mestre, Samper, Tur, & Armenta, 2010; Carlo, Padilla-Walker, & Nielson, 2015) and these rare studies provide evidence of the expected bidirectional relations between empathy and prosocial behaviours. It should be noted, however, that the newest findings suggest a relatively stronger effect of empathy on prosocial behaviours than the reverse (Carlo et al., 2015), although these findings may lack generalizability as the study was limited to 32 participants. Thus, the question of directionality is important and particularly relevant during adolescence, on the one hand because we do not know which of the constructs leads to the other: is it experiencing empathy which leads to more prosocial behaviours or is it the other way around? Or do both constructs influence each another? And on the other hand, because adolescence has been conceived as a transitional period that it is characterised not only by a number of physical and physiological changes, but also by individual, social and contextual transitions combined with the development of higher order emotional and cognitive reasoning abilities (Blakemore, Burnett, & Dahl, 2010; Blakemore & Mills, 2014; Steinberg, 2005).

Although an important basis is established in childhood, several cognitive, relational and physical changes that take place during adolescence might affect the capacity or tendency to show empathy (Hoffman, 2001b). Studies suggest that there is a connection between brain maturation and changes in the brain structure and adolescents' behavioural and emotional development (Paus, 2005; Steinberg, 2005) that may allow adolescents to engage in a wider variety of prosocial behaviours (Carlo, McGinley, Hayes, & Martinez, 2012). Neuro-imaging studies have shown that changes in social cognition during adolescence are paralleled by changes in the social brain network (Blakemore & Mills, 2014). Therefore, prosocial behaviours are expected to increase as a result of advances in perspective taking (Galinsky & Moskowitz, 2000; Van der Graaff et al., 2014), information processing and expertise (Ahmed, Bittencourt-Hewit, & Sebastian, 2015; Keating, 2004), and that may facilitate higher-stage moral reasoning and social understanding (Carlo, et al., 2010; Crone & Dahl, 2012; Eisenberg, Hofer, Sulik, & Liew, 2014; Kumru, Carlo, Mestre, & Samper, 2012; Luengo Kanacri et al., 2017). In addition, one of the most prominent changes in adolescence is related to the increased salience of social and peer interactions which might offer opportunities to engage in more prosocial behaviours due to changes in social contexts and interpersonal relationships (Allemand, Steiger, & Fend, 2015; Brown & Larson, 2009; Collins & Steinberg, 2006). Thus, besides prosocial behaviours, the ability to be empathic is particularly important

in adolescence because a lot of social reorientation takes place that heightens the salience of peer relationships and enhances the role of empathy in effective social interactions (Blakemore & Mills, 2014; Lamm et al., 2011; Singer & Lamm, 2009). Moreover, from a developmental point of view, it is important to consider the longitudinal relations between empathy and prosocial behaviours during this period characterised by a range of changes at different levels. The empirical findings between age and empathy development yield mixed and inconsistent results (Eisenberg, Cumberland, Guthrie, Murphy, & Shepard, 2005; Lockwood et al., 2014; Zakriski, Wright, & Underwood, 2005). Some studies suggest an increase in empathy across adolescence (Allemand et al., 2015; Eisenberg et al., 2006; Garaigordobil, 2009; Garaigordobil & Galdeano, 2006). Others have found an increase in affective empathy with females showing higher affective empathy than males (Knafo, Zahn-Waxler, Van Hulle, Robinson, & Rhee, 2008; Lam, Solmeyer, & McHale, 2012; Overgaauw, Rieffe, Broekhof, Crone, & Güroglu, 2017; Van der Graaff et al., 2017). In contrast, some researchers have shown stable levels of affective empathy over time for both genders (Eisenberg, et al., 2005), while others have revealed stable levels from ages 13 to 18 only for female adolescents, and a temporary decrease followed by an increase from middle adolescence for male adolescents (Van der Graaff et al., 2014). Despite all these inconsistencies and mixed results according to age and gender, most studies have shown that precursors of empathy appear early in life in the form of simple emotional contagion (e.g. Hoffman, 2000; Hoffman, 2001a; Singer & Klimecki, 2014; Singer & Lamm, 2009) and develop through childhood and adolescence alongside major cognitive and emotional development (Eisenberg & Morris, 2001).

Concerning prosocial behaviours, longitudinal studies that examined the link between age and changes during adolescence have shown somewhat mixed results. Often cited in support of an increase in prosocial behaviour frequencies with age is a meta-analysis conducted by Eisenberg and Fabes (1998). This increase is observed on some types of prosocial behaviours, for instance, adolescents engaging in more prosocial behaviours than children but only for measures of sharing or donating, not in instrumental help or comforting. However, it is important to mention that the vast majority of studies included in this meta-analysis relied on cross-sectional designs comparing children from different age cohorts. Therefore, differences are observed depending on the study design used. For instance, prosocial behaviours increase with age in experimental and structured studies but not in naturalistic or correlational designs (Flynn, Ehrenreich, Beron, & Underwood, 2015).

However, some studies have suggested that these differences are due to the informant or social desirability (Kumru et al., 2012).

Results from longitudinal studies using self-reports are mixed. Some studies found a decline from 12-13 years old followed by a slight increase at 17-18 years old. Specifically, in a 5-year longitudinal study of rural adolescents in the US, researchers found that the frequency of self-reported prosocial behaviours decreased throughout junior high school to 11th grade and increased marginally in 12th grade (Carlo, Crockett, Randall, & Roesch, 2007). These results have been supported by similar results in recent studies (Carlo et al., 2015; Flynn et al., 2015; Luengo Kanacri, Pastorelli, Eisenberg, Zufiano, & Caprara, 2013; Zuffianò et al., 2014). Other studies found stable levels of prosocial behaviours until age 14 (Caprara, Luengo Kanacri, Zuffiano, Gerbino, & Pastorelli, 2015; Van der Graaff et al., 2017), followed by an increase until age 17 and a slight decrease thereafter. Self-report studies have shown that girls scored higher than boys (Alessandri, Caprara, Eisenberg, & Steca, 2009; Barr & Higgins-D'Alessandro, 2007; Caprara et al., 2012; Eagly, 2009; Eisenberg, Cumberland, et al., 2005; Mestre, Carlo, Samper, Tur-Porcar, & Mestre, 2015). On the associations between gender and development of prosocial behaviours, some studies have shown an overall decrease in prosocial behaviours among males (Carlo et al., 2007; Carlo et al., 1999; Luengo Kanacri et al., 2013), while other studies suggest no significant gender differences, and more specifically, a cubic pattern of age-related changes in prosocial behaviours for boys and girls (Carlo et al., 2015). However, there is a relative dearth of direct research on the relation between the role of age and gender in the bidirectional relations between empathy and prosocial behaviours (Allemand, Steiger, & Fend, 2015). Even less is known about gender differences and bidirectional relations between empathy and prosocial behaviours during the period of adolescence, as most studies have focused on young children, middle-to-late adolescence or young adults (McMahon, Wernsman, & Parnes, 2006), as adolescents may differ in their bidirectional relations over the years.

In sum, although most studies posit empathy as a predictor of prosocial behaviours, authors from social cognitive theory and prosocial behaviours suggest that reverse direction effects are possible (Carlo et al., 2015; Kim & Kou, 2014; Van der Graaff et al., 2017). Thus, there are still large gaps in the literature that need to be addressed. First, although adolescence might be a particularly relevant developmental stage to study empathy and prosocial behaviours due to its range of physical, physiological, individual, social and contextual transitions combined with the development of higher order emotional and cognitive reasoning

abilities, longitudinal research on adolescents is scarce and ambiguous concerning developmental changes and most studies on the relation between empathy and prosocial behaviours have focused on children, middle-late adolescents or young adults. Second, there is a dearth of studies that have examined the bidirectional relations between empathy and prosocial behaviours. Therefore, the unique effects and direction of the effects taking into account the moderating factors, such as gender and age, have not been considered. There are however some crucial differences between males and females and between early and late adolescence with respect to empathy and prosocial behaviours. These differences may also result in differences in the relationship between empathy and prosocial behaviours. Third, most studies are cross-sectional, and although there are longitudinal studies, they have been based on statistics for between-person effects (i.e. capturing covariation in rank order positions of individuals), mean-levels changes, or aggregated within-and between-person effects. Thus, the practical implications of their findings are unclear because one should not equate between-person differences with within-person processes, as these might differ in strength and direction. In order to examine the effects between empathy and prosocial behaviours at the within-person level person while controlling for stable, between-person differences, some authors have suggested a new statistical approach, the Random Intercept-Cross Lagged Panel Model that partitions the variance of the scores into variance between persons (i.e. stable invariant) and variance within persons (i.e. fluctuations over time) and allows for examining cross-lagged relations at the within-person level.

The Present Study

The purpose of the present study is to address these three gaps in the current literature by (1) investigating the longitudinal bidirectional relations between empathy and prosocial behaviours in adolescence. To disentangle the direction of effects between empathy and prosocial behaviours, we explored cross-lagged relations, thereby controlling for concurrent associations and stability of empathy and prosocial behaviours when estimating bidirectional effects over time. We expected that empathy would be associated longitudinally with subsequent prosocial behaviours, and that earlier prosocial behaviours would also promote future empathy; (2) examining whether gender and age affect these relations. We expected that the bidirectional relations between empathy and prosocial behaviours would be stronger for girls than boys. Similarly, we expected that the bidirectional relationships between empathy and prosocial behaviours would be stronger for middle-to-late adolescents than for early-to-middle adolescence; and (3) examining the longitudinal, within-person relation

between empathy and prosocial behaviours; this aim was addressed by examining whether adolescents' empathy would predict within-person changes in their prosocial behaviours and whether adolescents' prosocial behaviours would predict within-person changes in empathy.

Method

Participants

The data used in this study are part of a three-wave study (2014-2017) on the role of living environments in empathy and prosocial behaviour development in adolescence. The waves were relatively equidistantly spaced, with the majority of the data collected annually in the same month as the first measurement time at each Junior and High School participating in the study. The sample consisted of 610 adolescents from 10.37 to 18 years old. There were no exclusionary criteria with respect to participant selection. Participants were recruited from various Junior and High Schools in the cities of Bordeaux and Saint Brieuc in France. Adolescents and their parents received written information about the research prior to the study; the possibility of not participating was also explained in this letter. Written informed consent was also obtained for the schools. Once a year, adolescents filled out a battery of questionnaires at school after school hours. Confidentiality was guaranteed explicitly. Research assistants gave verbal instructions to the adolescents to complement the written instructions printed above each questionnaire. Completing the questionnaires lasted an hour. Adolescents received no reward for any wave they participated in.

Of the 610 adolescents, 53.2% were females and 46.8% were males. In order to analyse the period of adolescence, participants were divided into 2 groups according to Educational Level (grade) at the first measurement time. The first group comprised 6th grade pupils ($n = 383$; $M_{\text{age}} = 12.14$; $SD = 0.59$) and was labelled "early-to-middle adolescence". The second one comprised 10th grade pupils ($n = 227$; $M_{\text{age}} = 14.70$; $SD = .50$) and was labelled "middle-to-late adolescent". As mentioned above, this study used three waves of data (i.e. Wave 1, 2, and 3) at three different grades (grades 6, 7, and 8 for the early-to middle adolescence group / grades 10, 11 and 12 for the middle-to-late adolescence one) with a one-year interval between waves. Because adolescents were assessed during three measurement waves, an age range from 10.37 to 14 years for the first cohort and from 14.70 to 17.80 for the second one was available.

In total, the percentage of missing data across waves and variables was 7.06%. The percentage of missing values across the prosocial behaviours and empathy variables ranged

between 5.37% and 8.41% respectively. No consistent relationships were found between missingness on variables and other variables, or the same variables at other waves. This indicates that data were likely to be missing at random (MCAR). In order to deal with the missing data, full information maximum likelihood (FIML) with robust estimates (MLR) in Mplus version 8.1 was used (Enders, 2001, Muthén, & Muthén, 2017).

Procedure

Measures

The Basic Empathy Scale (BES). In order to assess adolescents' perception of their own empathy behaviours, the BES, which is a 20-item questionnaire rated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) developed by Jolliffe and Farrington (2006) and adapted in French by Carré, et al., (2013) was used. It includes three dimensions: emotional contagion (6 items, e.g. "I get caught up in other people's feeling easily"), cognitive empathy (8 items, e.g. "I can understand my friend's happiness when she/he does well at something") and emotional disconnection (6 items, "I am not usually aware of my friend's feelings"). In order to assess the psychometric validity of the three-factor structure on an adolescents' sample, a CFA was performed. The three-factor structure was supported except for three items (item 15 from emotional contagion with factor loading lower than .30, and items 6 and 20 from cognitive empathy loading on more than one dimension). This three-factor model had a good fit, $\chi^2(116, N = 1545) = 879.25, p < .001$, RMSEA = .065 [0.061-0.069], CFI=.95, WRMR = 1.81. The reliability⁴ of the items in the study was good: .69, .72, and .73 for emotional contagion; .77, .73, and .78 for cognitive empathy; and .70, .75, and .79 for emotional disconnection at T1, T2 and T3, respectively. In addition, partial scalar measurement invariance across gender and age was attested $\chi^2(284, N = 1545) = 1062.41, p < .001$, RMSEA = .060, CFI=.94, WRMR = 2.189, $\Delta CFI = .002$, $\Delta RMSEA = -.005$ and $\chi^2(278, N = 1545) = 930.93, p < .001$, RMSEA = .055, CFI=.96, WRMR = 1.98, $\Delta CFI = .005$, $\Delta RMSEA = -.004$ respectively. Moreover, full scalar longitudinal measurement invariance was assessed, $\chi^2(1258, N = 610) = 1965.914, p < .001$, RMSEA = .030, CFI=.95, WRMR = 1.19, $\Delta CFI = -.005$, $\Delta RMSEA = .000$.

The Prosocial Behaviour Scale (PBS). Adolescents reported on their own prosocial behaviours toward others. A validated French adaptation (Carrizales et al., 2017) of the prosociality scale was used (Caprara, Steca, Zelli, & Capanna, 2005). The French version

⁴ Omega coefficients, *** p <.001.

assesses two types of prosocial behaviours: helping (6 items) and caring (8 items) (e.g. “I try to help others” and “I try to console people who are sad”, respectively) on a 5-point Likert scale ranging from 1 (*Never/ almost never*) to 5 (*almost always/always*). In the present study, in order to avoid a possible overlap among items of the caring dimension and the empathy scale, only four items for the caring dimension were used. The internal reliability⁵ of the items in the study was good: .78, .79, and .82 for helping and .69, .75; and .68 for caring at T1, T2 and T3, respectively. In addition, partial scalar measurement invariance across gender and age was attested χ^2 (182, N = 1640) = 571.90, $p < .001$, RMSEA = .051, CFI=.97, WRMR = 1.73, Δ CFI =.003, Δ RMSEA = .006 and χ^2 (180, N = 1640) = 569.29, $p < .001$, RMSEA = .051, CFI=.96, WRMR = 1.72, Δ CFI =.000, Δ RMSEA = .006 respectively. As well as full scalar longitudinal measurement invariance χ^2 (451, N = 610) = 692.023, $p < .001$, RMSEA = .030, CFI=.97, WRMR = 1.06, Δ CFI = -.004, Δ RMSEA = .000

Preliminary Analyses

Means, SDs and correlations of the study variables can be found in Table 1 and Table 2. Prosocial behaviours and empathy were positively related at each time point ($r = .51$, $r = .52$, $r = .48$) at T1, T2 and T3 respectively.

Table 1. Means, SDs of prosocial behaviours and empathy for the total population, males and females, early-to-middle and middle-to late adolescents

	Total (N=606)	Males (n=324)	Females (n=144)	Early-to- middle adolescents (n=144)	Middle-to-late adolescents (n=227)
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Prosocial behaviours					
Wave 1	3.68 (.63)	3.45 (.65)	3.87 (.55)	3.77 (.63)	3.56 (.62)
Wave 2	3.69 (.66)	3.53 (.71)	3.83 (.57)	3.70 (.68)	3.66 (.61)
Wave 3	3.74 (.64)	3.61 (.67)	3.85 (.59)	3.77 (.70)	3.69 (.54)
Empathy					
Wave 1	3.80 (.58)	3.53 (.57)	4.01 (.46)	3.80 (.59)	3.79 (.52)
Wave 2	3.77 (.62)	3.58 (.60)	3.93 (.58)	3.69 (.62)	3.92 (.58)
Wave 3	3.72 (.63)	3.55 (.62)	3.86 (.60)	3.64 (.66)	3.84 (.57)

⁵ Omega coefficients, *** $p < .001$.

Table 2. Correlation coefficients between prosocial behaviours and empathy

	ω_s	1	2	3	4	5	6
1. Prosocial behaviours (Time 1)	.75	1	.302***	.230***	.515***	.204**	.131**
2. Prosocial behaviours (Time 2)	.77		1	.393***	.315***	.519***	.314***
3. Prosocial behaviours (Time 3)	.80			1	.147***	.287***	.478***
4. Empathy (Time 1)	.67				1	.331***	.175***
5. Empathy (Time 2)	.69					1	.517***
6. Empathy (Time 3)	.69						1

Note. ω_s = omega coefficient, ** $p < .01$, *** $p < .001$.

In order to assess mean-level changes in empathy and prosocial behaviours across measurement times and taking into account gender and age, mixed repeated measure analyses of variance with a within-subjects factor (empathy / prosocial behaviours measurement time) and a between-subject factor of gender / age (male, female / early-to-middle and middle-to-late adolescent) were performed. For empathy and gender, Mauchly's test indicated that the assumption of sphericity had been violated ($\chi^2(2) = 34.44, p < .001$). Therefore, degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\epsilon = 0.93$). The main effects of empathy time measures, $F(1.87, 889.7) = 4.89, p < .01, \eta_p^2 = .010$, and gender, $F(1, 476) = 95.26, p < .01, \eta_p^2 = .17$, were qualified by an interaction between empathy time measures and gender, $F(1.87, 889) = 4.91, p < .01, \eta_p^2 = .010$. Pairwise comparison with Bonferroni adjustment showed that empathy between T1, T2 and T3 did not significantly differ ($p = 1; p = .08$) but empathy decreased between T2 and T3 ($p < .01$). Looking only at the effects of gender, the results showed that for males, empathy at T1 and T3 did not significantly change ($p = .95$), increased between T1 and T2 ($p < .05$) and decreased between T2 and T3 ($p < .05$). For females, there was no significant change between T1 and T2 ($p = .06$) and there was a decrease between T2 and T3 ($p < .05$) and T1 and T3 ($p < .001$). For prosocial behaviours and gender, Mauchly's test indicated that the assumption of sphericity had been violated ($\chi^2(2) = 7.95, p < .05$). Therefore, degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\epsilon = 0.98$). The main effects of prosocial behaviour time measures, $F(1.97, 284) = 2.03, ns$, and gender, $F(1, 520) = 70.77, p < .001, \eta_p^2 = .12$, were qualified by an interaction between prosocial behaviour time measures and gender, $F(1.97, 284) = 4.48, p < .01, \eta_p^2 = .0090$. Pairwise comparison with Bonferroni adjustment showed that prosocial behaviours did not significantly change over time (p from .18 to 1). Looking only at the effects of gender, the results showed that for males, prosocial

behaviours between T1 and T3 increased ($p < .01$), and no other significant change was observed. For females, there was no significant change over time (p from .41 to .93).

The same procedure was used with age as a between-subject factor (early-to-middle and middle-to-late). For empathy and age, Mauchly's test indicated that the assumption of sphericity had been violated ($\chi^2(2) = 33.48, p < .001$). Therefore, degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\epsilon = 0.93$). The main effects of empathy time measures, $F(1.87, 891.3) = 3.76, p < .05, \eta_p^2 = .008$, and age, $F(1, 476) = 8.12, p < .01, \eta_p^2 = .017$, were qualified by an interaction between empathy time measures and age, $F(1.87, 891.3) = 5.59, p < .01, \eta_p^2 = .012$. Pairwise comparison with Bonferroni adjustment showed that empathy between T1, T2 and T3 did not significantly differ ($p = 1; p = .26$) but empathy increased between T2 and T3 ($p < .01$). Looking only at the effects of age, the results showed that for early-to-middle adolescents, there was no significant change between T1 and T2 ($p = .11$) but empathy decreased from T2 to T3 ($p < .01$ and T1 to T3 ($p < .001$)). For middle-to-late adolescents, empathy increased from T1 to T2 ($p < .05$) and there was no other significant change. For prosocial behaviours and age, Mauchly's test indicated that the assumption of sphericity had been violated ($\chi^2(2) = 8.90, p < .01$). Therefore, degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\epsilon = 0.98$). There was no significant main effect of prosocial behaviours, $F(1.97, 1022.6) = 1.69, p = .18$ and no significant interaction effect between age and prosocial behaviours, $F(1.97, 1022.6) = .971, p = .38$. However, age has a main effect $F(1, 520) = 8.247, p < .01, \eta_p^2 = .016$. Pairwise comparison with Bonferroni adjustment showed that prosocial behaviours across time did not significantly differ (p from .25 to 1). Looking only at the effects of age, the results showed that there were no significant changes between age and prosocial behaviours (p from .10 to .73).

Primary Analysis

The research questions were examined with three types of analyses: (1) standard cross-lagged panel models (CLPM), (2) Random-Intercept cross-lagged panel models (RI-CLPM) and (3) Multigroup analyses (MG) within Mplus Version 8.1 (Muthén & Muthén, 2017). The first step in the analyses was testing a baseline model for the total sample, in which we estimated stability paths (autocorrelations) of empathy, stability paths of prosocial behaviours, as well as correlations between within-wave residuals, empathy and prosocial behaviours. In subsequent models, cross-lagged paths were added to the baseline model to investigate whether this improved the overall fit of the total model. The second model was a

unidirectional model from adolescents' empathy to prosocial behaviours, implying that empathy affects perceived prosocial behaviours and not vice versa. The third model was also a unidirectional model, but in this model paths were drawn from prosocial behaviours to empathy, implying that adolescents' perception of prosocial behaviours affect empathy and not vice versa. The last model was a bidirectional model with mutual paths between empathy and prosocial behaviours, based on the assumption that there are bidirectional effects between these constructs.

For the sake of parsimony we tested whether it was possible, across the waves, to fix the within-wave correlated residuals and the cross-lagged paths between adolescents' empathy and prosocial behaviours. After determining which model best represented the data of the total sample, we used two series of multi-group analyses to test the moderation effects of gender and age on the associations between empathy and prosocial behaviours. We constrained within-wave correlated residuals and cross-lagged paths between adolescents' empathy and prosocial behaviours to be equal across groups (i.e. males vs. females, early-to middle group vs. middle-to-late group). The setting of different paths as equal did not significantly worsen the model fit, there were no significant differences between the two groups, and we used the constrained models. To assess the fit of the models, several goodness-of-fit indices were used: the Comparative Fit Index (CFI), with values above 0.90 representing a satisfactory fit and values above 0.95 demonstrating a good fit; the Root Mean Square Error of Approximation (RMSEA), with values up to 0.10 indicating an acceptable fit and values up to 0.05 being indicative of a good fit (Hu & Bentler, 1999). Chi-square difference tests were used to compare the fit of different models. Relatively lower RMSEAs and higher CFIs also indicate better fits (Kline, 2016).

RESULTS

Standard Cross-Lagged Panel Model (CLPM)

To examine the bidirectional relations between empathy and prosocial behaviours, a cross-lagged panel model was estimated. First, we tested whether adding the cross-lagged paths between empathy and prosocial behaviours improved the model fit compared to a baseline model with only stability paths and within-wave correlated residuals (Model 1). Both Model 2 (baseline model with paths from empathy to prosocial behaviours) and Model 4 (baseline model with bidirectional paths) improved the fit compared to the baseline model (Model 1). As model 3 (baseline model with paths from prosocial behaviours to empathy) did

not improve the fit compared to the baseline model, and Model 4 did not improve the fit compared to Model 2, we chose Model 2 as the best fitting model (see Table 3).

Table 3. Model comparisons of standard cross-lagged path analysis of empathy and prosocial behaviours

	Model fit indices				Model comparison test		
	$\chi^2_{SB^2}$	df	CFI	RMSEA		$\Delta\chi^2_{SB^2}$	Δdf
Model 1. Baseline model	144.265	68	.97	.043			
Model 2. Baseline model +paths Empathy→Prosocial behaviours	131.589	66	.97	.040	2 vs. 1	13.21***	2
Model 3. Baseline model +paths Prosocial behaviours → Empathy	143.305	66	.96	.044	3 vs.1	1.011	2
Model 4. Baseline model + bidirectional paths	131.823	64	.97	.042	4 vs. 1	12.42**	4
					4 vs. 2	0.03	2
					4 vs. 3	11.53**	2

Note. $\chi^2_{SB^2}$ = Satorra-Bentler Chi-Square; df = degrees of freedom; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; CI = Confidence Interval; Δ = change in parameter. ** $p < .01$, *** $p < .001$. Model 3 vs 1 $p = .60$. Model 4 vs 2 $p = .98$

Then we examined whether it was possible to constrain stability paths, cross-lagged paths and within-wave correlations across waves and across age and gender. Unstandardized parameter estimates in our model were constrained and mean levels were allowed to vary across age and gender. This allowed us to test whether it was possible, across waves, to fix the stability paths of prosocial behaviours and empathy, the cross-lagged paths from empathy to prosocial behaviours and the within-waves correlations between empathy and prosocial behaviours in order to examine if these paths were of the same strength across waves while allowing these paths to vary between age and gender. The Wald test (Wald = 7.026 (5), *ns*) indicated that apart from the T2-T3 stability paths of empathy, all the other parameters could be constrained over time, reducing the model complexity (Hamaker, Kuiper, & Grasman, 2015). The fit of the final CLPM model was excellent $\chi^2_{SB^2}$ (66) = 131.589, $p < .001$, CFI=.97; RMSEA=.040, SRMR = .042.

The results showed that adolescents who at T1 reported higher levels of empathy relative to the rest of the sample reported significantly higher levels of prosocial behaviours. The effect was high, $r = .73$, $p = .001$. Moreover, the only significant cross-lagged effect found was from empathy to prosocial behaviours at T1 ($B = .31$, $p = .002$, 95% confidence interval [CI] [0.09]-[0.56]). In addition, correlated residuals were found for empathy and prosocial behaviours ($r = .64$, $p = .001$, and $r = .57$, $p = .001$ at T2, and T3). In sum, the

standard cross-lagged model showed no bidirectional relative effects between empathy and prosocial behaviours; the model comparison test and model fit indices of the different models showed that the best fitting model was the unidirectional model with the path from empathy to prosocial behaviours (Model 2) and that the only significant cross-lagged effect was at T1.

Gender Differences

Given the mean gender differences found above, we conducted a multigroup model comparison as a function of adolescent gender to examine whether the path coefficients differed between females and males. Model comparisons were conducted using the robust chi-square difference test ($\Delta\chi^2_{SB^2}$). We examined whether it was also possible to fix the different paths (i.e. stability paths except T2-T3 empathy path: $\Delta\chi^2_{SB^2} = .57$ (3) ns; cross-lagged paths: $\Delta\chi^2_{SB^2} = .47$ (2) ns; and within wave correlation: $\Delta\chi^2_{SB^2} = 6.36$ (3) ns), and each constrained path was tested separately. Considering the results of the robust chi-square difference test for each constrained path, we tested a final model where all the parameters that could be constrained were specified (stability paths except T2-T3 empathy path, cross-lagged paths and within wave correlations: $\Delta\chi^2_{SB^2} = 10.004$ (8) ns. The fit of the CLPM gender constrained model was good $\chi^2_{SB^2}$ (158) = 250.876, $p < .001$, CFI= .95; RMSEA=.044, SRMR = .080.

The results showed, as expected, that adolescents who at T1 reported higher levels of empathy relative to the rest of the sample, reported significantly higher levels of prosocial behaviours. The effects were higher, $r = .71$, $p = .001$ and $r = .55$, $p = .001$, for females than for males. Moreover, empathy significantly predicted prosocial behaviours at T1 ($B = .24$, $p = .015$, 95% confidence interval [CI] [0.03]-[0.51] and $B = .23$, $p = .014$, 95% confidence interval [CI] [0.03]-[0.51] for females and males, respectively). In addition, correlated residuals were found for empathy and prosocial behaviours ($r = .66$, $p = .001$, and $r = .56$, $p = .001$ at T2, and T3, for females and, $r = .62$, $p = .001$, and $r = .58$, $p = .001$ at T2, and T3, for males). In sum, adolescents who reported higher levels of empathy relative to the rest of the sample, reported significantly higher levels of prosocial behaviours, and these effects were higher for females. In addition, empathy predicted prosocial behaviours at T1, and this effect was significant even after controlling for cross-time stability and within-wave correlations of all variables.

Age Group Differences

Given the mean age differences found above, we conducted a multigroup model comparison as a function of adolescents' age group to examine whether the path coefficients differed between early-to-middle adolescence and middle-to-late adolescence. Model comparisons were conducted using the robust chi-square difference test ($\Delta\chi^2_{SB^2}$). We examined whether it was also possible to fix the different paths (i.e. stability paths, except T2-T3 empathy and T1-T2 prosocial behaviours paths: $\Delta\chi^2_{SB^2} = 7.74$ (2) *ns*; cross-lagged paths: $\Delta\chi^2_{SB^2} = 1.52$ (2) *ns*; and within wave correlation: $\Delta\chi^2_{SB^2} = 1.10$ (3) *ns*), and each constrained path was tested separately. Considering the results of the robust chi-square difference test for each constrained path, we tested a final model where all the parameters that could be constrained were specified (stability paths, except T2-T3 empathy and T1-T2 prosocial behaviours paths, cross-lagged paths and within wave correlations: $\Delta\chi^2_{SB^2} = 11.917$ (7) *ns*). The fit of the CLPM constrained model was good $\chi^2_{SB^2}$ (157) = 329.070, $p < .001$, CFI = .93; RMSEA = .060, SRMR = .95.

The results showed, as expected, that adolescents who at T1 reported higher levels of empathy relative to the rest of the sample, reported significantly higher levels of prosocial behaviours. The effects were higher for the middle-to-late adolescence group, $r = .89$, $p = .001$ compared to the early-to-middle adolescence group, $r = .68$, $p = .001$. Moreover, empathy significantly predicted prosocial behaviours at T1 ($B = 42$, $p = .002$, 95% confidence interval [CI] [0.13]-[0.22] and $B = 36$, $p = .002$, 95% confidence interval [CI] [0.18]-[0.66] for early-to-middle adolescence group and middle-to-late adolescence group, respectively). In addition, correlated residuals were found for empathy and prosocial behaviours ($r = .68$, $p = .001$, and $r = .50$, $p = .001$ at T2, and T3, for early-to-middle adolescence group and, $r = .61$, $p = .001$, and $r = .75$, $p = .001$ at T2, and T3, for middle-to-late adolescence group). In sum, adolescents who reported higher levels of empathy also reported higher levels of prosocial behaviours; these effects were higher for middle-to-late adolescents. Additionally, empathy predicted prosocial behaviours at T1, and this effect was significant even after controlling for cross-time stability and within-wave correlations of all variables.

RI-CLPM

To test whether the statistical effects found with the standard cross-lagged model reflect within-person linkages or between-person differences, the extent to which there is sufficient variance at the within- and between-person levels was first examined by calculating

the ICCs of latent variables. For adolescents' empathy, the ICC of latent variable was .151. This indicates that 15.1% of the variance in the latent measure of empathy is explained by differences between adolescents, and the remaining 84.9% is explained by fluctuations within a person. The ICC for prosocial behaviours was .145. This indicates that 14.5% of the variance in the latent measure of prosocial behaviours is explained by differences between adolescents, and the remaining 85.5% is explained by fluctuations within a person. Hence, for each of the variables in the study a small portion of the variance is due to stable differences between adolescents (ranging between .145 and 151 percent). However, this also means that 84.9% to 85.5% of the variance is due to fluctuations over time in adolescents' empathy and prosocial behaviours. Therefore, in the next model, RI-CLPM, these two types of variances were disentangled. The same steps used in the standard cross-lagged model were used in order to examine whether it was possible to constrain paths. The Wald test results (Wald= 4.622 (6), *ns*) indicated that apart from the T2-T3 stability paths of empathy, all the other parameters could be constrained over time. The fit of this RI-CLPM was excellent χ^2 (63) = 126.454, $p < 0.0001$, RMSEA = .041 [0.030-0.051], CFI=.97, SRMR = .041. The inclusion of the random intercept improved the model fit compared with the cross-lagged model ($\Delta\chi^2$ SB²= 5.199 (3), *ns*), suggesting it provides a better representation of the data.

The correlation between the overarching latent factors reflects how between-person differences in one construct are linked to the between-person differences in the other construct. Concerning the parameters that link the measures at the within-person level, a T1 correlation reflects whether individuals' deviations from their own expected scores in one variable are linked to deviations from their own scores in the other variable. The cross-lagged parameters reflect whether the within-person change in one variable is predicted by the deviation from own expected scores on the other variable assessed one year earlier. The correlated residuals at T2 and T3 reflect whether within-person changes in one variable are linked to within-person changes in the other variable.

At the between-person level, there was a strong correlation between empathy and prosocial behaviours, $r = .65$, $p = .01$. This indicates that adolescents who reported higher levels of empathy across three time points reported higher levels of prosocial behaviours. After controlling for these differences, some evidence was found for moderate to high within-person associations. Empathy predicted within-person changes in prosocial behaviours at T2 ($\beta = .519$, $p = .044$, 95% CI [0.14]–[1.02]). There was a significant correlation between empathy and prosocial behaviours at T1, $r = .747$, $p = .001$ and there were significant

correlated residuals between empathy and prosocial behaviours at T2, $r = .690, p = .001$ and T3 $r = .593, p = .001$. In sum, in addition to the between-person relations between empathy and prosocial behaviours, empathy predicted within-person changes in prosocial behaviours.

Discussion

This study examined the longitudinal bidirectional relations between empathy and prosocial behaviours. Three questions were examined: (1) whether adolescent relations between empathy and prosocial behaviours are bidirectional, (2) whether adolescents' gender and age moderate these bidirectional relationships, and (3) whether within-person empathy would predict within-person changes in prosocial behaviours, and vice versa. The results for the standard Cross-Lagged Panel Model that aggregates between-and-within-person variances did not show bidirectional effects between empathy and prosocial behaviours across the whole sample or across gender or age. The findings revealed that the unidirectional cross-lagged path from empathy to prosocial behaviours was a stronger predictor of prosocial behaviours than the reverse; for instance, the unidirectional cross-lagged path from prosocial behaviours to empathy did not improve the model fit. This result is in line with the literature and empirical studies that support the idea that empathy predicts prosocial behaviours (e.g. Batson, 2009; Benita, Levkovitz, & Roth, 2017; Decety et al., 2016; Eisenberg et al., 2015). Moreover, empathy at T1 significantly predicted prosocial behaviours at T2; this effect was not statistically significant at T2. Additionally, age and gender moderate this effect, even though no differences were found in the cross-lagged paths between empathy and prosocial behaviours among males and females and early-to-middle adolescents and middle-to-late adolescents. However, the strength of the relationships was stronger on the age group.

With respect to the longitudinal relationship, we found that, for the overall sample, evidence of a long-term relationship between empathy and prosocial behaviours was high over time. We found evidence of a prospective relationship between empathy and prosocial behaviours: adolescents who reported higher levels of empathy reported higher levels of prosocial behaviours. The same patterns of strong longitudinal relationships were found across gender and age sample, although these relationships were stronger for females than for males, especially at T1. These gender differences may be explained in light of different approaches such as neuro-psychology. Studies using functional magnetic resonance imaging (fMRI) suggest that gender differences may be due to differences in the mirror neuron system; when individuals are asked to focus on either themselves or others with oriented attentional focus when analysing a scene, females activate the inferior frontal cortex more than males

(Schulte-Rüther, Markowitsch, Shah, Fink, & Piefke, 2008). Therefore, it seems that females recruit more emotion-related regions, whereas males engage a different neural network, rather associated with cognitive evaluation, mentalizing and behaviour anticipation (Derntl et al., 2010). Moreover, gender socialisation theory posits that females are more relationally orientated than males (Eagly, 2009; Eisenberg, Fabes, et al., 2006; Rose & Rudolph, 2006) because they are socialized and encouraged to show concern for others, caring and nurturance, unlike males, who inhibit them (Brody, 1999; Chaplin, 2015). Similarly, gender intensification theory (Hill & Lynch, 1983) suggests that the physical changes of puberty prompt socialisation agents to increase pressure for sex-typed behaviours (Priess, Lindberg, & Hyde, 2009). Furthermore, in our study these longitudinal relationships were higher for middle-to-late adolescents than for early-to-middle adolescents, especially at T1 and T3. This result may be explained by age-related changes in biological factors such as functional changes in the brain and cognitive development, socio-moral cognitions such as perspective taking, moral reasoning (e.g. Eisenberg, Morris, McDaniel & Spinrad, 2009) and environmental factors such as parenting and peer-group affiliations (e.g., Carlo, et al., 2014; Carlo et al., 2015).

Similarly, the RI-CLPM that was used to examine how empathy and prosocial behaviours influence each other at the within-person level while controlling for between-person differences showed no bidirectional relations between empathy and prosocial behaviours. However, the results show that empathy directly predicted within-person changes in prosocial behaviours, and that within-person changes in prosocial behaviours and empathy were correlated. These results offer strong evidence to support the idea that empathy and prosocial behaviours might be causally linked. These findings add to the literature on empathy as a means to improve prosocial behaviours.

The present study has several important strengths. First, the design allowed for longitudinal analyses on the development of the relationship between perceived empathy and perceived prosocial behaviours, thereby extending current knowledge which is based mainly on cross-sectional studies. The development of empathy and prosocial behaviours has been examined from early to late adolescence. Furthermore, by testing different models, with univariate paths from empathy to prosocial behaviours, univariate paths from prosocial behaviours to empathy, and a model with bidirectional paths, more insight has been gained on linkages over time between these relationships. In this way, our study makes a relevant

contribution to current knowledge on the development of empathy and prosocial behaviours from early to late adolescence.

The present study also has an important methodological implication. Using the RI-CLPM appears to be a fruitful approach to empathy development, as the distinction between within- and between-subject variations allowed us to draw more specific conclusions about the relationship between empathy and prosocial behaviours.

Nevertheless, the current study also has several limitations. First, despite the longitudinal design and the insights gained of the direction of effects, no causal conclusion can be drawn. Another caveat is that the data were based on self-reported, paper and pencil measures. Although the findings were generally consistent with prior research, future studies using multiple methods would be desirable. With respect to the sample, especially the junior high school group, the current sample was relatively lacking in socioeconomic diversity. It is possible that variability was limited given the single data collection site and relative homogeneity of the sample, and thus findings may not generalize to all French adolescents and more diverse samples should be explored.

Despite these limitations, the current study adds importantly to existing research and has potential implications for intervention and educational programs targeted at youth. If stakeholders wish to work on adolescents' prosocial behaviours development, it seems that they should build the intervention and educational program around adolescents' empathy development, which in turn will influence prosocial behaviours. Moreover, our results provide promise for future research on empathy and prosocial behaviour development during adolescence. Future research should continue to move beyond a unidimensional approach in an attempt to more accurately capture the multidimensional nature of prosocial development during adolescence, in line with the recent interest in studying different forms of prosocial behaviours and helping as a function of the target (Padilla-Walker, Dyer, Yorgason, Fraser, & Coyne, 2015). Similarly, concerning empathy, taking into account and incorporating the group context, the personal motivations and the situational factors, some studies have found that among stable social groups, patterns of empathic responding might be relatively consistent across time and context (Gutsell & Inzlicht, 2010, 2012) and that observers appear to be especially prone to prosociality when they believe that their good deeds offer opportunities to capitalize on targets' positive emotion (Barraza, 2011; Zaki, 2014).

Moreover, future studies using the different dimensions of empathy and prosocial behaviours would be advised to identify possible specific relations over time among the different dimensions of empathy, for instance emotional contagion, cognitive empathy and emotional disconnection, as well as the two dimensions of prosocial behaviours, for instance helping and caring.

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CHAPTER IX

Adolescent Empathy and Prosocial Behaviour Latent Class Growth

Adolescent Empathy and Prosocial Behaviour Latent Class Growth: Does participating in extracurricular activities make a difference?

Abstract

The aim of this three-wave longitudinal study was to investigate heterogeneity in adolescents' patterns of prosocial behaviour and empathy development over time during adolescence, taking account of group membership (extracurricular activity participation and non-participation) and exploring whether the latent class trajectories for two dimensions of extracurricular activity participation (breadth of participation and intensity) were related to the class membership trajectory for prosocial behaviours and empathy.

Participants included 610 adolescents (53.2% female, $M_{\text{age}} = 13.57$; $SD = 1.94$) who completed measurements of prosocial behaviours, empathy and extracurricular activity participation annually. Growth mixture modelling (GMM) analyses demonstrated that the adolescent population was best typified by three latent growth trajectory classes for prosocial behaviours and two for empathy. Concerning the trajectories for prosocial behaviours across the extracurricular activity group compared to the non-extracurricular activity group, our results revealed that there was no downward linear trend trajectory. The same was observed for empathy development, with an upward linear trend over time during adolescence. Contrary to our expectations, the latent class trajectories for breadth of participation and intensity were not related to the class membership trajectory for prosocial behaviours and empathy.

These results highlight the importance of taking account of heterogeneity between class trajectories, with adolescents' prosocial behaviours and empathy being captured more effectively by diverse class trajectories. They emphasise the importance of moving away from analyses around mean-level change and examining other predictors besides gender and age to better understand which other factors might influence prosocial behaviours and empathy development over time during adolescence.

Keywords: Adolescence, Growth mixture modelling, Prosocial behaviours, Empathy, Extracurricular activity

Among the different developmental tasks in adolescence, prosocial behaviour and empathy development are considered essential to positive psychosocial development (Dunfield, 2014; Eisenberg & Spinrad, 2014; Spinrad & Eisenberg, 2014) and have been linked with several positive outcomes, including sense of social connection (Morelli, Ong, Makati, Jackson, & Zaki, 2017), academic success (Gerbino et al., 2017), high friendship relationship quality (McDonald, Wang, Menzer, Rubin, & Booth-LaForce, 2011), and psychological well-being (Benita, Levkovitz, & Roth, 2017; Carlo, Crockett, Wolff, & Beal, 2012). Moreover, several studies have identified prosocial behaviours and empathy as protective factors against various problematic behaviours: externalizing problems such as aggression and delinquency (Carlo et al., 2014); internalizing problems, including depressive symptoms, anxiety and suicidal ideation (Cáceda et al., 2014; Flynn, Ehrenreich, Beron, & Underwood, 2015); substance use (Carlo, Crockett, Wilkinson, & Beal, 2010); and relational problems, such as discrimination, loneliness, association with deviant peers and relational victimization (Davis et al., 2016; Griese & Buhs, 2014; Stuijzand et al., 2016).

Why and how prosocial behaviours and empathy develop are not fully understood, but theories and evidence point to a multifactorial process that includes within-individual characteristics, such as genetics (Knafo & Uzefovsky, 2013; Knafo et al., 2009), neural development (Chierchia & Singer, 2017; Decety, Bartal, Uzefovsky, & Knafo-Noam, 2016; Gonzalez-Liencre, Shamay-Tsoory, & Brune, 2013; Paulus, 2018) and temperament (Beechler, 2012; Hilbig, Glöckner, & Zettler, 2014), and socialisation guidance from socialisation agents, such as modelling and reinforcement by parents or teachers, learning social and moral norms and peer relationships (Eisenberg, Spinrad, & Knafo-Noam, 2015; Manczak, DeLongis, & Chen, 2016; Miklikowska, 2017; Overgaauw, 2015; Sierksma, Thijs, & Verkuyten, 2014). Among these processes, we were interested in socialization, and more specifically adolescent development in interpersonal contexts, from an ecological perspective that posits that development is not the result of the aggregation or additive interaction of various elements, but arises from the multidirectional reciprocal relationships between all the aspects of the ecological system (Lerner, Lerner, Bowers, & Geldhof, 2015; Overton, 2010). Therefore, understanding the pathways that enable and promote prosocial behaviours and empathy, identifying and aligning adolescent strengths with contextual assets and mobilizing internal and external assets are critical for promoting positive outcomes (Brown & Larson, 2009; Damon, 2004; Larson, 2000), along with the plasticity inherent in the development system, which represents a fundamental strength of the adolescent period (Eisenberg, Morris,

McDaniel, & Spinrad, 2009; Lerner et al., 2015; Lerner & Steinberg, 2009). Among the different enriching activities, we focused on leisure activities and more specifically on extracurricular activities which have been linked to a range of positive outcomes (Forneris, Camiré, & Williamson, 2015; Knifsend, 2015; Martinez, Coker, McMahon, Cohen, & Thapa, 2016; Weininger, Lareau, & Conley, 2015).

The Development of Prosocial Behaviours: Developmental Change and Individual Differences

Prosocial behaviours are influenced by multiple factors and can therefore be expected to be subject to both developmental changes and individual differences. Research suggests that during adolescence, there is a gradual decline in prosocial behaviours, with a possible rebound in late adolescence/early adulthood (Carlo, Crockett, Randall, & Roesch, 2007; Luengo Kanacri, Pastorelli, Eisenberg, Zuffiano, & Caprara, 2013; Spinrad & Eisenberg, 2009; Van der Graaff, Carlo, Crocetti, Koot, & Branje, 2017). These studies took account of the beneficiaries of the behaviours, normative and situational variables, and individual differences, with different groups of individuals showing different trajectories (Nantel-Vivier et al., 2009). Gender differences in prosociality have been consistently observed. Generally, girls score higher than boys on measures of prosociality, but the development trend is the same (Luengo Kanacri et al., 2013). However, boys appear less likely to follow a high prosociality trajectory (Nantel-Vivier, Pihl, Côté, & Tremblay, 2014). The few studies that have analysed age-related change in prosocial behaviours focused either on the transition from childhood to early adolescence (Barker, Oliver, & Maughan, 2010; Côté, Tremblay, Nagin, Zoccolillo, & Vitaro, 2002; Kokko, Tremblay, Lacourse, Nagin, & Vitaro, 2006) or on change during adolescence using a multi-informant design (i.e. self-report, mother and teacher) and cross-cultural perspective (i.e. Canadian and Italian), with this latter study yielding different trajectories according to the informant and the cultural group (Nantel-Vivier et al., 2009). One recent study examined heterogeneous trajectories of prosocial responding from adolescence to early adulthood and found three developmental paths with distinctive developmental trends (Luengo Kanacri, et al., 2014). Two prosocial trajectories showed no linear change, no mean-level stability over time, an initial decline from 13 to 17-18 and then a slight increase from 18-21, while one class showed a linear increase trajectory reaching its highest level at age 21. Taken together, these findings suggest that the heterogeneity in the development of prosocial behaviours might be dependent on the different factors taken into account by the studies.

The Development of Empathy: Developmental Change and Individual Differences

Empathy is regarded as central in social interactions relating to social emotions and social reasoning. The ability to empathize is an important part of social and emotional development that affects the individual's behaviour toward others and thus the quality of social relationships (Batson, 2018; Overgaauw et al., 2017). The issue of individual differences in the development of empathy has produced numerous empirical studies in the last decades (e.g. Eisenberg, Betkowski, & Spinrad, 2013; Lafferty, 2004; Stern & Cassidy, 2018) and the empirical findings regarding age differences and age-related changes in self-reported empathy are mixed. Most of the studies have focused on childhood and the transition to adolescence (Decety & Michalska, 2010; Tobari, 2003). Through childhood and early adolescence, Overgaauw et al. (2017) found an increase for girls and a decrease for boys in affective and cognitive empathy.

During adolescence, studies have found that affective empathy remained stable or showed a slight increase, whereas cognitive empathy increased toward mid-adolescence, specifically for girls from age 13 onward, in contrast to boys for whom there was a decrease in affective empathy (Van der Graaff et al., 2014). In one of the few studies that analysed age-related change in empathy during adolescence, Allemand, Steiger, and Fend (2014) found relatively high levels of stability in empathy, a modest increase in the mean level and individual differences in the developmental trajectory of empathy in boys and girls. A recent study explored age trends and gender differences across adolescence and showed that empathic concern did not significantly increase, remaining stable over time for girls and showing a temporary decline for boys, while perspective taking increased across adolescence for boys and girls (Van der Graaff et al., 2017). In sum, the results in both empathy and prosocial behaviour development are mixed and besides gender and age factors, this may be assumed to be due to contextual factors, such as extracurricular activity participation.

Extracurricular Activity Participation and Positive Adolescent Development

Adolescents spend much of their discretionary time in organized recreational and leisure activities. Research suggests that more than half of American teenagers attending schools participate in some sort of organized activities (Gardner, Roth, & Brooks-Gunn, 2008). Some authors have even suggested that approximately 83% of adolescents ages 12-17 participate in at least one extracurricular activity (Moore, Hatcher, Vandivere, & Brown,

2000). In France, data concerning extracurricular activities per se in adolescence is very sparse, with the latest data on adolescents suggesting that 77% of males and 60% of females from 12-17 years participate in organized activities (Mignon, 2015; Muller, 2018).

Extracurricular activities have been conceptualized as one important developmental context of adolescents' lives (Agans et al., 2014; Lerner et al., 2014; Martinez et al., 2016). Researchers have shown that extracurricular activity participation is linked to a range of positive outcomes including, for example, psychological, social and physical health (Eime, Young, Harvey, Charity, & Payne, 2013; Fredricks & Eccles, 2008), emotional regulation (Larson, Hansen, & Moneta, 2006), well-being and self-esteem (Busseri, Rose-Krasnor, Willoughby, & Chalmers, 2006; Kort-Butler & Hageman, 2011), high friendship quality and social connectedness (Barber, Abbott, Blomfield, & Eccles, 2009; Bohnert, Fredricks, & Randall, 2010). However, little is known about whether extracurricular activity participation is linked to developmental benefits for prosocial behaviours and empathy. As approximately two thirds of French adolescents take part in an extracurricular activity (Muller, 2018), investigating the potential consequences of this participation is important and may highlight opportunities for facilitating positive adolescent development, specifically prosocial behaviours and empathy development. Moreover, extracurricular activities constitute a setting for undertaking the developmental tasks of adolescence at both the personal and interpersonal levels (Feldman & Matjasko, 2012; Hansen, Skorupski, & Arrington, 2010). They provide adolescents with a context for self-assessment outside the more restricted expectations of school and family settings (Barber, Stone, & Eccles, 2005; Darling, 2005). From a developmental point of view, extracurricular activities together with family, peer group and school context offer individual social experiences that are likely to promote positive adjustment (Denault & Poulin, 2009).

However, some authors have suggested that it is difficult to assess the impact of activity participation without accounting for changes or patterns in that participation over time. Adolescents have a multitude of opportunities to explore their abilities and talents through extracurricular activities and participation is not a static variable. Adolescents may change activity from year to year and there is also within-individual variability over time (Feldman & Matjasko, 2012; Mahoney & Vest, 2012). Thus, in addition to taking account of participation or not, other dimensions of activity participation, such as breadth of participation and intensity, should also be taken into account. Breadth of participation is the number of different types or activity contexts to which an adolescent is exposed; it does not mean the

total number of activities, but rather the variety of activities (Fredricks & Eccles, 2006a; Sharp, Tucker, Baril, Van Gundy, & Rebellon, 2015). Some studies have shown that adolescents involved in more than one type of activities have more positive outcomes, because by taking part in different activities, they get involved in more contexts and have more opportunities for exploring a broad range of skills, interests and values, as well as gaining exposure to a rich variety of people and experiences (Busseri & Rose-Krasnor, 2009; Linver, Roth, & Brooks-Gunn, 2009; Rose-Krasnor, Busseri, Willoughby, & Chalmers, 2006). Intensity of participation corresponds to the time the adolescent spends in activities; it refers to the frequency (e.g. once a month; four times a week) or number of hours of participation (e.g. 2 h a week or 3h each day) (Feldman & Matjasko, 2012; Zarrett & Mahoney, 2011). Some authors have revealed that the more time adolescents spend in activities, the greater the opportunities to be exposed to factors that are likely to promote positive development outcomes (Gardner et al., 2008), such as strengthening their skills and knowledge, and to engage in interpersonal transactions with activity peers (Busseri et al., 2006).

Current Study

In brief, the findings of the aforementioned studies on prosocial behaviours and empathy have shown age-related changes. Nevertheless, the main limitation of most of these studies is that their evidence was gathered by mean-level change (i.e. a growth curve model), which may miss important information because it assumes that the observed population is homogeneous (e.g. Duncan & Duncan, 2004, 2009; Kreuter & Muthén, 2008; Reinecke & Seddig, 2011). A more realistic picture could be offered by differentiating subgroups with different trajectories in terms not only of their development patterns over time during adolescence, but also of the different variables that might account for developmental heterogeneity, in addition to gender and age differences. The purpose of the present longitudinal study was to examine whether participating or non-participating in an extracurricular activity would show different prosocial behaviours and empathy trajectory groups. Specifically, two key questions were investigated in this study. (a) How many different prosocial behaviour and empathy trajectory groups across time during adolescence would be identified on the basis of extracurricular activity participation vs. non-participation? And (b) in the extracurricular activity group, are breadth of participation and intensity predictors of prosocial behaviour and empathy trajectory groups?

We assumed that different trajectories of prosocial behaviours and empathy could be identified across participating and non-participating extracurricular activity groups. Although there are no previous studies of this link, based on theoretical literature about extracurricular activity and adolescent development and positive outcomes, it was conceivable that adolescents who participate in an extracurricular activity, regardless of school educational level, would have higher levels of prosocial behaviours and empathy than those that do not participate in an extracurricular activity. Building on the extensive literature on gender and age differences in prosocial behaviours and empathy development, gender and age were included in our analyses as covariates, in order to control for their influence on latent class trajectory groups. Finally, based on the complex patterns of extracurricular participation practices beyond the participating and non-participating groups, we reasoned that breadth of participation and intensity might be especially likely to predict the probability of belonging to high and / or increasing trajectory groups for prosocial behaviours and empathy.

Method

Participants

The data used in this study are part of a three-wave longitudinal study (2014-2017) on the role of living environments in empathy and prosocial behaviour development in adolescence. The waves were relatively equidistantly spaced, with the majority of the data being collected annually in the same month as the first measurement for each Junior and High School participating in the study. The sample consisted of 610 adolescents from 10.37 to 18 years old. There were no exclusionary criteria with respect to participant selection. Participants were recruited from various Junior and High Schools in the cities of Bordeaux and Saint Briec in France. Adolescents and their parents received written information about the research prior to the study; the possibility of not participating was also explained in this letter. Written informed consent was also obtained for the school. Each year, the adolescents filled out a battery of questionnaires at school after school hours. Confidentiality was explicitly guaranteed. Research assistants gave verbal instructions to the adolescents to complement the written instructions printed at the top of each questionnaire. Completing the questionnaires lasted an hour. Adolescents received no reward for any wave they participated in.

Of the 610 adolescents, 53.2% were females and 46.8% were males ($M_{\text{age}} = 13.57$; $SD = 1.94$). In order to cover the entire period of adolescence, participants were divided into 2 groups on the basis of their Educational Level (grade) at the first measurement time: the first group was composed of 6th grade ($n = 383$; $M_{\text{age}} = 12.14$; $SD = 0.59$) and the second one of 10th grade ($n = 227$; $M_{\text{age}} = 14.70$; $SD = .50$). These two groups (respectively early and mid-adolescence) were used to control for age in our analyses. As mentioned before, this study used three waves of data (i.e. Waves 1, 2, and 3 labelled T1, T2 and T3 respectively) at three different grades (grades 6, 7, and 8 for the early-to middle adolescence group; grades 10, 11 and 12 for the middle-to-late adolescence one) with a one-year interval between waves.

In total, the percentage of missing data across waves and variables was 7.06%. The percentage of missing values across the prosocial behaviour and empathy variables ranged between 5.37% and 8.41% respectively. No consistent relationships were found between missingness on variables and other variables, or the same variables at other waves. This indicates that data were likely to be missing completely at random (MCAR). In order to deal with the missing data, full information maximum likelihood estimation (FIML) with robust estimates (MLR) in Mplus 8.1 version was used (Enders, 2001, Muthén & Muthén, 2017). However, for the GMM analyses, 45 cases were excluded due to missing values in the variable to determine the “known class”. For these analyses, data from 561 adolescents were therefore used; the extracurricular group was composed of 292 adolescents and the non-extracurricular group of 269 adolescents.

Measures

The Prosocial Behaviour Scale (PBS). Adolescents reported on their own prosocial behaviours toward others. A validated French adaptation (Carrizales, Perchen, & Lannegrand-Willems, 2017) of the prosociality scale was used (Caprara, Steca, Zelli, & Capanna, 2005). The French version assesses two types of prosocial behaviours: helping (6 items) and caring (8 items) (e.g. “I try to help others” and “I try to console people who are sad”, respectively) on a 5-point Likert scale ranging from 1 (*Never/ almost never*) to 5 (*almost always/always*). In the present study, in order to avoid possible overlap among items of the caring dimension and the empathy scale, only four items for the caring dimension were used. In addition, partial scalar measurement invariance across gender and age was attested $\chi^2(182, N = 1640) = 571.90, p < .001, RMSEA = .051, CFI = .97, WRMR = 1.73, \Delta CFI = .003, \Delta RMSEA = .006$ and $\chi^2(180, N = 1640) = 569.29, p < .001, RMSEA = .051, CFI = .96, WRMR = 1.72, \Delta CFI = .000, \Delta RMSEA = .006$ respectively. Partial scalar measurement invariance across gender

and age was attested $\chi^2 (182, N = 1640) = 571.90, p < .001, RMSEA = .051, CFI = .97, WRMR = 1.73, \Delta CFI = .003, \Delta RMSEA = .006$ and $\chi^2 (180, N = 1640) = 569.29, p < .001, RMSEA = .051, CFI = .96, WRMR = 1.72, \Delta CFI = .000, \Delta RMSEA = .006$, respectively. As well as full scalar longitudinal measurement invariance $\chi^2 (451, N = 610) = 692.023, p < .001, RMSEA = .030, CFI = .97, WRMR = 1.06, \Delta CFI = -.004, \Delta RMSEA = .000$. In this study, the scores for the two scales were summed together to create an overall prosocial score.

The Basic Empathy Scale (BES). In order to assess adolescents' perception of their own empathy behaviours, we used the BES which is a 20-item questionnaire rated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) developed by Jolliffe and Farrington (2006) and adapted in French by Carré et al. (2013). It includes three dimensions: emotional contagion (6 items, e.g. "I get caught up in other people's feelings easily"), cognitive empathy (8 items, e.g. "I can understand my friend's happiness when she/he does well at something") and emotional disconnection (6 items, "I am not usually aware of my friend's feelings"). In order to assess the psychometric validity of the three-factor structure on a sample of adolescents, a CFA was performed, the three-factor structure was supported but three items were deleted (item 15 from emotional contagion with factor loading lower than .30, and items 6 and 20 from cognitive empathy loading on more than one dimension). This three-factor model had a good fit, $\chi^2 (116, N = 1545) = 879.25, p < .001, RMSEA = .065 [0.061-0.069], CFI = .95, WRMR = 1.81$. In addition, partial scalar measurement invariance across gender and age was attested $\chi^2 (284, N = 1545) = 1062.41, p < .001, RMSEA = .060, CFI = .94, WRMR = 2.189, \Delta CFI = .002, \Delta RMSEA = -.005$ and $\chi^2 (278, N = 1545) = 930.93, p < .001, RMSEA = .055, CFI = .96, WRMR = 1.98, \Delta CFI = .005, \Delta RMSEA = -.004$ respectively. Moreover, full scalar longitudinal measurement invariance was assessed, $\chi^2 (1258, N = 610) = 1965.914, p < .001, RMSEA = .030, CFI = .95, WRMR = 1.19, \Delta CFI = -.005, \Delta RMSEA = .000$. In this study, the scores for the three scales were summed together to create an overall empathy score.

Extracurricular Activity Participation

In order to capture adolescents' participation in extracurricular activity, they had to answer 'yes' or 'no' to the following question: "*Do you participate in an extracurricular activity?*". If their answer was positive, they responded to a variety of questions, including the number of extracurricular activities, type of activity and frequency of participation per week and, for those who had more than one extracurricular activity, which one was the most important to them. With this information, two groups were created the extracurricular activity

participation group with 292 adolescents and the group of non-extracurricular activity participation made up of 269 adolescents.

Dimensions of Participation in Extracurricular Activities.

Breadth of Participation (BoP). First, the extracurricular activities identified from grades 6 to 12 were classified into four categories: (1) team sports, (2) individual sports, (3) team performance and fine arts and (4) individual performance and fine arts. This classification was based on previous research (e.g. Barber et al., 2009; Barber, Eccles, & Stone, 2001; Eccles & Barber, 2001; Fredricks & Eccles, 2006b; Larson et al., 2006). Second, the number of different extracurricular activities across the two age groups was calculated each year. Breadth of participation represented the number of different extracurricular activities adolescents participated in and could vary from 1 to 3. For example, if an adolescent reported participating in a soccer team, group dance and a swimming activity, the adolescent was given a score of three, i.e. one for being in a team sport, one for being in a performing and fine arts activity and one for being in an individual sport (Denault & Poulin, 2009). Two hundred and ninety-two adolescents reported on their different types of extracurricular activity participation, but it is worthy of mention that although the responses ranged from 1 to 3, there were only few adolescents in our sample that had three different types of extracurricular activities; across the waves, the means were as follows: T1 ($M = 1.23$, $SD = 0.19$), T2 ($M = 1.21$, $SD = 0.18$) and T3 ($M = 1.34$, $SD = 0.27$) respectively.

Intensity of Participation (IoP). In order to calculate participation intensity, the number of hours of participation per week was multiplied by the number of weeks of participation for each activity within the school year (10 months, thus 40 weeks). The sum of the number of hours of all activities across the school year was calculated. In order to lower the dependency with breadth of participation, the total number of hours per year was divided by the number of activities the adolescents were involved in during that year and divided by ten in order to facilitate model estimation. For example, if an adolescent reported playing soccer for 3h, group dance for 2 h and swimming for 1 h per week, this was calculated as 120 h, 80 h and 40 h, respectively, thus 240 h of extracurricular activity participation over the school year divided by the number of activities (3), so, 80 h and then divided by ten (Denault & Poulin, 2009). Two hundred and ninety adolescents reported on the intensity of participation and the intensity of participation per month in our sample ranged from 4 to 24 hours, with stable means across waves: T1 ($M = 8.03$, $SD = 4.20$), T2 ($M = 8.38$, $SD = 4.13$) and T3 ($M = 8.20$, $SD = 4.19$) respectively.

Data Analysis

First, we constructed two separate univariate latent growth curve models (LGM; Duncan & Duncan, 2004) on the three annual waves of prosocial behaviours and empathy (using the mean level at each wave) across group memberships (extracurricular activity group and non-extracurricular activity group) in Mplus 8.1 (Muthén & Muthén, 2017), using the Maximum Likelihood (ML) estimation. Good model fit was indicated by a non-significant χ^2 , Comparative Fit Indices (CFI) and Tucker and Lewis's Indices (TLI) above .95 (Hu & Bentler, 1999), and a Root Mean Square Error of Approximation (RMSEA) below .08 (Browne & Cudeck, 1992). LGM expresses growth in a variable as an intercept (i.e. initial level) and slope (i.e. rate of change) for each individual. Subsequently, the mean intercept and slope, as well as the variance around these growth factors, were estimated for the sample.

Second, we conducted Growth Mixture Modelling (GMM; Muthén, 2003) on the three waves of prosocial behaviours and empathy. Because we found that individuals varied significantly in the initial level and rate of change in prosocial behaviours and empathy, the purpose of using GMM was to examine whether more homogeneous subgroups of individuals that followed more or less the same level and change in prosocial and empathy could be found. Latent variable mixture modelling relaxes the assumption of LGM that all respondents are drawn from the same population and thus have a common underlying slope of change. Growth mixture modelling (GMM) captures the heterogeneity in slopes of change within the population by modelling distinct subpopulations through the incorporation of a latent categorical variable. The purpose of GMM is to find the smallest number of classes that captures the most variance among individuals in terms of initial levels and development of the variable under examination. Specifically, GMM analyses were conducted with two pre-specified known groups (i.e. extracurricular activity group and non-extracurricular activity group) and a latent variable (cg) to predict the probability of class membership in classes (c) and meaning that the probability of being in a given class is allowed to differ as a function of group membership (cg). Because of that, some considerations had to be taken into account and the GMM model had to be based on the same indicators and include the same number of classes across the grouping variable, making this approach slightly more restrictive than the multiple group approach to variable-centred analyses (Duncan & Duncan, 2009; Lubke & Muthen, 2005, Muthén, 2004).

We considered various criteria to decide on the optimal number of latent classes for prosocial behaviours and empathy. The best-fitting classification model was determined based

on the Bayesian Information Criterion (BIC; Schwarz, 1978), a criterion calculated from the log-likelihood of the model and the number of parameters in the model. The lowest BIC suggests the best fit. We also consulted the bootstrap likelihood ratio test (BLRT; McCutcheon, 1987; McLachlan & Peel, 2000) which uses a bootstrap resampling method to approximate the p-value of the generalized likelihood ratio test comparing the K0-class mixture model with the K -1-class mixture model. A small probability value (e.g. $p < .05$) indicates that the K0-class model provides significantly better fit to the observed data than the K -1-class model. The entropy index (Celeux & Soromenho, 1996) which indicates the accuracy with which the cases are classified between the profiles was also examined. Although entropy should not be used to determine the optimal number of profiles (Lubke & Muthén, 2007; Lubke & Muthen, 2005) it does provide a useful summary of classification accuracy. The normalized version of entropy, which scales to the interval [0, 1], indicates the level of separation between classes. A higher value of entropy represents a better fit; values > 0.80 indicate that the latent classes are highly discriminating (Nylund, Asparouhov, & Muthén, 2007). In general, scholars recommend an entropy level of 0.6 or higher (Clark & Muthén, 2009). Finally, we evaluated the content and theoretical meaningfulness of the classes in the various solutions. If an additional class in a solution with k classes was found to be a slight variation of a class already found in a solution with k-1 classes, we chose the most parsimonious solution (Muthén & Muthén, 2000).

Third, we tested the possible influence of breadth of participation and intensity in predicting the probability of belonging to the high or increasing trajectory groups of prosocial behaviours and empathy in the extracurricular groups. Considering the time-varying nature of our variables and the different levels (for breadth of participation, for instance, the diversity of types of activities from 1 to 3 and for intensity, from 4 to 24), we decided to examine initial levels and rates of change in both dimensions over time during adolescence, and how these participation practice class trajectories were related to class trajectory membership for prosocial behaviours and empathy in the extracurricular group. In order to identify adolescent groups with different breadth of participation and intensity trajectories, the same statistical steps performed for prosocial and empathy variables were used. Finally using the class membership of breadth of participation and intensity, two multinomial logistic regressions were performed to analyse the relationship between the trajectories of breadth of participation and intensity, and class membership trajectory of prosocial behaviours and empathy.

Results

Development of Prosocial Behaviours

Univariate Growth Models for Prosocial Behaviours

The linear model for prosocial behaviours across group membership showed an excellent fit with the data (see Table 1 for descriptive statistics and Table 2 for the fit indices). Variances of both intercept and slope were found to be significant in the non-extracurricular activity group, indicating inter-individual differences in the initial levels and change rates of prosocial behaviours. By contrast, in the extracurricular activity group, only the variance of the intercept was significant, indicating inter-individual differences in the initial levels but not in the rates of change of prosocial behaviours. Finally, in the non-extracurricular activity group, the correlations between intercept and slope were found to be significant and negative, suggesting that higher initial levels of prosocial behaviours were associated with lower rates of change (See Figure 1).

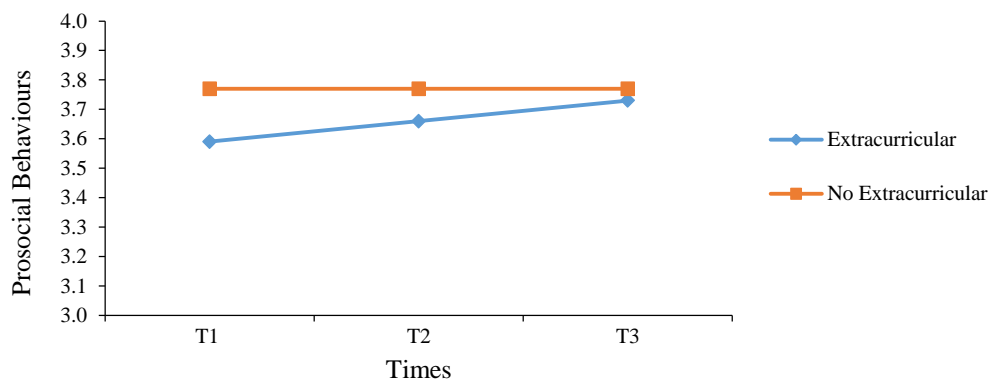


Figure 1 Estimated LGM for Prosocial Behaviours across Group Memberships
Note: T1 = Time 1; T2 = Time 2, T3 = Time 3

Latent Growth Trajectories of Prosocial Behaviours

In order to identify adolescent groups with different prosocial behaviour trajectories, latent classes over three measurement waves were modelled using growth mixture modelling (GMM). The difference with conventional growth modelling, where the common strategy is to first consider an unconditional model (i.e. not introducing covariates for the growth factors), can lead to confusion with GMM (Li & Harring, 2017; B. Muthén & 2004; Nylund et al., 2007). Because of that, gender and school educational level were added as covariates and were allowed to influence class membership and the growth factors directly.

Two sets of latent growth curve models with two through four classes were estimated for prosocial behaviours. The results indicated that the three-class solution was better than the two-class solution (BLRT was significant at $p < .001$). Adding a fourth class did not have a surplus value since it was a variation of the three-class solution. The three-class solution was therefore selected for the analyses. The results yielded a reasonably high level of classification accuracy (i.e. reasonably distinct profiles), with an entropy value of .815 and average posterior probabilities of class membership varying from .790 to .949 (with relatively low cross-probabilities varying from .01 to .11). The smallest class ($N= 30$, or 5.4% of the sample) was characterised by adolescents with a lower mean initial level of prosocial behaviours (M Intercept = 1.55, $p < .001$) that increased over time (M slope = .978, $p < .001$). The second class ($N= 104$, or 17.6% of the sample) was composed by adolescents with a medium mean initial level of prosocial behaviours (M Intercept = 2.44, $p < .001$) that decreased slightly but was non-significant over time (M slope = -.026, $p = .78$). Finally, the third class ($N= 472$, or 77.0% of the sample) was characterised by adolescents with a higher initial level of prosocial behaviours (M Intercept = 3.01, $p < .001$) that increased over time (M slope = .210, $p < .01$). We labelled the first latent class *low-increased prosocial class* (LIP), the second one, *stable prosocial class* (SP) and the last one, *higher prosocial class* (HP).

Table 1. Descriptive statistics of prosocial behaviours and empathy

	T1		T2		T3	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Prosocial behaviours	3.68	0.63	3.69	0.66	3.74	0.64
Empathy	3.80	0.58	3.77	0.62	3.72	0.63

Note: *M* = Mean; *SD* = Standard Deviation. . T1 = Time 1; T2 = Time 2, T3 = Time 3

Table 2. Fit Indices and growth factor estimates for the univariate growth curve models of prosocial behaviours and empathy

	MG Model Fit Indices					Growth Factors					
	χ^2	<i>df</i>	TLI	CFI	RMSEA	Group	<i>M</i> Intercept	Δ Intercept	<i>M</i> Slope	Δ Slope	<i>r</i> (I, S)
Prosocial behaviours	2.58	2	.98	.99	.032	EAG	3.59***	.12*	.07**	.04	-.09
						NEAG	3.77***	.18***	.00	.06**	-.50***
Empathy	13.72	2	.90	.93	.093	EAG	3.75***	.09**	-.00	.04	.011
						NEAG	3.80***	.18***	-.07**	.11***	-.49***

Note: χ^2 = chi square; *df* = degrees of freedom; TLI = Tucker–Lewis index; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation.; EAG = Extracurricular Activity Group; NEAG = Non-Extracurricular Activity Group. * $p < .05$. ** $p < .01$ *** $p < .001$.

The next step was to include group membership as the known grouping variable. As mentioned before, due to missing data on the variable used to determine the known grouping variable, 45 cases were excluded from the analyses. The extracurricular activity group had 292 adolescents and the non-extracurricular activity group 262 adolescents. The results yielded a reasonably high level of classification accuracy with an entropy value of .910 and average posterior probabilities of class membership varying from .792 to .959 in the non-extracurricular activity group (with relatively low cross-probabilities varying from .02 to .18) and from .844 to .959 in the extracurricular activity group (with relatively low cross-probabilities varying from 0.1 to .10). The six latent classes are represented in Figure 2.

In the non-extracurricular activity group, the smallest class ($N= 14$, or 2.5% of the sample) was characterised by adolescents with lower mean initial levels of prosocial behaviours (M Intercept = 1.85, $p < .001$) that increased over time (M slope = .908, $p < .001$). We labelled the first latent class *low-increased prosocial non-extracurricular class* (LIPNE). The second class ($N= 225$, or 40.3% of the sample) was composed of adolescents with a higher mean initial level of prosocial behaviours (M Intercept = 3.00, $p < .001$) that increased over time (M slope = .169, $p < .05$); most of them were females from junior high school. This class was labelled *higher-increased prosocial non-extracurricular class* (HIPNE). The third class ($N= 28$, or 5.2% of the sample) was characterised by adolescents with a medium initial level of prosocial behaviours (M Intercept = 2.54, $p < .001$) that decreased over time (M slope = -.227, $p = .23$); most of them were males from junior high school. It was labelled *decreased prosocial non-extracurricular class* (DPNE). In the extracurricular activity group, the smallest class ($N= 18$, or 4.3% of the sample) had a low initial level of prosocial behaviours (M Intercept = 1.45, $p < .001$) that increased over time (M slope = .951, $p < .001$). We labelled it *low-increased prosocial extracurricular class* (LIPE). The next class ($N= 220$, or 39.4% of the sample) exhibited a higher mean initial level of prosocial behaviours (M Intercept = 3.036, $p < .001$) that increased over time (M slope = .196, $p < .01$), characterised by females and males principally from high school. It was labelled *higher-increased prosocial extracurricular class* (HIPE). The final class ($N= 52$, or 8.3% of the sample) was characterised by a low initial level of prosocial behaviours (M Intercept = 2.36, $p < .001$) that stayed stable over time (M slope = .014, $p = .41$); most of them were males from junior high school. This was labelled *stable prosocial extracurricular class* (SPE).

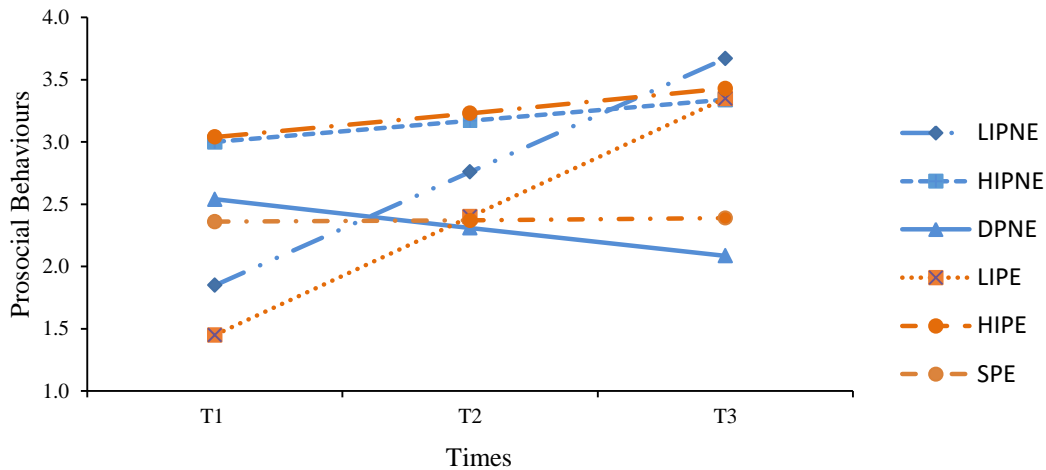


Figure 2. Prosocial behaviours trajectory classes across group membership

Note: LIPNE = low-increased prosocial non-extracurricular class. HIPNE = higher-increased prosocial non-extracurricular class. DPNE = decreased prosocial non-extracurricular class. LIPE = low-increased prosocial extracurricular class. HIPE = higher-increased prosocial extracurricular class. SPE = stable prosocial extracurricular class. T1 = Time 1; T2 = Time 2, T3 = Time 3.

Development of Empathy

Univariate Growth Models for Empathy

The linear model for empathy across group membership fitted the data poorly (see Table 1 for descriptive statistics and Table 2 for the fit indices). Variances of both intercept and slope were found to be significant in the non-extracurricular activity group, indicating inter-individual differences in initial levels and change rates of empathy. By contrast, in the extracurricular activity group, only the variance of the intercept was significant, indicating inter-individual differences in the initial levels but not in the rates of change of empathy. Finally, in the non-extracurricular activity group, the correlations between intercept and slope were found to be significant and negative, suggesting that higher initial levels of empathy were associated with lower rates of change (See Figure 3).

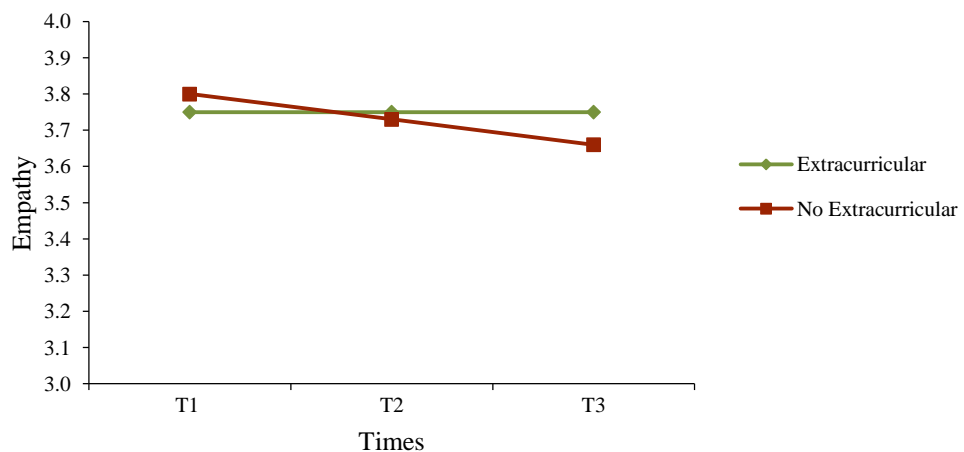


Figure 3 Estimated LGM for Empathy across Group Memberships

Note: T1 = Time 1; T2 = Time 2, T3 = Time 3

Latent Growth Trajectories of Empathy

In order to identify adolescent groups with different empathy trajectories, latent classes over the three measurement waves were modelled using growth mixture modelling. The same steps and approach applied to prosocial behaviours analyses were used.

The results indicated that the two-class solution was better than the single-class solution (BLRT was significant at $p < .001$). Adding a third class did not have a surplus value because this third class was a variation of the two-class solution. The two-class solution was therefore selected for the analyses. The results yielded a reasonably high level of classification accuracy, with an entropy value of .680 and average posterior probabilities of class membership varying from .844 to .931 (with relatively low cross-probabilities varying from .07 to .16). The first class ($N= 454$, or 73,8% of the sample) was characterised by adolescents with a high initial level of empathy (M Intercept = 3.40, $p < .001$) that increased over time (M slope = .205, $p < .05$). The second class ($N= 151$, or 26.2% of the sample) was composed by adolescents with a lower initial level of empathy (M Intercept = 2.63, $p < .001$) that increased over time (M slope = .366, $p < .001$). We labelled the first latent class *high empathy class* (HE) and the second one, *low empathy class* (LE).

The next step was to include group membership as the known grouping variable. The results yielded a reasonably high level of classification accuracy with an entropy value of .946 and average posterior probabilities of class membership varying from .936 to .951 in the non-extracurricular activity group (with relatively low cross-probabilities varying from .05 to .06) and from .998 to 1 in the extracurricular activity group. The four latent classes are represented in Figure 4. In the non-extracurricular activity group, the smallest class ($N= 67$, or 13.7% of the sample) was characterised by adolescents with a high mean initial level of empathy (M Intercept = 3.16, $p < .001$) that decreased over time (M slope = -.043, $p = .66$); most of the adolescents belonging to this class were males from junior high school. We labelled it *high-decreased empathy non-extracurricular class* (HDENE). The next class ($N= 202$, or 34.3% of the sample) was composed by adolescents with a lower mean initial level of empathy (M Intercept = 3.09, $p < .001$) that increased over time (M slope = .45, $p < .001$); most of them were females principally from junior high school and high school. This class was labelled *lower-increased empathy non-extracurricular class* (LIENE). In the extracurricular activity group, the smallest class ($N= 99$, or 17.6% of the sample) had a low initial level of empathy (M Intercept = 3.00, $p < .001$) that increased over time (M slope = .133, $p = .13$); we labelled the first latent class *low-increased empathy extracurricular class* (LIEE), this class was

characterised by only males from junior high school. The next class ($N= 193$, or 34.4% of the sample) exhibited a higher mean initial level of empathy (M Intercept = 3.13, $p < .001$) that increased over time (M slope = .425, $p < .001$); the majority were female and principally from high school and junior school; this was labelled the *higher-increased empathy extracurricular class* (HIEE).

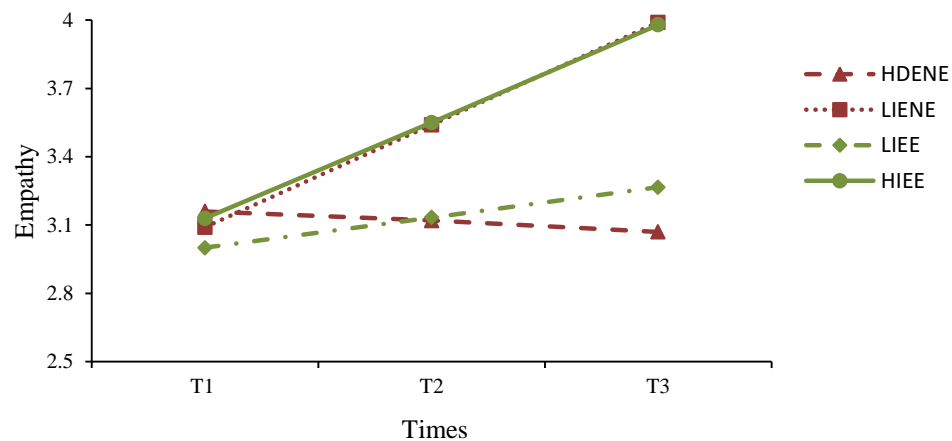


Figure 4. Empathy trajectory classes across group membership

Note: HDENE = higher-decreased empathy non-extracurricular class. LIENE = low-increased empathy. LIEE = low-increased empathy extracurricular class. HIEE = higher-increased empathy extracurricular class. T1 = Time 1; T2 = Time 2, T3 = Time 3.

Breadth of Participation and Intensity Latent Growth Trajectories

Development of Breadth of Participation

The results for the univariate growth model of breadth of participation revealed a poor fit of the model, $\chi^2(1, N = 292) = 3.88, p < .05, RMSEA = .099, CFI = .97, SRMR = .072$. Mean intercepts and slopes were significant, as were mean variances, indicating inter-individual differences. Next, GMM analyses controlling for gender and age were performed and our findings indicated that the two-class solution was better than the single-class solution (BLRT was significant at $p < .001$). There was a higher value of entropy (1) as well as high average posterior probabilities of class membership (1). The first class ($N= 64$, or 21.9% of the sample) was characterised by adolescents with a high initial level of breadth of participation (M Intercept = 2.005, $p < .001$) that decreased over time (M slope = $-.284, p < .001$). The second class ($N= 228$, or 78.1% of the sample) was composed of adolescents with a lower initial level of breadth of participation (M Intercept = 0.97, $p < .001$) that stayed stable over time (M slope = .028, $p = .70$). We labelled the first latent class *two decreasing diversity class* (TDD) and the second one, *one stable diversity class* (OSD).

Development of Intensity of Participation

The results for the univariate growth model of intensity of participation revealed a good model fit, $\chi^2(2, N = 290) = 3.28, p < .05, RMSEA = .047, CFI = .99, SRMR = .039$. Mean intercept and intercept variance were significant, revealing inter-individual differences in the initial level of intensity. Next, GMM analyses controlling for gender and age were performed and our findings indicated that the two-class solution was better than the single-class solution (BLRT was significant at $p < .001$), with a high value of entropy (.93) as well as high average posterior probabilities of class membership of .935 and .988. The first class ($N = 18$, or 6.9% of the sample) was characterised by adolescents with a high initial level of intensity of participation (M Intercept = 22.59, $p < .001$) that decreased over time (M slope = -2.64, $p < .05$). The second class ($N = 272$, or 93.1% of the sample) was composed of adolescents with a lower initial level of intensity of participation (M Intercept = 12.08, $p < .001$) that decreased, although this decrease was not statistically significant over time (M slope = -.832, $p = .31$). We labelled the first latent class *high-decreasing intensity class* (HDI) and the second one, *lower stable intensity class* (LSI).

Breadth of Participation and Intensity Trajectories and Prosocial Behaviour and Empathy Latent Class Membership

For prosocial behaviours, our results suggested that the model fits the data poorly, $\chi^2(4, N = 292) = 3.6483, \text{Nagelkerke } R^2 = .076, p = .456$. The reference group was those adolescents that exhibited a higher mean initial level of prosocial behaviours that increased over time (HIPE). And for empathy, the model also showed a poor model fit $\chi^2(2, N = 292) = 1.038, \text{Nagelkerke } R^2 = .005, p = .595$. Accordingly, each factor had two parameters for prosocial behaviours, one for predicting memberships in the low-increased prosocial extracurricular class (LIPE) rather than the HIPE group, and one for predicting membership in the stable prosocial extracurricular class (SPE). And in empathy, each factor had one parameter, for predicting membership in the low-increasing empathy (LIEE) rather than the high-increasing empathy class. As shown in Table 3, there were not significant contributions of breadth of participation or intensity to trajectory class membership of prosocial behaviours and empathy.

Table 3. Multinomial Logistic Regression Parameter Estimates Model Assessing Characteristics of Prosocial Behaviour and Empathy Classes

	Factor	Class	B	OR	p
M1- Prosocial Behaviours		HIPE vs.			
	BoP- Class Trajectory (TDD)	LIPE	-.848	.428	.269
	Intensity- Class Trajectory (HDI)	LIPE	-.274	.760	.797
	BoP- Class Trajectory (TDD)	SPE	.059	1.06	.873
	Intensity- Class Trajectory (HDI)	SPE	-1.25	.285	.230
M2-Empathy		HIEE vs.			
	BoP- Class Trajectory (TDD)	LIEE	.229	1.26	.438
	Intensity- Class Trajectory(HDI)	LIEE	.368	1.44	.471

Note: M1 = Model 1. M2= Model 2. Breadth of Participation = BoP. HIPE = higher-increased prosocial extracurricular class. LIPE = low-increased prosocial extracurricular class, SPE = stable prosocial extracurricular class. HIEE = higher-increased empathy extracurricular class. LIEE = low-increased empathy extracurricular class. TDD = two decreasing diversity class. HDI = high decreasing intensity class. B= Standardized regression coefficients. OR= Odds Ratio. . *p* = *p*-value.

Discussion

A growing body of research has explored longitudinal change in adolescent prosocial behaviours and empathy and has found mixed results. Moreover, most of these results came from variable-centred approaches that did not take heterogeneity into account. The purpose of this study was therefore to (a) longitudinally examine patterns of adolescents' development trajectories of prosocial behaviours and empathy across time during adolescence, taking into account participating or not in extracurricular activities and controlling for covariates such as gender and age assessed by school educational level; and (b) to investigate whether dimensions of extracurricular activity participation (breadth of participation and intensity) had an influence on the growth pattern trajectories of prosocial behaviours and empathy.

Development of Prosocial Behaviours and Prosocial Behaviour Trajectories Across Group Membership

First, we investigated development of prosocial behaviours across two groups (non-extracurricular activity participation and extracurricular activity participation) and the Latent Growth Curve indicated that prosocial behaviours had different trajectories between the two groups; for instance, in the group of non-extracurricular activity, prosocial behaviours were found to be stable over the three periods of this study. By contrast, for the extracurricular activity participation group, prosocial behaviours increased linearly over time. In addition, Growth Mixture Model (GMM) results revealed three different classes of adolescents who were distinct in their patterns of change in levels of prosocial behaviours. Examining the

trajectories across group membership (extracurricular activity participation, non-extracurricular activity participation) showed that there were differences across groups. Although the initial levels of prosocial behaviours in the non-extracurricular activity group were different, the rate change in both classes showed an upward linear trend over time. Gender and school educational level were also related to the initial mean level of intercepts, but not to the rate change. By contrast, one class showed a downward linear trend over time and gender and school educational level were not related to the mean initial level or the rate change. Gender and school educational level were therefore related only to the mean initial level of intercepts in all classes, except the stable one. This pattern was in line with studies related to an increase in self-focused modes of prosocial moral reasoning (Alessandri, Caprara, Eisenberg, & Steca, 2009; Eisenberg, Shea, Carlo, & Knight, 1991). In the extracurricular activity group, there were also different mean initial levels of prosocial behaviours, and for two groups, there was an upward linear trend over time and the last group was found to be stable over time. The main difference with the non-extracurricular group was that for adolescents that took part in an extracurricular activity, there was no class trajectory that decreased over time. These patterns were in line with theoretical expectations concerning maturational brain changes and cognitive development (see Eisenberg, Fabes, et al., 2006), but also changes in the social world related to the adolescent period. The increasing group patterns were in line with previous research that found a group starting with lower levels at the beginning of adolescence and displayed a linear growth till early adulthood (Luengo Kanacri, Pastorelli, Eisenberg, et al., 2014). Thus, our findings highlight the relevance of taking account of contextual factors such as extracurricular activity participation to study prosocial behaviour trajectories in order to better capture heterogeneity in adolescence. They contribute to our knowledge of the role of extracurricular activities in adolescent development, in line with previous considerations (Denault & Poulin, 2016; Feldam & Matjasko, 2012; Hansen et al., 2010).

Development of Empathy and Empathy Trajectories Across Group Membership

First, we investigated the development of empathy across the two groups (non-extracurricular activity participation and extracurricular activity participation) and the Latent Growth Curve indicated that empathy development had different trajectories between the two groups; for instance, in the non-extracurricular activity group, empathy decreased linearly over time, in contrast to the extracurricular activity group where empathy was stable over time. However, LGM analyses revealed considerable variability in intercepts and GMM

analyses showed that the developmental trajectories of empathy were not the same for all adolescents, with two distinguishable classes being found. One was characterised by individuals who exhibited high initial levels of empathy that increased over time during adolescence, in contrast to one class trajectory characterised by adolescents with lower levels of empathy that increased over time during adolescence. Initial levels of empathy were also influenced by gender and school educational level, while the change rate of empathy was influenced only by school educational level, with the negative slope indicating that empathy decreased over time for high school adolescents, which is in line with some studies that have found a decrease in empathic concern with age for boys (e.g. Overgaauw et al., 2017; Van der Graaff et al., 2017).

Considering the results yielded by the GMM analyses across group membership, our findings suggested that, for adolescents that did not participate in extracurricular activities, there were two different trajectories, one class trajectory that was characterised by adolescents that had a high initial level of empathy and showed a downward linear trend over time, and the other class that had a slightly lower initial level and showed an upward linear trend over time. Interestingly, in the extracurricular activity group, although one group had a lower initial intercept level, both classes had an upward linear trend over time. Moreover, gender and school educational level were related to the initial mean level of intercepts but not to the rate change. These results suggest that there is a distinction between the trends of empathy development across adolescents, since taking part in an extracurricular activity had an influence over the trajectory of empathy development as there was no downward linear trend over time during adolescence. This could be explained by results from studies showing that similarity influences empathic responding. In fact, it seems that the observer has a tendency to identify more closely with others that appear to be more similar to him or herself (Lamm, Meltzoff, & Decety, 2010; Preston & de Waal, 2002; Preston & Hofelich, 2012) in features such as personality (Avenanti, Minio-Palluelo, Bufalari, & Aglioti, 2009), appearance but also cultural likeness, sentience or social circumstances (Cheng et al., 2007; Forgiarini, Gallucci, Maravita, 2011; Preston, Hofelich, & Stansfield, 2013; Xu, Zuo, Wang, & Han, 2009). According to the in-group empathy hypothesis, people show exaggerated affective responses to more similar in-group members than to less similar out-group members (Brown, Bradley, & Lang, 2006; Farrant, Devine, Maybery, & Fletcher, 2012; Gutsell & Inzlicht, 2010, 2012). The results demonstrate that not only the level but also change in empathy development was different across groups. They are in line with those we found regarding

prosocial behaviours. Our results therefore suggest that taking part in an extracurricular activity contributes to prosocial and empathy development in adolescence, as pointed out previously by scholars (Dunfield, 2014; García-López & Gutiérrez, 2015; Sevdalis & Raab, 2014; Spinrad & Eisenberg, 2014; Zarrett et al., 2009).

Breadth of Participation and Intensity

In an effort to understand the class membership trajectories of prosocial behaviours and empathy in the extracurricular group, we explored the relations between breadth of participation and intensity class trajectories and the former; we sought to examine the hypothesized influence of these two dimensions of extracurricular participation on class trajectory membership for prosocial behaviours and empathy. Interestingly, prosocial behaviours and empathy latent class trajectories were not related to the diversity of extracurricular activities and intensity of participation. This could be explained by the fact that the diversity of extracurricular activities in our sample was low, for instance, 78.62% of adolescents had a value of 1 for diversity of activities, 11.11% had a value of 2 and 0.69% a value of three, and another possible explanation is related to the homogenous type of extracurricular activity, specifically sports. In line with this, some studies have suggested that what adolescents experience in the activities is likely to be associated with the specific characteristics of the activities they are involved in and the level of psychological engagement in the activity (Denault & Poulin, 2016). However, taking part in a broad range of activities provides a space that helps to equip adolescents with a variety of skills to support their successful growth and adjustment and facilitate exposure to different contexts and experiences, such as identifying with others, fostering relationships and promoting a greater sense of belonging (e.g. Busseri et al., 2006; Knifsend & Graham, 2012; Lerner, Freund, De Stefanis, & Habermas, 2001; Zarrett & Mahoney, 2011). Furthermore, concerning the latent class trajectory of breadth of participation, interestingly, the majority of adolescents followed a stable linear trend, contrary to what is most widely reported in the literature that involvement in a range of different activities declines over time (Barnett, 2008; Bohnert et al., 2010; Bowers et al., 2014; Collins & Steinberg, 2006; Donlan, Lynch, & Lerner, 2015). This might be a cultural difference, with French adolescents being involved in fewer activities but their engagement and participation staying stable over time.

Limitations and Conclusions

Although this study contributes meaningfully to the existing literature on adolescents' prosocial behaviours and empathy, it is not without limitations. Most importantly, the current study is relatively homogeneous in terms of socioeconomic status and type of schools. Given that this is a study seeking to explore heterogeneity, we may not have captured all the existing trajectories of prosocial behaviours and empathy given our sample, and future research should continue to explore these questions with more diverse samples. Also, the current study only considered extracurricular activity participation and non-participation, while it would have been interesting to consider differences between different types of activities (i.e. sports, performing arts). Due to the low data available in the performing group in our sample, we were not able to explore different possible trajectories of prosocial behaviours and empathy among them.

We consider that future research should acknowledge the heterogeneity of types of extracurricular activities, as it would be interesting to determine whether the trajectories are similar or different in these diverse types of extracurricular activities over time, and might provide a more holistic picture of the process within them and of prosocial behaviour and empathy developmental trajectories. In line with this, latent transition class analyses might help us to counter the difficulty of assessing the relationship between the two dimensions of activity participation and class trajectory membership of prosocial behaviours and empathy. In addition, all the variables in the current study were self-reported; multi-informant approaches, such as prosocial behaviours and empathy ratings of the adolescents by their parents and peers, could provide additional information in our understanding of prosocial behaviours and empathy. However, self-report measures are essential in the collection of information on adolescent internal and subjective processes such as empathy and prosocial behaviours, because they are difficult for others to observe (Achenbach, McConaughy, & Howell, 1987; Brenner & DeLamater, 2016; Lucas, 2018).

Despite these shortcomings, this study constitutes a significant extension of our understanding of the pathways that enable positive outcomes (prosocial behaviours and empathy), building responsibility and initiative through engaging and enriching activities (extracurricular) and identifying and aligning youth strengths with contextual assets that are able to mobilise internal and external assets related to the adolescent development (Brown & Larson, 2009; Brown, 2009; Damon, 2004; King et al., 2005). The results highlight the heterogeneity of trajectories within each group and across the two groups. For instance, this

study captures two additional trajectories that underline a sizable minority of adolescents who showed an increase in prosocial behaviours over time, a trend that is specific to the extracurricular group. This study also suggests that except some latent class trajectories, gender and school educational level were related to the initial level of the intercept of prosocial behaviours, whereas for empathy, the initial level of the intercept was only related to school educational level. These findings have important implications for potential intervention efforts aimed at increasing adolescents' prosocial behaviours and empathy in at-risk groups of adolescents. For instance, it seems that extracurricular activity participation could be used as an intervention strategy in order to promote positive development not only in a leisure activity context but also at the school level, and might result in greater benefits than those delivered in isolation. Social interchanges in the leisure context, in this case, extracurricular activity participation, might provide some protective benefits, considering that adolescents can apply the social knowledge and skills acquired in one social context to the other social contexts they encounter, and these acquired social skills differ depending on the attending social context (Bronfenbrenner & Morris, 1998). In this way, prosocial behaviours and empathy may propagate across adolescents' social networks, as research suggests that as individuals improve their social relationships, they have more possibilities to experiment with positive social interactions and fulfill their psychological need for the relatedness and belonging that are essential to human development and growth (Deci, La Guardia, Moller, Scheiner, & Ryan, 2006; Weinstein & Ryan, 2010).

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General Discussion

General discussion

The three complementary studies which compose this dissertation were inspired by research showing that during adolescence there is a range of changes not only at the cognitive, physiological, emotional and affective levels but also at the social level, with the diversifying social contexts and thus the social reorientation that characterises this period of life. This enhances the importance of social skills as social networks with peers who become central elements in the adolescent's life and, among the diverse social skills; we focused on empathy and prosocial behaviours. The frame of reference of this dissertation is the positive youth development (Lerner, 2005), that considers *“that youth is developing individuals who display considerable strengths, and who can be guided to become positive and constructive contributors to society”* (p. 4), and views adolescence through the lens of system theories which examine development throughout the life span as a product of relations between the individuals and their world. One core aspect is the idea of plasticity that posits that individuals have the potential for systematic change across life. This potential means that adolescent's trajectories of development are not immovable and can be influenced by diverse factors coming from their living environments (Lerner, 2006).

The general aim of this dissertation was to examine and provide more insight into the role of living environments on adolescents' empathy and prosocial behaviours. One part (the context) of the SSMD theory (Connell & Wellborn, 1991; Skinner & Belmont, 1993; Skinner et al., 2005) and the ecological perspective (Bronfenbrenner, 2005; Bronfenbrenner & Morris, 1998) were used to guide our empirical research in Chapter 7. The first framework considers that there are six core features of parenting, including warmth, rejection, structure, chaos, autonomy support and coercion that are critical to the children's experiences of belonging, competence and expressions of autonomy and have an influence on children's openness to socialisation (Bower & Carroll, 2015; Steinberg, 2005). These core features have been adapted and studied at the class and extracurricular activity peer group. The second framework supports the idea that in addition to individual dispositions, family and peer groups represent the most proximate influence on development. Although it recognises the primacy of certain developmental niches like family and school, it also emphasises multiple influences and developmental effects within and across the different spheres in which adolescents live. Most importantly, this theory emphasises the central role of proximal processes – the reciprocal and ever-changing interactions between an individual's unique and

intrinsic developmental assets and the individual's subjective experiences, across different environmental contexts and times (Bronfenbrenner & Morris, 2006). To further explore the role of proximal processes with regard to adolescent prosocial behaviour development, we included adolescents' perceptions of group prosocial behaviours (parents, class, and extracurricular peer group) in order to capture the possible influence of adolescents' perceptions of prosocial behaviours across the different contexts and their own prosocial behaviours. Overall, our findings suggest that, on the one hand, extracurricular peer group features but also family features (particularly the negative ones) and, on the other hand, extracurricular peer group and parents' prosocial behaviours play a major role in adolescents' prosocial behaviours via empathy in adolescence. In addition to the main aim, this dissertation had two other aims based on research questions drawn from the literature review concerning the development of empathy and prosocial behaviours during adolescence. We addressed these questions using longitudinal with between- and within-person analytical techniques. First, we tested the bidirectional relations between empathy and prosocial behaviour development during adolescence (Chapter 8) and we found that empathy is a driver of prosocial behaviours. Second, we identified empathy and prosocial behaviour's latent class growth considering extracurricular activity participation and that in the extracurricular activity group there is no downward trend trajectory of empathy and prosocial behaviours over time during adolescence compared to the non-extracurricular group (Chapter 9).

This final chapter aims to put this dissertation into a broader context by discussing the implications of this research and the potential directions to future research on adolescent empathy and prosocial behaviours considering the features of the living environments and the groups' prosocial behaviours as well as the strengths and limitations of our research.

Implications

Scientific and Theoretical Implications

The use of one part of the SSMMD approach across three living environments allowed us to capture the common and specific features of the family, school and extracurricular peer group contexts that influence adolescents' prosocial behaviours. This highlights the importance to move beyond the individual level focus and incorporate community, systems-level-factors and recognise the interplay of the different living environment adolescents are involved in (e.g. Burke, Joseph, Pasick, & Barker, 2009; Caldwell & Witt, 2011; Smith, Osgood, Caldwell, Hynes, & Perkins, 2013). Additionally, it is important to recognise the

common features among contexts but more importantly to acknowledge and consider the specificities of each context that might have a unique influence on adolescent development (e.g. Chen et al., 2011; Dovidio, Piliavin, Schroeder, & Penner, 2006; Zito, Parcel, & Solebello, 2011). Thus, our findings suggest the relevance of this extended approach and that further research is needed to evaluate the validity of our theoretical integrative model into a developmental and dynamic perspective.

Concerning the directionality of the effects between empathy and prosocial behaviours, our results are in line with research that found that empathy is a predictor of prosocial behaviours (e.g. Allemand, Steiger, & Fend, 2015; Decety et al., 2016). Using approaches that allow separating the within-person process from the between-person differences is encouraged (Collins, 2006; Curran & Bauer, 2011; Hamaker, Kuiper, & Grasman, 2015; Hoffman & Stawski, 2009; Wang, 2017). We emphasise the need to carefully decide the statistical analyses in relation with our research goal, moving and clearly stating the differences concerning the between and within processes. This can be achieved by applying the best adapted statistical approach. This prevent from making inferences from between-person results and present as within-person, for instance, the use of cross-lagged analyses and the results obtained from it, does not represent and does not capture the actual within-person relationships over time. Not considering this difference might lead to erroneous conclusions concerning the presence, predominance of causal inferences among the variables under study.

Similarly, to move from mean-centre approaches when studying heterogeneity in development that as our results suggest in line with other research are better captured when heterogeneity is considered from a statistical point of view which allows us to identify the different prosocial and empathy developmental trajectories (e.g. Jung & Wickrama, 2008; Li & Harring, 2017; Ram & Grimm, 2009).

Practical Implications

The findings of our studies allow us to offer some practical implications. Consistent with previous research (e.g. Ben-Arieh & Attar-Schwartz, 2013; Lam, 2013; Lerner et al., 2015), our results suggest the importance of considering the living environments adolescents are involved in, when examining the predictors of adolescents' prosocial behaviours, there are common and specific predictors of adolescent prosocial behaviours (Chapter 7). This suggests that in crafting interventions, it is important to consider the context targeted and its specific

features. Acknowledging the influence that the peer context exerts on adolescents' prosocial behaviours and empathy development (Berger, Batanova, & Cance, 2015; Chen et al., 2011; Dallaire & Zeman, 2013; Padilla-Walker & Carlo, 2014; Sierksma, Thijs, & Verkuyten, 2014; Toseeb, Pickles, Durkin, Botting, & Conti-Ramsden, 2017) and preventive efforts might focus on expanding adolescents' behavioural repertoires through empathy but also considering the specific features of the context over which intervention is being implemented. For example, based on our results it seems that in the school context, intervention programmes should emphasise on the one hand, the importance of building up individual capacities (i.e. empathy) to foster students' prosocial behaviours by strengthening contextual social interaction (i.e. positive features of the context) and on the other hand, pointing out the importance of having a positive atmosphere within the classroom through features in the classroom environment. In extracurricular groups it seems that the efforts should be directed toward the inclusion of models conducive to positive, prosocial exchange that could promote prosocial behaviours and redirect the tendency of the context's negative features with their negative effect on adolescents' prosocial behaviours (Dishion, Piehler, & Myers, 2008; Hoeve et al., 2009).

Moreover, it seems that in to enhance prosocial behaviour development we should focus on empathy development, considering different factors such as the group context (i.e. in-group/out-group), personal motivations and situational factors but also to consider multiple expression forms of prosocial behaviours (e.g. the target toward who are directed, the situation). Furthermore, our promising findings concerning the developmental trend of empathy and prosocial behaviours in adolescents that participate in an extracurricular activity highlights the benefits of using these social groups as avenues to increase adolescents' positive development (e.g. Knifsend, 2015; Ruvalcaba, Gallegos, Borges, & Gonzalez, 2017). Specifically, further applied research should be done to explore and invest these social groups in order to develop adolescents competencies related to empathy and prosocial behaviour development. Extracurricular group settings provide naturalistic and experimental opportunities to develop life skills such as, for example, in performance and fine arts that seems a good way to the expression of emotions, develop positive relationships (Bower & Carroll, 2015; Bundick, 2011; Martin et al., 2013; Rusk et al., 2013); concerning the sports groups, research suggests that it offers a social support system and sense of belonging, and the other contexts adolescents are involved in offer opportunities for using such skills (e.g.

Bowers et al., 2014; Lerner et al., 2015) that could create groups bonds and favour good citizenship.

Limitations, Suggestions for Future Research and Strengths

While this research is among the first to address the use of the same approach across living environments to capture the features that might influence adolescents' empathy and prosocial behaviours, the findings should be considered in light of the following limitations. In the study of the integrative theoretical model, the cross-sectional nature of the design impedes to make strong causal inferences about the constructs. A longitudinal design would overcome this limit by allowing better implying causality and ascertaining the direction of causal relations. Moreover, data was gathered through self-reports, instead including multi-informants might increase the validity of our findings. Also, questionnaires concerning parents' prosocial behaviours were assessed considering parents as a single unit; however, adolescents' perceptions of fathers' and mothers' prosocial behaviours might have been significantly different and for instance might influence adolescents' prosocial behaviours differently.

Concerning the data used for the longitudinal studies (Chapters 8 and 9), the sample used, particularly the junior high school population, was relatively lacking socioeconomic diversity and types of school for high school samples. Thus, it is possible that variability was limited due to the homogeneity of the sample, and for instance the results are not generalisable to all French adolescents, and then more diverse sample should be explored.

We did not consider the heterogeneity of extracurricular activities due to the low data available in our sample concerning performing and fine arts activities. However, future research should acknowledge this heterogeneity while determining the trajectories of empathy and prosocial behaviours. Another limit was the use of the two dimensions of extracurricular activity participation (i.e. breadth of participation and intensity) as latent growth trajectories that did not reflect the possibility of change over three years concerning the type of activity or the intensity of participation. To counter this limit, future research should consider latent transition analyses. Therefore, in our analyses we used the measures of prosocial behaviours as a whole and the same was done for empathy measures. Future research should definitely consider the different dimensions of these constructs to better capture their specificities and expression.

Despite these shortcomings, this dissertation constitutes a significant extension in our understanding of the pathways that enable or hinder adolescents' empathy and prosocial behaviours. Specifically, it provides new insights into how features of different contexts could be studied simultaneously using the same approach with the purpose of capturing not only common features across contexts but also the specificities of each context. Our study highlights the fact that it is not the same features of the contexts that influence adolescents' prosocial behaviours; it seems that the presence and the strength of the relationship between the features of the context and adolescents' prosocial behaviours depend on the context being studied.

Moreover, the longitudinal design allowed us to examine the bidirectionality of the effects between empathy and prosocial behaviours during adolescence and highlighted the unidirectional path from empathy to prosocial behaviours. This result is in line with previous research that posits that empathy is a driver of prosocial behaviours and that prosocial behaviours are the expression of the development of empathy (e.g. Balconi & Canavesio, 2012; Barford et al., 2014; McMahon, Wernsman, & Parnes, 2006; Van der Graaff et al., 2017). Therefore, we highlighted the importance of disentangling the between from the within-person variations while exploring the development of empathy and prosocial behaviours. Finally, the latent class growth analyses allowed us to explore if participation in enriching contexts, for instance, extracurricular activity, was related to specific empathy and prosocial behaviour developmental trends; our results showed that there is heterogeneity in the developmental trajectory that is better captured by statistical analyses that consider this heterogeneity. Globally, we highlight the importance of considering the contextual assets related to an adolescent's strengths that can mobilise internal and external assets that may enhance empathy and prosocial behaviours, and thus influence the adolescent's positive development.

Conclusion

Overall, this dissertation addressed important issues and contributes to a better understanding of adolescents' empathy and prosocial behaviour development particularly during adolescence, a period that have received less attention in previous empirical research. The current dissertation examined the role of living environments on empathy and prosocial behaviours, with a specific focus on one approach applied to the different proximal contexts adolescents are involved in (i.e. family, class and extracurricular activity). Moreover, it offers an insight concerning the directionality of the effects between empathy and prosocial

behaviour development, and finally the trajectories of development considering extracurricular participation or non-participation. The results of this dissertation suggest the pertinence of using one approach to capture the influence of living environment on empathy and prosocial behaviours, especially the relationships with the persons in the contexts that influence individuals and their behaviours. For instance, there are common features and specificities across contexts that influenced adolescents' prosocial behaviours. However, they are to be understood in a broader range considering the complex relationships between multiple social contexts. Moreover, empathy is a driver predictor of prosocial behaviours, and the developmental trajectories of empathy and prosocial behaviours for adolescents that participate in an extracurricular activity showed no downward trend over time and support the idea that extracurricular activity participation influences the positive development of adolescents. Our results highlight the importance of considering the relations between the living environments adolescents are involved in and the psychosocial development of adolescents. Furthermore, it is crucial to carefully consider the between person differences and the within-person processes of development as well as the heterogeneity of developmental trajectories concerning empathy and prosocial behaviours during adolescence. This is essential if we want to capture the complex interplay between family, class, extracurricular peer group, empathy and prosocial development.

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APPENDICES

Appendices

Abbreviations

Prosocial Behaviour Scale	PBS
Prosocial Behaviour	PB
Helping Wave1	HELPS_W1
Caring Wave1	CARS_W1
Helping Wave2	HELPS_W2*
Caring Wave2	CARS_W2*
Helping Wave3	HELPS_W3*
Caring Wave3	CARS_W3*
Class Peer Group Prosocial Behaviour	CPGPB
Helping class	HELPCl
Caring class	CARCl
Extracurricular Peer Group Prosocial Behaviour	EPGPB
Helping activity	HELPAct
Caring activity	CARAct
Parents Prosocial Behaviours	PPB
Helping parents	HELPPa
Caring parents	CARPa
Empathy Scale	BES
Emotional Contagion Wave1	EmoCon_W1
Cognitive Empathy Wave1	CogEm_W1
Emotional Disconnection Wave1	EmoDis_W1
Emotional Contagion Wave2	EmoCon_W2*
Cognitive Empathy Wave2	CogEm_W2*
Emotional Disconnection Wave2	EmoDis_W2*
Emotional Contagion Wave3	EmoCon_W3*
Cognitive Empathy Wave3	CogEm_W3*
Emotional Disconnection Wave3	EmoDis_W3*
Group as Social Context	GaSC
Class Peer Group as Social Context	CPGaSC
Extracurricular Peer Group as Social Context	EPGaSC
Family as Social Context	FaSC
Multi-Group Confirmatory Factor Analyses	MGCFA

Table 1. Descriptive statistics of Group as Social Context (GaSC)-adapted to different contexts (Class, Extracurricular Peer Groups and Family).

Measures		Age				Total Sample		Gender			
		Early-to Middle adolescence (N = 867)		Middle-to-late adolescence (N = 773)		Adolescents (N = 1640)		Males (n = 871)		Females (n = 769)	
		M	SE	M	SE	M	SE	M	SE	M	SE
GaSC-Class Peer Group	Warmth	3.58	.34	3.44	.49	3.51	.41	3.53	.39	3.51	.42
CPGaSC	Rejection	2.36	.11	2.34	.21	2.35	.16	2.40	.17	2.29	.15
	Structure	3.45	.02	3.42	.07	3.44	.04	3.37	.05	3.52	.03
	Chaos	2.45	.35	2.10	.37	2.28	.36	2.35	.36	2.21	.36
	Autonomy Support	3.57	.24	3.66	.34	3.62	.29	3.58	.27	3.66	.31
	Coercion	2.18	.22	1.63	.09	1.99	.25	2.08	.24	1.89	.25
GaSC-Extracurricular Peer Group-EPGaSC	Warmth	3.93	.24	3.88	.29	3.91	.27	3.88	.27	3.95	.28
	Rejection	2.24	.18	1.99	.31	2.14	.24	2.23	.19	2.03	.28
	Structure	3.71	.08	3.69	.01	3.70	.04	3.57	.06	3.86	.02
	Chaos	2.11	.21	1.63	.18	1.91	.19	2.06	.19	1.73	.19
	Autonomy Support	3.99	.10	3.92	.22	3.96	.15	3.86	.15	4.08	.16
GASC-Family-FaSC	Coercion	1.99	.11	1.63	.09	1.84	.10	2.04	.11	1.59	.10
	Warmth	4.44	.13	4.33	.19	4.39	.16	4.36	.14	4.41	.17
	Rejection	2.01	.07	1.85	.16	1.94	.11	3.03	.93	1.84	.14
	Structure	4.19	.08	4.14	.04	4.17	.06	4.13	.05	4.19	.07
	Chaos	2.14	.22	1.95	.28	2.05	.25	2.18	.27	1.91	.23
	Autonomy Support	4.05	.08	4.03	.24	4.04	.15	4.03	.12	4.05	.19
	Coercion	2.34	.26	2.24	.25	2.29	.26	2.38	.25	2.20	.27

Note. All the dimensions are latent factor means calculated in CFA. Individual standard errors of observed means were calculated in SEM when examining correlations with all latent factors. Four multi-group comparisons of all latent factor means were conducted within SEM (Early- vs. Late-Adolescents, Male vs. Female Adolescents).

Table 2. Descriptive Statistics of PBS self and PBS-adapted to different contexts (Class, Extracurricular Peer Group and Parents) and Empathy

Measures		Age				Total		Gender			
		Early-to Middle adolescence		Middle-to-late adolescence		Adolescents		Males		Females	
		(n = 867)		(n = 773)		(N = 1640)		(n = 871)		(n = 769)	
		M	SE	M	SE	M	SE	M	SE	M	SE
PBS-Self	HELPS_W1	3.53	.39	3.40	.52	3.47	.68	3.36	.45	3.59	.46
	CARs_W1	3.65	.28	3.51	.33	3.58	.72	3.37	.28	3.82	.33
	HELPS_W2*	3.57	.43	3.48	.55	3.54	.47	3.41	.45	3.65	.49
	CARs_W2*	3.65	.26	3.69	.28	3.84	.19	3.24	.45	3.85	.28
	HELPS_W3*	3.64	.45	3.57	.46	3.62	.45	3.51	.42	3.71	.47
	CARs_W3*	3.73	.23	3.72	.23	3.87	.69	3.35	.35	3.87	.24
PBS-Class	HELPEl	3.04	.30	2.91	.34	3.05	.27	2.97	.31	2.99	.32
	CAREl	3.33	.20	3.09	.24	3.22	.21	3.12	.18	3.33	.28
PBS-Extracurr.	HELPEct	3.62	.46	3.59	.47	3.76	.31	3.51	.44	3.72	.49
	CAREct	3.79	.09	3.63	.17	3.72	.11	3.55	.16	3.92	.12
PBS-Parents	HELPEpa	3.94	.38	3.66	.47	3.92	.31	3.78	.39	3.83	.46
	CAREpa	4.08	.06	3.79	.12	3.95	.08	3.88	.09	4.01	.09
Empathy	EmoCon_W1	3.55	.17	3.48	.12	3.52	.82	3.28	.19	3.82	.25
	CogEm_W1	3.91	.21	3.96	.27	3.93	.66	3.78	.29	4.10	.24
	EmoDis_W1	3.61	.20	3.87	.29	3.73	.87	3.54	.32	4.01	.28
	EmoCon_W2*	3.27	.17	3.69	.19	3.61	.17	3.41	.17	3.80	.18
	CogEm_W2*	3.92	.18	4.08	.24	3.97	.19	3.84	.18	4.09	.21
	EmoDis_W2*	3.58	.22	3.96	.24	3.71	.21	3.49	.19	3.91	.23
	EmoCon_W3*	3.57	.15	3.61	.20	3.58	.17	3.44	.09	3.70	.23
	CogEm_W3*	3.81	.17	4.00	.22	3.89	.19	3.77	.19	3.99	.19
	EmoDis_W3*	3.56	.22	3.92	.19	3.69	.21	3.45	.20	3.89	.21

Note. All the dimensions are latent factor means calculated in CFA. Individual standard errors of observed means were calculated in SEM when examining correlations with all latent factors. Four multi-group comparisons of all latent factor means were conducted within SEM (Early- vs. Late-Adolescents, Male vs. Female Adolescents). * The data available at Wave 2 and Wave 3 is N = 610, Early-to-middle adolescents (n = 383), middle-to-late adolescents (n = 227), males (n = 285) and females (n = 324).

Table 3. Fit Indices for the different Factor Models of the PBS adapted to different contexts (Class, Extracurricular Peer Groups and Parents)

Models	χ^2	df	RMSEA [90 CI %]	WRMR	CFI
Class (N=1631)					
One factor model	369.80	35	0.077 [0.070- 0.084]	1.44	0.98
Two factor model	278.61	34	0.066 [0.059- 0.074]	1.24	0.98
Two factor model +1 Cov. error *	182.19	33	0.053 [0.045- 0.060]	0.99	0.99
Extracurricular (N=1042)					
One factor model	558.62	35	0.120 [0.111- 0.129]	1.61	0.97
Two factor model	255.85	34	0.079 [0.070- 0.088]	1.06	0.99
Two factor model +1 Cov. error*	200.29	33	0.070 [0.061- 0.079]	0.93	0.99
Two factor model +2 Cov. error **	155.56	32	0.061 [0.051- 0.071]	0.81	0.99
Parents (N=1599)					
One factor model	910.24	35	0.125 [0.118- 0.132]	2.23	0.96
Two factor model	715.43	34	0.112 [0.105- 0.119]	1.91	0.97
Two factor model +1 Cov. error *	572.36	33	0.101 [0.094- 0.108]	1.70	0.97
Two factor model +2 Cov. error**	471.92	32	0.093 [0.085- 0.100]	1.53	0.98
Two factor model +3 Cov. error ***	331.84	31	0.078 [0.070- 0.086]	1.25	0.98

Note. χ^2 Chi-square; *df* = degrees of freedom; RMSEA = Root Mean Square Error of Approximation; CI = Confidence Interval; WRMR = Weighted Root Mean Square Residual; CFI = Comparative Fit Index. *Cov. Error = errors of items 1 and 3. ** Cov. Error = errors of items 1 and 3, 4 and 5. ***Cov. Error = errors of items 1 and 3, 4 and 5, 11 and 12, are allowed to covary.

Table 4. Multi-Group confirmatory factor analysis two-factor model of PBS-adapted to different contexts across age and gender

MGCFA	Models across contexts	χ^2	<i>df</i>	RMSEA [90 CI %]	WRMR	CFI
	Class (N=1631)					
Age	Two factor model	377.34	104	0.057 [0.051- 0.063]	1.72	0.98
	Two factor model +1 Cov.error *	286.60	102	0.047 [0.041- 0.054]	1.49	0.99
Gender	Two factor model	388.82	104	0.058 [0.052- 0.064]	1.72	0.98
	Two factor model +1 Cov.error *	318.64	102	0.051 [0.045- 0.057]	1.56	0.98
	Extracurricular (N=1042)					
Age	Two factor model	329.09	104	0.064 [0.057- 0.072]	1.49	0.99
	Two factor model +1 Cov.error *	280.39	102	0.058 [0.050- 0.066]	1.36	0.99
	Two factor model +2 Cov.error **	250.93	100	0.054 [0.046- 0.062]	1.29	0.99
Gender	Two factor model	342.83	104	0.066 [0.059- 0.074]	1.50	0.99
	Two factor model +1 Cov.error *	300.71	102	0.061 [0.053- 0.069]	1.40	0.99
	Two factor model +2 Cov.error **	272.67	100	0.058 [0.049- 0.066]	1.33	0.99
	Parents (N=1599)					
Age	Two factor model	622.82	104	0.079 [0.073- 0.085]	2.21	0.97
	Two factor model +1 Cov.error *	520.79	102	0.072 [0.066- 0.078]	2.02	0.98
	Two factor model +2 Cov.error **	435.25	100	0.065 [0.059- 0.071]	1.84	0.98
	Two factor model +3 Cov.error ***	334.47	98	0.055 [0.049- 0.061]	1.59	0.99
Gender	Two factor model	585.57	104	0.076 [0.070- 0.082]	2.13	0.98
	Two factor model +1 Cov.error *	492.91	102	0.069 [0.063- 0.075]	1.95	0.98
	Two factor model +2 Cov.error **	424.34	100	0.064 [0.058- 0.070]	1.80	0.98
	Two factor model +3 Cov.error ***	318.81	98	0.053 [0.047- 0.060]	1.54	0.99

Note. χ^2 Chi-square; *df* = degrees of freedom; RMSEA = Root Mean Square Error of Approximation; CI = Confidence Interval; WRMR = Weighted Root Mean Square Residual; CFI = Comparative Fit Index. *Cov. Error = errors of items 1 and 3. ** Cov. Error = errors of items 1 and 3, 4 and 5. ***Cov. Error = errors of items 1 and 3, 4 and 5, 11 and 12, are allowed to covary.

Table 5. Multi-Group Tests of Model Invariance of PBS-adapted to different contexts across age and gender

Comparison	Model	χ^2	df	CFI	RMSEA	WRMR	Δ Model	$\Delta \chi^2$	Δ CFI	Δ RMSEA
PBS-Class										
Early- vs. Late Adolescents	M0. Configural invariance	247.023	66	.987	.058	1.19	---	---	---	---
	M1. Full metric invariance	243.115	74	.988	.053	1.26	M1-M0	14.75	.001	-.005
	M2. Full scalar invariance	286.605	102	.987	.047	1.49	M2-M1	64.18***	-.001	-.006
Male vs. Female Adolescents	M0. Configural invariance	252.89	66	.987	.059	1.18	---	---	---	---
	M1. Full metric invariance	265.93	74	.987	.056	1.30	M1-M0	26.08**	.000	-.003
	M2. Full scalar invariance	318.64	102	.985	.051	1.56	M2-M1	75.37***	.002	-.005
PBS-Extracurricular										
Early- vs. Late- Adolescents	M0. Configural invariance	221.150	64	.992	.069	1.01	---	---	---	---
	M1. Full metric invariance	203.288	72	.993	.059	1.06	M1-M0	9.72	.001	-.010
	M2. Full scalar invariance	250.933	100	.992	.054	1.29	M2-M1	66.54***	-.001	-.005
Male vs. Female Adolescents	M0. Configural invariance	231.632	64	.990	.071	1.02	---	---	---	---
	M1. Full metric invariance	215.289	72	.992	.062	1.07	M1-M0	11.29	.002	-.009
	M2. Full scalar invariance	272.667	100	.990	.058	1.33	M2-M1	75.14***	-.002	-.004
PBS-Parents										
Early- vs. Late- Adolescents	M0. Configural invariance	403.419	62	.983	.083	1.42	---	---	---	---
	M1. Full metric invariance	349.224	70	.986	.071	1.48	M1-M0	14.40	.003	-.012
	M2. Full scalar invariance	334.470	98	.988	.055	1.59	M2-M1	39.65	.002	-.016
Male vs. Female Adolescents	M0. Configural invariance	375.842	62	.985	.080	1.36	---	---	---	---
	M1. Full metric invariance	313.523	70	.988	.066	1.39	M1-M0	8.59	.003	-.014
	M3. Full scalar invariance	318.814	98	.989	.053	1.54	M3-M1	48.15**	.001	-.013

Note. χ^2 = Chi-square; *df* = degrees of freedom; RMSEA = Root Mean Square Error of Approximation; CI = Confidence Interval; WRMR = Standardized Root Mean Square Residual; CFI = Comparative Fit Index. $\Delta\chi^2$ = Delta Chi-square; Δ CFI = Delta Comparative Fit Index. Δ RMSEA = Delta Root Mean Square Error of Approximation. * $p < .05$; ** $p \leq .01$; *** $p < .001$. For all tests, a significant deterioration of model fit would indicate non-invariance. Chi-square difference tests detect small discrepancies with no practical or theoretical implications when sample sizes > 200 . We thus considered a Δ CFI $\geq -.010$, supplemented by a Δ RMSEA $\geq .015$, as more meaningful indicators of model fit deterioration (Chen, 2007; Cheung & Rensvold, 2002; Meade et al., 2008), this two cut-off criteria performed reasonably well with categorical data and WLSMV estimator, although caution is advised, as these statistics do not perform well with misspecified models (Sass et al., 2014). Some chi-square tests were significant, but no drops in CFI or RMSEA exceeded the thresholds of $\geq -.010$ or $\geq -.015$, respectively.

Table 6. Fit Indices for the different Factor Models of GaSC adapted to different contexts (Class, Extracurricular Peer Groups and Family)

Models	χ^2	<i>df</i>	RMSEA [90 CI %]	WRMR	CFI
Class (N=1634)					
Three Single Bipolar model	5973.74	167	0.145 [0.143- 0.149]	4.91	0.79
Six Unipolar model	1561.99	155	0.075 [0.071- 0.078]	2.02	0.95
Six Unipolar model + 2 Cov. error*	1205.68	153	0.065 [0.062-0.068]	1.75	0.96
Extracurricular (N=1038)					
Three Single Bipolar model	5237.00	167	0.171 [0.167- 0.175]	5.02	0.80
Six Unipolar model	1071.95	155	0.075 [0.071- 0.080]	1.64	0.96
Six Unipolar model + 2 Cov. error**	848.60	153	0.066 [0.062- 0.071]	1.45	0.97
Parents (N=1605)					
Three Single Bipolar model	5422.27	167	0.140 [0.137- 0.143]	4.63	0.86
Six Unipolar model	1454.92	155	0.072 [0.069- 0.076]	1.85	0.96
Six Unipolar model + 2 Cov. error*	1037.19	153	0.060 [0.057- 0.063]	1.54	0.98

Note. χ^2 = Chi-square; *df* = degrees of freedom; RMSEA = Root Mean Square Error of Approximation; CI = Confidence Interval; WRMR = Weighted Root Mean Square Residual; CFI = Comparative Fit Index. *Cov. Error = errors of items 7 and 8. («Je ne peux pas compter sur eux pour des choses importantes», «Je ne peux pas compter sur eux quand j'ai besoin d'eux») and items 17 and 18 («Mes camarades de classe/parents essaient de contrôler tout ce que je fais», «Mes camarades de classe/parents sont toujours en train de me dire ce qu'il faut faire»). **Cov. Error = error of items 7 and 8, and items 2 and 6 («Mes camarades se soucient vraiment de moi», «Mes camarades parlent avec moi») are allowed to covary.

Table 7. Multi-Group Confirmatory Analyses (MGCFA) of GaSC-adapted to different contexts across age and gender.

Models	χ^2	<i>df</i>	RMSEA [90 CI %]	WRMR	CFI
MGCFA_Educational Level					
Class (N=1634)					
Six Unipolar model	1708.79	378	0.066 [0.062- 0.069]	2.25	0.95
Six Unipolar model +2 Cov.error *	1403.15	374	0.058 [0.055- 0.061]	2.01	0.96
Extracurricular (N=1038)					
Six Unipolar model	1276.91	378	0.068 [0.064- 0.072]	1.81	0.96
Six Unipolar model +2 Cov.error **	1066.96	374	0.060 [0.056- 0.064]	1.64	0.97
Parents (N=1605)					
Six Unipolar model	1556.79	378	0.063 [0.059- 0.066]	2.04	0.97
Six Unipolar model +2 Cov.error *	1167.83	374	0.051 [0.048- 0.055]	1.72	0.98
MGCFA_Gender					
Class (N=1631)					
Six Unipolar model	1769.32	378	0.067 [0.064- 0.070]	2.28	0.95
Six Unipolar model +2 Cov.error *	1454.98	374	0.059 [0.056- 0.063]	2.04	0.96
Extracurricular (N=1038)					
Six Unipolar model	1341.15	378	0.070 [0.066- 0.074]	1.91	0.96
Six Unipolar model +2 Cov.error *	1147.91	374	0.063 [0.059- 0.067]	1.75	0.97
Parents (N=1605)					
Six Unipolar model	1526.09	378	0.062 [0.058- 0.065]	2.03	0.97
Six Unipolar model +2 Cov.error *	1352.54	374	0.057 [0.054- 0.060]	1.89	0.97

Note. χ^2 = Chi-square; *df* = degrees of freedom; RMSEA = Root Mean Square Error of Approximation; CI = Confidence Interval; WRMR = Standardized Root Mean Square Residual; CFI = Comparative Fit Index. *Cov. Error = errors of items 7 and 8, and 17 and 18. **Cov. Error = error of items 7 and 8, and items 2 and 6.

Table 8. Multi-Group Tests of Model Invariance of GASC across age and gender.

Comparison	Model	χ^2	<i>df</i>	CFI	RMSEA	WRMR	Δ Model	$\Delta \chi^2$	Δ CFI	Δ RMSEA
CPGaSC										
Early- vs. Late Adolescents										
	M0. Configural invariance	1287.213	306	.965	.063	1.84	---	---	---	---
	M1. Full metric invariance	1324.458	320	.965	.062	1.88	M1-M0	49.77***	.000	-.001
	M2. Full scalar invariance	1403.149	374	.964	.058	2.01	M2-M1	155.93***	-.001	-.004
Male vs. Female Adolescents										
	M0. Configural invariance	1411.433	306	.962	.066	1.93	---	---	---	---
	M1. Full metric invariance	1440.856	320	.961	.065	1.96	M1-M0	43.255***	-.001	-.001
	M2. Full scalar invariance	1454.976	374	.963	.059	2.04	M2-M1	99.522**	.002	-.006
EPGaSC										
Early- vs. Late- Adolescents										
	M0. Configural invariance	1023.770	306	.969	.067	1.56	---	---	---	---
	M1. Full metric invariance	1020.699	320	.970	.065	1.58	M1-M0	13.21	.001	-.002
	M2. Full scalar invariance	1066.966	374	.970	.060	1.64	M2-M1	91.53**	.000	-.005
Male vs. Female Adolescents										
	M0. Configural invariance	1089.468	306	.968	.070	1.65	---	---	---	---
	M1. Full metric invariance	1094.926	320	.968	.068	1.67	M1-M0	23.35	.000	-.002
	M2. Full scalar invariance	1147.155	374	.968	.063	1.75	M2-M1	107.62***	.000	-.005
FaSC										
Early- vs. Late- Adolescents										
	M0. Configural invariance	1158.305	306	.976	.059	1.63	---	---	---	---
	M1. Full metric invariance	1162.219	320	.977	.057	1.66	M1-M0	34.05**	.001	-.002
	M2. Full scalar invariance	1167.819	374	.978	.051	1.72	M2-M1	81.75**	.001	-.006
Male vs. Female Adolescents										
	M0. Configural invariance	1194.392	306	.976	.060	1.67	---	---	---	---
	M1. Full metric invariance	1168.822	320	.977	.057	1.68	M1-M0	13.91	.001	-.003
	M2. Full scalar invariance	1179.433	374	.978	.052	1.75	M2-M1	86.87**	.001	-.005

Note. χ^2 = Chi-square; *df* = degrees of freedom; RMSEA = Root Mean Square Error of Approximation; CI = Confidence Interval; WRMR = Standardized Root Mean Square Residual; CFI = Comparative Fit Index. $\Delta\chi^2$ = Delta Chi-square; Δ CFI = Delta Comparative Fit Index. Δ RMSEA = Delta Root Mean Square Error of Approximation. * $p < .05$; ** $p \leq .01$; *** $p \leq .001$. For all tests, a significant deterioration of model fit would indicate non-invariance. Chi-square difference tests detect small discrepancies with no practical or theoretical implications when sample sizes > 200 . We thus considered a Δ CFI $\geq -.010$, supplemented by a Δ RMSEA $\geq .015$, as more meaningful indicators of model fit deterioration (Chen, 2007; Cheung & Rensvold, 2002; Meade et al., 2008), this two cut-off criteria performed reasonably well with categorical data and WLSMV estimator, although caution is advised, as these statistics do not perform well with misspecified models (Sass et al., 2014). Some chi-square tests were significant, but no drops in CFI or RMSEA exceeded the thresholds of $\geq -.010$ or $\geq -.015$, respectively.

Table 9. Confirmatory Factor Analyses and Multiple-group factor analysis of the three-factor model of the BES across age and gender

Models	χ^2	<i>df</i>	RMSEA [90 CI %]	WRMR	CFI
Three-factor model	2898.64	167	0.103 [0.100- 0.106]	3.15	0.85
Three-factor model (except items 6, 15 and 20)	879.25	116	0.065 [0.061- 0.069]	1.81	0.95
MGCFA_Age					
Three-factor model (except items 6, 15 and 20)	1026.71	294	0.057 [0.053- 0.061]	2.11	0.95
MGCFA_Gender					
Three-factor model (except items 6, 15 and 20)	1204.95	294	0.063 [0.060- 0.077]	2.36	0.93

Note. χ^2 = Chi-square; *df* = degrees of freedom; RMSEA = Root Mean Square Error of Approximation; CI = Confidence Interval; WRMR = Standardized Root Mean Square Residual; CFI = Comparative Fit Index.

Table 10. Multi-Group Tests of Model Invariance of BES cross age and gender

	Model	χ^2	df	CFI	RMSEA	WRMR	Δ Model	$\Delta \chi^2$	Δ CFI	Δ RMSEA
Early- vs. Late Adolescents										
	M0. Configural invariance	982.02	232	.951	.065	1.93	---	---	---	---
	M1. Full metric invariance	917.13	246	.956	.059	1.94	M1-M0	8.52	.005	-.006
	M2. Full scalar invariance	1026.71	294	.952	.057	2.11	M2-M1	160.88***	-.004	-.002
	M3. Partial Scalar invariance	930.93	278	.957	.055	1.98	M3-M1	41.28	.005	-.004
Male vs. Female Adolescents										
	M0. Configural invariance	1095.90	232	.930	.069	2.10	---	---	---	---
	M1. Full metric invariance	1046.37	246	.935	.065	2.14	M1-M0	21.78	-.005	-.004
	M2. Full scalar invariance	1204.95	294	.926	.063	2.36	M2-M1	223.90***	-.009	-.002
	M3. Partial scalar invariance	1062.41	284	.937	.060	2.18	M3-M1	47.22	.002	-.005

Note. χ^2 = Chi-square; *df* = degrees of freedom; RMSEA = Root Mean Square Error of Approximation; CI = Confidence Interval; WRMR = Standardized Root Mean Square Residual; CFI = Comparative Fit Index. $\Delta\chi^2$ = Delta Chi-square; Δ CFI = Delta Comparative Fit Index. Δ RMSEA = Delta Root Mean Square Error of Approximation. * $p < .05$; ** $p \leq .01$; *** $p \leq .001$. For all tests, a significant deterioration of model fit would indicate non-invariance. Chi-square difference tests detect small discrepancies with no practical or theoretical implications when sample sizes > 200 . We thus considered a Δ CFI $\geq -.010$, supplemented by a Δ RMSEA $\geq .015$, as more meaningful indicators of model fit deterioration (Chen, 2007; Cheung & Rensvold, 2002; Meade et al., 2008), this two cut-off criteria performed reasonably well with categorical data and WLSMV estimator, although caution is advised, as these statistics do not perform well with misspecified models (Sass et al., 2014). Some chi-square tests were significant, but no drops in CFI or RMSEA exceeded the thresholds of $\geq -.010$ or $\geq -.015$, respectively.

Table 11. Model Fit Statistics of Prosocial Behaviours and Empathy for the Different Levels of Measurement Invariance Across Three Successive Years.

	Model	χ^2	<i>df</i>	CFI	RMSEA	WRMR	Δ Model	$\Delta \chi^2$	Δ CFI	Δ RMSEA
Prosocial Behaviours	M0. Configural invariance	569.562	360	.978	.031 [.026 - .036]	.925	---	---	---	---
	M1. Full metric invariance	583.138	376	.979	.030 [.025 - .035]	.979	M1-M0	27.24*	.001	-.001
	M2. Full scalar invariance	692.023	451	.975	.030 [.025 - .034]	1.06	M2-M1	127.69***	-.004	.000
Empathy	M0. Configural invariance	1688.759	1136	.958	.028 [.025 - .031]	1.07	---	--	---	---
	M1. Full metric invariance	2089.996	1164	.930	.036 [.034 - .039]	1.31	M1-M0	257.65***	-.028	.007
	M1P Partial metric invariance ¹	1803.142	1162	.952	.030 [.027 - .033]	1.16	M1P-M0	101.58***	-.006	.002
	M2. Full scalar invariance	1965.914	1258	.947	.030 [.027 - .033]	1.19	M2-M1P	161.51***	-.005	.000

Note. χ^2 = Chi-square; *df* = degrees of freedom; RMSEA = Root Mean Square Error of Approximation; CI = Confidence Interval; WRMR = Standardized Root Mean Square Residual; CFI = Comparative Fit Index. $\Delta \chi^2$ = Delta Chi-square; Δ CFI = Delta Comparative Fit Index. Δ RMSEA = Delta Root Mean Square Error of Approximation. * $p < .05$; ** $p \leq .01$; *** $p \leq .001$. For all tests, a significant deterioration of model fit would indicate non-invariance. Chi-square difference tests detect small discrepancies with no practical or theoretical implications when sample sizes > 200 . We thus considered a Δ CFI $\geq -.010$, supplemented by a Δ RMSEA $\geq .015$, as more meaningful indicators of model fit deterioration (Chen, 2007; Cheung & Rensvold, 2002; Meade et al., 2008), this two cut-off criteria performed reasonably well with categorical data and WLSMV estimator, although caution is advised, as these statistics do not perform well with misspecified models (Sass et al., 2014). Some chi-square tests were significant, but no drops in CFI or RMSEA exceeded the thresholds of $\geq -.010$ or $\geq -.015$, respectively.¹ Factor loadings of items 1 at T1 and T2 had to be freed.



Chère participante, cher participant,

Voici une série de questions concernant **la façon dont les jeunes se comportent, perçoivent les comportements des autres** (groupe de pairs et parents) **et ce qu'ils ressentent** dans différentes **situations de la vie courante**, et **selon les groupes dont ils font partie**. Pour chaque questionnaire, lisez attentivement les instructions avant de commencer.

Il n'y a pas de bonne ou de mauvaise réponse car chacun a sa propre façon de voir les choses. Pour chaque proposition qui va suivre, **une seule réponse est possible et toutes les questions doivent être complétées**.

Votre collaboration est précieuse car elle nous permettra de mieux savoir ce que pensent, ressentent les jeunes.

Ce questionnaire est **anonyme et strictement confidentiel**. Soyez libre de répondre de manière honnête et ouverte.

Nous vous remercions chaleureusement de votre collaboration!

Date:/...../.....

1. Moi et les autres.

Les énoncés suivants décrivent quelques situations de la vie courante. Lisez chaque phrase attentivement et entourez le numéro qui reflète votre première réaction, selon l'échelle suivante :

Jamais/Presque jamais	Rarement	Des fois	Souvent	Presque toujours/ Toujours
1	2	3	4	5

1. J'ai plaisir à aider les amis ou camarades dans leurs activités.	1	2	3	4	5
2. Je partage ce que j'aime avec mes amis.	1	2	3	4	5
3. J'essaie d'aider les autres.	1	2	3	4	5
4. Je suis disponible pour des activités bénévoles d'aide à ceux qui sont dans le besoin.	1	2	3	4	5
5. Je suis en phase avec l'état d'humeur de ceux qui souffrent.	1	2	3	4	5
6. Je porte rapidement secours à ceux qui en ont besoin.	1	2	3	4	5
7. Spontanément, je m'active pour éviter que les autres se trouvent en difficulté.	1	2	3	4	5
8. Je ressens très fortement les émotions d'autrui.	1	2	3	4	5
9. Je mets volontiers mes connaissances et compétences au service des autres.	1	2	3	4	5
10. J'essaye de consoler ceux qui sont tristes.	1	2	3	4	5
11. Je prête facilement de l'argent ou autre chose.	1	2	3	4	5
12. Je me mets facilement à la place de ceux qui sont dans l'inconfort.	1	2	3	4	5
13. J'essaye d'être proche et de prendre soin de ceux qui en ont besoin.	1	2	3	4	5
14. Je partage facilement avec mes amis toute bonne opportunité qui s'offre à moi.	1	2	3	4	5
15. Je tiens volontiers compagnie aux amis qui se sentent seuls.	1	2	3	4	5
16. Je ressens immédiatement la gêne de mes amis même s'ils ne me le disent pas.	1	2	3	4	5

2. Mes camarades de classe

Quelle importance accordez-vous au fait d'appartenir à votre groupe de classe? Entourez la réponse selon l'échelle suivante.

1	2	3	4	5	6	7	
..Pas du tout important					Très important		

A. Pensez aux camarades de votre groupe de classe. Les énoncés suivants décrivent quelques situations de la vie courante. Entourez le numéro qui reflète votre première réaction, selon l'échelle suivante:

Jamais/Presque jamais 1	Rarement 2	Des fois 3	Souvent 4	Presque toujours/ Toujours 5
-----------------------------------	----------------------	----------------------	---------------------	---

Mes camarades de classe.....					
1....ont plaisir à aider leurs amis ou d'autres dans leurs activités.	1	2	3	4	5
2....partagent ce qu'ils aiment avec leurs amis.	1	2	3	4	5
3....essaient d'aider les autres.	1	2	3	4	5
4....sont disponibles pour des activités bénévoles d'aide à ceux qui sont dans le besoin.	1	2	3	4	5
5....aident tout de suite ceux qui en ont besoin.	1	2	3	4	5
6....font tout ce qu'ils peuvent pour éviter aux autres de se trouver en difficulté.	1	2	3	4	5
7....mettent volontiers leurs connaissances et compétences au service des autres.	1	2	3	4	5
8....essaient de consoler ceux qui sont tristes.	1	2	3	4	5
9....prêtent facilement de l'argent ou autre chose.	1	2	3	4	5
10...essaient d'être proches et de s'occuper de ceux qui en ont besoin.	1	2	3	4	5
11...partagent facilement avec leurs amis toute bonne opportunité qui s'offre à eux.	1	2	3	4	5
12...tiennent volontiers compagnie aux amis qui se sentent seuls.	1	2	3	4	5

B. Lisez chaque phrase attentivement et **entourez le numéro qui correspond le mieux** à ce que vous pensez des relations avec vos camarades de classe, selon l'échelle suivante:

Pas vrai du tout					Complètement vrai
1	2	3	4		5

Mes camarades de classe					
1....m'apprécient.	1	2	3	4	5
2....se soucient vraiment de moi.	1	2	3	4	5
3....me connaissent bien.	1	2	3	4	5
4....ne me comprennent tout simplement pas.	1	2	3	4	5
5....passent du temps avec moi.	1	2	3	4	5
6....parlent avec moi.	1	2	3	4	5
7....je ne peux pas compter sur eux pour des choses importantes.	1	2	3	4	5
8....je ne peux pas compter sur eux quand j'ai besoin d'eux.	1	2	3	4	5
9....agissent différemment d'une fois sur l'autre quand je fais quelque chose de mal.	1	2	3	4	5
10...ne cessent de changer la façon dont ils agissent envers moi.	1	2	3	4	5
11...ne précisent pas clairement ce qu'ils attendent de moi dans le groupe.	1	2	3	4	5
12...ne cessent de changer les règles dans notre groupe.	1	2	3	4	5
13...m'aident à trouver des solutions quand j'ai un problème.	1	2	3	4	5
14...je peux compter sur leur aide lorsque je n'arrive pas à résoudre un problème.	1	2	3	4	5
15...me laissent faire ce qui est important pour moi.	1	2	3	4	5
16...pensent qu'il y a qu'une seule façon de bien faire les choses – la leur	1	2	3	4	5
17...essaient de contrôler tout ce que je fais.	1	2	3	4	5
18...sont toujours en train de me dire ce qu'il faut faire.	1	2	3	4	5
19...n'écoutent pas mon avis.	1	2	3	4	5
20...essaient de comprendre mon point de vue.	1	2	3	4	5

3. Pratiquez-vous une activité extrascolaire dans un club ou une association? Oui / Non

Si vous avez répondu **OUI**, veuillez **répondre aux questions suivantes**. Sinon, passez au point 4 de la page 7.

Si oui, quel (les) activité (s) extrascolaire(s) ? (la ou les noter dans le tableau suivant) :

		Est-ce une activité collective ? Oui / Non	Nombre d'années de pratique	Combien de fois par semaine ?
1				
2				
3				

Parmi ces différents groupes d'activités, si vous avez indiqué plusieurs activités, entourez dans le tableau précédent, le numéro de celle qui est la plus importante pour vous.

Quelle importance accordez-vous au fait d'appartenir à ce groupe d'activité ?

1	2	3	4	5	6	7
Pas du tout important						Très important

3. Mes camarades de groupe d'activité

A. Pensez aux camarades du groupe d'activité que vous avez entouré précédemment et qui est le plus important pour vous. Les énoncés suivants décrivent quelques situations de la vie courante. Entourez le numéro qui reflète votre première réaction, selon l'échelle suivante :

Jamais/Presque jamais 1	Rarement 2	Des fois 3	Souvent 4	Presque toujours/ Toujours 5
----------------------------	---------------	---------------	--------------	------------------------------------

Mes camarades d'activité extrascolaire....					
1...ont plaisir à aider leurs amis ou d'autres dans leurs activités.	1	2	3	4	5
2...partagent ce qu'ils aiment avec leurs amis.	1	2	3	4	5
3...essaient d'aider les autres.	1	2	3	4	5
4...sont disponibles pour des activités bénévoles d'aide à ceux qui sont dans le besoin.	1	2	3	4	5
5...aident tout de suite ceux qui en ont besoin.	1	2	3	4	5
6...font tout ce qu'ils peuvent pour éviter aux autres de se trouver en difficulté.	1	2	3	4	5
7...mettent volontiers leurs connaissances et compétences au service des autres.	1	2	3	4	5
8...essaient de consoler ceux qui sont tristes.	1	2	3	4	5
9...prêtent facilement de l'argent ou autre chose.	1	2	3	4	5
10...essaient d'être proches et de s'occuper de ceux qui en ont besoin.	1	2	3	4	5
11...partagent facilement avec leurs amis toute bonne opportunité qui s'offre à eux.	1	2	3	4	5
12...tiennent volontiers compagnie aux amis qui se sentent seuls.	1	2	3	4	5

B. Lisez chaque phrase attentivement et **entourez le numéro qui vous correspond le mieux** à ce que vous pensez des relations avec vos camarades d'activité, selon l'échelle suivante :

Pas vrai du tout					Complètement vrai
1	2	3	4	5	

Mes camarades d'activité extrascolaire					
1....m'apprécient.	1	2	3	4	5
2....se soucient vraiment de moi.	1	2	3	4	5
3....me connaissent bien.	1	2	3	4	5
4....ne me comprennent tout simplement pas.	1	2	3	4	5
5....passent du temps avec moi.	1	2	3	4	5
6....parlent avec moi.	1	2	3	4	5
7....je ne peux pas compter sur eux pour des choses importantes.	1	2	3	4	5
8....je ne peux pas compter sur eux quand j'ai besoin d'eux.	1	2	3	4	5
9....agissent différemment d'une fois sur l'autre quand je fais quelque chose de mal.	1	2	3	4	5
10...ne cessent de changer la façon dont ils agissent envers moi.	1	2	3	4	5
11...ne précisent pas clairement ce qu'ils attendent de moi dans le groupe.	1	2	3	4	5
12...ne cessent de changer les règles dans notre groupe.	1	2	3	4	5
13...m'aident à trouver des solutions quand j'ai un problème.	1	2	3	4	5
14...je peux compter sur leur aide lorsque je n'arrive pas à résoudre un problème.	1	2	3	4	5
15...me laissent faire ce qui est important pour moi.	1	2	3	4	5
16...pensent qu'il y a qu'une seule façon de bien faire les choses – la leur	1	2	3	4	5
17...essaient de contrôler tout ce que je fais.	1	2	3	4	5
18...sont toujours en train de me dire ce qu'il faut faire.	1	2	3	4	5
19...n'écoutent pas mon avis.	1	2	3	4	5
20...essaient de comprendre mon point de vue.	1	2	3	4	5

4. Mes parents.

A. Pensez à vos parents. Les énoncés suivants décrivent quelques situations de la vie courante. Lisez chaque phrase attentivement et entourez le numéro qui reflète votre première réaction, selon l'échelle suivante :

Jamais/Presque jamais 1	Rarement 2	Des fois 3	Souvent 4	Presque toujours/ Toujours 5
----------------------------	---------------	---------------	--------------	------------------------------------

Mes parents....					
1....ont plaisir à aider leurs amis ou collègues dans leurs activités.	1	2	3	4	5
2....partagent ce qu'ils aiment avec leurs amis.	1	2	3	4	5
3....essaient d'aider les autres.	1	2	3	4	5
4....sont disponibles pour des activités bénévoles d'aide à ceux qui sont dans le besoin.	1	2	3	4	5
5....aident tout de suite ceux qui en ont besoin.	1	2	3	4	5
6....font tout ce qu'ils peuvent pour éviter aux autres de se trouver en difficulté.	1	2	3	4	5
7....mettent volontiers leurs connaissances et compétences au service des autres.	1	2	3	4	5
8....essaient de consoler ceux qui sont tristes.	1	2	3	4	5
9....prêtent facilement de l'argent ou autre chose.	1	2	3	4	5
10...essaient d'être proche et de s'occuper de ceux qui en ont besoin.	1	2	3	4	5
11...partagent facilement avec leurs amis toute bonne opportunité qui s'offre à eux.	1	2	3	4	5
12...tiennent volontiers compagnie aux amis qui se sentent seuls.	1	2	3	4	5

B. Lisez chaque phrase attentivement et **entourez le numéro qui vous correspond le mieux** à ce que vous pensez des relations avec les membres de votre famille, selon l'échelle suivante :

Pas vrai du tout					Complètement vrai
1	2	3	4		5

Les membres de ma famille....					
1....m'apprécient.	1	2	3	4	5
2....se soucient vraiment de moi.	1	2	3	4	5
3....me connaissent bien.	1	2	3	4	5
4....ne me comprennent tout simplement pas.	1	2	3	4	5
5....passent du temps avec moi.	1	2	3	4	5
6....parlent avec moi.	1	2	3	4	5
7....je ne peux pas compter sur eux pour des choses importantes.	1	2	3	4	5
8....je ne peux pas compter sur eux quand j'ai besoin d'eux.	1	2	3	4	5
9....agissent différemment d'une fois sur l'autre quand je fais quelque chose de mal.	1	2	3	4	5
10...ne cessent de changer la façon dont ils agissent envers moi.	1	2	3	4	5
11...ne précisent pas clairement ce qu'ils attendent de moi.	1	2	3	4	5
12...ne cessent de changer les règles familiales.	1	2	3	4	5
13... m'aident à trouver des solutions quand j'ai un problème.	1	2	3	4	5
14...je peux compter sur leur aide lorsque je n'arrive pas à résoudre un problème.	1	2	3	4	5
15...me laissent faire ce qui est important pour moi.	1	2	3	4	5
16...pensent qu'il y a qu'une seule façon de bien faire les choses – la leur.	1	2	3	4	5
17...essaient de contrôler tout ce que je fais.	1	2	3	4	5
18...sont toujours en train de me dire ce qu'il faut faire.	1	2	3	4	5
19...n'écoutent pas mon avis.	1	2	3	4	5
20...essaient de comprendre mon point de vue.	1	2	3	4	5

5. Mes ressentis avec les autres.

Les énoncés suivants décrivent d'autres situations de la vie courante. Pour chaque énoncé, veuillez donner votre degré d'accord selon l'échelle suivante:

Pas du tout d'accord	Pas d'accord	Ni d'accord, ni pas d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5

1. Les émotions de mes amis (ies) ne m'affectent pas beaucoup.	1	2	3	4	5
2. Après avoir été avec un(e) ami(e) qui est triste, je me sens généralement triste.	1	2	3	4	5
3. Je peux comprendre le bonheur d'un (e) ami (e) lorsque quelque chose marche bien pour lui/elle.	1	2	3	4	5
4. Je peux être effrayé (e) par un bon film d'horreur.	1	2	3	4	5
5. Je m'imprègne facilement des émotions des autres.	1	2	3	4	5
6. J'ai du mal à savoir quand mes amis (ies) ont peur.	1	2	3	4	5
7. Je ne suis pas triste quand je vois une personne pleurer.	1	2	3	4	5
8. Les sentiments des autres ne me tracassent pas du tout.	1	2	3	4	5
9. Quand quelqu'un a la sensation d'être « au plus bas », je peux comprendre ce qu'il ressent.	1	2	3	4	5
10. Généralement, je peux me rendre compte que mes amis (ies) sont effrayés (ées).	1	2	3	4	5
11. Souvent, je me sens triste quand je regarde des choses ou des films tristes.	1	2	3	4	5
12. Souvent, je peux comprendre comment les gens se sentent avant même qu'ils ne me l'aient dit.	1	2	3	4	5
13. Voir une personne se mettre en colère n'a aucun effet sur moi.	1	2	3	4	5
14. Habituellement, je sais quand les gens sont joyeux.	1	2	3	4	5
15. J'ai tendance à me sentir apeuré(e) quand je suis avec des amis (ies) qui sont effrayés (ées).	1	2	3	4	5
16. Généralement, je me rends vite compte quand un(e) ami(e) est furieux (se).	1	2	3	4	5
17. Je suis souvent happé(e) par les sentiments de mes amis (ies).	1	2	3	4	5
18. Je ne ressens rien face à la tristesse de mes amis (ies).	1	2	3	4	5
19. Je ne suis généralement pas attentif (ve) aux sentiments de mes amis (ies).	1	2	3	4	5
20. J'ai du mal à comprendre quand mes amis (ies) sont heureux (ses).	1	2	3	4	5

Quelques précisions sur vous:

- Date de naissance (jour/mois/année) : / /

-Vous êtes: un garçon une fille

- Collège / Lycée:

- Classe ou Filière d'étude:

Etat civil des parents : mariés / concubins séparés / divorcés

autre:.....

- Profession du père (indiquez la dernière profession exercée, le plus précisément possible):

.....

- Profession de la mère (indiquez la dernière profession exercée, le plus précisément possible):

.....

- Niveau de formation des parents :

Père

Diplôme universitaire ou de grandes écoles

Formation professionnelle supérieure

Baccalauréat

Diplôme professionnel CAP/BEP

Certificat d'études, brevet des collèges

Ecole obligatoire

Autre: _____

Mère

Diplôme universitaire ou de grandes écoles

Formation professionnelle supérieure

Baccalauréat

Diplôme professionnel CAP/BEP

Certificat d'études, brevet des collèges

Ecole obligatoire

Autre: _____

Merci de votre participation !

Article

Carrizales, A., Perchec, C. & Lannegrand-Willems, L. (2017): Brief report: How many dimensions in the prosocial behavior scale? Psychometric investigation in French-speaking adolescents, *European Journal of Developmental Psychology*, doi:10.1080/17405629.2017.1419952

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Abstract

The purpose of the study was to evaluate the factor structure and the reliability of the Prosocial Behavior Scale (PBS) by Caprara, Steca, Zelli, and Capanna (2005). To our knowledge, no factorial validity of the multifactorial structure of PBS has been published to date. The psychometric characteristics of the PBS were examined in several samples of French adolescents (aged 11-19, N1 = 1141, N2 = 1071, and N3 = 1640) using Confirmatory factor analyses (CFA). The original four-factor structure was not confirmed due to lack of discriminant validity. CFA led us to retain a two-factor solution with a good fit and a satisfactory reliability. Furthermore, the results support the convergent validity of the PBS: helping and caring dimensions were positively correlated with empathy. In addition, partial measurement invariance across gender and grade was attested. In conclusion, the results indicate that the French version of the PBS is a useful instrument for the assessment of prosocial behaviors in adolescence.

Brief report: How many dimensions in the Prosocial Behavior Scale?

Psychometric investigation in French-speaking adolescents

Alexia Carrizales¹, Cyrille Perchee¹, & Lyda Lannegrand-Willems¹

Research on the development and correlates of prosocial behaviors (*i.e.* behaviors intended to benefit others) has been an active field of study for the last three decades. Prosocial behaviors have been theoretically and empirically linked to a variety of positive cognitive, socioemotional and psychological outcomes for personal and social adjustment during adolescence (Alessandri et al., 2014; Gregory, Light-Häusermann, Rijdsdijk, & Eley, 2009). Although the importance of understanding behaviors that benefit society has been highlighted, surprisingly few measures are available, and none in French for evaluating prosocial behaviors.

While some measures do exist, they are typically characterized by a conceptualization of prosocial behaviors as a unidimensional global construct (Ladd & Profilet, 1996; Rushton, Chrisjohn, & Fekken, 1981). However, the developmental literature has shown different types of prosocial behaviors to be associated differently with other psychological constructs (Batson, 1998; Padilla-Walker & Carlo, 2014). For example, prosocialness is primarily expressed in the actions of helping, sharing, taking care of, and feeling empathic with others. Caprara, Steca, Zelli, and Capanna (2005) proposed a new scale for measuring these four behavioral expressions of prosocialness. Its properties were examined using an item response theory (IRT) approach. Specifically, unidimensional IRT models were used; hence, the multifactorial structure was not tested. To our knowledge, the factorial validity of the multifactorial structure has not been assessed to date. Moreover, it has mainly been used with late adolescents and emerging adults (college students). However, from early – middle to late adolescence, we consider that the socialization experiences and cognitive abilities may lead to

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changes in the internalization of culturally related values and in prosocial behaviors (Calderón-Tena, Knight, & Carlo, 2011). Therefore, studies focusing on early-to-late adolescence should be conducted.

The aim of our study was to investigate whether the factor structure of the Prosocial Behaviors Scale (PBS) identified by Caprara and colleagues (2005) in adults would be the same in a French sample of early and late adolescents. To this end, we proceeded by translating and assessing the factorial validity, reliability, convergent validity (with empathy), and measurement invariance of the French PBS.

Method

Participants

Three independent samples were used for the analyses, Sample 1 ($N = 1141$, $M_{\text{age}} = 14.35$, $SD = 1.69$) and Sample 2 ($N = 1071$, $M_{\text{age}} = 15.19$, $SD = 2.27$) used in the EFA analyses and Sample 3 ($N = 1640$, $M_{\text{age}} = 14.58$, $SD = 1.88$) used in the CFA analyses. Specifically, participants from Sample 3 came from an ongoing longitudinal study. They were divided into two groups based on educational grade. The first one included 867 junior high school adolescents (grade 6-9, 51 % females, $M_{\text{age}} = 13.11$; $SD = 1.17$) and the second one included 773 high school adolescents (grade 10-12, 43 % females, $M_{\text{age}} = 16.22$; $SD = 0.93$). The data are a nationally representative sample of adolescents in Secondary school: 84.39 % were from public schools and 15.61 % from private ones, 47.07 % were from High School including 21.35% vocational education. Adolescents reported on the highest education level obtained by either parent, there were as follows: 34 % Master level, 26 % Bachelor's level, 18 % upper secondary general education, 14 % upper secondary vocational education, 3% lower secondary education, 5% primary education. Parents were informed of the study and provided consent. Students completed self-report questionnaires during lesson time, with one hour reserved for completion. They were informed that participation was voluntary and that their responses were anonymous.

Measures

The PBS (Caprara et al., 2005) is a 16-item questionnaire rated on a 5-point Likert scale ranging from 1 (*never/almost never true*) to 5 (*almost always/always true*) that assesses four types of

prosocial behaviors (sharing, helping, taking care of, and feeling empathic; 4 items per dimension). The translation from English to French by three independent researchers was made according to the recommendations of the International Test Commission (Hambleton, 2001).

The Basic Empathy Scale (BES) is a 20-item questionnaire rated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) developed by Joliffe and Farrington (2006) and adapted in French by Carré, Stefaniak, D'Ambrosio, Bensalah, and Besche-Richard (2013). It includes three dimensions: emotional contagion (6 items), cognitive empathy (8 items) and emotional disconnection (6 items). Its internal consistency was satisfactory in our sample (see Table 3).

Analytic Strategy

Three sets of analyses were performed: (1) CFA for testing the original factor using Sample 1, (2) EFA for investigating the factor structure using Sample 2 and (3) CFA for testing the two-factor solution obtained by EFA using Sample 3 and Convergent Validity. In order to account for the ordered – categorical nature of the scale items, Weighted Least Square Means-Variance (WLSMV) and theta parameterization (for multiple group models) were performed using Mplus 7.3.

In total, missing data ranged from 0 to 3.75 % across all samples. No missing data in Sample 1, 3.75% in Sample 2 and 3.72% in Sample 3. The percentage of missing values across the prosocial behaviors and empathy variables ranged between 0.57 % and 6.63% in Sample 2 and 0.26 % and 4.75% in Sample 3. In order to deal with the missing data, the WLSMV Multiple Imputations procedures were applied (Asparouhov & Muthén, 2010).

Exploratory factor analysis (EFA) and factor analyses replication were performed using Sample 2. Concerning the EFA, the factor retention methods used included scree test and Velicer's MAP criteria (Velicer & Jackson, 1990) using an oblique rotation. For the factor analyses replication, internal replicability analyses were performed, data was randomly split, and the same number of factors were extracted using the same rotation (Geomin) and extraction procedures in order to compare standardized factor loadings (Osborne & Fitzpatrick, 2012).

Measurement Invariance across gender and grade through a series of multiple group models with progressively more stringent constraints were performed using Sample 3. A more constrained

solution was rejected when: a) the chi-square difference test ($\Delta\chi^2$) had a probability lower than .05² (Byrne & van de Vijver, 2010), b) the decrease in the Comparative Fit Index criterion (ΔCFI) was higher than .01³ (Cheung, 2002; Vandenberg & Lance, 2000), c) an increase in ΔRMSEA was higher than .015, indicating non-invariant loadings, thresholds or residuals (Chen, 2007).

Results

CFA for testing the original four factor structure

Confirmatory factor analyses of the original four factor structure yielded an acceptable fit $\chi^2 = 1026.661$ (98), $p < .001$, $\text{RMSEA} = .076$ [.072 - .080], $\text{CFI} = .93$ and $\text{WRMR} = 1.920$. The main concern of this original structure is the high factor correlations among latent variables ($r = .87$ and $.86$, respectively). Taking into consideration items similar wording and modification indices, 3 error covariances were added. Model fit was $\chi^2 = 806.488$ (95), $p < .001$, $\text{RMSEA} = .068$ [.036 - .072], $\text{CFI} = .95$ and $\text{WRMR} = 1.687$. Although a better fit was achieved, this resulted in an inflated estimate of the factors correlations (all above $.85$). In light of these issues, we decided to test a second - order model, this lead to an inadmissible parameter solution. Despite the good model fit, the discriminant validity is too low to accept the four-factor solution (Brown, 2015).

EFA for investigating the factor structure

Taking into account the exploratory factor analyses factor retention results and internal replicability analyses, we report the two-factor solution which provided much more statistically and theoretically coherent and interpretable factors than did the other solutions. EFA replicability suggested that 2 items (2, 11) failed to meet the initial criteria, i.e. the structural replication⁴; these two items were removed from further analyses.

²Owing to the WLSMV estimator used here, the change in χ^2 and degrees of freedom cannot be calculated in a straightforward fashion. "The difference in chi-square values for two nested models using the [. . .] WLSMV chi-square values is not distributed as chi-square" (Muthén & Muthén, 2017) . Therefore, a scaling correction (DIFFTEST function) is used, of which only the p-value should be interpreted.

³The $\Delta\chi^2$ and ΔCFI may sometimes suggest different conclusions. Clear rules on how to proceed in such a situation are lacking (Byrne & van de Vijver, 2010). Researchers can opt to describe the conclusions of both approaches or choose one over the other, based on the admissibility of the solution and examination of the modification indices.

⁴Specifically, looking at the factor loadings, item 2 "I share what I like with my friends" has the highest factor loading on Factor #2 in the first analysis and on Factor #1 in the second analysis; and item 11 "I easily lend money or other things" has the highest factor loading on Factor #1 in the first analysis and on Factor #2 in the second analysis. All other items have their strongest loading on congruent factors, so if we delete these two items, we would say that the factor structure of the scale meets the basic level of replication. The next step was to look at the squared differences in the factor loadings; these were within reasonable range (0.0000 to 0.0324), indicating that the largest difference between the standardized factor loadings is [.18].

Table 1. Fit Indices for the Different Factor Models of the PBS

Model	χ^2	df	RMSEA [90 CI %]	WRMR	CFI	TLI
Two factor model	700.369	76	.071 [.066-.076]	1.74	.95	.94
Two factor model + 3 Cov. errors	505.39	73	.060 [.055-.065]	1.46	.97	.96

Note. χ^2 = Chi-square; *df* = degrees of freedom; RMSEA = Root Mean Square Error of Approximation; CI = Confidence Interval; WRMR = Weighted Root Mean Square Residual; CFI = Comparative Fit Index; TLI = Tucker Lewis Index. Cov. Error = errors of items 1 and 3, 8 and 5, 12 and 8, are allowed to covary.

Table 2. Multiple-group confirmatory factor analyses of the two-factor + 3 cov. error model for measurement and structure invariance across gender and grade (*N* = 1640)

Model	χ^2 (<i>df</i>)	RMSEA [90% CI]	WRM	CFI	$\Delta\chi^2$	Δdf	<i>p</i>	ΔCFI	$\Delta RMSEA$
<i>MG-CFA Gender</i>									
M ₁ . Configural invariance	609.69 (146)	.062 [.057 – .067]	1.65	.959	–	–	–	–	
M ₂ . Metric invariance	578.75 (158)	.057 [.052 – .062]	1.67	.963	9.63	12	.65	.004	.005
M ₃ . Scalar invariance	677.61 (198)	.054 [.050 – .059]	1.92	.958	135.16	40	***	.005	.003
M _{3a} . Partial Scalar invariance	571.90 (182)	.051 [.046 – .056]	1.73	.966	31.25	24	.15	.003	.006
M ₄ . Strict invariance	691.08 (215)	.052 [.048 – .056]	2.02	.958	48.28	17	***	-.008	.001
<i>MG-CFA Grade</i>									
M ₁ . Configural invariance	592.69 (146)	.061 [.056 – .066]	1.61	.965	–	–	–	–	
M ₂ . Metric invariance	584.49 (158)	.057 [.052 – .062]	1.67	.966	25.47	12	**	.001	.004
M ₂ . Metric invariance (except Item 6)	568.13 (157)	.056 [.052 – .062]	1.64	.967	13.75	11	.25	.001	.001
M ₃ . Scalar invariance	685.77 (198)	.055 [.050 – .059]	1.92	.961	137.98	40	***	.005	.002
M _{3a} . Partial Scalar invariance	569.29 (180)	.051 [.047 – .056]	1.72	.966	30.41	22	.11	.000	.006
M ₄ . Strict invariance	800.16 (215)	.058 [.053 – .062]	2.19	.954	243.83	35	***	-.007	.003

Note. χ^2 = Chi-square; *df* = degrees of freedom; RMSEA = Root Mean Square Error of Approximation; CI = Confidence Interval; WRMR = Weighted Root Mean Square Residual; CFI = Comparative Fit Index. $\Delta\chi^2$ = Delta Chi-square; ΔCFI = Delta Comparative, $\Delta RMSEA$ = Change in RMSEA. Fit Index. ** *p* < .01. *** *p* < .001.

CFA for testing the two factor structure and Convergent validity

Confirmatory Factor Analyses using Sample 3 for testing the two-factor structure obtained by EFA was performed; due to similar wording and underlying motivation, three error covariances were added (see Table 1). This two factor-solution had an acceptable discriminant validity (see Table 3). This solution was tested to be invariant across gender and grade. The results confirmed partial measurement invariance for the two-factor model. All factor loadings (except item 6 across grade).

Table 3. Descriptive statistics and correlations between PBS and BES dimensions

Measure	<i>M</i>	<i>SD</i>	ω_s	2	3	4	5
1. PBS - Helping	3.47	0.68	.79	.79*	.35*	.41*	.34*
2. PBS - Caring	3.58	0.72	.81	-	.60*	.55*	.52*
3. BES - Emotional contagion	3.52	0.82	.70		-	.68*	.54*
4. BES - Cognitive empathy	3.93	0.66	.74			-	.50*
5. BES - Emotional disconnection	3.73	0.87	.80				-

Note: ω_s = omega coefficient.

* $p < .0001$

proved to be invariant over gender and grade, and since at least two items for which all thresholds were invariant (Steinmetz, Schmidt, Tina-Booh, Wieczorek, & Schwartz, 2009), meaningful latent mean comparison using the partially invariant factor are still possible, as it was suggested by Byrne, Shavelson, & Muthén (1989) that it “makes substantive sense to do so” (p. 465). Fit indices are shown in Table 2. We labeled the first factor “Helping” (6 items; items 1, 3, 4, 6, 7, and 9) on which people who scored high reported being helpful and sharing with others. We labeled the second factor “Caring” (8 items; items 5, 8, 10, 12, 13, 14, 15, and 16) on which people who scored high were likely to feel responsibility for and concern about the welfare of others (see Supplementary material). The omega coefficients⁵ for the two dimensions were satisfactory and the two-factor solution did have an acceptable discriminant validity (see Table 3).

Convergent validity

Finally, we examined the convergent validity of the dimensions of the PBS and BES using CFA (i.e. latent correlations). The results revealed that Helping and Caring were positively associated to BES factors. The correlations between Caring and BES were higher than the correlations between Helping and BES (see Table 3). These results demonstrated convergent validity and were in line with those reported in the literature (Eisenberg, Eggum, & Di Giunta, 2010).

Discussion

In the present study, we investigated the psychometric properties of the French version of the PBS in a large age range sample covering early and late adolescence. First, we tested the original four-

⁵ Open source software JASP was used to calculate omega coefficients.

factor structure, but decided not to retain this structure due to low discriminant validity. Secondly, Replication Analysis in Exploratory Factor Analysis suggested a two-factor solution. Third, Confirmatory Factor Analyses showed that the two-factor model had a good fit. The internal consistency of Helping and Caring were good. In addition, Helping and Caring were positively associated with empathy dimensions. This is in concordance with previous studies that reported a positive link between these two constructs (Eisenberg et al., 2010). Finally, our findings of partial measurement invariance across gender and grade confirm the relevance of the two-factor solution.

Further investigations with other samples (*e.g.* emerging adults and adults) compared to adolescents are needed in order to test whether the two-factor model is the best one across age, or whether this structure in two dimensions of prosocial behaviors is specific to the period of adolescence. Indeed, several theories on the development of social cognition posit that during adolescence important steps forward are made in social perspective-taking (Hoffman, 2001), thereby fostering prosocial behaviors (Eisenberg, Spinrad, & Knafo-Noam, 2015). Meanwhile, the capacities of internalized / self-reflective other-oriented modes of reasoning observed across the 20s and into the early 30s might lead to a finer distinction of different dimensions of prosocial behaviors (Eisenberg, Hofer, Sulik, & Liew, 2014). These considerations support our findings and other investigations across age from a developmental perspective.

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Le rôle des milieux de vie dans le développement de l'empathie et des comportements prosociaux à l'adolescence

L'adolescence est une période importante de la vie caractérisée par des changements majeurs psychologiques et comportementaux qui ont été théoriquement et empiriquement reliés aux changements dans l'environnement social. Les différents milieux de vie des adolescents leur offrent un «terrain de jeu» pour explorer, tester, développer et intégrer des compétences cruciales nécessaires à l'interaction sociale, comme les comportements prosociaux. À l'adolescence, les relations entre pairs deviennent plus saillantes et plus importantes qu'à toute autre période de la vie. Au-delà des contextes familial et scolaire, les adolescents consacrent beaucoup de temps à différentes activités avec des pairs. Parmi ces activités, nous nous sommes focalisée sur la participation à des activités extrascolaires qui sont considérées comme un milieu de vie important dans le développement positif des adolescents.

Le premier objectif de cette thèse était de mieux comprendre le rôle des milieux de vie dans l'empathie et les comportements prosociaux à l'adolescence. Nous avons développé et examiné un modèle théorique intégratif des relations entre les caractéristiques positives et négatives des milieux de vie (famille, classe et groupe de pairs extrascolaire), la perception par les adolescents des comportements prosociaux dans chacun de ces milieux de vie et de leurs propres comportements prosociaux, en tenant compte du rôle médiateur de l'empathie.

Le deuxième objectif était de mieux comprendre les relations longitudinales bidirectionnelles entre l'empathie et les comportements prosociaux à l'adolescence, en mettant un accent particulier sur les processus internes à la personne.

Enfin, le troisième objectif était de mieux comprendre les trajectoires de développement de l'empathie et des comportements prosociaux des adolescents en prenant en compte leur participation à des activités extrascolaires.

Nous avons conduit un recueil de données longitudinales à 3 vagues avec un intervalle d'un an. Les adolescents ont répondu à des questions concernant les caractéristiques des trois milieux de vie, les comportements prosociaux dans chacun d'eux, leur participation extrascolaire, ainsi que leur empathie et leurs comportements prosociaux.

Nos résultats suggèrent que les caractéristiques des groupes de pairs extrascolaires et de la famille (en particulier les plus négatives) et la perception de leurs comportements prosociaux jouent un rôle majeur dans les comportements prosociaux des adolescents via l'empathie à l'adolescence. Ils montrent également que l'empathie est un prédicteur des comportements prosociaux et que les trajectoires de développement de l'empathie et des comportements prosociaux à l'adolescence sont différentes chez ceux qui participent à des activités extrascolaires où on n'observe pas de trajectoire développementale décroissante comparé à ceux qui n'y participent pas.

En utilisant une seule approche théorique dans trois milieux de vie différents, nous avons pu saisir les caractéristiques communes et spécifiques de la famille, du groupe-classe et des groupes de pairs extrascolaires, qui ont une influence sur les comportements prosociaux des adolescents. De plus, prendre en compte les différences entre les individus et les processus de développement intra-individuels, l'hétérogénéité des trajectoires développementales concernant l'empathie et les comportements prosociaux à l'adolescence est essentiel pour saisir l'interaction complexe entre la famille, la classe, le groupe de pairs extrascolaire, l'empathie et le développement prosocial

Mots-clés: Adolescence, Empathie, Comportements prosociaux, Milieux de vie, Etude longitudinale

The role of living environments in empathy and prosocial behaviour development in adolescence

Adolescence is a significant period in life that is characterized by major changes that have been theoretically and empirically related to changes in social environments. Adolescents' different living environments offer the 'playground' to explore, to test, to develop and integrate social cues and crucial abilities that are necessary for social interaction, such as prosocial behaviours. During adolescence, peer relationships become more salient and prominent than in any other period in life. Away from the family and the school context, adolescents spend a large amount of time in activities with peers. Among these activities we focused on extracurricular activity participation, that have been conceptualised as an important developmental context of adolescents' lives

The first aim of this dissertation was to provide more insight into the role of living environments in relation to empathy and prosocial behaviours in adolescence. We developed and examined an integrative model of the relations between positive and negative living environment features, adolescents' perceptions of prosocial behaviours across the three contexts (family, class and extracurricular peer group) and their own prosocial behaviours, taking into account the potential mediating role of empathy.

The second aim was to provide more insight into the bidirectional longitudinal relations between empathy and prosocial behaviours during adolescence, with a special focus on the within-person processes.

Finally, the third aim of this dissertation was to provide more insight into adolescents' prosocial behaviours and empathy developmental trajectories considering extracurricular activity participation.

This dissertation used data from a 3-Wave longitudinal study gathered during the three years of the PhD with data collected at one-year intervals. Adolescents answered questions concerning the features of the living environment, their peer group's and parents' prosocial behaviours, extracurricular activity participation, and their own empathy and prosocial behaviour.

Our findings suggest that extracurricular peer group features, family features (particularly the negative ones) and extracurricular peer group and parents' prosocial behaviours play a major role in adolescents' prosocial behaviours via empathy in adolescence. Therefore, we found that empathy is a driver of prosocial behaviours. We also identified that latent class growth for empathy and prosocial behaviour were different in the extracurricular activity group for which there was no downward trend trajectory over time compared to the non-extracurricular group.

Using one approach across three living environments allowed us to capture the common and specific features of the family, school and extracurricular peer group contexts that influence adolescents' prosocial behaviours. Furthermore, our results highlighted the need to acknowledge the between person differences and the within-person processes of development. Moreover, it is important to consider the heterogeneity of developmental trajectories concerning empathy and prosocial behaviours during adolescence if we want to capture the complex interplay between family, class, extracurricular peer group, empathy and prosocial development.

Keywords: Adolescence, Empathy, Prosocial Behaviours, Living Environments, Longitudinal design