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Methodological insights to understand the effects of context on consumer hedonic evaluation of food products

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Methodological insights to understand the effects of context on consumer hedonic evaluation of food products

Thèse de doctorat de l'Université Paris-Saclay
préparée à AgroParisTech
(Institut des sciences et industries du vivant et de l'environnement)

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“My mother always taught us
that if people don't agree with you,
the important thing is to listen to them.
But if you've listened to them carefully and
you still think that you're right, then
you must have the courage of your convictions.”

Jane Goodall

SUMMARY

Environmental factors modulate consumers' perception and in turn, consumers' evaluation of food in a given context, either directly or through context-induced beliefs and expectations. However, food products are usually evaluated in standardized conditions in an attempt to neutralize possible context effects on consumer evaluation. This questions the generalization of such measures to more natural consumption contexts.

The aim of this research was to examine the conditions under which context affects consumer evaluation of food products. This work is grounded in Prospect Theory, which considers the effects of context on judgement through the notion of reference points.

The first objective was to understand how consumers' experiences and subsequent product evaluations are influenced by consumers' representations about food in different consumption contexts. A qualitative study (12 focus groups; N =86) revealed that consumers' beliefs and expectations towards a particular context are intimately associated to different types of products and culinary methods, and that external factors have a different weight depending on the consumption context.

The second objective was to understand how consumers' hedonic responses in natural consumption contexts may differ depending on the type of evaluation task. The hedonic responses of products with different degrees of culinary preparation (bread = control; pizza = homemade, industrial and mixed) were compared (N = 457) between two different tasks in a student cafeteria. The results showed that multicomponent products subjected to a different degrees of culinary preparation (homemade pizza) were indeed more sensitive to the type of evaluation task compared to more standardized products (bread).

The last objective of the thesis was to test hypotheses based on Prospect Theory to explain contextual influences on consumers' food evaluation. Two experiments compared hedonic evaluations in (i) two contexts (CLT and restaurant; N= 283), in blind and informed conditions about the degree of culinary preparation of a product (ham-olive cake); and (ii) in one context (restaurant; N = 114) in informed conditions about the degree of culinary preparation and origin of the ingredients (quiche); where consumers' beliefs and expectations towards the food served were modified. Results showed that the effects of external factors could be reduced through careful control of consumers' beliefs and expectations in a given context.

This thesis contributes to the understanding of context effects on consumer hedonic evaluation and it proposes a theoretical framework to investigate those effects by means of reference points. The results could be valuable to develop guidelines for industrials and researchers using hedonic evaluations to include context adequately at each stage of product development.

Keywords: context effects; hedonic evaluation; reference points; food preparation; expectations; information

RÉSUMÉ

Le contexte de consommation module la perception des aliments par les consommateurs et leur évaluation, soit directement soit par le biais de croyances et d'attentes induites par le contexte. Parallèlement, les méthodologies d'évaluation des produits alimentaires requièrent souvent des conditions standardisées afin de tenter de neutraliser ces éventuels effets de contexte. Mais ce gain en contrôle peut remettre en question la généralisation des mesures obtenues à des contextes naturels de consommation. Cette thèse examine les conditions dans lesquelles le contexte affecte l'évaluation des produits. Ce travail s'appuie sur la théorie des perspectives, qui considère les effets du contexte sur le jugement à travers la notion de points de référence.

Les travaux visaient d'abord à comprendre comment les perceptions des consommateurs et leur évaluation des produits sont influencées par leurs représentations concernant les produits dans différents contextes de consommation. Une étude qualitative (12 groupes de discussion ; N = 86) a révélé que les croyances et les attentes des consommateurs à l'égard d'un contexte particulier sont associées à différents types de produits et de méthodes culinaires, et que les facteurs externes ont un poids différent selon le contexte de consommation.

Le deuxième objectif était de comprendre en quoi l'évaluation par les consommateurs d'un produit alimentaire dans des contextes naturels de consommation pouvait différer selon la nature de la tâche d'évaluation. Les évaluations hédoniques de produits présentant différents degrés de préparation culinaire (pain = contrôle ; pizza = fait maison, industriel et assemblé) ont été comparées (N = 457) entre deux tâches différentes lors d'une expérience conduite en cafétéria. Les résultats ont montré que les produits à plusieurs composants soumis à différents degrés de préparation culinaire (pizza fait maison) étaient en effet plus sensibles au type de tâche d'évaluation que des produits plus standardisés (pain).

Le dernier objectif de la thèse était d'explorer les facteurs contribuant à la formation de points de référence pour expliquer les influences contextuelles sur l'évaluation des consommateurs. Deux expériences ont comparé les évaluations hédoniques dans (i) deux contextes (CLT et restaurant ; N = 283) en condition informée et non informée sur les degrés de préparation culinaire d'un produit (cake salé) ; et (ii) dans un seul contexte (restaurant ; N = 114) en condition informée sur les degrés de préparation culinaire et l'origine des ingrédients (quiche) ; où les croyances et les attentes des consommateurs à l'égard des aliments servis changent. Les résultats ont montré que les effets de facteurs externes pouvaient être réduits par un contrôle minutieux des convictions et des attentes des consommateurs dans un contexte donné.

Cette thèse contribue à la compréhension des effets des contextes sur l'évaluation hédonique des consommateurs et propose un cadre théorique pour étudier ces effets à travers des points de référence. Les résultats pourraient être utiles pour élaborer des lignes directrices pour les industriels et chercheurs utilisant des évaluations hédoniques pour inclure le contexte de manière adéquate à chaque étape du développement du produit.

Mots-clés : effets de contexte ; évaluation hédonique ; points de référence ; préparation des aliments ; attentes ; information.

THESIS VALORISATION

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GENERAL INTRODUCTION

GENERAL INTRODUCTION

Why aren't products equally appreciated at home, at a restaurant or at a consumer test laboratory?

Is it a matter of context? A matter of product? Or it is because of the consumers?

Those questions set the starting point of the present work. Context has an impact on consumer evaluation that involves multiple factors difficult to disentangle. A product can perfectly fit in a particular context whereas it may not do so in another one. This can be explained by means of the **physical context**, by means of differences in the **food preparation**, or through **consumers' expectations** and **beliefs** towards a particular product in a particular context.

The issue of context was pointed out by Meiselman in 1992 regarding studies on human eating behavior. He argued that eating behavior cannot be studied without the consideration of "real food" in "real" contexts. Consumers' eating decisions in "real" context may be influenced by "situational, economic and social constraints" that studies in controlled conditions such as laboratories may not include (Meiselman, 1992, p.50). In 2017, the sensory and consumer science field also highlighted the consideration of context as one of the four most important perspectives for the future of the discipline (Jaeger et al., 2017). Generally, consumers' tests have been done in controlled conditions. However, the lack of realism in those tests has been associated to a lack of ecological validity on consumer evaluation which can be translated in a lower reliability of consumer tests data. Thus, the generalization of data from consumer tests in controlled conditions to "real-life" contexts is questionable (Köster, 2003).

The numerous failures of market launches for new products have been attributed to this lack of ecological conditions in consumer tests (Köster & Mojet, 2012a). Liking a product in a consumer tests does not guarantee that the product will be purchased and consumed. As Meiselman argued about consumers' eating behavior, situational aspects may be considered in order to understand how and when products are consumed. Fast Moving and Consumer Goods companies launch products to the competitive market every day. However, between 80 and 90 per cent of new launches are taken out of the food and beverage market within a year (Köster & Mojet, 2012a). In 2016/2017, FMCG invested €2.9 billion in Research & Development (R&D) (FoodDrink Europe, 2018). Consequently, companies cannot neglect the huge loss of money and time that those launch failures may cause. Therefore, the debate about ecological conditions on consumer tests does not only affect research but industry.

In the last decade, several contextual methodologies have been developed in order to gain in ecological validity and increase the generalizability of experimental data (Jaeger & Porcherot, 2017). Evoked contexts (Hein, Hamid, Jaeger, & Delahunty, 2010), immersive scenarios (Hathaway &

Simons, 2017) or the use of virtual reality (Andersen, Kraus, Ritz, & Bredie, 2018) are some of the contextual approaches used by sensory and consumer practitioners to bring context (or contextual elements) to the laboratory and ensure in a certain way the success of products.

However, **how and to which degree context influences consumer evaluation is still unclear**. The **lack of a theoretical framework** behind context studies makes it difficult to understand the role played by contextual variables in consumer evaluation. Yet, consumers may have a different frame of reference depending on the situation, and this may be the case at different levels: at the context level, the product level, or the consumer level. This difference in the evaluation framework may directly impact consumers' hedonic judgement. Therefore, the **role of the evaluation task** should be also considered when performing context studies in order to improve the generalizability of the results.

Within this context, the present PhD project, started in February 2016, is a joint initiative by the University of AgroParisTech, the Institute Paul Bocuse Research Center (IPBRC), and the Scientific Society of Food Hygiene (SSHA), which financially supported the project. The theoretical aim is to understand and examine the conditions under which context affects consumers' evaluation of food products. This work is grounded in Prospect Theory (Kahneman & Tversky, 1979) which considers the effects of context on judgement through the notion of reference points. The practical aim of this research is to inform professionals and scientists who use hedonic evaluations about the inclusion of context at each stage of product development.

The present thesis dissertation comprises nine chapters, articulated in five parts. It begins with a review of current literature on context studies, and a presentation of the research hypotheses (Part A, chapters 1-4). The review is split into three chapters. First, a review of context and its effect on consumers' hedonic judgement is presented (chapter 1). The second part of the review is presented as a paper written in journal format focused on the ecological validity of context studies (chapter 2). The review concludes with a theoretical framework proposal to study context effects (chapter 3). Part A ends with a presentation of the problematic and research hypotheses (chapter 4).

Part B contains two chapters associated to a preliminary phase to the present project (chapter 5 and 6). Chapter 5 presents a preliminary study where the effects of context on consumer hedonic evaluation are assessed within blind and informed conditions when product-related variables are standardized. Chapter 6 includes an exploratory study that aims to investigate the effect of food information on consumers' choice and hedonic evaluation in a natural consumption context.

Part C contains one chapter (chapter 7), presented as a paper written in journal format. This chapter presents a qualitative study that aims to understand how consumer experience is influenced by consumers' representations about food in different consumption contexts.

Part D contains one chapter (chapter 8) also presented as a paper written in journal format. Chapter 8 presents a study that examines how consumer hedonic evaluation in a natural consumption context differs depending on the type of evaluation task.

Part E aims to understand how framing effects related to the task modulate consumer hedonic evaluation based on Prospect theory. It contains one chapter (chapter 9) that includes two studies presented as a paper written in journal format. The first study examines the influence of context on consumer hedonic evaluation of two products with different degrees of culinary preparation associated to different consumers' beliefs and expectations. The second study assesses the influence of the type of information (consistent or inconsistent with consumers' expectation and beliefs) on consumer hedonic evaluation of a product in a natural consumption.

This work concludes with a general discussion that gives an overview of the thesis as a whole, including a summary of the main findings and the contribution of the empirical chapters (5-9) to current understanding the conditions under which context affects consumer hedonic evaluation of food products.

PART A. LITERATURE REVIEW AND
RESEARCH HYPOTHESES

Chapter 1. The effects of context on consumer's judgement

I love “churros con chocolate”. A traditional dish and a hot drink from Spain, usually consumed at breakfast. When I go back home, I always buy the churros in the small truck in front of my house. I really like to have this food for breakfast. However, their taste has nothing to do compared with the churros con chocolate I had when I was a child in the cafeteria close to my grandparents' house.

This discrepancy could be explained by the simple fact that the preparation between the two contexts may have differed, modulating my global judgement. However, other factors may have been included in the formulation of this judgement as the product experience is inscribed in one or several contexts. If I think about the churros con chocolate that I had when I was a child, I am thinking about the physical context of the cafeteria, the nice ambiance, the feelings that this ambiance induces, and all of that is related to the food. So, when I formulate a judgement about the churros con chocolate, I am going to consider not just the product but different external factors. If I think about the churros con chocolate in another context, just the modification of the physical context and the ambiance associated to this new context may change my personal judgement as well.

In consumer tests, food products are hedonically evaluated in controlled conditions. The evaluation tasks are designed so that consumers focus on the product rather than on external factors. However, the lack of realistic conditions implies that the judgement about a product in the laboratory may not be representative of a judgement about the same product in natural consumption contexts.

This first chapter introduces two of the key elements of the thesis: consumer hedonic evaluation and the role of context. First, consumers' hedonic judgement and behavior are introduced. Then, definitions about context and contextual variables are given. A review of the effects of context and contextual variables on hedonic judgements is then presented. The chapter ends with a discussion of context studies and ecological validity.

1. Consumer hedonic judgement and behavior

Before starting this section, two main concepts should be defined: judgement and behavior.

A judgement is an evaluation of something like an object or a situation. Hedonic judgements are evaluations of product's attributes that determine, in part, if a consumer likes or dislikes a product.

Behavior is defined as the sum of actions one conducts. Eating behavior involves the selection of products (choice) and their consumption (intake).

When we elaborate a judgement different cognitive processes are involved. According to Stanovich &

West (2000), we have a dual system that codifies the information we perceive and translates it into a judgement:

1. System 1, composed by **perception** and intuition, is characterized by processes that are “fast, automatic, effortless and associative”
2. System 2, **reasoning**, is characterized by “slower, serial, effortful and deliberately controlled processes” (Kahneman, 2002, p.450)

When we eat, the mechanisms behind the judgement formation are used to translate the sensory properties of a particular product, perceived by our senses, into a hedonic perception. This process occurs automatically and we do not have any control over it. However, when consumers participate in a test, they perform two different tasks. The first one, tasting it is more prone to activate system 1, perception; and the second one, answering a question, that activates system 2, reasoning. The switch between both systems makes us to formulate a more explicit answer. The fact of asking a question highlights different aspects of the product (framing effects). This modulates our perception in an unconsciously way and “forces” us to give a more conscious and explicit judgement (Dijksterhuis, Smith, van Baaren, & Wigboldus, 2005).

Kahneman (2002) illustrates framing effects with an example of letters and numbers. If we observed the Figure 1 we identify the letters A, B and C, and the numbers 12, 13 and 14, our System 1 is activated. However, we also perceived that letter B and number 13 can be interpreted in a different way. Conversely, if we cut the figure in two lines, we will not have the same access to the information and we will perceive and interpret the letter and number in its contexts. A parallel can be drawn when consumers evaluate products during a test. When we evaluate three products in a consumer’s tests, we frame our perception towards those three products in that particular contexts; whereas in a more complex or natural consumption situation, different information will surround us, which may affect our perception and then our judgement.

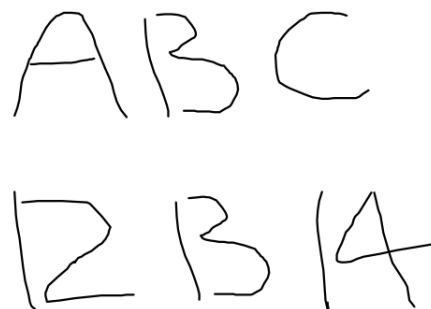


Figure 1. Effects of context on consumers' perception (Retrieved from Kahneman, 2002).

In natural consumption contexts, multiple factors external to the product are likely to influence our judgement and our behavior: the environment where we eat, with who we eat, our psychological and physiological state, etc. Factors that are going to unconsciously influence our perception and then, judgement. Figure 2 shows a model proposed by Mojet (Köster, 2009) mapping essential factors in the study of consumers' eating and drinking behavior, and showing the complexity that surrounds consumers' hedonic judgements and behavior.

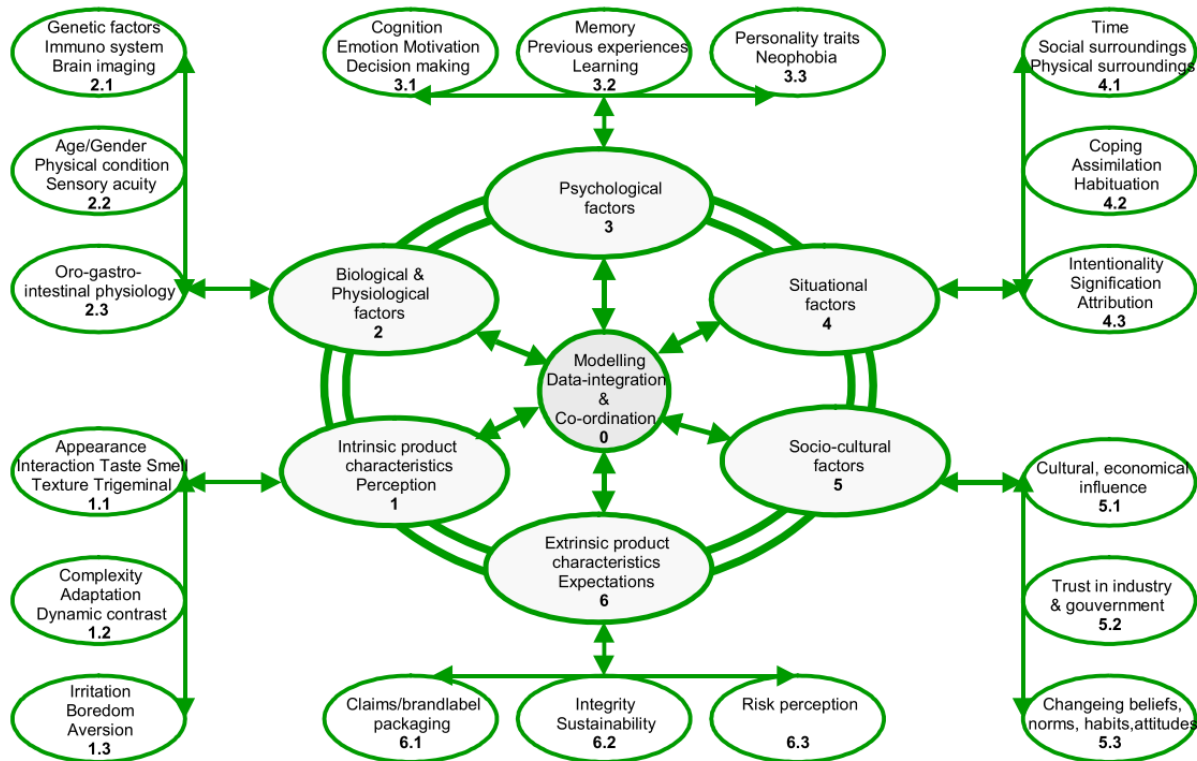


Figure 2. "Essential factors that influence eating and drinking behavior and food choice" according to Mojet (Retrieved from Köster, 2009, p.72).

When studying consumers' hedonic judgement in consumer's tests, we avoid somehow the interaction with all those external factors described by Mojet (Köster, 2009). In the last decade, the way to approach consumers' judgement and behavior has been the center of a debate between sensory and consumer scientists, and psychologists. Köster (2009) highlights the differences between disciplines and underlines the importance to move from a reductionist approach to a deductionist approach. Reductionist approach means consumers' judgements and behaviors are studied by the modulation of separate variables chosen by the researchers. For example, considering Kahmenan's letters and numbers example, consumers evaluate A, B and C or 12, 13 and 14. Conversely, a deductionist approach means that consumers' judgements and behaviors are studied in more complex conditions closer to the natural consumption situation. For example, consumers evaluate A, B, C, 12, 13 and 14.

Thus, **when studying consumers' hedonic judgement** in different contexts, we need to **first understand the factors (contextual variables) that may influence consumers' perception in a particular context** and **second, how the use of questions and scales are going to frame those factors** modulating consumers' perception and in turn, consumers' hedonic judgement. Therefore, two levels of context effects are presented.

2. Context and contextual variables: definitions

“The actions people take are affected by a dazzlingly complex set of relational situations, social norms, frames, past experiences, and the lessons gleaned from those experiences. Consequently, the experimental investigator often lacks complete control over the full context within which the subject makes decisions” (Levitt & List, 2007, p. 162).

Context has an impact on consumers' hedonic judgement which makes it relevant for the performance of consumer tests. The lack of consideration for context when implementing a consumer test has been seen as the lack of ecological conditions and therefore, has aroused the question of ecological reliability. Not only researchers but also industrialists have questioned this, due to the high number of new products failures in the market (Köster & Mojet, 2012a; Köster & Mojet, 2012b)

Context is a very broad concept that has been indistinctly used in the scientific literature as environment, setting, location and/or situation. Meiselman (2006) refers to it as specific physical, social and situational conditions in which food and beverages are consumed. Hence, conditions that are going to influence consumers' hedonic judgement. For the purpose of this thesis, context refers to specific environment where social interaction may or no occur, in which food and beverages are consumed, and evaluated. In the sensory and consumer research literature, context is considered mainly in two ways. The first approach considers context as a whole (as defined by Meiselman), and the second approach considers the presence or absence of some specific contextual variables in a given context.

Several typologies of contextual variables have been proposed in the literature. Rozin & Tuorila (1993) classify contextual variables in simultaneous (where “contextual factors are physically present during the reference event” p.12) and temporal (“past or anticipated future events that enter the mind of the subject at the time the reference event is occurring” p.12), size of the eating reference unit (bite, dish, meal), and type of contextual variables (food or non-food related); Meiselman (1996) proposes a three classification of contextual variables based on the situation, the individual and the product; whereas Stroebele & De Castro (2004) classify the contextual variables in social variables, physical

surroundings, time related characteristics and distractions. Meanwhile, Sester (2013) includes physical environmental variables and consumer variables within the context, and at the same time classify physical environmental variables in those related (or not) to the product and the consumer variables in stable and punctual.

Contexts effects influence consumers' hedonic perception, so consumers' judgement. However, the lack of ecological conditions in consumer tests, compromise the generalization of results from controlled conditions to natural consumption contexts. Moreover, in consumer tests, the use of questionnaires or scales, also influence the way in which consumers perceive those factors and in turn, their hedonic judgement. Considering that, and the lack of consensus among previous classifications, we classified the contextual variables in four categories that correspond to the features needed to determine if an experiment is ecologically valid or not (Galiñanes Plaza, Delarue, & Saulais, 2019). This classification includes the environment in which consumers perceive a product, the product evaluated, the consumer who evaluate the product within the environment, and the evaluation task that takes place in that environment (Figure 3).

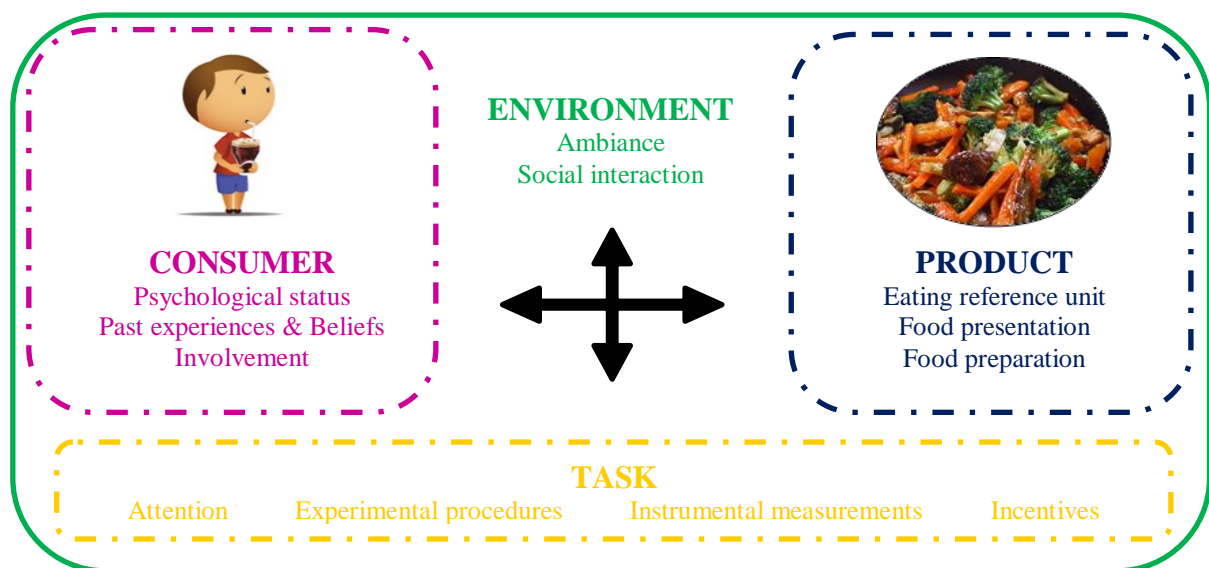


Figure 3. Organization of the contextual variables that influence consumers' judgement and behavior.

Within each category different contextual variables that may influence consumers' perception and that have aroused the interest of some researchers in the field have been considered. Regarding the environment, variables such as the physical situation, the ambiance and the social interaction have been considered; for the product the eating reference unit proposed by Rozin & Tuorila (1993), the

presentation and the preparation of the product have been investigated; for the consumer her/his psychological status, past experiences and beliefs, products' familiarity and involvement have been explored. Finally, for the task, the experimental procedures, instrumental measurements, the attention demand to perform the task and the incentives have been included.

3. Effects of context and contextual variables on consumers' hedonic judgement

In the following section, a review of the contextual variables classification and their effects on consumers' hedonic judgement is presented. The work done by Sester (2013) has set the bases for this review and it has been completed with recent research on context studies, and the contextual variables of interest.

3.1. Contextual variables: environment

Several studies have reported differences in consumers' hedonic judgements of a same product in varying environments (we will consider the environment as the physical context) which include variables such as the ambiance and social interaction (Boutrolle, Arranz, Rogeaux, & Delarue, 2005; Edwards, Meiselman, Edwards, & Leshner, 2003; King, Weber, Meiselman, & Lv, 2004). Those differences have been associated to higher liking scores and discrimination when consumers taste products in more natural conditions. However, those results are not conclusive.

3.1.1. Factors related to the *ambiance* such as the colors (Cho et al., 2015; Sester et al., 2013; Spence, Velasco, & Knoeferle, 2014), decoration (Bell, Meiselman, Pierson, & Reeve, 1994) and sounds (Spence & Shankar, 2010) have been pointed out as some of the causal factors for the changing in food perception through cross modal interactions.

3.1.2. Moreover, *social interaction* within a particular environment has also shown to modulate consumers' behaviors in different ways, specially depending on the degree of familiarity among consumers (Di Monaco, Giacalone, Pepe, Masi, & Cavella, 2014; Robinson & Field, 2015). However, no clear evidences are found as regards consumers' hedonic judgement.

Environment-related variables may modulate consumers' hedonic judgements. However, how those environmental variables affect consumer hedonic evaluation is still unclear as there is no standardization in the way they should be used. Moreover, the interaction between several environmental variables at a time may occur being difficult to disentangle the causal relation between

consumers' hedonic judgement and one specific environmental factor. Additionally, we may consider that consumers' expectations towards a particular physical context may also differ, affecting in turn consumers' hedonic perception (Köster, 2003). Hence, this may affect the comparison between context studies and the generalization of results from one context to another.

For further discussion about the effect of environmental variables the reader is directed to Sester (2013). Moreover, the review carried out by Cruwys, Bevelander, & Hermans (2015) about the social influence on consumers' behavior is also recommended.

3.2. Contextual variables: product

When we eat or drink we formulate conscious and unconscious judgements about the product. The product itself, its organoleptic characteristics, are going to influence consumers' perception. However, there are other variables such as the quantity of the food and its presentation that are going to impact consumers' hedonic judgement, for example through the mechanisms of satiation (Meillon, Thomas, Havermans, Pénicaud, & Brondel, 2013) or cross modal interactions (Zellner, Loss, Zearfoss, & Remolina, 2014).

Product-related variables include all the contextual characteristics that define the product beyond its sensory properties - from the quantity of food tested (referred to as the *eating reference unit*) to the type and number of other foods offered (or not) in combination to the evaluated product, but also the way the food is presented and the process of its preparation.

3.2.1. The *eating reference unit* is a concept defined by Rozin & Tuorila (1993) that refers to the size of the tested food (bite, dish, meal) over time. Each reference unit has a different level of complexity, temporal and spatial importance as well as research application. For example, in consumer tests participants usually taste a bite of a product in a short period of time while a meal involves more complex elements and it demands a longer period of tasting (Hyde & Witherly, 1993).

3.2.2. *Combinations of foods* are rarely seen in laboratory contexts, where the studied food products are generally evaluated as single items (bite or dish) rather than as part of a meal. However, several studies have shown that products evaluated as part of a meal were higher rated than individual items (King, Meiselman, Hottenstein, Work, & Cronk, 2007; King et al., 2004). The definition of "meal" is vague and depends on the researchers' orientation. Meals are food eaten as part of a structured event, following rules of combination and sequence; however, snacks are unstructured food events which do not follow any rules concerning time, place or sequence (Pliner, Bell, Road, Bell, &

Meiselman, 2004). In this case, we may consider that depending on the event (meal or snack) the hedonic judgment and behavior may differ (De Graaf et al., 2005; King et al., 2004).

Regarding the rules of combination and sequence, most of the research on eating behavior has focused on food items instead of food combinations. Nevertheless, in the last fifteen years, researchers have shown that suitable food combinations result in more pleasant recipes, thus in higher overall liking scores (Elzerman, Hoek, van Boekel, & Luning, 2015; Pagliarini, Gabbiadini, & Ratti, 2005); and others researchers have also studied how much of each meal component contributes to that hedonic judgement (Jimenez et al., 2015; Meiselman, 2006). Moreover, the sequence and appropriateness of mealtimes when evaluating products have also shown to influence hedonic judgements (Boutrolle & Delarue, 2009; Cardello, Schutz, Snow, & Leshner, 2000).

- 3.2.3. Regarding *food presentation*, we may include not only the dish but the *cutlery*. Several studies have shown the impact of cutlery on consumers' hedonic perception and judgement in natural contexts (Piqueras-fizman, Alcaide, Roura, & Spence, 2012; Piqueras-Fizman, Laughlin, Miodownik, & Spence, 2012; Spence & Velasco, 2018). However, when looking at consumer tests, this variable is rarely considered.

With regard to the *plating*, the expression "you eat first with your eyes" easily explains how the visual composition of a product or a dish may affect consumers' perception so, consumers' judgement. Some researchers have shown their interest on the effect of subtle changes in the visual presentation of a dish on flavor perception and consumers' liking. Zampollo, Kniffin, Wansink, & Shimizu (2012) showed the effect of food presentation on children preferences by modifying the number of items and their distribution on a plate in a school. Zellner et al., (2011) showed that a neatness presentation increased consumers' liking and also their Willingness to Pay (WTP), whereas Michel, Velasco, Fraemohs, & Spence, 2015 and Michel, Velasco, Gatti, & Spence (2014) found opposite results.

Within this variable, Sester (2013) also include *packaging and labelling*. The role of information has shown to influence consumers' beliefs and expectations modifying consumers' hedonic judgements and behaviors (Bernard, Duke, & Albrecht, 2019; Fernandes et al., 2016; Jo & Lusk, 2018; Mcfadden & Lusk, 2015). The fact of priming over a particular product aspect frames consumer evaluation, and then consumers' perception as certain characteristics of the product become more salience.

- 3.2.4. The concept of *food preparation* has been widely used in the scientific literature referring to different meanings ranging from the way consumers taste products to the actual

preparation method or culinary technique, the presentation of food samples in the laboratory (Siret & Issanchou, 2000) and the served temperature (Cardello & Maller, 1982; Kähkönen, Tuorila, & Hyvönen, 1995).

According to Delarue & Boutrolle (2010), individual food preparation is involved in the formulation of the hedonic judgement. Several studies have shown a direct effect on liking and products' discrimination when consumers have the freedom to taste and prepare the products according to their own consumption habits (Hathaway & Simons, 2017; Posri, Macfie, & Henson, 2001). However, little research has been carried out in laboratory contexts.

Food preparation as *culinary techniques or methods* has also proved to modify the perceived sensory properties of a product, thus the hedonic judgement. A product prepared at home may differ from another one prepared at the restaurant or at the laboratory contributing to the negative correlations between the hedonic judgements at laboratory and natural consumption contexts (De Graaf et al., 2005). Moreover, the culinary preparation seems to be related to consumers' expectations and preference for products or dishes in particular contexts (Edwards, 2013).

Product-related variables show to have an impact on consumers' hedonic judgement that goes from a simple bite to the preparation of the product. When looking at context studies, especially at consumer tests, special attention should be put on each of those variables. If the environment has already shown to influence in a certain way consumers' hedonic judgement, the fact of include variability in the way products are tested may induce higher differences in how consumers perceive the product. In general, in consumer tests small portion sizes of the products are presented usually in plastic cups and dishes. They are not included as part of a meal or an eating situation and they are served ready to consume, so no preparation from the consumer side is needed. All those aspects have shown to matter for consumers when they formulate a judgement. Therefore, they cannot be neglected.

3.3. Contextual variables: consumer

Consumers' physiological, psychological status and food habits are some of the consumer-related variables that have shown to influence consumers' hedonic judgements. In this section only the variables treated in this thesis and those not examined by Sester (2013) are presented. However, for further discussion about the effect of consumer-related variables such physiological or cultural variables the reader is directed to Sester (2013).

Within the consumer-related variables consumers' emotions, mood, expectations, beliefs and past experiences, product familiarity, and consumers' involvement have been considered.

- 3.3.1. *Consumers' emotions* and their relation with consumer hedonic judgement and behavior have become one of the most explored areas of research in the past years (Jaeger et al., 2017; Meiselman, 2015). Emotions do not have a consensual meaning within the scientific community. However, it is agreed the idea that emotions have "multiple components, including physiological arousal, motivation, expressive motor behavior, action tendencies and subjective feeling", and that they are characterized by "a synchronized response, rapidity of change, behavioral impact, high intensity and relatively short duration" (Spinelli, Masi, Dinnella, Zoboli, & Monteleone, 2014, p.110). Piqueras-Fiszman, Giboreau, & Spence (2013) associated different emotions to different product categories and several evoked contexts. These authors showed that consumption context and context-product appropriateness impact consumers' emotional associations. Neutral categories such as fruits showed more stable emotions along different contextual situations while categories such as chocolates or chips were related to an emotional eating strategy or satisfy cravings state. Gutjar et al., (2015), and Köster & Mojet (2015) discussed about the need of emotions to predict consumers' choices as liking ratings often fail when envisaging market success or are insufficient to predict products acceptance.
- 3.3.2. The effect of consumers' *mood* on their hedonic judgement and vice versa has been also shown through consumers' memories and expectations (Köster & Mojet, 2015). Considering the effect of mood on food, in the study performed by Platte, Herbert, Pauli, & Breslin (2013) the intensity of sucrose and quinine as indicators of sweetness and bitterness perception was positively correlated to depression and anxious moods; whereas when studying the effect of food on mood results showed how carbohydrate and sweet food have a positively impact on consumers' mood (Macht & Dettmer, 2006).
- 3.3.3. Regarding consumers' *expectations*, several studies have shown an interaction between expectations and consumers' perception, judgement and behavior (Delwiche, 2012; Schifferstein, Wehrle, & Carbon, 2019). Expectations influence consumers' hedonic judgement through top-down processes (Lee et al., 2006). When consumers taste a product they tend to compare it to personal standards, mental representations, and from there elaborate a judgement. Effects of assimilation or contrast may then occur modifying the hedonic judgement depending on the distance between the actual perception and consumers' personal standard (Cardello, 1995; Davidenko et al., 2015). This is an

important variable as consumers' expectations may also differ depending on the environmental variables. Thus, consumers' personal standard may vary depending on whether they are in a consumer tests or at home or at a restaurant, and in turn the differences in hedonic judgements among contexts.

- 3.3.4. **Beliefs and past experiences**, have proved to impact consumers' hedonic judgement and behavior (Bernard & Liu, 2017; Jo & Lusk, 2018; van den Heuvel, van Trijp, Gremmen, Jan Renes, & van Woerkum, 2006). Beliefs "are statements of real or perceived knowledge about a product or object" (Kempen et al., 2017, p. 246) ruled by different cognitive process responsible of their updating when consumers face a new information (Mcfadden & Lusk, 2015). They are related to consumers' past experiences with a product or a situation which may help to explain contexts differences when comparing consumers' hedonic judgements (Köster, 2003). When it comes to context studies it is important to keep in mind that consumers' beliefs and past experiences towards a particular context may influence consumers' perception. In the case of consumer tests, there is lack of information regarding what consumers think about this type of contexts. Nevertheless, this information could help to explain in a certain way contexts differences.
- 3.3.5. Consumers' **product familiarity** has also shown to impact consumers' hedonic judgement. Most of consumer tests are performed with regular consumers of the target product. However, when looking at context studies, unfamiliar products have shown to be more context-dependent than familiar ones (Giacalone et al., 2015; Kim et al., 2015).
- 3.3.6. The lack of consumers' **involvement** in consumer tests has also shown to influence consumers' hedonic judgement (Köster, 2009). Brien & Toms (2008) describes that consumers are motivated to participate in a task when they found the experience enjoyable and engaging. Recent studies have been interested in this area showing positive correlations between consumers' involvement in more natural contexts and products discrimination (Bangcuayo et al., 2015; Boutrolle, Delarue, Köster, Aranz, & Danzart, 2009; Hathaway & Simons, 2017). The fact that consumers are not involved in the task, as occurs with the preparation of the product, may reduce their interest, impacting on their hedonic judgement.

Consumer-related variables have shown to influence consumers' hedonic judgement. Emotions and mood have shown to influence the way in which products are perceived. Moreover, those feelings may change not only depending on the product but on the context as it occurs with consumers' expectations

and beliefs. Past experiences and product familiarity have also shown to be context-dependent. Therefore, when comparing context studies special attention should be put on those variables that may help to explain context differences. In consumer tests' it is needed to understand what consumer think and expect to find in this type of context. Context studies compare not only hedonic responses but consumers' food experiences, so defining those variables may help to explain the differences between controlled conditions and natural consumption contexts.

3.4. Contextual variables: task

The evaluation task is not usually considered as a contextual variable. However, when consumers formulate an explicit hedonic judgement it means that an evaluation task has been performed. Moreover, regarding the problematic of ecological validity about consumer tests' data, it is important to understand if the task performed in a context is representative and relevant in the context of interest to ensure the ecological validity of the results (Galiñanes Plaza et al., 2019). Hence, the evaluation task performed within the environment of consumption has been considered as a contextual variable.

The effects of the evaluation task on consumers' judgement have been further studied by psychologists and behavioral economics (Ariely, Loewenstein, & Prelec, 2006; Harrison & List, 2004; Kahneman, 2002). The framing of the evaluation task has shown to have a significant impact in the way that consumers perceive a specific task and integrate the information to formulate a judgement (Köster, 2009; Köster, 2003). When consumers receive the instructions to perform a particular task, the type of information given, the amount of given information and the way it is presented may drive the **attention** of consumers to particular features (Kahneman, 2002; Lee et al., 2006). This attention placed on the task may bias the actual perception and judgement of the consumer, so the reliability of the results (Dijksterhuis et al., 2005; Köster, 2003).

When eating or drinking, consumers make spontaneous judgements usually related to the fact they like or dislike a product. In consumer tests, hedonic evaluation task can involve global judgements that refer to a *synthetic evaluation task* or more detailed judgements, that refers to an *analytical evaluation task*. The latter involves the description of specific sensory characteristics of the products. This, may led to a more cognitive demand due to the attention consumer may place on it. This may then modulate the frame of consumers' perception, and in turn consumers' hedonic judgement.

The act of eating involves different cognitive processes (System 1) than the act of evaluating (System 2). Considering that, the features of the evaluation task as the **experimental procedures** and **measurements tools** (questionnaires, scales) may also influence consumers' judgement. In fact, several studies have shown that depending on the number of questions (Prescott, Lee, & Kim, 2011),

the order in which they are asked (Earthy, MacFie, & Hedderley, 1996) and the way they are formulated (Jaeger et al., 2013; Popper, Rosenstock, Schraidt, & Kroll, 2004) may influence consumers' hedonic judgement:

- a. Number of questions: higher number of questions about specific sensory product characteristics may inhibit or distort the cognitive representation of synthetic characteristics of the product (Prescott et al., 2011). That is that consumers focus on product characteristics instead of the global liking of the product. However, controversial results are found related to this issue (Jaeger et al., 2013).
- b. Order of questions: Related to the previous factor, the order in which questions appears seems to also affect consumers' hedonic judgement. When a synthetic question such as the overall liking of a product is asked after the evaluation of sensory characteristics, the overall liking scores tend to decrease especially after the evaluation of negative attributes (Earthy et al., 1996). Consumers may concentrate their attention to those specific attributes modulating their perception of the product and then, their judgement. However, when the synthetic question is formulated before, those effects are not observed.
- c. Formulation: as described before, depending on the way questions are formulated consumers' attention towards the product and its characteristics may vary. The salience of certain sensory characteristics may catch the attention of the consumers who are going to focus their evaluation and posterior judgement on those characteristics (Jaeger et al., 2013; Popper et al., 2004).

Moreover, research has been carried out on the use of hedonic scaling and the outcomes of those measurements tools (Cardello, 2017; Lim, 2011). Cardello (2017) insists on the fact that attention should be placed in the way hedonic scales are selected, the end-point anchors established and the framing of the questionnaire set. All of that is going to impact the way in which consumers are going to evaluate a product and the way in which the researcher is going to analyze and interpret the data.

Within the evaluation task-related variables, another important variable that has not been deeply investigated in consumer's tests is the *presence of incentives*. In natural consumption contexts consumers usually pay for the food they consume whereas in consumer's test they are paid or compensate for doing it. Studies in experimental economics have shown how the presence or absence of an incentive can modulate consumers' involvement (Carson & Groves, 2007; Shogren, 2005). Involvement has shown to influence consumer evaluation and consumers' judgement. Therefore, this

variable should be considered when comparing the results of consumer's tests and natural consumption contexts as it may help to explain certain differences.

Evaluation task-related variables have shown to influence directly and indirectly consumers' hedonic judgement. The frame of the evaluation task plays a key role on the way consumers perceive a product and judge it. When comparing context studies, it is important to consider that two contexts effects may occur: one at environmental level in which the product and consumer interact, and another one at evaluation task level within the environment. This means that by controlling the contexts effects at evaluation task level, the generalization of the results among contexts may be in a certain way ensured.

4. Conclusions

The present chapter has shown that contextual variables have an effect on consumers' hedonic judgement. The presence and/or the lack of contextual variables seems to modulate consumers' perception both in controlled conditions and in natural consumption contexts. However, it is still unclear the mechanisms behind those effects and this directly questions the reliability and ecological validity of the data obtained in controlled conditions; but also the ecological validity of the data when comparing different natural consumption contexts.

It has been shown that whereas environmental and consumer-related variables may be difficult to controlled, product and evaluation-task related variables may do. Concerning consumer-related variables, expectations and beliefs towards products have shown to modulate consumers' hedonic judgement. However, when comparing context studies, expectations and beliefs towards the contexts of consumption and evaluation may also influence the way in which consumers are going to perceive the product as part of the food experience. Therefore, special attention should be placed on those variables to explain in a certain level differences in hedonic responses. Moreover, when comparing context studies, product and evaluation task-related variables should be controlled to at least ensure the interpretation of context effects at evaluation task level. Variables such as the quantity of served food, presentation and preparation should be controlled in order to be comparable among context studies. Besides, consumers may evaluate the product differently in a consumer's test than in a more natural consumption context due to the presence of questionnaires and incentives. Therefore, special attention should be placed on those variables in order to ensure the representativeness of the task in the context of interest and their posterior comparison among contexts.

Chapter 2. Looking for ecological validity

In the last decade, the need for more ecological research has been highlighted to ensure the generalization of the results from consumer's tests to natural consumption contexts. New methodologies have been developed in order to increase the realism on laboratory contexts and consumer tests. The use of evoked contexts, immersive scenarios or the virtual reality are some of the methodologies that aim to increase the ecological validity of consumer tests by the use of contextual variables. However, how those contextual variables are integrated and the explanations of the causal relations remains still uncertain as the question of the ecological validity.

This chapter focuses on the current debate in the field of sensory and consumer research about the ecological validity of context studies. A review concerning the question of ecological validity on the use of contextual variables in controlled conditions and within the different contextual methodologies is presented.

1. Introduction

Both academia and industry have identified a need for more ecologically valid methods in sensory and consumer research, in order to better understand consumers' behaviors and predict new products success. In the last decade, several methodological approaches have been proposed in response, mostly focused on the contextualization of evaluations, either through the addition of contextual referents in the physical environment or, more recently, through the use of virtual reality. However, in the absence of standardized criteria, the robustness and reliability of their results remains uncertain. This narrative review examines the notion of ecological validity from the perspective of different disciplines and proposes an analytical framework to evaluate the transferability of data in sensory and consumer research. We argue that ecological validity cannot be achieved by simply moving from the internal validity of laboratory settings to the external validity of the natural settings, but that a compromise between them is possible. We assess evidence of how contextual effects should be taken into account and propose a framework to guide experimental choices, composed of four criteria pertaining to the validity of measures: (1) experimental environment, which has been the most thoroughly investigated so far in the literature; (2) the nature of the product and its presentation (3) the selection of participants and their mindset and, (4) the evaluation task. This framework is used to identify potential critical points in current studies and to discuss the recent methodological developments in sensory and consumer studies. Finally, we draw some research perspectives.

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2. The pursuit of ecological validity through contextual methodologies (Article 1)



The pursuit of ecological validity through contextual methodologies

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1. Introduction and background

It is vastly recognized that context impacts consumers' liking and choice of food, with direct implications regarding the validity of measures of the latter obtained in a given context. This issue is key for the food industry, whose strategic choices require reliable models of consumers' liking and behavior in order to predict the commercial success of a product. Yet, the everyday practice of consumer tests appears very heterogeneous regarding the inclusion of context variables, which may contribute to the low reliability of hedonic data used in the industry.

Since Meiselman in 1992 proposed to study real foods in real contexts (Meiselman, 1992), several studies have been conducted in natural consumption settings in an effort to improve the ecological validity of consumer data used in sensory science (Bell & Pliner, 2003; de Castro, 1994; Hetherington, Anderson, Norton, & Newson, 2006; Marshall & Bell, 2003). However, the gain in realism of studies in natural contexts is obtained to the detriment of control over context variables, questioning the reproducibility and transferability of the results.

In the past decades, several approaches have been developed in order to fill the gap between laboratory and natural contexts. They encompass evoked context studies, immersive technologies or the use of virtual reality. These approaches are intended to provide richer contextual realism to standard laboratory approaches by playing on contextual variables such as the physical or social contexts, or by using advanced technology in the case of the virtual reality. However, there are no standardized criteria to determine the type of variable that should or should not be added, and how and when they should be. Therefore, the question of validity and transferability of the data obtained in such conditions remains.

Based on a narrative review, this article discusses the added value of contextual approaches to increase the validity of consumer and sensory data. We argue that the addition of contextual cues in experimental approaches should be based on sufficient experimental evidence gathered within a clear theoretical framework. This review examines the notion of validity and ecological validity through the prism of different experimental disciplines (and particularly consumer psychology and behavioral economics) and draws some implications for sensory and

consumer science. We review the recent research on context studies and the effect of context on consumers' liking, choice and intake. We also discuss the use of contextual variables in laboratory settings and the emerging use of new methodologies.

This article sets out to (1) define an analytical framework for assessing the relevance of moving towards more ecological validity; (2) assess evidence on how contextual effects should be taken into account in sensory and consumer science studies; and (3) identify the conditions and potential critical points for the design of experiments that take into account context to ensure ecological validity.

2. The concept of validity in sensory and consumer studies

2.1. Evaluating the validity of an experiment: internal, external and ecological validity

The experimental approach is used in various scientific fields concerned with individual behaviors. In particular, consumer psychology and economics use experiments to investigate consumer behaviors and preferences. In these fields, the role of theory in the experimental approach is significant, although not systematic (for a discussion on the role of theory in experimental economics, the reader is directed to Card, DellaVigna & Malmendier, 2011). For instance, experiments in economics aim to either (i) test theoretical assumptions, (ii) generate data on a little known phenomenon or (iii) evaluate the potential impact of policy scenarios or private sector innovations (Saulais et al., 2017). In consumer psychology, experiments use conceptual models and psychology theories (Kempen et al., 2017; Köster, 2009,) such as the Theory of Planned Behavior or the Expectancy-value theory (Ajzen, 1991). While studies in sensory science share this overall goal of better understanding consumer behavior, they often focus on operational objectives, such as to support product development through consumer tests.

In the various scientific fields relating to consumer science, experiments range from controlled, standardized laboratory experiments (standard approach) to natural experiments (experiments run in natural contexts), including different types of field experiments or field data (for more detailed information on field experiments, the reader is

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directed to the seminal papers by Carpenter, Harrison, & List, 2004; Harrison & List, 2004; and to the Fréchet & Schotter, 2015 (Part IV: The Lab and the Field) for a more recent view).

In general, the validity of experimental data is assessed from two complementary perspectives: internal and external validity. While internal validity refers to the ability of experimental data to provide understanding and to explain the causal relations within an experiment, external validity refers to the ability of the results of a given experiment to be generalized to other situations (Guala, 2012; Roe & Just, 2009). Therefore, moving from controlled to natural experiments implies a tradeoff between these two perspectives.

Ecological validity refers to the representation of the studied stimuli in an environment. This concept was introduced by Egon Brunswik in the area of the psychology of perception (Brunswik, 1943, 1955). “Representative design” addresses the ecological validity issue by considering a stimuli representative of the organism-environment relation. Brunswik therefore proposes to move from the study of people to the study of situations, replacing proper sampling of participants with representative sampling of a situation or task; and moving from “artificial” to “natural” contexts (Diehl, Wahl, & Freund, 2017). On the other hand, Brofenbrenner (1977) also includes the role of the researcher in the definition of ecological validity. The degree of ecological validity may be determined by the researchers who should ensure that the environment experienced by the subjects has similar properties to the context of interest.

The ecological validity of a study thus depends on whether the task performed in an experimental context is relevant in the context of interest. If a researcher runs an experiment in the context of interest without modifying the ecology of that particular context, the internal validity as well as the ecological validity of that context can be ensured. However, if the researcher runs an experiment in a context that highly differs from the context of interest or has to modify it to establish internal validity, the inferences for ecological validity may not be guaranteed.

This definition of ecological validity generates an ambiguity between the notions of external and ecological validity making it difficult to understand the real purpose of adding ecological value to consumer and sensory studies. Nevertheless, we can assume that a greater ecological validity leads to a greater external validity of the results.

Some of the main features of laboratory experiments is the required control over the studied stimuli and the control of the environment in which the experimental study takes place. Laboratory or central location experiments may also allow better control of participants’ characteristics (e.g. weigh, hunger state, fasting period...). These factors ensure the ability to explain causal relationships between the stimuli and response. Natural experiments may lack of control over those factors, however they ensure greater ecological validity as natural relationships between the participants and the stimuli occur without restrictions or control of the environment. As an intermediate approach, field experiments attempt to reinforce both internal validity, obtained through strict control over the experimental task, and external validity through the use of a natural physical context, following the rationale that if causality is determined by internal validity, the probability that this relationship (stimuli-response) will be relevant in another ecologically valid setting may increase (Roe & Just, 2009).

These concepts, defined below (Table 1) highlight the importance of three features of an experiment when considering whether it is ecologically valid: the nature of the environment, the nature of the stimuli (in this paper we will refer to the nature of the product) and, the nature of the task. Following the works of experimental economists, we propose to consider an additional criterion: the participants – and more precisely, the nature of the pool of participants and the experience they can bring to the task (Carpenter et al., 2004).

2.2. Critical points in sensory and consumer studies

In sensory and consumer sciences, laboratories and central location test (CLT) have long been considered the “gold” standard for the study of consumers’ liking and behavior. Those scenarios have offered great reliability and robustness of results due to the control of experimental variables through the application of standards (e.g. the AFNOR V09-500 in France) which establishes a methodological framework to explain causal relations. However, in the last decades, the high rate of market failures of new food products that had been selected on the sole basis of CLT, has prompted researchers and industrialists to question the ability of these methodological approaches to provide reliable data (Garber, Hyatt, & Starr, 2003; Jaeger, Hort, et al., 2017; Köster & Mojet, 2012).

Using the perspective of the four criteria listed above, we try to identify the main critical points that should be considered when assessing the validity of experimental data in sensory and consumer science.

2.2.1. Experimental environment

Context was defined by Meiselman (2006) as the specific physical, social and situational conditions in which food and beverages are consumed. Several studies have shown that the context in which food is evaluated impacts consumers’ liking scores and food choices (Edwards, Meiselman, Edwards, & Leshner, 2003; King, Weber, Meiselman, & Lv, 2004; Meiselman, Johnson, Reeve, & Crouch, 2000; Stroebele & De Castro, 2004). These effects can be seen as a result of the role of context as a whole, or more specifically as a result of the presence or absence of some specific contextual variables in a given setting. These aspects will be more specifically addressed in the next section of the article (Section 3).

2.2.2. Nature of the product

In this review, focus is placed on studies related to food products, although most considerations would also apply to other product categories. In laboratory settings, food products are usually evaluated as single items (bite or dish) and not as part of a meal; even the portion’s size is usually smaller than in more natural settings. However, several studies have shown that products evaluated as part of a meal are higher appreciated than individual items (King, Meiselman, Hottenstein, Work, & Cronk, 2007; King et al., 2004). Rozin and Tuorila (1993) have described the concept of “eating reference unit” as the size of the tested food (bite, dish, meal, diet pattern) over time. Each reference unit has a different level of complexity, temporal and spatial importance, and research application. For example, a bite is a unit of reference eaten in a short period of time, in a single space and it is used by sensory and product developers; however, a meal is a unit of reference more complex that includes smaller reference unit as bites and that would be used by food service and institutional researchers (Meiselman, 2006).

However, in studies taking meals into account rather than isolated products, the definition of “meal” is not standardized, as it depends on the researchers’ culture and orientations (Meiselman, 2006; Pliner, Bell, Road, Bell, & Meiselman, 2004).

Another critical aspect regarding the ecological validity of the product is its method of preparation. Sensory tests usually employ optimized, standardized cooking methods and minimize variations between batches of products. However, the method of food preparation is involved in the formulation of the hedonic judgement, therefore questioning the ecological validity of the standardized approach (Delarue & Boutrolle, 2010). Several studies have reported a direct effect of preparation methods on liking and discrimination when consumers have the freedom to taste products according to their own habits as they do in natural conditions (Matuszewska, Baryłko-Pikielna, Szczecinska, & Radzanowska, 1997; Posri, Macfie, & Henson, 2001). Variations in preparation methods occur in real life situations, where optimized conditions are rarely met. Yet the standardized tests rarely account for

Table 1
Definitions and quotes.

<u>The different types of experiments</u>	<u>Notions commonly used to evaluate experimental data</u>
Laboratory or controlled experiments: “allows underlying causal relations to become manifest at the level of empirical regularities. In a competently performed experiment, single causal connections can be “read off” directly from statistical associations.” (Guala, 2012, p. 613)	Validity: “the best available approximation to the truth of a given proposition, inference, or conclusion.” (Trochim, 2006)
Field experiments: “define what might be better called an ideal experiment, in the sense that one is able to observe a subject in a controlled setting but where the subject does not perceive any of the controls as being unnatural and there is no deception being practiced.” (Harrisson & List, 2004, p.1010)	Robustness: “measure of the method’s capability to remain unaffected by small, but deliberate variations in method parameters (environment, protocol, laboratory, equipment, staff, …).” (Boutrolle, Arranz, Rogeaux, & Delarue, 2005, p. 707)
Natural experiments: “researcher cannot manipulate the stimulus or influence the data generation process. Rather, the researcher takes advantage of a change in context or setting that occurs for some subjects due to natural causes or social changes beyond the researcher’s and subjects’ influence” (Roe & Just, 2009, p. 1267)	Reliability: “the degree to which the result of a measurement, calculation, or specification can be depended on to be accurate.” (Oxford Dictionaries, 2018, «Reliability», https://en.oxforddictionaries.com/ viewed online July 2nd, 2018) Replicability: “the ability of a scientific experiment or trial to be repeated to obtain a consistent result.” (Oxford Dictionaries, 2018, «Replicability», https://en.oxforddictionaries.com/ viewed online July 2nd, 2018)

the possible impacts of these variations in the data obtained.

2.2.3. Selection of participants

The mindset of participants when performing a study is a key element in the pursuit of ecological validity. Initial beliefs, attitudes, intentions, knowledge and exposure can all have a significant impact on perceptions and decisions, yet they are rarely taken into account in the interpretation of sensory tests (Bernard & Liu, 2017; Boutrolle, Delarue, Köster, Aranz, & Danzart, 2009; Cardello, Bell, & Kramer, 1996; Edwards & Hartwell, 2009; Kempen et al., 2017; Mahon, Cowan, & McCarthy, 2006; Tuorila, Palmujoki, Kytö, Törnwall, & Vehkalahti, 2015).

In addition to this, the way participants are involved in the test seems to impact consumers’ evaluation. Recent studies have pointed out the motivation and involvement of participants as a critical factor when analyzing and comparing different type of experiments (Banguayo et al., 2015; Hathaway & Simons, 2017).

The way the participants are selected and recruited may also constitute an issue. One of the main criticisms made to inferences drawn in sensory and consumer studies has been the use of non-representative populations. This concern is primarily directed to studies conducted for academic purposes, which frequently use student populations. However, this factor only needs to be considered if the mechanisms or tasks involved in a particular behavior depend on the population type. Depending on the research question, specific populations may be required and in this case, the recruitment of the wrong population may compromise the generalization of the results to a more diverse population (Harrisson & List, 2004).

2.2.4. Evaluation task

The features of the experimental task (experimental procedure or instrumental measure) may also have a significant impact on the respondents’ behavior – and therefore on the validity of data. The importance of the nature of the evaluation task performed, as well as the psychological processes involved in the task, have been the focus of several studies in the fields of experimental economics and experimental psychology (Harrisson & List, 2004). In sensory and consumers’ studies, participants generally answer a questionnaire after tasting a product. The framing of a task, the number and the way of asking the questions have been found to have an impact on consumers’ responses (Cardello, 2017; Kwak, Ahn, Lee, Kreger, & Lee, 2013; Kwak & Lee, 2016; Lim, 2011; Prescott, Lee, & Kim, 2011). Furthermore, some factors such as attention or time perception are known to play a significant role in judgement and decision-making and may directly affect the outcome of a hedonic test or a choice experiment (Dijksterhuis, Smith, van Baaren, & Wigboldus, 2005; Köster, 2003).

Another critical point related to the task is the incentive to reply. The presence of incentives directly associated to an experimental task has been shown to have an impact on the way participants report their willingness to pay for a product. In the absence of an incentive (and

even in the presence of a remuneration for their participation), responses tend to exhibit a hypothetical bias, which often manifests in the form of an over-evaluation of the product compared with a consequential task (Carson & Groves, 2007; Shogren, 2005). However, despite its possible implications for new product development, this question has not, to our knowledge, been investigated in the field of hedonic evaluation yet.

3. Increasing ecological validity: what do context studies say?

3.1. From laboratory to natural settings

As a way of addressing the concerns identified in the previous section regarding the validity of such data, it has been suggested to move from controlled settings towards more natural environments – that is to say, to use more contextualized approaches.

Indeed, as an alternative to the laboratory, consumers can be studied in non-standardized, natural consumption environments. The advantage of this field approach is that it reinforces the ecological validity of the experimental setting (environment), allowing researchers to study the interactions between the multiple contextual variables and the consumer’s behavior. Regarding the product, while a food product in a laboratory is tested alone and punctually (such as a food product tested as a single dish and presented in a small quantity), the same stimulus in a natural environment (such as a restaurant) may occur in a different, more ecological manner (such as a food product consumed within a meal, in a large quantity). Regarding the task, participants can be unaware of the existence and of the purpose of the study (pure observation of choices or food intake) or be made aware only of some aspects, at the end of the consumption (questionnaires that can be delivered once participants have finished eating or have selected their food) (Lin & Mattila, 2010).

While adding contextual elements may reinforce ecological validity by nature, we are still not sure about the transferability of the data obtained in natural environments in other contexts – not only because of the environment, but also because the stimulus or product itself and, the features of the task performed are different. In the following subsections, we examine more closely the question of ecological validity of context studies.

3.2. Do context parameters play a role in the validity of data?

The way to see ecological validity and its potential effects on consumer judgment has direct methodological implications. In the field of sensory and consumer science, studies looking at the validity of contextualized experiments fall into two categories: those that approach the issue of ecological validity as a whole (the experimental context consist of a combination of the environment and the task performed and, attempts to keep most of them as close to natural as possible) and those that focus on specific factors that are found to have an impact on

the measures and, try to make these more ecologically valid.

The studies following a global approach compare scores on food liking and choices in different natural environments (restaurants, canteens, prisons) with those obtained on laboratory or central location settings showing differences on hedonic scores (Edwards et al., 2003; King et al., 2004; Meiselman et al., 2000). Those differences are usually related to the degree of discrimination among products – consumers being more discriminant in natural settings than in laboratory settings – or to the higher scores on natural settings versus laboratory settings. The studies focusing on context variables compare how the addition of contextual variables in controlled experiments affect food liking and choice (King et al., 2004; Stroebele & De Castro, 2004; Weber, King, & Meiselman, 2004). We may first notice that several classifications of contextual variables have been proposed: Rozin and Tuorila (1993) divide contextual variables into either product and non-product variables and subdivide them in simultaneous and temporal contextual factors; Meiselman (1996), proposes to distinguish between three categories of variables (the situation, the individual and the product); whereas Stroebele and De Castro (2004), divide the contextual variables into social context variables, physical surroundings, time related characteristics and distraction and/or television viewing. From these studies, it is difficult to fully disentangle the various factors and isolate a specific context effect. The relevance of those contextual variables thus remains unclear. To date, the lack of knowledge of the combined effects of these contextual variables on consumers' responses compromises the ability to identify causal relationships through experimental approaches. In practice, a consequence of this is that participants to a test may not perceive the study context the way the researcher assumes they would. This questions the ecological validity as defined by Brofenbrenner.

The issue seen as a whole would naturally lead to global changes in the test design, while dividing context into separate variables would bring targeted improvements of the experimental setup, keeping the rest of the task and environment potentially non ecological.

3.3. Key determinants of ecological validity: a literature review

3.3.1. Methodology

For this literature review, a search on Google Scholar and Science Direct was conducted using the following keywords: 'context'; 'consumption context'; 'social facilitation'; 'food liking'; 'food choice'; 'food intake'. These keywords were used in combination to identify studies on the effect of the contextual factors (context, consumption context, social facilitation) on consumers' evaluation and behaviors (food liking, food choice, food intake). The reference lists and citations of eligible publications were also reviewed to identify pertinent literature.

A criterion for inclusion in the review was that the study had an experimental design in which either food liking, choice or intake was manipulated by a contextual variable (physical, social or food related). Table 2 shows a complete list of all the studies related to context effects following a a) global, b) separated variable and/or c) global and separated variable approach. We analyzed how those studies try to answer to the question of ecological validity by considering the four factors (participant, stimuli as food product, environment and task) previously presented. Twenty articles were identified that met these selection criteria. Of these, the majority (13) measured food acceptability as the dependent variable of interest, whereas nine articles investigated consumers' choice and intake as regards of meal duration and social facilitation.

On the other hand, in the interpretation of the table we also discuss studies that did not meet our inclusion criteria, but which provided additional insight as regards the use of context and ecological validity.

3.3.2. Main results

As can be seen from Table 2, some studies show that context effects on food acceptability differ depending on product categories. Social

facilitation shows to increase meal duration as well as food intake whereas food choice seems to increase food acceptability.

Similarities and differences are found when comparing the results from studies following a global approach with those following a separated variable approach. The studies following a global approach study consumer behavior through observation (there is no control over the contexts, products, participants and task) or task modulation. When only observation is used, ecological validity is ensured as consumers behave in their regular basis. In this type of studies, food choice, meal duration and intake can be analyzed, however food perception or liking cannot. When the task is modulated (questionnaire filling, food diary), social facilitation increases food intake and differences in hedonic scores are observed across studies. However, these results are controversial as in some situations no differences were observed (Kozłowska et al., 2003). These studies ensured ecological validity as the contexts, products and participants are not altered, however the transferability of the results into another context should be questioned.

The studies following a separated variable approach modify not just one contextual factor but several factors at a time (for example the nature of the product or the evaluation task) decreasing the internal validity of the results as well as the ecological validity. In this type of studies, the effect of context on product category should be highlighted as differences between snacks and meals ratings are observed, as well as the effect of the use of congruent elements on consumers' liking. This type of studies has also shown controversial results, being significant in some cases and irrelevant in others (Hersleth, Ueland, Allain, & Næs, 2005; Petit & Sieffermann, 2007).

The following parts discuss the outcomes of the literature review regarding the four factors from the previously proposed framework to analyze ecological validity.

3.3.3. Experimental environment

Context has shown to have a certain impact on consumers' liking (Boutrolle, Delarue, Arranz, Rogeaux, & Köster, 2007; De Graaf et al., 2005; Edwards et al., 2003; García-Segovia, Harrington, & Seo, 2015). The experimental environment is the most studied factor in the literature on context. However, the comparison of completely different contexts or the addition of contextual variables have led to controversial results as we have previously indicated. The ecological validity of the results can be compromised due to the use of different participant pool in the case of the global approach (different age, social status, etc.) or to the use of incongruent elements in the case of the separated variable approach (García-Segovia et al., 2015; Petit & Sieffermann, 2007). As shown in Table 2, participants and contexts are confounding elements (i.e. we cannot dissociate both variables) because comparative studies are usually conducted according to a between-group design.

Besides, consumers' expectations and beliefs towards specific food consumption contexts play a key role on consumers' judgement (Bernard & Liu, 2017; Köster, 2003). Hence, it must be stressed that comparing laboratory settings to natural consumption contexts may lead to results as different as comparing hedonic scores from two natural contexts (e.g. school canteen and restaurant). Not only the products may differ in both situations, but also consumers' expectations. Unfortunately, participants' expectations are never really taken into account in studies on context even if they could help to explain differences in consumer behavior and hedonic scores.

3.3.4. Nature of the product

Concerning the nature of the product, when the served food sample in a laboratory setting is not representative of the regular amount, preparation and presentation of the same food in a natural setting, it may be hazardous to compare studies because the product/meal combination may not be representative of participants' previous experiences and may convey dissonance and related biases (Rozin & Tuorila, 1993). In fact, we can observe how some products like snacks are able

Table 2
Summary of 20 context studies (using a) global approach, b) separated variable approach and c) global and separated variable approach).

Study	Studied response	Studied factor	Selection of participants	Nature of the product	Experimental environment	Evaluation task	Results	Comments
a) Global approach								
de Castro (1994)	Food intake	Social facilitation	515 participants recruited and remunerated Between-group design	Regular meals	Natural consumption contexts	Food diary for 7 consecutive days: what was eaten or drunk, time, amount, preparation method, type and gender of people eating with. Hunger, degree of relation and anxiety ratings	Meals eaten with other people were larger and longer compared to meals eaten alone. Meals eaten with spouse and family were larger and eaten faster, while meals eaten with friends were larger and of longer duration	Ecological validity and external validity may have been ensured because no changes were done in the contexts and the regular task (eat) was not affected No food type comparison
Meiselman et al. (2000)	Food acceptance	Eating location	Cross-cultural study: 74 and 125 participants (UK data) Participants were recruited for all locations except sensory laboratory Between-group design	<ul style="list-style-type: none"> • Menu based on canned food • Menu main dish Chicken fettuccine Alfredo 	<ul style="list-style-type: none"> • Training restaurant vs Student cafeteria (UK); • Training rest. vs Food lab vs cafeteria (USA) 	Food acceptance on a 9-point hedonic scale (UK) Food attributes (flavor, texture, color, overall rating) on a 7-point hedonic scale (USA)	Hedonic scores were 1 point higher in the restaurant > cafeteria. Regarding hedonic attributes (texture, flavor, color), ratings were higher in the restaurant > cafeteria ones	The tested canned food may be unfamiliar to the UK tested population. The nature of the task (questionnaire distribution and number of questions) differed between and within contexts. Participants in the lab condition were in a very specific context and mood state (students in attendance to take a final exam)
Bell and Pliner (2003)	Meal duration	Number of people at the table	1124 regular clients Participants were unaware of the study and not remunerated Between-group design	Regular meals	<ul style="list-style-type: none"> • Worksite cafeteria • Moderately priced restaurant • Fast-food restaurant 	Purely observational No questionnaire	Significant effect of group size on meal duration in the three settings, however the effect was smaller in the fast-food setting	Ecological validity and external validity is ensured because no changes were done in the contexts
Edwards et al. (2003)	Food acceptability	Eating location	Participants: Army training camp: 44 • University staff refectory/ 38 • Private boarding school: 88 • Freshman's buffet: 83 • Private party: 78 • Residential home (elderly): 43 • Student refectory: 33 • Day care center (elderly): 33 • University 4-star restaurant: 19 • Hotel 4-star restaurant: 32 Participants were unaware of the current study and not remunerated Between-group design	Chicken à la King and Rice	Ten locations, representing different types of food service situations	Demographic questionnaire + appearance, texture, taste and overall acceptability ratings on a 9-point scale + satiety ratings on a 6-point scale	Contexts affected acceptability ratings: different scores were obtained as regards product sensory attributes (appearance, taste and texture as well as satiety)	Food preparation is context dependent; therefore, acceptability may differ from one context to another due to sensory properties modification. Contexts also differed on service style, dining, choice, etc. = > Ecological validity is ensured however results may not be comparable across contexts

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Table 2 (continued)

Study	Studied response	Studied factor	Selection of participants	Nature of the product	Experimental environment	Evaluation task	Results	Comments
a) Global approach								
Kozłowska et al. (2003)	Predictive value of hedonic test	Eating location	35 elderly people 33 young people Participants were recruited Between and within-group design	5 apple juices with different sugar concentrations	<ul style="list-style-type: none"> Central Location Test (CLT) Home Use Test (HUT) 	Overall liking on a 9-point hedonic scales	<p>Context do not have a significant effect on hedonic scores even if higher scores were obtained at home than in laboratory.</p> <p>Poor prediction of laboratory scores of juice consumption</p>	<p>The nature of the product differs among contexts (50 ml v 150 ml) as regards the eating reference unit. Scope for choice differs across contexts, although it may be key to ecological validity</p> <p>The evaluation task differs among contexts:</p> <p>participants answer questionnaires at different times (HUT at the end of the day as a recall) what could affect the attention participants put on the product and therefore, on the final hedonic score</p>
Boutrolle et al. (2007)	Hedonic scores	Eating location Product type	Participants: regular users of the tested products <ul style="list-style-type: none"> Study 1: 240/context Study 2: 240/context Study 3: 160/context Participants were recruited in-situ (CLT) or pre-recruited by phone (HUT) Between-group design	2 variants of each product: <ul style="list-style-type: none"> Milk beverage Salted crackers Sparkling water Products were sequentially presented	<ul style="list-style-type: none"> CLT HUT 	Overall liking scores on a 10-point hedonic scale. CLT: 2 products evaluated during 1 session HUT: After one week of testing participants got the second product and repeated the same task	<p>Products got higher scores at the HUT. The influence of the method used depends on the type of product (how products are usually eaten)</p> <p>Pure monadic were slightly higher than monadic sequential scores (natural product consumption)</p>	<p>The evaluation task differed between contexts (time for evaluation); Ecological validity of HUT may depend on both the environment and the task itself (natural product consumption)</p>
Morizet, Depezy, Combris, Picard, and Giboreau (2012)	Food choice	Labelling	Participants: <ul style="list-style-type: none"> Non label: 125 Basic label: 116 Moderated Label: 131 Participants were recruited Between-group design	Carrot and broccoli dishes	Three school canteens: <ul style="list-style-type: none"> School 1: 140 School 2: 113 School 3: 111 	Chef give or not information about the vegetable options Food choice at lunch time	<p>Children chose significantly more often the familiar version of the dish when no information was given. The addition of a descriptive label led to an increased frequency of choice for the new vegetable dish for carrots only, and not for broccoli</p>	<p>Ecological validity is ensured as no contextual variable is highly modified. Only the information is manipulated</p>
b) Separated variable approach								
Herleth et al. (2003)	Liking	Eating location Food accompaniment	55 participants: likers of wine Participants were pre-recruited Within-group design	Eight different wines + dummy wine Food accompaniment: crackers with cheese, carrots and broccoli with dip and tortilla chips with mild salsa	4 contexts: <ul style="list-style-type: none"> Laboratory: with/without food Reception room: with/without food 	Participants taste the 4 wines at each time and were asked to rate their liking on a 9-point hedonic scale	<p>Sensory differences among wines and contexts significantly influenced liking scores (same size effect)</p> <p>Food accompaniment had a positive effect on liking scores</p>	<p>Sensory stimuli differ when the wine is tested together with foods. Using a reception room allowed social interaction and food accompaniment in a natural way</p> <p>(continued on next page)</p>

Table 2 (continued)

Study	Studied response	Studied factor	Selection of participants	Nature of the product	Experimental environment	Evaluation task	Results	Comments
King et al. (2004)	Food acceptability	Social interaction Eating location Choice	Participants: regular consumer of the tested products ● Test 1: 104 ● Test 2: 93 ● Test 3: 106 ● Test 4: 106 ● Test 5: 101 ● Test 6: 35 Participants were recruited (CLT) and/or contacted by phone or advertisements at the local offices (Test 3–5) Between-within group design	Side salad with dressing Small pizza Iced tea Each component has two flavor variants	6 contexts: ● T1: Laboratory + individual items ● T2: Laboratory + meal ● T3: Laboratory + meal + social interaction ● T4: Mock restaurant + meal + social interaction ● T5: Mock restaurant + meal + social interaction + choice ● T6: Restaurant	Overall liking for the entire meal + overall liking for each meal component on a 9-point structured hedonic scale Demographic information	Meal situation had a strongest positive effect on tea and salad; social interaction negatively affected pizza hedonic scores; eating location had a weak but positive effect on pizza and tea and a negative effect on salad; and choice had a positive effect on salad	The number of participants varied a lot from on context to another (from 35 to 106) The nature of the product differs from one context to another (meal versus individual meal components) as well as the preparation method because of equipment differences (CLT vs Restaurant). This limits the comparison between hedonic scores obtained in different contexts. The evaluation task implied by one context (questionnaire distribution, choice option, etc.) contributes positively to ecological validity in real and recreated restaurant, but is not applied to the standard CLT
Weber et al. (2004)	Food consumption	Social interaction Eating location Cutlery Choice	Participants: regular consumer of the tested products ● Test 1: 93 ● Test 2: 106 ● Test 3: 106 ● Test 4: 101 Participants were pre-recruited Between-within group design	Pizza + salad + tea: 2 variants of each product	4 contexts: ● T1: Laboratory + meal ● T2: Mock restaurant + meal + social interaction ● T3: Mock restaurant + meal + social interaction + silver cutlery ● T4: Mock restaurant + meal + social interaction + silver cutlery + choice	Portion size estimation on a portion size scale	Salad consumption was higher when there was a choice of dressings in an enhanced environment. Pizza and tea consumption were higher in an enhanced restaurant-like environment. Social interaction alone has no impact on food consumption	Participants have time to eat and then answer the questionnaire in all context. Social facilitation and choice may increase ecological validity

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Table 2 (continued)

Study	Studied response	Studied factor	Selection of participants	Nature of the product	Experimental environment	Evaluation task	Results	Comments
Hersleth et al. (2005)	Food acceptance	Eating locationSocial facilitationMeal accompaniments	87 participants: regular cheese consumers Participants were pre-recruited Within-group design	Hard and semi-hard Norwegian cheeses	3 contexts: <ul style="list-style-type: none"> ● Laboratory ● Club house of a soccer team ● HUT 	Overall liking on a 9-point hedonic scale + Questionnaire in HUT about social interaction, food eaten together with and beverages	No differences among contexts and social facilitation	Product experience differs between contexts due to the possibility to eat the cheese together with other products at the HUT (bread, crisp bread, biscuits) so the evaluations may not be comparable. The evaluation task differed between contexts (time for evaluation), Ecological validity of HUT may depend on both the environment and the task itself (natural product consumption)
Hetherington et al. (2006)	Food intake	Social facilitation Relation among participants	37 participants pre-recruited and remunerated Within-group design	Different type of products: bread rolls, potato crisps, fresh green salad, etc.	3 contexts: <ul style="list-style-type: none"> ● T1: Laboratory ● T2: Laboratory + TV ● T3: Laboratory + negative social facilitation ● T4: Laboratory + positive social facilitation 	Food dairy before the test + Appetite and mood ratings on VAS + eat product + recall how much they had eaten using photographs of 6 possible portion size	Energy intake was significantly enhanced by presence of familiar others and watching TV	The experimental environment at T2 and T4 may have influence the evaluation task increasing the ecological validity of the results as regards consumers' intake. Consumers may have experienced a natural consumption situation
Stroebele and de Castro (2006)	Food intake and meal duration	Music	78 participants pre-recruited Within-group design	Food and drink intake of 7 consecutive days	Natural consumption contexts	Food diary: amount and type of eaten food, where, when with whom, for how long, presence of music, music speed and volume on a 7-point scale	Music increased food and drink intake and longer meal duration. No significant differences were found in music speed or volume	Social facilitation and meal occasions are confounding variables which can limit the comparison between contexts

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Table 2 (continued)

b) Separated variable approach

Study	Studied response	Studied factor	Selection of participants	Nature of the product	Experimental environment	Evaluation task	Results	Comments
King et al. (2007)	Food acceptability	Meal situation Social interaction Eating location Choice	Participants: regular consumers of the tested product ● Test 1: 74 ● Test 2: 83 ● Test 3: 386 Participants were pre-recruited on test 1 and 2 Between-group design	<ul style="list-style-type: none"> ● Iced tea ● tossed salad with Italian dressing ● garlic bread sticks ● cannelloni with meat filling ● meat lasagna 	3 contexts: <ul style="list-style-type: none"> ● T1: CLT restaurant ● T2: national Italian chain restaurant ● T3: nation-wide in-store satisfaction survey in the same chain restaurant 	Overall liking on a 9-point structured hedonic scale (just on CLT) + overall rating on a 6-point structured hedonic scale	Location and food choice had the strongest positive effects on acceptance ratings, while social facilitation and enhanced environment had no significant effect on the acceptability scores	The number of participants highly differs among contexts. The nature of the product differs from one context to another (portion size and preparation). The evaluation task differs from T1 and T2 compares to T3 (whereas in T1 and T2 questionnaires were presented at the beginning of the meal in T3 each product was accompanied by the specific questionnaires). In this case higher number of questions were presented on T1 and T2 which may could affect the evaluation task
Zeinstra et al. (2010)	Liking	Preparation method	116 participants: ● 46: 4-6ys ● 25: 7-8ys ● 23: 11-12ys ● 22: 18-25ys Participants were pre-recruited Between-group design	Carrots and French beans: ● mashed ● steamed ● boiled ● stir-fried ● grilled ● deep-fried	Restaurant	Familiarity questionnaire + ranking test + testing and rating with 3 smiley faces (like, neutral, dislike) + attributes rating + preference ranking	Vegetable liking was related to a uniform surface and the typical vegetable taste. Brown coloring and a granular texture were negatively related	Small number of participants. In spite of effort to conduct the test in an experimental restaurant, children were seating alone which may not have been representative of a regular lunch at school
Piqueras-Fizman, Alcaide, Roura, and Spence (2012)	Food perception	Product presentation: shape and color of the plate	Participants: ● Study 1: 53 ● Study 2: 51 Participants were recruited Within-group design	Strawberry mousse	Laboratory: ● Study 1: white vs black dishes ● Study 2: triangular vs squared vs rounded	Taste one spoonful of the sample and rate perceived sweetness, flavor intensity, and quality of the strawberry mousse on an unstructured 10-cm-long scales + liking on a 9-point hedonic scale	Mousse was perceived more intense and sweeter in a white plate than in a black plate. The shape did not affect	The nature of the product/task differs between a dessert spoonful and a dessert in terms of reference unit
Di Monaco et al. (2014)	Food acceptability	Social interaction Drink accompaniments	Participants: regular consumers of the tested product ● Test 1: 32 ● Test 2: 33 ● Test 3: 30 Participants were pre-recruited Between-group design	5 frozen croissants	3 contexts: <ul style="list-style-type: none"> ● T1: Laboratory ● T2: Laboratory + social facilitation ● T3: Laboratory + social facilitation + drink options 	Overall liking + attribute liking (appearance, odor, flavor, taste and texture.) on a 9-point hedonic scales Freshness on a 9-point scale	Social interaction negatively affected all the liking scores when compared to the control group. Social + drink accompaniments seemed to increase hedonic scores	Ecological validity could be questioned since participants did not know each other. However, evaluating croissants with a drink is closer to usual eating habits

(continued on next page)

Table 2 (continued)

Study	Studied response	Studied factor	Selection of participants	Nature of the product	Experimental environment	Evaluation task	Results	Comments
b) Separated variable approach								
García-Segovia et al. (2015)	Food acceptance and intake	Eating location Table setting	Participants: ● Test 1: 94 ● Test 2: 90 Participants were pre-recruited	Ready-to-eat (RTE) herb-roasted chicken	2 contexts: ● T1: Laboratory (Room, experimental home-style dining room, experimental restaurant) ● T2: More realistic context (plastic tray, home-style table, gourmet)	Hunger status on a 9-point Likert scale before and after eating ● Before eating: Impression of the appearance of the table setting on a 9-point hedonic scale + the willingness to eat on a 9-point Likert scale ● After eating: overall flavor and overall impression of the served food on two 9-point hedonic scales + portion size impression on a 9-point Likert scale	Appearance was higher rated on the gourmet setting as well as the willingness to eat in realistic contexts whereas in the laboratory the table setting did not affect the scores Intake differs depending on the context (laboratory < realistic (gourmet < home and plastic tray)	Even in contexts designed to be realistic, the task differed from natural situation, and participants were not allowed to talk and they did not have the possibility to select their meal which may affect the ecological validity of the data
c) Global and separated variable approach								
De Graaf et al. (2005)	Liking ratings response	Eating location Choice	Participants and soldiers: ● T1: 199 ● T2: 36 ● T3: 36 Participants were pre-recruited Between-group design	● Main dishes (unfamiliar and familiar) ● 4 groupings of snacks (sweet commercial, savory commercial, sweet military, savory military), ● 3 entire meal menus	3 contexts: ● Field study (military camp) ● Laboratory ● Laboratory + choice	Liking ratings on a 9-point hedonic scale Field environment: before breakfast, soldiers chose three meals for the that included some of the tested products and evaluated them Participants chose three menus in a short period of time. Laboratory: participants tested small bites of the stimuli. Choice simulation: participants chose three products from a range of stimuli + tasted and evaluated in the laboratory	High correlation between field and laboratory scores for snacks but not for main dishes. Correlations improved when laboratory subjects were offered a choice of foods	Nature of the product differs between contexts (entire meal vs small bites); this compromises the ecological validity of lab data as small bites cannot be compared to regular meal consumption situations. The nature of the task (questionnaire filling) differs within the field and between the lab experiment. There is no control over the conditions under which foods were tested and evaluated (by soldiers) which may compromise the comparison of the data. Scope for choice may increase ecological validity as the task is closer to natural consumption situations The nature of the product differs in each context as the (continued on next page)
	Liking and consumption		Participants: ● T1: 96	Iced coffee: water and milk based	4 contexts: ● T1: Laboratory		No significant differences between	

Table 2 (continued)

c) Global and separated variable approach

Study	Studied response	Studied factor	Selection of participants	Nature of the product	Experimental environment	Evaluation task	Results	Comments
Petit and Steffermann (2007)		Product preparation Eating location	<ul style="list-style-type: none"> T2: 96 T3: 52 T4: 55 Participants were recruited for the laboratory study Between-group design		<ul style="list-style-type: none"> T2: Laboratory + contextual elements (curtains, pictures, etc.) T3: meeting room T4: cafeteria 	<ul style="list-style-type: none"> Overall liking and ranging on a 21-point scale + short questionnaire (demographic + consumption habits) 	<p>T1 and T2 Significant product differences in T3</p> Differences between laboratory and natural settings	preparation method differs. The experimental environment in the T2 may has not been perceived as representative of real life because of external elements that were incongruent (ex: curtains, candles, etc...). Differences regarding the room temperature in the different studies (22 °C vs 28 °C) may have also impacted the evaluation of the iced coffee (a product typically consumed in summer) The evaluation task also differs among contexts: sequential presentation versus simultaneous

to “pass across contexts” without significant differences on the hedonic scores whereas meals do not (De Graaf et al., 2005; Edwards et al., 2003). This aspect linked to the product category is important to ensure the ecological validity of the results in both global and separated variable approach.

As regards the effect of food combination and sequence of food items during a meal, it is interesting to notice that most of the research on human eating behavior has been focused on food items instead of food combinations. In the last decades, researchers have shown that suitable food combinations result in more pleasant recipes and this is translated in higher overall hedonic scores (Di Monaco, Giacalone, Pepe, Masi, & Cavella, 2014; Elzerman, Hoek, Van Boekel, & Luning, 2011; Hersleth, Mevik, Næs, & Guinard, 2003; Pagliarini, Gabbiadini, & Ratti, 2005). While others have also studied how much of each meal component contributes to that (Jimenez et al., 2015; Meiselman, 2006). In addition to this, the sequence and appropriateness of mealtimes when evaluating products has produced different results (Boutrolle et al., 2007; Cardello, Schutz, Snow, & Leshner, 2000; King et al., 2004; Meiselman, 2006). Therefore, the study of products as food items instead of part of a meal may contribute to misleading results that cannot be generalized from one context to another.

Another important aspect that has been already mentioned is that consumers and locations are most often confounded variables. They cannot be studied independently as they are intimately related to consumers’ expectations and mindset. Even if a food is exactly the same in two different contexts, consumers may not bring to those contexts the same experience, beliefs and/or expectations. As a consequence, even if they like a given food in one context, consumers may prefer another one that fits better another context. Besides, when comparing consumption settings and particularly meals, the preparation method is a key element in the variability of the sensory properties of the product and may be the source of beliefs, that could, in turn, affect hedonic responses (De Graaf et al., 2005; Edwards & Hartwell, 2009).

3.3.5. Selection of participants

In Table 2, we highlighted the following participant-related aspects found in the literature on context: remuneration, group size and relations and, consumers’ familiarity. Most of the participants in laboratory settings are recruited on-purpose and compensated whereas participants to natural context studies are not. This aspect can have a strong impact on consumers’ implication and therefore, on obtained data. However, remuneration of participants has not been really explored in the literature on context. On the other hand, some of the studies have compared hedonic scores among different contexts were the studied population was too small to generalize their findings (Edwards et al., 2003; Zeinstra, Koelen, Kok, & de Graaf, 2010). Moreover, the degree of relation between participants have shown to have different impact on consumers’ behavior. When participants know each other they behave in their regular basis whereas when it is not the case, negative correlation with the hedonic scores is obtained (Di Monaco et al., 2014). As regards consumers’ familiarity toward the tested products, it must be noted that most of the studies have recruited regular consumers of the tested product. This is an important factor when comparing contexts because some studies have shown that products familiarity may reduce contexts’ effects whereas unfamiliar products may be more context-dependent (Giacalone et al., 2015; Hersleth et al., 2005; Kim, Jombart, Valentin, & Kim, 2015). However, we should be very cautious with this notion because in the case of main dishes, familiarity may also be related to particular consumption contexts.

3.3.6. Evaluation task

Table 2 reveals that different tasks have been applied across studies: comparison of overall impression of served food by 9-point hedonic scale, comparison of overall liking by visual analogue scale (VAS), comparison of food attributes, comparison of consumers’ willingness to pay, etc. (De Graaf et al., 2005; García-Segovia et al., 2015; Kozłowska

Table 3
Summary of new methodological approach studies (a) Living Labs, b) Evoked contexts, c) Immersive contexts, d) Virtual reality).

Study	Studied response	Studied Factor	Selection of participants	Nature of the product	Experimental environment	Evaluation task	Results	Comments
a) Living Labs								
Bell et al. (1994)	Food acceptability and selection	Decoration	Participants: regular consumers ● Test 1: 63 ● Test 2: 75 Participants were neither recruited nor remunerated Between-group design	A full restaurant menu	2 contexts: ● T1: regular decoration and British food names ● T2: Italian decoration and Italian food names	Perceived ethnicity rating and hedonic scores of each component of the meal on a 9-point hedonic scale	Food acceptability was not affected by decoration but food selection	Consumers on Italian decoration will may perceived the context as a particular day that may judges their choices. Scope for choice increase ecological validity of both studies
Allrot et al. (2014)	Food intake	Food choice	17 participants pre-recruited and remunerated Within-group design	A breakfast consumed in one eating episode (F1) and another one consumed in 4 eating episodes (F4). Buffet meal versus standardized meal	2 contexts: ● Experimental restaurant ● Laboratory	Appetite rating in a VAS* + blood sampling	In F4, participants consumed less food in grams and less energy from low energy dense foods at the buffet , but total energy intakes were not different between conditions	Combination of laboratory and field experiments to ensure the ecological validity of the experiment.No comparison with natural context.Scope for choice increase ecological validity of both studies
b) Evoked contexts								
Study	Studied response	Studied factor	Selection of participants	Nature of the product	Experimental environment	Evaluation task	Results	Comments
Hein, Hamid, Jaeger, and Delahunty (2010)	Hedonic ratings	Eating location Product	Participants: regular apple juice consumers ● Test 1: 72 ● Test 2: 70 Participants were pre-recruited and remunerated Between-group design	4 apple juices: different concentrations of citric acid and strawberry flavor	2 contexts: ● T1: laboratory ● T2: evoked refreshing drink occasion	● T1: overall liking on a 9-point hedonic scale + 2 questions about task difficulty and accuracy on a 9-point scale + open ended question about purpose of the study ● Evoked context: Participants described their own context + same questionnaires as T1 + 2 more questions about projection task	Differences in hedonic ratings of the samples were observed between the two contexts. Tendency of greater discrimination in evoked context. Task was considered easier in evoked context and provided information more accurate	The experimental environment might be different for each participant making difficult context comparison. The evaluation task may differ from one participant to another: time needed to project themselves, the accuracy of the scenario, etc.
Hein, Hamid, Jaeger, and Delahunty (2012)	Hedonic ratings	Eating location Product	Participants: regular consumers of the tested product ● Test 1: 64 ● Test 2: 62 ● Test 3: 63 ● Test 4: 68 Participants were pre-recruited Between-group design	Appel and blackcurrant juice: different concentrations of citric acid and strawberry flavor/ sucrose and orange flavor	4 contexts: ● T1: laboratory ● T2: evoked refreshing drink occasion ● T3: evoked breakfast situation ● T4: evoked movie situation	Similar task to the previous study. ● T1: after evaluate apple juices participants evaluate the blackcurrant ones ● T2, T3, T4: one more question about context appropriateness	Higher effect of evoked consumption contexts on hedonic response was observed for the blackcurrant juice compared to the apple juice. Lower hedonic ratings for blackcurrant juice on evoked than laboratory context	The blackcurrant juice may not be representative for the evoked contexts.The experimental environment might be different for each participant making difficult context comparison.The evaluation task may differ from one participant to another: time needed to project themselves, the accuracy of the scenario, etc.

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Table 3 (continued)

Study	Studied response	Studied factor	Selection of participants	Nature of the product	Experimental environment	Evaluation task	Results	Comments
b) Evoked contexts								
Giacalone et al. (2015)	Situational appropriateness	Familiarity degree Eating location	Participants: <ul style="list-style-type: none"> ● Study 1: 76 regular ● Study 2: 97 ● Study 3: 93 ● Study 4: 145 Participants were pre-recruited and remunerated Within-group design	9 images of commercially available beers: different familiarity degree	Laboratory + verbal or pictorial contexts (sports, home, alone, etc.)	Participants rated all the usages they perceived appropriate for beer consumption through a checklist task	Context affected differently familiar and unfamiliar products	The use of pictorial contexts may help consumers to better project themselves in a particular context of consumption
Hersleth, Monteleone, Segman, and Nes (2015)	Intrinsic and extrinsic product cues	Eating location	120 participants: regular consumers of the tested product Participants were pre-recruited Within-group design	6 types of dry-cured ham	2 contexts: <ul style="list-style-type: none"> ● Evoked traditional meal ● Evoked novel meal 	Evaluation of intrinsic characteristics on a 9-point hedonic scale, + extrinsic characteristics on a 9-point scale + question about most common eating situation	Evoked meal contexts affected both the intrinsic and the extrinsic ratings , with the strongest effect for the extrinsic ratings. Consumers were somewhat more discriminating when evoking a traditional meal than a novel meal	The use of pictorial contexts may help consumers to better project themselves in a particular context of consumption Role of product/recipe familiarity and expectations is highlighted in this study as a key element when studying consumers' evaluation in food contexts
Lusk, Hamid, Delahunty, and Jaeger (2015)	Hedonic responses	Eating location Evaluation task	Participants: regular consumers of the tested product: <ul style="list-style-type: none"> ● Study 1: 65 ● Study 2: 48 Participants were pre-recruited and remunerated Between-group design	4 apple juices: <ul style="list-style-type: none"> ● 2 common ● 2 premium) 	Evoked refreshing drink occasion	<ul style="list-style-type: none"> ● S1: Overall liking on a best-worst scaling + questions about task complexity and response accuracy ● S2: 9-point hedonic scale + questions about task complexity and response accuracy 	Higher product discrimination was obtained with Best-worst scaling. Best-worst scaling was perceived as more difficult than the 9-pt scale . No difference between the two methods on the perceived accuracy of the given information	The evaluation task differs between studies: S1 participants taste 3 times same products during which may lead to better product discrimination
de Andrade et al. (2016)	Purchase intention	Eating location Product presentation	Participants: regular lamb consumers: <ul style="list-style-type: none"> ● Study 1: 157 ● Study 2: 171 Participants were pre-recruited Between-group design	Lamb meat	2 contexts: <ul style="list-style-type: none"> ● A celebratory lunch with family over the weekend (weekend lunch context) ● A dinner at home after a day's work (weekday dinner context) 	Purchase intention on a 9-point structured scale (rating based-conjoint analysis)	Purchase intention scores were significantly affected by the evoked context . Consumers were more willing to purchase lamb meat when the celebratory weekend lunch context was considered. In both contexts, price was the most important variable	The use of pictures may help consumers to better project themselves in a particular context of purchase occasion however. The evaluation task may differ from one participant to another: time needed to project themselves, the accuracy of the scenario, etc.

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Table 3 (continued)

Study	Studied response	Studied factor	Selection of participants	Nature of the product	Experimental environment	Evaluation task	Results	Comments
b) Evoked contexts Kim, Lee, and Kim (2016)	Food acceptability	Eating location	200 participants: regular consumers of the tested product Participants were pre-recruited Between-group design	2 types of coffee	4 contexts: ● T1: Laboratory ● T2: Laboratory + evocation ● T3: Laboratory + physical elements ● T4: Laboratory + physical elements + evocation	● T1: overall liking on a 9-point hedonic scale. ● T2, T3, T4: vividness of evocation on 9-point category scale + liking scores on a 9-point hedonic scale + involvement questionnaire	Vividness of evocation lasted longer in the simulated café setting, implying physical cues reinforcing cognitive evocation No significant effect of evocation and context but evocation*context+product differ from one participant to another: time needed to project themselves, the accuracy of the scenario, etc. There is no a clear causal relation between the adding contextual elements on the simulated coffee context	The experimental environment as well as the task may have not been representative for the consumers. The evaluation task may differ from one participant to another: time needed to project themselves, the accuracy of the scenario, etc. There is no a clear causal relation between the adding contextual elements on the simulated coffee context
Jaeger, Fizman, et al. (2017)	Hedonic product discrimination and sensory characterization	Eating location	Cross cultural study: 1727 participants Participants were pre-recruited Between-subject design	Food and drinks familiar for the studied population	2 contexts: ● T1: Laboratory ● T2: Evoked drinking a particular product ● T3: Evoked breakfast on a weekend morning	● Overall liking on a 9-point hedonic scale + CATA questions + questions about task difficulty and engagement	No consistent trend in the results regarding the influence of evoked contexts The evoked context did not systematically influence the results Higher product discrimination on controlled conditions	The experimental environment as well as the task may have not been representative for the consumers. The evaluation task may differ from one participant to another: time needed to project themselves, the accuracy of the scenario, etc.

c) Immersive contexts

Study	Studied response	Studied factor	Selection of participants	Nature of the product	Experimental environment	Evaluation task	Results	Comments
Sester et al. (2013)	Drink choice	Drinking location	Participants: ● Study 1A: 93 ● Study 1B: 83 ● Study 2A: 60 ● Study 2B: 60 Participants were pre-recruited for the study 2 Within- and between-group design	Drinks	4 Contexts ● S1,2A: immersive bar with warmth furniture ● S1,2B: immersive bar with cold furniture S1A, B: + 5 different clips	● S1A, B: look at the clips + order a drink from a list + bar warmth rating on a 10-point scale ● Study 2A, B: triangle test + questionnaire (warmth scale and bar appropriateness)	S1A, B: immersive contexts influenced drink choice (association between drinks and video clips). S2A, B: drink choices were different according to the ambience	The nature of the task in the S2 is not representative of the natural environment (triangle test) Results should be replicate in another immersive or natural environments Task in S1 is different to the S2 so the robustness of the data should be questioned

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Table 3 (continued)

Study	Studied response	Studied factor	Selection of participants	Nature of the product	Experimental environment	Evaluation task	Results	Comments
c) Immersive contexts								
Banguayo et al. (2015)	Liking and preference	Drinking location	46 participants: regular coffee consumers Participants were pre-recruited and remunerated Within-subject design	5 coffees	2 contexts: ● Laboratory ● Immersive café	● Laboratory: demographic questionnaire + acceptability on a 9-point hedonic scale + ranking + Engagement ● Café: same evaluation task after a month	Significant differences in preference order and liking were found between contexts Participants were more discriminants in the immersive coffee and results more reliable predictor of future coffee liking (replication) Immersive coffee increased engagement	The nature of the immersive context may be representative for a coffee drinking situation Contrary to the evaluation task that may have not been representative of a natural situation (5 testing coffees). However, results from replication seems to confirm products liking
Hathaway and Simons (2017)	Data quality and panelist engagement	Eating location	59 participants: regular consumers of the tested products Participants were pre-recruited and remunerated Within-subject design	4 commercially available chocolate chip cookies	4 contexts: ● Laboratory ● Mixed immersive domestic kitchen ● Full immersion domestic kitchen	Demographic questionnaire + acceptability on a 9-point hedonic scale + Engagement questionnaire	Participants were more discriminants in the full immersion context. Similar levels of engagement in the two immersive conditions Different results as regards the first and second replication with no liking differences among contexts	The nature of the product, a familiar product that may be eaten in different type of contexts may have caused this effect on liking; certain product categories are more context-dependent than others
Holthuysen et al. (2017)	Overall-liking and just-about-ratings	Eating location Product	Participants: ● Study 1, 2: 242 ● Study 3: 222 Participants were recruited for the controlled and recreated condition Between-group design	2 airplane meals: 2 variants of each	3 contexts: ● S1: Laboratory ● S2: Recreated airplane ● S3: Real airplane	● S1: selection of the product + overall liking on a Visual Analogue Scale. ● S2, S3: evaluation of the previous tested sample but as a full meal + overall liking on a VAS + sensory attribute rating on a JAR scale	Recreated and actual airplane were more discriminant than the controlled condition. No significant difference on ratings between recreated and natural context were found	First study that compares new approaches to natural conditions
Liu, Hooker, Parasidis, and Simons (2017)	Food quality, nutritional content, liking	Labelling	120 participants: regular peanut butter consumers divided in 3 labelling conditions Participants were pre-recruited and remunerated Between-group design	Peanut butter	Immersive context: virtual grocery store + 3 conditions: ● Blind ● Labelled ● Labelled + verbal call-out	Acceptability on a 9-point hedonic scale + WTP + Food quality questionnaire + demographic information	Labelling improved product quality and nutritional content perception but not liking and WTP Verbal call out improved food quality, nutritional content and WTP	
Sinesio et al. (2018)	Food perception and liking	Eating location	48 participants: regular consumers of the tested product Participants were pre-recruited Within-subject design	Salad tomato and wild rocket salad at different storage time	2 contexts: ● Study 1: Laboratory ● Study 2: Immersive holiday farm dining room	● S1: overall liking on a 9-point hedonic scale + perceived freshness on a 9-point scale. ● S2: same evaluation task + Engagement Questionnaire	Liking scores were higher in the immersive environment setting than in the lab. However, higher discrimination as regards storage time was found in the lab	The nature of the task at the lab could increase consumers' attention leading to a higher discrimination

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Table 3 (continued)

Study	Studied response	Studied factor	Selection of participants	Nature of the product	Experimental environment	Evaluation task	Results	Comments
d) Virtual reality								
van Herpen, van den Broek, van Trijp, and Yu (2016)	Shopping behavior	Location	100 regular consumers of the tested products and buyers of the tested real supermarket pre-recruited Between-group design	Milk, fruit vegetables and biscuits	3 contexts: ● Real supermarket ● 3D VR supermarket ● Laboratory + supermarket pictures	Same task in the 3 contexts: ● buy a list of products fill a questionnaire	Similar results were obtained in the VR condition and the real context for milk and biscuits. However, participants bought more products and spent more money (for biscuits and fruit & vegetables), in VR and picture condition	The nature of the environment and evaluation task in the picture condition and VR may not be representative of the actual behavior. We should consider the effect of the VR devices on the evaluation task
Andersen et al. (2018)	Desires and liking	Location	60 participants pre-recruited Between and within-group design	Beverages and skin care lotion odor	3 contexts: ● Laboratory ● 3D VR beach ● Laboratory + beach picture	Thirst, hunger and emptiness/fullness on VAS + familiarity with VR + desires for particular beverages on a 10-point scale + odor skin liking on a 10-point scale + engagement on a 7-point Likert scale + level of excitement + choice of a snack at the end of the test	Desire for cold vs hot beverages was significantly higher in the beach exposures and particularly for VR. After exposure, beach and laboratory contexts did not differ in beverages desires. Beach scenarios did not affect odor liking and no retention effect on choice behavior was observed. Beach scenarios increased participant engagement especially VR	The nature of the stimuli, VR environment and task may have been representative of natural environments. However, a natural context comparison would be needed to prove the predictability and ecological validity of the applied methodology as electronic devices could impact consumers' evaluation ("wow" effect)
Ouellet, Boller, Corriveau-Lecavalier, Cloutier, and Belleville (2018)	Feasibility and construct validity of a new methodology	Memory	Participants: ● Study 1: 49 ● Study 2: 35 Participants were pre-recruited Between and within-group design	List of products	Virtual supermarket	● S1: memorize a list of products + buy those products ● Study 2: Multifactorial Memory Questionnaire (MMQ) + same task S1	The virtual store showed to have an appropriate level of difficulty, supporting the feasibility and construct validity of the task according to everyday memory tasks' results	The nature of the task (memorize) may have been representative of natural context. However a natural context comparison would be needed to prove those results
Schnack, Wright, and Holdershaw (2018)	Telepresence and usability	Location	Participants: ● Study 1A: 62 ● Study 2: 49 Participants were recruited Between-group design	Food products	2 contexts: ● S1: 3D VR supermarket ● S2: Laboratory + screen with supermarket images	Same task in both contexts: products purchasing + Presence Questionnaire (7-point Likert scale) + usability and open ended questions	Immersive Virtual Reality improves participants' telepresence and usability. A significant age group and gaming experience was shown	The nature of the task (purchase) may have been representative of natural context. However, a natural context comparison would be needed to prove those results as electronic devices could impact consumers' evaluation ("wow" effect)
Siegrist et al. (2018)	Food selection	Location Task	Participants: ● Study 1A: 37 ● Study 1B: 31 ● Study 2: 50 Participants were pre-recruited and remunerated Between and within-group design	Cereals	2 contexts: ● S1A: Real life supermarket ● S2: 3D VR supermarket	S1A, B: similar task. Select one cereal package for kid's camp + one for a specific type of diet S2: select a healthy or tasty cereal package depending on the test condition (healthy or tasty)	S1A, B: no significant differences between contexts were found. S2: significant differences between tasks were found. Participants spend more time for the healthy package selection than the tasty one	The use of Eye tracking devices in the real life context may have reduces the ecological validity of the experiment providing similar results between S1A and S1B

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Table 3 (continued)

Study	Studied response	Studied factor	Selection of participants	Nature of the product	Experimental environment	Evaluation task	Results	Comments
d) Virtual reality Ung, Menozzi, Hartmann, and Siegrist (2018)	Energy content	Location	34 participants pre-recruited and remunerated Within-subject design	3 types of foods (Fake food buffet)	2 contexts: • Laboratory buffet • 3D VR buffet	Same task in both contexts: serve themselves a meal similar to what they would normally have for lunch	No significant differences as regards the energy content between settings were found	The nature of the environment in the laboratory may not have been representative of the natural consumption setting even as a fake buffet. As regards the task (serving) this may be representative for the participants. However, a natural context comparison would be needed to prove those results

et al., 2003; Meiselman et al., 2000). Besides, we may observe that, even when the task is the same, hedonic scales and questionnaires frequently differ from one experiment to another as well as from one study to another. We also notice important differences in experimental procedures when comparing one context to another. For example, questionnaires are distributed or displayed differently in different contexts (e.g. paper and pencil vs. digital screen). The same goes with the way to ask participants to test the products, etc. It should also be added that tests in laboratory or in central location do not usually account for the fact in natural situations consumers may have the possibility to choose the food they want to eat. This may have important consequences in consumers' mindset, not to mention the product experience itself.

All in all, the lack of standardization of protocols in the reviewed literature may (at least partly) explain the lack of consistent results as regards the effects of context on consumers' evaluation and behavior.

We argue that ecological validity cannot be seen as independent of internal validity but complementary, and that the focus should be shifted from a search for realism to the definition of clear criteria for transferability from one context to another. Moreover, the focus should be placed on how to isolate the causal effect rather than on the realism from one context to another in order to explain differences among contexts. The pursuit of ecological validity may be seen as a good opportunity to implement the methodologies currently used in the laboratory and try to find a satisfying compromise between the laboratory results and natural setting data.

4. New methodological approaches: towards increased transferability?

Rolls and Shide (1992) already anticipated the need to bring together the best features of laboratories and natural consumption contexts in order to study the interactions between contextual variables, but in a controlled way. We identify five approaches designed to address the question of ecological validity. The first one, the classical approach, is the use of natural context that we already described in Section 3. The four other approaches are more recent: Living Labs, evoked contexts, immersive contexts and virtual reality. Some of these methods have been described in previous reviews, in particular by Jaeger and Porcherot (2017).

We will first define each type of approach, and then characterize the different studies according to this typology.

- a) *Living labs* – Even if a no clear definition for Living labs is found in the literature, the authors have decided to use the definition given by Dell’Era and Landoni (2014) (p. 139) where Living Lab is defined as “a design research methodology aimed at co-creating innovation through the involvement of aware users in a real-life setting”. In Living labs, the researcher can control and record a selected number of contextual variables and the interaction between them, within a natural consumption situation. Living lab experiments can be seen as an attempt to compromise with the limitations and advantages of laboratory and field experiments, as the control of contextual variables increases the internal validity of the study, while the situation is kept as ecological as possible. Examples of Living labs dedicated to food studies are “The Restaurant of the Future” Wageningen, Netherlands (Hinton et al., 2013; Zeinstra et al., 2010), “The Grill Room” in Bournemouth, United Kingdom (Bell, Meiselman, Pierson, & Reeve, 1994; Meiselman et al., 2000) and “The Living Lab” at the Research Centre of the Institute Paul Bocuse in Ecully, France (Allirot et al., 2014; Iborra-Bernad, Saulais, Petit, & Giboreau, 2018).
- b) *Evoked contexts* – In the evoked contexts approach, the researcher places the consumer in a typical laboratory evaluation task, but uses either text, audio recordings, and/or pictures that evoke what would be a natural consumption situation of the product (Jaeger &

Porcherot, 2017). In this case, consumers have to imagine themselves in a particular situation and evaluate a product or a set of products. This approach is well established in other disciplines such as marketing studies (Bitner, 1990; Daunt & Greer, 2015; Esmark, Noble, & Breazeale, 2017).

- c) *Immersive contexts* – To define immersive contexts, we should first define what immersion means. Immersion is defined by Witmer and Singer (1998) as “a psychological state characterized by perceiving oneself to be enveloped by, included in, and interacting with an environment that provides a continuous stream of stimuli and experiences”. The main difference between immersive and evoked context approaches is that consumers do not have to imagine themselves in a particular consumption situation, but they experience it instead. Three main features describe the characteristics of immersive contexts: lack of awareness of time, loss of awareness of the real world, involvement and a sense of being in the task environment (Jennett et al., 2008). These approaches usually imply a wealth of means (videos displayed on large screens, multisensory stimulation, including temperature, background sounds, odours, etc.). Within this category, we can also include the recreated environments. Recreated environments are a form of immersive approach where the setting reproduces the physical natural environment where the food consumption would be done, and consumers actually experience a similar situation as in a natural context.
- d) *Virtual reality* – Finally, the virtual reality approach is defined by the “use of virtual environments to present digitally recreated real world activities to participants via immersive (head-mounted displays) and non-immersive (2D computer screens) mediums” (Parsons, 2015). We argue that including non-immersive mediums such as the 2D computer screen in the virtual reality definition may create certain confusion with the evoked and immersive contexts categories, where such tools can be also used. For this reason, we have considered only virtual reality studies where head-mounted displays are used.

Following these definitions, Table 3 provides an analysis of these four new methodological approaches through the prism of the four criteria of experimental validity that were previously discussed.

Before analyzing each approach, as a general comment, we would like to highlight that the results obtained from each approach may differ depending on the nature of the product (product category) and the familiarity with the product. Certain products may be more affected by situation-specific cues than others. Therefore, special attention should be given to these aspects when analyzing and comparing products evaluations from one context to another.

As it can be seen in the Living Lab studies (Table 3, section a) the characteristics of the participants, the nature of the product and the environment are kept as realistic as possible, whereas the evaluation task through the inclusion of questionnaires may compromise the external validity of the results in a certain way. Consumers experience a natural consumption situation, therefore the transferability of the data to another setting that follows similar patterns can be achieved. However, the use of this type of settings may be costlier and require additional logistics compared to the use of other contextual methodologies.

Concerning the evoked context studies, this approach is easy to apply and inexpensive because not physical elements are added. However, the degree to which participants project themselves to the evoked context is not controlled, despite attempts to measure vividness of evocations, making generalization of results to other contexts difficult (Köster, 2003). Therefore, the gain in ecological validity due to evocation of a consumption situation is difficult to assess, and may very well be outweighed by the loss due to artificiality of the projective task implied by such a procedure.

Immersive approaches have been hypothesized to improve consumers' involvement as well as product discrimination as participants may experience similar psychological processes that in natural contexts

(Andersen, Kraus, Ritz, & Bredie, 2018). As it was previously discussed, consumers' experiences and prior beliefs about particular contexts are key elements when conducting sensory evaluations in contexts studies (Köster, 2003). The fact that consumers experience a natural consumption situation even if it is under controlled conditions may ensure the ecological validity of the results and improve the external validity. However, as it can be seen in Table 3 – section c, there is a lack of standardization of the contextual variables in the immersive studies that have been conducted so far, – different degrees of immersion can be shown – therefore there is limited knowledge about the relevance of each contextual variable and their contribution to the outcome of experimental studies. Moreover, the higher costs that these methodologies involve have been highlighted as main drawbacks in their use.

To our knowledge, so far only one published study has attempted to compare immersive and natural settings methodologies. In a study of the impact of context on food evaluation of airplane meals, Holthuysen, Vrijhof, de Wijk, and Kremer (2017) compared overall liking and just-about-right ratings in laboratory, recreated airplane and an actual plane. Recreated and actual plane settings showed similar results, contrary to laboratory settings. However, in this case it should be highlighted that the actual immersive context was a recreated environment. A flight was recreated through the use of a physical environment (cabin creation), use of boarding passes and hand luggage, flight instructions, regular time of flight, etc. Unlike most immersive tests, recreated environments do not place participants in a location where screens, sounds or smells are combined. Further work is therefore needed in the definition and categorization of immersive experiments and on the comparison of external validity between this approach and natural settings.

Finally, an increasingly popular methodological approach to improve the ecological validity is the use of virtual reality. Until now, most of these studies have focused on consumers' purchasing behavior in food stores. This methodological approach has offered controversial results as regards product discrimination and consumer behavior (Dreyfuss, Porcherot, Sinesio, Henneberg, Depoortere, & McEwan, 2018). Whereas in some studies similar results have been obtained in virtual and natural environments, in other situations an over effect has been reported. The virtual reality allows participants to place themselves in particular contexts (telepresence) and improve products usability increasing the engagement in the task. However, in some situations, depending on the type of used technology, the use of electronic devices may compromise the “natural” experience and biases the obtained results even if consumers are used to this type of technology. Moreover, the nature of the environment remains non-ecological when 2D computer screens are used as well as the product evaluation task, especially when the research question is related to product acceptability. For further discussion about virtual reality studies, the reader is directed to Stelick and Dando (2018).

5. Contribution

5.1. Research

Our analysis of context studies in sensory and consumer science considers four critical points when evaluating the need for a given contextual parameter: the experimental environment, the nature of the product, the selection of participants, and the evaluation task. This review adds evidence to the lack of standardized methodologies and analytical framework highlighted by several previous reviews, as well as the problems of robustness and reliability of the results that it induces. We suggest that the use of contextual variables needs to be assessed according to their contribution to ecological, but also internal validity.

There has been a lot of research on the effects of context on consumers' hedonic response, food choice or intake, however the overall inconsistency of findings renders difficult their integration into clear

guidelines to improve the ecological validity of a study. In particular, to date, the results are too context-specific, product category specific or task specific to enunciate more general principles that could be used to develop such a framework. This has led to the emergence of new methodological approaches, with limited effort to determine how, and whether, each of these methods may complement or outrank the other.

This review also highlights that contexts and consumers are confounded variables that make the generalization of the results even more hazardous, as hedonic responses are deeply related to consumers' expectations, which are themselves related to each context.

Therefore, we propose to pursue the ecological validity in sensory and consumer studies from a complementary perspective, in which laboratory and new methodological approaches work together in complementarity. When and how we should consider ecological validity as a goal in research on context should be the most important question. Living labs and immersive studies may be able to reinforce ecological validity when looking at consumers' choice or purchase intention. However, no study has yet examined the external validity of data acquired in such conditions. It is advisable for researchers to plan studies to compare similar methodological approaches (internal comparisons of living labs and immersive studies) across different contexts and different product categories in order to gain better knowledge and understanding of the reliability of the applied methodologies.

In line with the theories of behavioral economics, in particular Prospect Theory (Tversky & Kahneman, 1991), we also propose to give more attention to context-induced reference points when evaluating products. Beliefs (prior experiences) associated to a particular context may indeed play a role by predisposing consumers to a different framework of evaluation. Reference points have been shown to greatly modulate judgement and decision making. Even if very few studies have focused on the effects of context and beliefs on food evaluation, the reference framework of evaluation is likely to be an important factor explaining context effects (Bernard & Liu, 2017; Kempen et al., 2017).

5.2. Practical implications

This review has several practical implications. Firstly, we observe that, even though contextual variables have been found to modulate consumer behavior, we cannot establish clear operational recommendations because of the heterogeneity of results found in the literature.

However, this review provides a framework and criteria to assess ecological validity, which could contribute to increase methodological thoroughness in the fields of sensory and consumers' studies, providing workable outcomes to the private sector, notably for product development.

Among all the attempts to improve context, based on our review of the (limited number of) works using recent methodologies, it seems that consumers are more engaged in the task and able to experience a natural context in living lab and immersive approaches. A possible explanation could be that unlike in evoked settings and virtual reality, participants do not have to put too much effort in imagining a consumption situation or use electronic devices which could make the task more ecologically valid. However, this type of experiments can be expensive and difficult to logistically handle, and this conclusion needs to be strengthened by more comparative data.

As regards the nature of the food, it is important to consider, especially in the context of new product development, the type of product that the test aims to evaluate, at which stage of development process the data is needed, and in which settings the final product will be consumed. It has been shown that the impact of context depends on the product category and units of evaluation (e.g. product vs dish). Moreover, familiarity towards the tested product seems to modulate the contexts effects: while a product familiar to consumers can be eaten in several contexts, unfamiliar products can be related to particular

occasions and consumption contexts. In the early stages of product development, when specific sensory product characteristics should be defined, laboratory settings should be considered as the best solution. However, when it comes to the choice or purchase intention, more naturalistic environments may be needed to ensure product success.

Although survey institutes and stakeholders in the industry are well aware of the necessity to recruit consumer samples that are representative of a target population, other participant-related factors (the way the participants are recruited and the incentives they receive to take part in the studies) are less considered and yet may also be relevant concerning the validity of hedonic results. Besides, some studies have shown that it is important to consider participants' prior experiences, expectations and beliefs when testing a food, as those factors can tell us more about the consumer and the way he/she will behave in a specific context. These aspects are particularly important when evaluating full dishes. In particular, when comparing natural contexts (institutional meals, restaurants, etc.), food preparation has been shown to have a direct impact on the sensory properties of a product and to indirectly influence consumers' evaluation due to the associations made between context and served food.

Finally, as regards the evaluation task, we should consider several aspects. First of all, when comparing contexts, we should ensure that the task and the experimental procedure are the same in order to be able to compare the results. Moreover, it is important to keep in mind, consumers will be more focused on the task performance, therefore on the product itself, in laboratory settings than in the natural consumption settings where the hedonic score can include other aspects such as the actual experience, environment, etc. Therefore, further research is needed to improve the understanding of the effect of experimental procedures and instrumental measures used when comparing settings on the participants' evaluation processes.

6. Limitations

The lack of homogeneity in the definition and the lack of consistency and standardization in the use of contextual variables and associated tools to measure consumers' behavior may have limited the conclusions that could be drawn from this review.

Another important point is that, although the literature has shown different ways of classifying contextual variables, the relative weight and significance of those variables on consumer behavior need further assessment, especially through replicated studies. Moreover, as it has been shown, several experimental procedures are used through the different studies, thus making it difficult to compare their findings. We suggest that further research should dedicate more attention to the understanding of the nature of the task.

7. Conclusion & perspectives

Increasing the number of consumer studies in natural settings was pointed as one of the most important challenges for research during the 11th Pangborn Sensory Science Symposium (Jaeger, Hort, et al., 2017). In the past decades, sensory and consumer scientists have tried to move from laboratory experiments to natural experiments and different alternative approaches, such as evoked or immersive contexts or virtual reality, have emerged with the purpose of ensuring better ecological validity.

Ecological validity is achieved if participants perceive the experimental environment, the food they taste and the task they perform to be representative of a natural consumption situation.

On the other hand, as Guala (2012) proposes, internal validity should be firstly addressed to tackle the problem of external validity. By knowing under which circumstances the results can be extrapolated may allow us to find the specific reasons to explain why results may not be generalized. The problem of external validity might be related to the lack of important factors or the presence of artificial conditions in the

experimental design that are far from the natural situations. However, it is important to determine the extent to which those factors can be transferred and reproduced in the laboratory, whether this is always possible, and what is the degree of ecological validity and realism that the researcher should assume and seek depending on the purpose and finality of the study.

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Chapter 3. Theoretical framework: Prospect theory

I love “churros con chocolate”. I really like to have this food for breakfast when I am at home. Now that I am in France, “churros con chocolate” are less easy to find, and when I find a place that serves them, I am a bit disappointed as they do not taste the same as those back at home.

As it was introduced in chapter 1, judgements rely on perception, which can vary depending on the context. This, in turn, can impact reasoning. Therefore, the judgement we elaborate is framed according to a particular situation of evaluation. Likewise, during hedonic evaluation tests, the framing of the evaluation task could affect consumers’ perception and therefore, their judgements: this is referred to as *framing effects* in the field of Psychology. However, when looking at context studies, the task is rarely considered in itself to explain contexts effects. As proposed in the review about the ecological validity of contextual methodologies presented in the previous chapter (Galiñanes Plaza et al., 2019), Prospect Theory (Tversky & Kahneman, 1991) provides a relevant framework to investigate such effects.

In the present chapter, the origins and main principles of prospect theory are introduced. The concepts of framing effects, reference points and loss-aversion are addressed. Then the use of these concepts in the fields of sensory and consumer studies is discussed. The chapter ends with a proposal about the role of consumers’ expectations and beliefs about the food offered in the definition of reference points.

1. Prospect theory

Prospect Theory (PT), introduced in 1979 by Daniel Kahneman and Amos Tversky, proposes a model of judgement and decision-making between different options or prospects, under risk and uncertainty. The central assumption of this theory is that the outcomes of our decisions are defined by losses versus gains with respect to a reference point instead of absolute and/or final states of wealth (Tversky & Kahneman, 1991).

Prospect theory relies on four principles (Barberis, 2013, p.176):

1. *Reference dependence*: consumers make decisions according to a reference point
2. *Loss aversion*: consumers are more sensitive to losses than to gains of the same magnitude as regards that reference point
3. *Diminishing sensitivity*: bigger changes on the outcomes have a higher impact on consumers’ decisions than smaller changes
4. *Probabilities weighting*: consumers “overweight unlikely extreme outcomes” when making decisions

The third and fourth principles refer to risky situations that are not central in hedonic evaluation. Therefore, the rest of this chapter will focus mainly on the first two principles.

2. Framing effects and reference point

Framing effects are attributed to the fact that “alternative formulations of a same situation make different aspects of it accessible”, resulting in potentially different outcomes (Kahneman, 2002, p.481). Depending on the type of information and/or the amount of information accessible when consumers make a decision, their perception of an object or situation may vary, modifying consumers’ judgements.

To illustrate this, McNeill et al., (1982) presented two different choices of cancer treatment to two different groups: patients and doctors. They could choose between surgery and radiation therapy. Surgery entailed a risk of 10% of perioperative mortality but a longer life-expectancy compared to the radiation therapy; this means a higher long-term option at the cost of a greater immediate risk. The authors described the outcomes of the decisions by survival and mortality rates. Within the groups some of the participants received the outcomes of their decisions on survival rates whereas the rest on mortality rates. They showed that as “90% short-term survival is less threatening than 10% immediate mortality, the survival frame yielded a substantially higher preference for surgery than radiation” (sample retrieved in Kahneman, 2002, p. 457).

This example highlights the importance of the task’s formulation on consumers’ perception. The way the attributes of an object or situation are perceived depends on the context in which the object or situation is evaluated, and on the reference used as a point of comparison with a prior or another evaluation (Kahneman, 2002).

Figure 4 shows two large squares: one black (left) and another one grey (right), each containing a smaller square. The square in the middle is identical in both cases; however, we perceive its color as brighter in the left image because it is framed within a more contrasting hue. When consumers respond to attributes such as brightness, temperature or taste, the past and present contexts of an experience define a reference point: “stimuli” are perceived in relation to this reference point (Higgins & Liberman, 2018). Reference points are considered the status quo or current state from which consumers make the evaluation of outcomes (Tversky, 1992). Outcomes can be perceived differently if the reference point changes or is manipulated (Jervis, 2004), through aspirations, expectations, norms, and social comparisons (Tversky & Kahneman, 1991).



Figure 4. Example to explain reference-dependent (Retrieved from Kahneman, 2002).

Extrapolating this information to the context of the evaluation task and consumers' hedonic judgement, it could be assumed that framing effects will occur depending on the way the evaluation task (procedures and instrumental measurements) is formulated. The salience of certain characteristics of the product may be modulated, and in turn the reference point from which consumers evaluate the product. Hence, depending on the framing effects of the evaluation task, consumers' hedonic judgement may vary.

3. Loss-aversion

The principle of loss aversion relies on the observation that consumers are more sensitive to losses than to gains of the same magnitude, with regard to a reference point. Moreover, it considers that losses have a stronger psychological impact on consumers' decision-making which means that consumers are more willing to run the risk to avoid losses than to make gains (Jervis, 2004). Figure 5 illustrates this principle by the asymmetric S-shaped value function in which the slope below the reference point is steeper than the slope above the reference point.

Loss-aversion has been also related to the "endowment effect" (Kahneman, Knetsch, & Thaler, 1991) which means that when consumers possess something, their sensitivity to losses and gains changes. In an example given by Knetsch (1989), he offers either a mug and a candy to different groups of participants. After a while, he asks the participants with the mug if they would like to exchange it for a candy, and he does the same with the participants with the candy by offering them the possibility to exchange it for a mug. 89% of the participants keep their initial option showing the effect of the initial endowment on the consumers' choice. He also runs a similar experiment in which he asks the participants with the mug to select a price from a list of prices to sell the mug whereas the other group of participants without a mug has to select a price for buying it. In this experiment participants with the mug asked for higher prices to sell (that is to say, to lose their endowment) than the participants without the mug in order to buy it (to gain something).

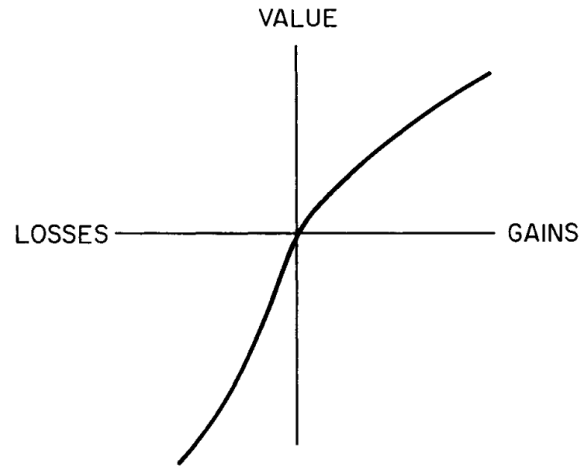


Figure 5. Illustration of loss-aversion theory (Retrieved from Tversky & Kahneman, 1991).

Coming back to product evaluation, when looking at consumers' judgement in natural consumption contexts, the value (either monetary, or hedonic value) that consumers expect to gain from eating in a given context may influence their judgement. In this case, when looking at hedonic evaluations between consumer testing facilities and natural consumption contexts, the consumers' value function could be a key contributor to explain those differences.

4. Applying prospect theory to sensory and consumer studies

Prospect theory offers a theoretical framework to study and explain the effects of context on consumers' decision-making, through the perspective of effects related more specifically to the framing of the task itself. Although this theory has been used by experimental economists and psychologists in order to explain and predict consumers' decision-making depending on the way a situation is framed (Cartwright, 2014; Jervis, 2004; Kahneman, 2002), it has been rarely considered in the field of sensory and consumer science to explain contexts effects in consumer hedonic evaluation. In the paper "*Diversity in the determinants of food choice: A psychological perspective*", Köster (2009) argues that little multidisciplinary research is done in the field of sensory and consumer science. However, solid theoretical principles from disciplines such as psychology could help to explain some of the questions sensory and consumer scientists arises.

Chapter 1 showed how contexts effects are observed in consumer's hedonic judgement at the environmental level (Meiselman, 1992), and at the evaluation task level. Nevertheless, there is not a clear explanation about how those effects may occur and which mechanisms are behind them.

**Does prospect theory help to explain / predict consumer responses' sensitivity
to the context of evaluation in hedonic tests?**

Although prospect theory has not, to our knowledge, been applied to the study of context effects in consumer hedonic evaluation of food products in the field of sensory and consumer science, some works in those fields have discussed the use of this theory in the context of consumers' *expectations and the confirmations or disconfirmations of expectations* (Piqueras-Fiszman & Spence, 2015; Schifferstein, Kole, & Mojet, 1999).

4.1. Expectations: confirmations and disconfirmations as gains and losses

Expectations can be defined as “the relationship between the objective stimulus and some pre-existing cognitive basis against which the objective stimulus is judged” (Cardello & Sawyer, 1992, p.254). This means that any (new) information related to a product is going to create an expectation towards it in the moment of consumption that is going to influence the whole experience of the product, so its judgement. If consumers' expectations are achieved they will be considered as gains; however, if they are not met, they will be considered as losses. Therefore, this can be related to the principle of losses and gains of the prospect theory.

Looking at consumers' hedonic judgements and expectations through the lens of prospect theory, Schifferstein, Kole, & Mojet (1999) showed an asymmetry on consumers' expectations, explained by the assimilation/contrast theory which follows a similar pattern to the asymmetric S-shaped value function of the prospect theory (Figure 6). The assimilation contrast theory defends that when the differences between what is expected and experienced is relatively small, assimilation will likely occur; however, when the differences between both states increases, contrast effects may be observed (Piqueras-Fiszman & Spence, 2015). Consumers with high expectations who receive an inferior product may perceive it as a “loss” whereas those with low expectations who receive a good product may perceive it as a “gain”.

According to this idea, it could be assumed that consumers' expectations may influence consumers' hedonic judgement by the modulation of consumers' reference points. In chapter 1, consumer-related variables such as expectations and beliefs towards a particular product, showed to influence consumers' hedonic judgements. If this influence could be explained by the modulation of consumers' reference point, special attention should be placed on these variables when comparing context studies.

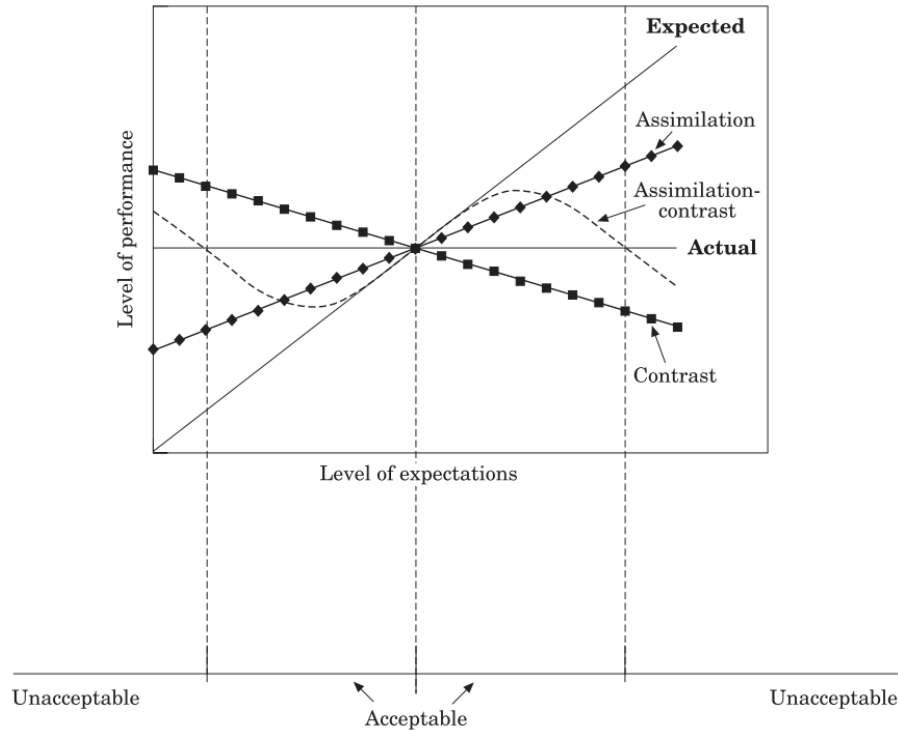


Figure 6. Schematic representation of the source and predictions of Assimilation-Contrast Theory. The upper part gives the responses predicted by Assimilation, Contrast and Assimilation-Contrast Theory for a labelled product. The lower part shows the sections of the underlying, subjective continuum used in the latter theory to classify a stimulus after an expectation has been formed (Retrieved from Schifferstein et al., 1999).

5. Applying prospect theory to explain contexts effects on consumers' hedonic judgement

Prospect theory lays the foundations to explain the empirical observations about contexts effects on hedonic judgements, and it may allow to further formalize the effects of context to ensure a better reliability of consumer tests.

When I go back home I expect to have the “real churros con chocolate” whereas if I go to a cafeteria in France I do not have the same level of expectations; they are much lower as I do not think they will make the “original” churros. A particular dish such as the “*boeuf bourguignon*” (a traditional French stew made with beef and red wine from Burgundy, carrots, onions, mushrooms and bacon), is expected to be delicious at a restaurant, whereas the level of expectations may be lower at the university cafeteria or at the hospital; or even at the laboratory where it may be difficult to find something like that.

Therefore, when studying consumers' hedonic judgement in different contexts, (1) the context of consumption and (2) the evaluation task of the target product within the context of consumption should be considered.

1. **Context of consumption:** As it was previously mentioned, consumers' expectations and beliefs have shown to influence consumer's hedonic judgement through the modulation of consumers' reference points. Those references points may be built from consumers' past experiences with a product in a particular context. Therefore, it is important to identify what differ on consumer experience when moving from a context to another, in order to characterize those reference points.
2. **Evaluation task:** Framing effects regarding the way in which a situation is contextualized have shown to influence consumers' perception and in turn, consumers' hedonic judgement. However, to the author knowledge these effects have not been further investigated in the sensory and consumer science literature when looking at context studies. Hence, special attention should be placed on this new contextual variable to identify differences among consumers' hedonic judgement that may go beyond the actual context of consumption.

The present work proposes to examine the effects of context on consumers' hedonic judgements through the prism of those two levels of context effects. The following chapter (chapter 4) will explain in detail how to do it.

Chapter 4. Problematic and Research Hypotheses

Why aren't products equally appreciated at home, at a restaurant or at a consumer test laboratory?

Is it a matter of context? A matter of product? A matter of the consumers?

Or it is a matter of evaluation task?

The literature reviewed in the first three chapters suggests that context influences consumer's hedonic judgement through different mechanisms implied by several contextual variables (Figure 7). We classified those contextual variables according to the criteria used to define the ecological validity of an experiment. However, how those contextual variables affect consumer hedonic judgement is still unclear as there is no standardization in the way the variables should be used or interpreted. This does not allow inferring underlying mechanisms of the context effects on consumer evaluation. Therefore, to increase the ecological validity of data obtained in consumers' tests, it is essential **to understand the conditions under which context affects consumer hedonic evaluation of food products.**

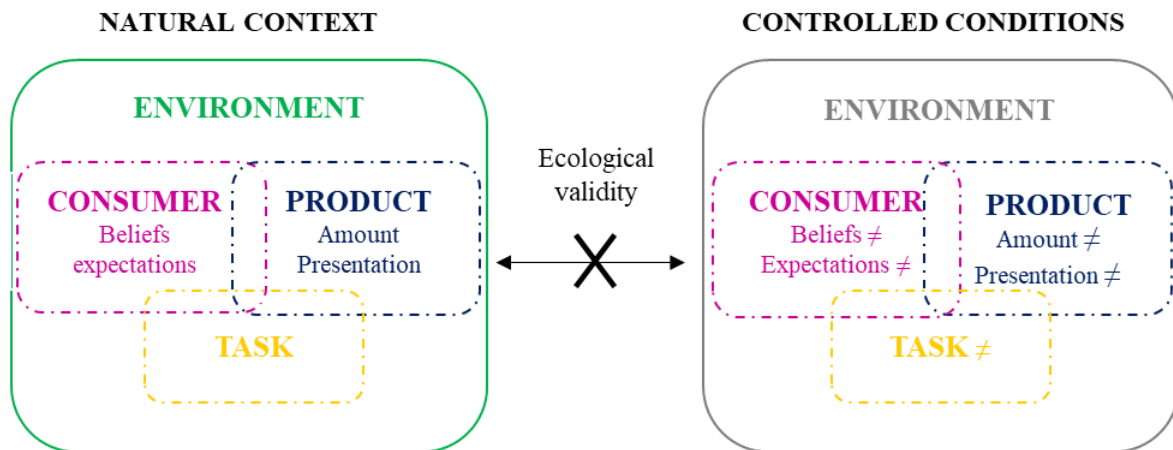


Figure 7. Schematic representation of the problematic.

Regarding the different contextual variables that may affect ecological validity, most studies on context have focused on environmental, product and consumer-related variables (“classical approach”). Those variables could represent the first level of context effects that may influence consumer experience. However, when consumers formulate an explicit hedonic judgement it means that an evaluation task has been performed. Therefore, the evaluation task should be also considered as a key contextual variable, especially in the frame of the present work whose objective is to understand the conditions in which contexts affects consumer hedonic evaluation. In particular, regarding the question of ecological validity of data collected in controlled conditions, it is important to understand if the task performed in a context is representative and relevant in the context of interest.

The literature review, also showed a lack of theoretical framework behind context studies. This makes the role played by context effects in consumer evaluation difficult to understand. Besides, in disciplines such as psychology and behavioral economics, context effects are explored from the perspective of Prospect Theory which considers the effects of context on consumer evaluation through the notion of framing effects and reference points (Kahneman & Tversky, 1979). Framing effects may indeed explain behavioral differences when a given set of alternative options is differently presented or formulated to the consumers. However, those effects have not been considered in studies on context in the field of sensory and consumer science. This is in spite of studies conducted in controlled conditions reporting that evaluation task formats could affect consumers' hedonic response. In order to address this question, we grounded this work in Prospect Theory.

Once identified the four contextual variables and defined the theoretical framework, we delimited four main objectives (Figure 8) for the present thesis. They will be addressed successively in the following chapters. For each objective, the specific research hypotheses and experimental design are detailed below.

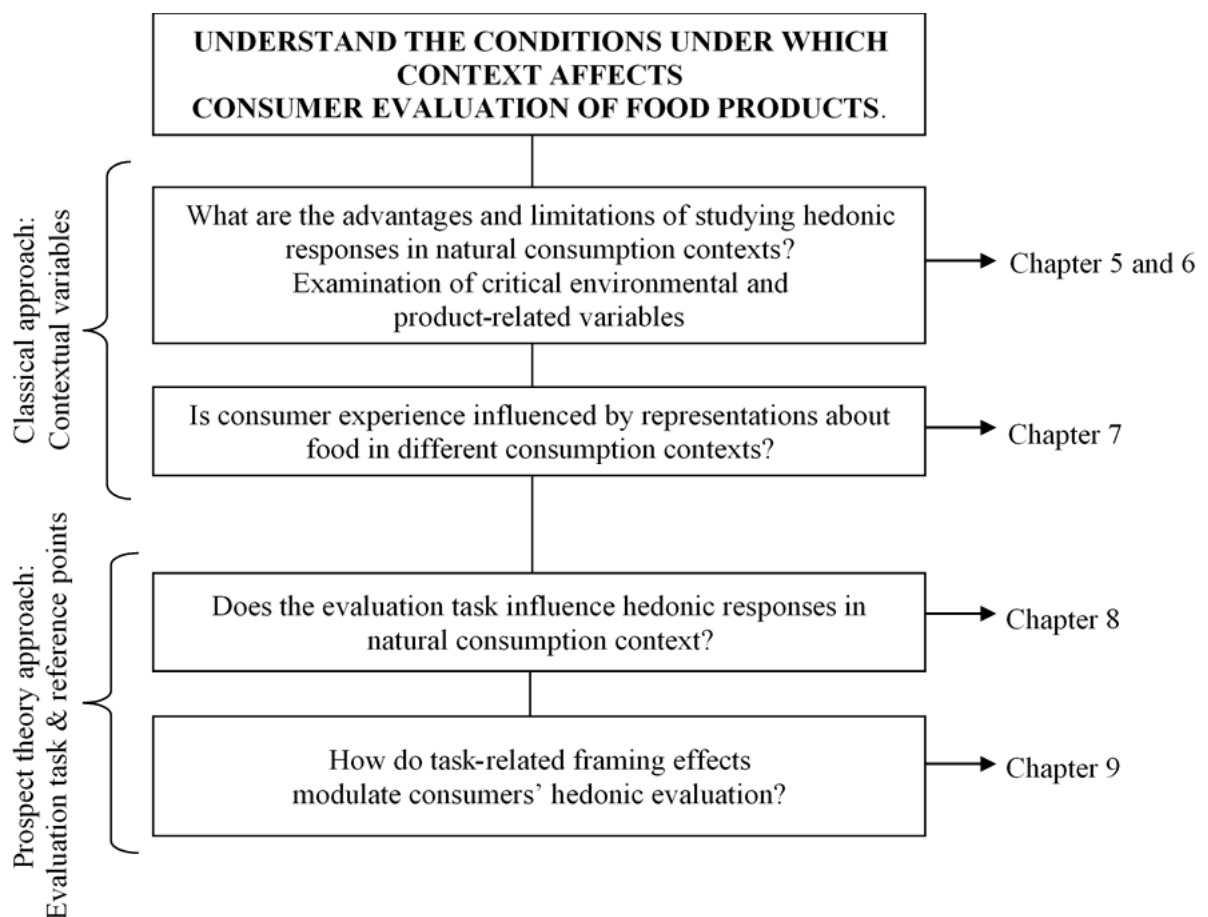


Figure 8. Summary of the research questions of the present thesis.

Chapter 5 and 6: Consumer experience of food products cannot be disentangled from the context of consumption. Likewise, the context of consumption cannot be disentangled from expectations and beliefs towards the product experience. However, in the industry, food products are usually evaluated in controlled conditions where those consumer-related variables are considered as non-existent or neutralized. Additionally, in those controlled conditions consumers' beliefs and expectations may not be expressed in the same way as in more natural contexts of consumption.

This raises questions about the transferability and ecological validity of results from consumers' tests in controlled conditions to natural consumption contexts. The literature review presented in chapter 2 (Galiñanes Plaza et al., 2019) showed that new methodological approaches have been developed in order to gain in ecological validity. However, apart from very few examples (Holthuysen, Vrijhof, de Wijk, & Kremer, 2017) these approaches have not been compared with truly natural consumption contexts. This lack of comparison, could be related to the methodological aspects that entails the setting up of an experiment in natural contexts. However, the lack of data about consumer hedonic evaluation in natural consumption contexts makes it difficult to understand what contextual variables should be considered in order to improve tests conducted in controlled conditions. Hence, the first objective of this thesis is to explore **what are the advantages and limitations of studying consumer hedonic responses in natural consumption contexts**. For this purpose, two exploratory studies were conducted in different contexts and within different conditions. In both studies, we tested the role of information which has been shown in previous studies to influence consumers' beliefs and expectations and to modify consumer hedonic evaluation and behavior (Bernard, Duke, & Albrecht, 2019; Fernandes et al., 2016; Jo & Lusk, 2018; Mcfadden & Lusk, 2015). In effect, priming over a particular product aspect frames consumer evaluation as certain characteristics of the product become more salient. Considering that the context of consumption cannot be disentangled from consumers' expectations and beliefs towards the product experience, information seemed to be a good tool to assess this possible interaction. Moreover, it allowed us to explore if consumers perceived information in the same way depending on the context.

- **Chapter 5:** aimed at identifying how environmental-related variables would influence consumer hedonic evaluation when product-related variables were standardized (amount of food and presentation). Following a between-subject design, we assessed consumers' hedonic responses in three different contexts (Central Location Test (CLT); evoked context; restaurant). Moreover, different information conditions were tested (blind and informed). The hypotheses formulated were:
 - Hypothesis 1: Higher hedonic responses would be observed in the natural (restaurant) and in evoked context than in standardized testing context.

- Hypothesis 2: The information about food preparation would modify the salience of consumers' beliefs and expectations, and therefore, consumer hedonic responses as compared with the blind condition.
- **Chapter 6:** explored whether consumers considered information about food-related variables when choosing food, and if this information influenced their hedonic evaluation. Consumers responses were obtained during a food event conference in the United Kingdom. Different levels of information were tested during the three days of the event.

Chapter 7: The literature review showed that consumer-related variables such as consumer' beliefs and expectations play a major role in the way consumers perceive and experience a product (Delwiche, 2012; Jo & Lusk, 2018; Schifferstein et al., 2019). Moreover, those beliefs and expectations may differ depending on the context, modulating consumer experience, perception and hedonic evaluation (Köster, 2003). However, to the author knowledge context studies have not explored how expectations towards a particular context may influence consumer hedonic evaluation even if they have pointed out these consumer-related variables as factors responsible of context differences. Hence, chapter 7 aims to understand **if consumer experience is influenced by consumers' representations about food in different consumption contexts.**

Additionally, most of studies on context effects comparing controlled and natural consumption contexts have been carried out in the United States, the United Kingdom and Northern European countries. This thesis took place essentially in France, a country that may differ in the way consumers perceive and experience food in different contexts due to its gastronomic culture. Hence, for the purpose of this study, twelve focus groups were performed in two different regions (Paris and Lyon), and with two different groups of population (students and non-students). In regard of the literature review, the following hypotheses were made:

- Hypothesis 1: context-related variables would have a different weight on consumer experience depending on the contexts of consumption.
- Hypothesis 2: consumer-related variables towards different contexts would be intimately related to the served food.
- Hypothesis 3: differences between the two regions would be observed in terms of context and product-related variables due to gastronomic cultural differences.
- Hypothesis 4: differences between the two types of population would be observed in terms of consumer experience due to different consumption habits.

Chapter 8: The literature review has shown that within the context effects, the evaluation task may play a major role on the way consumers evaluate and judge a product. Different hedonic responses

have been obtained when modifying the evaluation task in controlled conditions. Köster (2003) already highlighted that differences in consumers' hedonic responses could be related to the fact that consumers may differently perceive the product or may differently perceive the task. If it is due to the task, this may be related to a difference in "the understanding the instruction" or to "the use of a different strategy in solving the problem" (Köster, 2003, p.360). However, in the studies looking at context effects, this variable has not raised the same interest as environmental and food-related variables. Therefore, the third objective of the thesis aims to understand **if the evaluation task influences consumers' hedonic responses in natural consumption context**. Consumers' hedonic responses are usually collected through a global question about the overall liking of a product (synthetic evaluation task), or through a global question followed of a series of product' attributes ratings (analytical evaluation task). Those differences in the formulation of the hedonic evaluation task have shown controversial results regarding differences between hedonic responses (Gacula, Mohan, Faller, Pollack, & Moskowitz, 2008; Prescott et al., 2011). For this purpose, two different evaluation tasks (synthetic and analytical) were performed in different products (bread and pizza) with different degree of culinary preparation (homemade, readymade and mixed of the two) in a university cafeteria. Consumer hedonic responses were compared between the two tasks and the products. Moreover, the sensitivity to variations of food preparation and task was assessed. According to the literature, the following hypotheses were made:

- Hypothesis 1: when two different formats of the evaluation task (synthetic or analytical) would be presented in natural consumption contexts, larger differences between the hedonic responses of consumers should be found.
- Hypothesis 2: the effect of explicitly asking consumer to rate sensory attributes in a natural consumption context would be even greater for products that involve culinary preparation than for ready-made products.

Chapter 9: Reference dependence is one of the fundamental principles of prospect theory and behavioral economics. This principle posits that consumers make decisions according to a reference point. Reference points are considered as the status quo or current state from which consumers make the evaluation of outcomes (Tversky, 1992). Outcomes can be perceived differently if the reference point changes or is manipulated (Jervis, 2004), through aspirations, expectations, norms, and social comparisons (Tversky & Kahneman, 1991). The present chapter integrates previous results and test hypotheses based on Prospect Theory to explain contextual influences on consumers' food evaluation. The aims of this chapter is to understand **how task-related framing effects modulate consumer hedonic evaluation**.

Environmental and product-related variables have shown to influence the way in which consumers perceived a food in a particular context contributing to the creation of reference points that could be

modulated through consumer-related variables such as beliefs and expectations. The present chapter proposes to go a step further by focusing on the interaction between the food and the consumer in a particular context, drawing consumers' attention to specific aspects of the product-related variables intimately associated to consumers' beliefs and expectations. Because of the use of product-related information, consumers' beliefs and expectations are expected to change the reference points created from environmental and product-related variables, helping to explain contexts effects on consumer hedonic evaluation. To do so, this chapter includes two different studies:

- **“Cakes” study:** The purpose of this study was to investigate the extent to which different aspects of the context (eating context, product context, information context) could act as reference points in consumer hedonic evaluation. Following a between-subject design, two contexts (CLT and restaurant) and two versions of a product (ham-olives cake homemade and readymade) were tested. Consumers' hedonic responses were assessed as well as the level of fulfillment of their expectations. Additionally, two different information conditions were tested (blind and informed). The following hypotheses were formulated:
 - Hypothesis 1: In the restaurant, consumers liking scores would be higher than in the central location test (standard testing room).
 - Hypothesis 2: Information about homemade products would obtain higher rates than readymade products regardless of contexts.
 - Hypothesis 3: The impact of information regarding food quality (homemade and readymade) would differ depending on the testing location.

- **“Quiche” study:** The purpose of this study was to examine the influence of the type of information provided on food preparation and origin of ingredients on consumers' hedonic responses to a product in a natural consumption context. Following a between-subject design, consumers' expectations and beliefs towards a specific context (restaurant), together with consumer hedonic responses in that specific restaurant were assessed. Additionally, two different information conditions were tested related to consumers' expectations. The following hypotheses were formulated:
 - Hypothesis 1: Consumers' expectations and beliefs towards food in a particular context would help to explain consumers' hedonic responses.
 - Hypothesis 2: “Consistent information” with consumers' expectations and beliefs would increase participants liking scores compare to “inconsistent information”.
 - Hypothesis 3: Food-related factors would influence consumers' overall satisfaction.

PART B. PRELIMINARY STUDIES

Chapter 5. Standardisation of product-related variables in context studies

The present chapter aims to **identify how environmental-related variables may influence consumer hedonic evaluation when product-related variables are standardized**. Moreover, the feasibility of context studies a large scale and their potential improvements and limitations for future studies were addressed. This work is presented in the following preliminary study.

1. Preliminary study: « Hedonic evaluation of Lebanese Tabbouleh in different contexts »

1.1. Introduction

The need for a more ecological research has been pointed out as one of the four main challenges for the sensory and consumer science field. In the recent years, different approaches (evoked, immersive, recreated contexts and virtual reality) have been developed in order to increase the ecological validity of context studies and improve the generalization of the results from controlled conditions to natural contexts (Galiñanes Plaza et al., 2019). However, very few studies have compared these approaches to a natural consumption situation (Holthuysen et al., 2017).

The literature review (presented in chapter 2) examined how different contextual methodologies make use of the contextual variables to gain in ecological conditions. Among those methodologies, evoked contexts approach aims at placing the consumers in natural consumption contexts by evoking different situations through audio or video or written scenarios (Jaeger & Porcherot, 2017). This approach has obtained higher hedonic responses than in controlled conditions (Hein, Hamid, Jaeger, & Delahunty, 2012) and in some cases a better discrimination among products (Hersleth, Monteleone, Segtnan, & Næs, 2015). Moreover, it is less expensive than the use of immersive scenarios or virtual reality. However, it is difficult to control how consumers project themselves in a particular context and how vivid this image last during the evaluation task (Galiñanes Plaza et al., 2019). Moreover, chapter 1 showed that the presence of contextual variables such as the environment, food presentation or consumers' expectations may influence consumers' perception about food and in turn, consumer hedonic evaluation. Hence, it is important to also consider those variables when designing an experiment especially in controlled conditions; that includes evoked contexts.

In order to assess how environmental-related variables influence consumer hedonic evaluation, this study compares consumer hedonic responses of a product (Lebanese Tabbouleh) under three different contexts: central location test (CLT), evoked context and student cafeteria. The evoked context was selected due to logistical facilities.

It was hypothesized that **higher hedonic responses would be generally observed in the natural (restaurant) and evoked context (Hypothesis 1).**

Moreover, in order to explore the role of product-related variables such as food preparation, this study examines the effect of information about food preparation on consumers' hedonic responses. The literature review showed that food preparation may influence consumer hedonic evaluation when comparing context studies. According to the literature review, **the information about food preparation would have an impact on consumers' beliefs and expectations, and therefore, on consumer hedonic responses compare to the blind condition (Hypothesis 2).**

1.2. Material and methods

1.2.1. Participants

One hundred and fifty-one students (mean age 18.7 ± 2.5) from the Institute Paul Bocuse were recruited and randomly affected to either the CLT study (restaurant) or the evoked study or the restaurant study and within each context, to the informed or the non-informed condition (each condition was tested on a different day). Participants were not financially compensated for their participation, but they were offered a small gift at the end of the study. Inclusion criterion to participate was allergies (no known food allergy).

1.2.2. Products

Participants had to evaluate a Lebanese Tabbouleh, which was a familiar starter served at the school restaurant. For this study, the evaluated product was offered by Bonduelle[®] and it was composed of: Bulgur (35%), (precooked wheat, rehydrated), durum wheat semolina rehydrated (24%), tomatoes (12%), cucumbers, parsley (6%), extra virgin olive oil (3%), onions shallot, rapeseed oil, alcohol vinegar, dehydrated onions, salt, Dijon mustard (water, mustard seeds, alcohol vinegar, salt), natural lemon aroma, cumin. Participants tasted 70 grams of this product as it was the regular amount consumers had at the school restaurant.

1.2.3. Contexts

The three contexts were located at the Institute Paul Bocuse (Figure 1). This offered a logistical advantage but also allowed as to control the population recruited as we assumed participants may have the same level of expectations towards the food served in the different contexts within the frame of the Institute.

1. The CLT study was carried out in a room as a classical control test.
2. The evoked context was conducted in a room and participant used tablets where pictures of the school restaurant were showed to allow participants to imagine themselves in such context while tasting the products. As evoked scenario the following information was given:
 - a. « *Imagine you are having lunch at a fast-food restaurant like Square Flaveur. This Lebanese tabbouleh is offered in the menu of the day, accompanied by a sandwich and a dessert.* »
 - b. « *Imagine you are having lunch at a fast-food restaurant like Square Flaveur. This Lebanese tabbouleh **proposed by our gourmet caterer** is offered in the menu of the day, accompanied by a sandwich and a dessert.* » in the informed condition.

Square Flaveur was the name of the school restaurant so participants could have a clear and precise image about the type of restaurant where the food would be served. Then information about the menu was given following the classical menu student had at this school restaurant.
3. *Square Flaveur* school restaurant was the last context in which participants evaluate the product. This restaurant was a fast food type restaurant where students had a menu that include a salad, a sandwich and a dessert all served in paper or plastic cutlery. The Lebanese Tabbouleh was a recipe that the chef usually prepared but for the study he used the Bonduelle[®] product we gave him. The selection of this product was first validated with the chef in order to ensure that participants did not find huge differences among the two versions: the homemade one and the readymade.

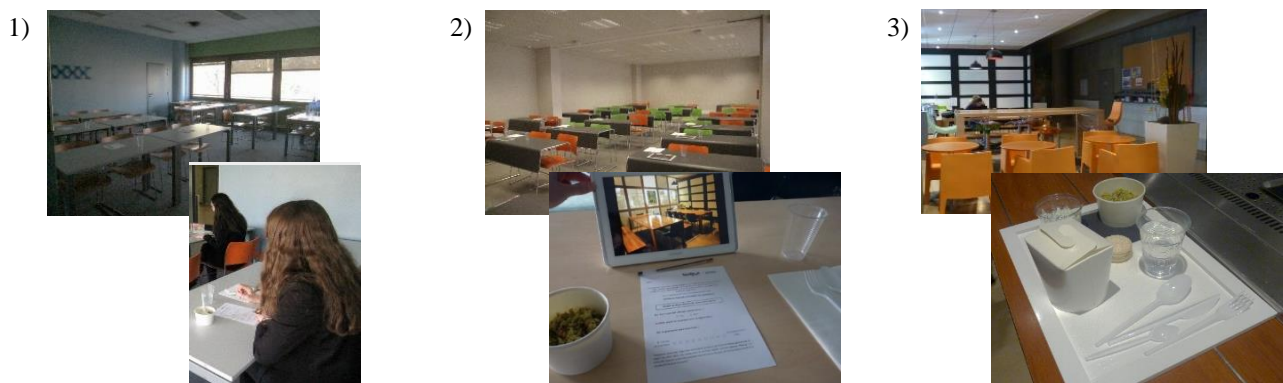


Figure 1. Three context of study: 1) CLT; 2) evoked context; 3) Squared Flaveur Restaurant.

1.2.4. Experimental design

1.2.4.1. Information conditions

Two information conditions were tested in each context. In the blind condition, participants were provided the product with no information about the preparation and origin of the product. In the

informed condition, the Lebanese Tabbouleh was presented together with a questionnaire in which it was indicated: « *product proposed by our gourmet caterer* ». As the Institute Paul Bocuse is a well-known gastronomy school, the fact of indicate that the product served was “industrial” was not appropriate and after various discussions we opted for the “gourmet caterer” option.

1.2.4.2. Sessions

The experiment followed a 3 (setting) x 2 (information condition) design. The experimental campaign was conducted over the course of two weeks (one per setting), and sessions were conducted from: 10h30 to 13h30. The regular lunch was from 11h30 to 14h00. The two experimental conditions (blind and informed) were conducted on separate days to avoid confusion and uncontrolled information.

1.2.4.3. Experimental procedure and evaluation task

In all three experimental conditions, participants were presented the dish in the same way as at the school restaurant. 70g of Lebanese Tabbouleh were served in a white paper cup as usually salads were presented at the school restaurant, together with plastic cutlery, a plastic cup of water and a paper napkin. Participants were asked to rate their level of hunger on a 9-point scale ranging from “not hungry at all” (1) to “extremely hungry” (9); and their liking for the tabbouleh on a 9-point hedonic scale ranging from “I do not like it at all” (1) to “I like it very much” (9).

In the case of the evoked context, after the question about the hunger level, participants were asked to read the information given about the scenario, look at the tablet pictures and then rate their liking.

All responses were collected using a paper form (see Appendix 1).

1.2.5. Data analysis

Mean liking scores for a known product (tabbouleh) and two different information conditions (informed/ non-informed about “gourmet caterer” preparation method) were compared between and within three experimental contexts. Equality of variances was tested using Levene’s test. Means were compared using either ANOVA or Student t-test (SPSS v.16, SPSS Statistics, Chicago, I).

1.3. Results

1.3.1. Consumer liking scores in blind conditions

In Figure 2 mean liking scores were observed between experimental contexts. There was no overall difference between the liking scores obtained between the three contexts in blind conditions ($F_{(1,87)} = 1.638$; $p = 0.192$). In the CLT context, liking scores were closed to those obtained in evoked context. However, in evoked context, a higher consensus on liking scores was found among participants. 50%

of scores were set between 6.5 and 8. Conversely, participants showed a higher variance of liking scores in the restaurant context. Although not significant, a decrease of liking scores was observed compare to evoked and laboratory contexts.

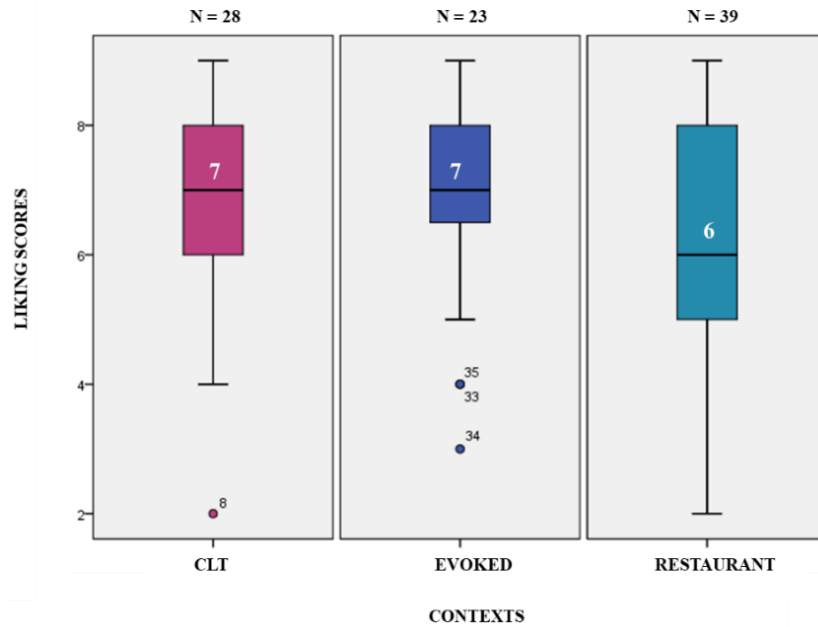


Figure 2. Mean liking scores for all context in blind conditions. N refers to the numbers of participants per context.

1.3.1.1 Effects of information

In Figure 3 mean liking scores were observed between two experimental contexts CLT and restaurant, and conditions. No significant differences were observed between both blind and informed conditions for both CLT ($t_{(53)} = 0.875$, $p = 0.731$). and restaurant contexts ($t_{(68)} = 1.292$, $p = 0.472$). In the CLT context, the presence of information, slightly decreased the appreciation of the product whereas in the restaurant the presence of information did not make a significant difference in liking scores but on consumers consensus.

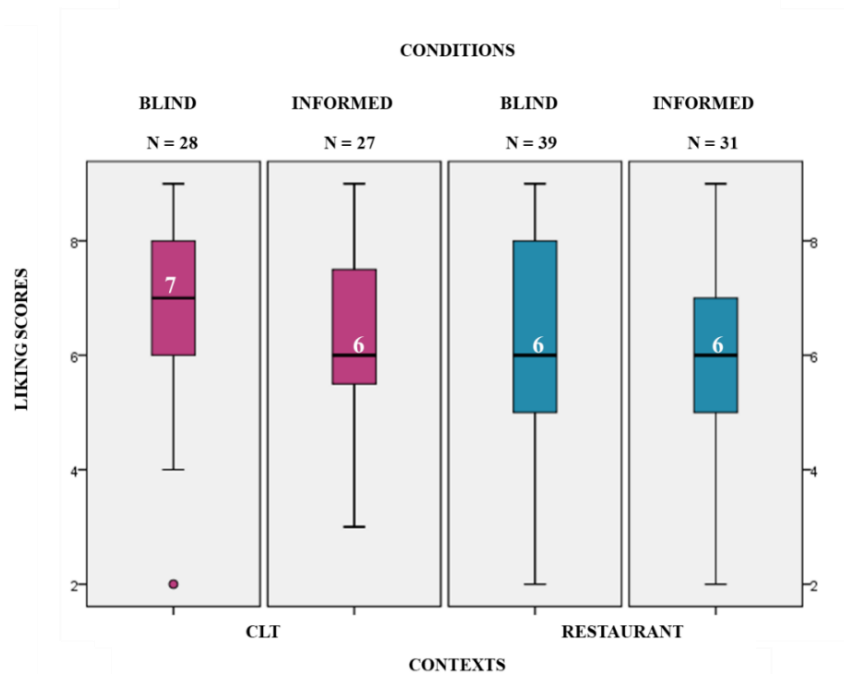


Figure 3. Mean hedonic scores for CLT and restaurant contexts in blind and informed conditions. N refers to the number of participants per condition.

1.4. Discussion

No significant differences regarding participants liking scores among the three contexts were observed. Nevertheless, slightly higher liking scores were obtained at CLT and evoked context. Those results differed from those obtained by Meiselman, Johnson, Reeve, & Crouch (2000) where laboratory liking scores were lower than those obtained in restaurant contexts. Moreover, regarding evoked contexts and CLT contexts, no differences in liking scores were neither obtained. Those results are line from the results obtained by Lusk, Hamid, Delahunty, & Jaeger (2015) when liking scores were compared by using a 9-point liking scale. Regarding the studies comparing CLT to new contextual approaches as evoked contexts and, natural contexts, no comparison with previous studies can be made as this was the first study to the authors knowledge that conducted such comparison. Nevertheless, when comparing our results from those of Holthuysen et al. (2017), who compared CLT, recreated context and a natural context, our results did not find any significant differences among contexts whereas they did. This could be explained by the fact that product-related variables such as the amount of served food and the presentation were standardized among contexts and they were kept as similar as participants were used to have in their natural consumption contexts. According to the literature review (chapter 1), those variables have shown to have an impact on consumers' hedonic judgement. Moreover, regarding the evoked context as previously observed by Hersleth et al., (2015), contextual information conveyed in evoked context may positively impacted consumer evaluation.

Looking at the information conditions, food preparation information showed to have a slight impact on liking scores. This may be related to the lack of given information or wording (gourmet) as well as the low number of participants per condition. Moreover, as both contexts were inscribed in the frame of the Institute Paul Bocuse participants may not have expected to find readymade products in this context. Nevertheless, it could be observed that the presence of information about food preparation tended to increase the consensus among the participants, especially in the case of the natural consumption context. We could then hypothesize that the presence of information may frame consumer evaluation towards a particular characteristic of the product that could be related to consumers' beliefs and expectations, reducing the interaction with other contextual variables such as environmental ones. This aspect will be further investigated in the following chapters.

1.5. Conclusion

In evoked context participants showed a higher consensus in hedonic responses than in laboratory and natural consumption contexts. This could be explained by the fact that the amount of served food and the presentation were standardized and presented in a familiar way close the natural consumption situation. However, the hedonic responses obtained in the evoked context were still closer to those obtained in the CLT. This could be related to the fact that in natural consumption contexts there was still a big number of contextual variables that may lack in the evoked and CLT contexts, modulating consumers' hedonic responses.

No significant differences on hedonic responses were observed when information about food preparation was given. However, the low number of participants per conditions as well as the wording used do not allow us to make direct inferences between the presence of information and hedonic responses. Nevertheless, we observed a higher consensus among participants when information was given in the natural consumption context. Additionally, the presence of information elicited that participants questioned certain characteristics of the product and related them to their own expectations. Studies on contextual variables standardization and consumers' expectations regarding food preparation should be performed with a larger number of participants in order to further explore consumer hedonic evaluation among different contexts.

Chapter 6. The impact of food-related information in natural consumption contexts

The previous chapter suggested that information may play a role on consumer hedonic evaluation in natural consumption contexts. However, no clear and conclusive results were obtained. Chapter 1 showed that within the product-related variables, packaging and labelling had an effect on consumer evaluation and decision-making due to the priming on certain characteristics of the product that may impact consumer prior beliefs and expectations, e.g. through health claims or provenance information (Asioli et al., 2017; D’Alessandro & Pecotich, 2013; Hersleth et al., 2015; Jo & Lusk, 2018). Nevertheless, evidence of those effects in natural consumption contexts is lacking (Boyland, Kavanagh-safran, & Halford, 2015; Fernandes et al., 2016).

The present chapter examines how consumers’ food choices and hedonic evaluation change depending on the type of information displayed on menu card in a natural consumption context. This study aims to gain insights about **whether consumers consider food information when choosing food**, and if this **information influences their hedonic evaluation**. Moreover, methodological and logistical difficulties associated with field experiments are reported, and suggestions for potential improvements are drawn for future studies.

1. The experimental cafe: an exploratory study on consumers' behavior towards food information in a natural consumption context

1.1. Introduction

Food Matters Live is a cross-sector event that brings together different sectors of the food and drink industry in order to enable collaboration and innovation to support a sustainable food landscape for the future. In November 2017, the Center for Food and Hospitality Research of the Institut Paul Bocuse participated in this event performing an exploratory study about consumer behavior and food information.

During this event, different products “free from”, “organic” or “vegan” were presented as part of the trends in the food market. In the last decade, consumers have started to be much more interested in this type of products, focusing on food process and information (Asioli et al., 2017). Food information has shown to impact consumer hedonic evaluation and behavior as specific characteristics of the product are primed modulating consumers’ beliefs and expectations towards it (Jo & Lusk, 2018; Liu, Hooker, Parasidis, & Simons, 2017; Reis, Alcaire, Deliza, & Ares, 2017; Schouteten, De Steur, Sas, De

Bourdeaudhuij, & Gellynck, 2017). Most of these studies, look at the effects of the information presented on packages on liking, choice or willingness to pay. However, there is still a lack regarding those effects on natural consumption contexts such as restaurants or cafeterias where no packaging is used but menus (Boyland et al., 2015; Fernandes et al., 2016). Therefore, the objectives of this exploratory study were (i) to **examine the effect of information on food choice and liking** and (ii) to **analyze the advantages and disadvantages of setting up a study like this in a natural consumption context**.

Before the event, an online survey about conference food was sent to the participants to get more insight about consumers' beliefs and expectations towards the food served in this particular context (Conference food). Unfortunately, not enough data were collected to offer any results (15 responses). During the event, a live experiment on food choice was set up, in partnership with Levy Restaurants and Food Matters Live. During the three days of the experiment, data were collected on the food choices and liking of the Café's customers.

1.2. Material and methods

1.2.1. Participants

Conference attendees who voluntarily came to the restaurant during their lunch break were recruited at the checkout counter. They were told that we were conducting a survey as part of a PhD thesis project and if they could fill out a questionnaire on the food that they had freely selected while eating. In total 188 conference attendees (mean age = 39; 72% women) participated in the study.

1.2.2. Products

The menu was created by Levy Restaurants. It was composed of three proteins options (meat, fish and vegetarian options) and five different salad options. Conference attendees could choose between 1 protein dish and 2 or 3 salads.

1.2.3. Context

The Experimental Café (Figure 1) was set in the conference center close to the different conference rooms under the name "Build your own salad". Tables and chairs were set-up so attendees could have their lunch at the café. The food was displayed in a food stand so attendees have an easy access to the food offer.

1.2.4. Experimental design

1.2.4.1. Information conditions

The information presented on the menu cards at the food stand and tables was slightly modified each day (Figure 2). This modification was highlighted by changing the color of the added descriptors.

1. Day 1: Name of the dish
2. Day 2: Information about the food preparation method (more appealing description)
3. Day 3: Information of food preparation method + origin + sustainable claims



Figure 1. Setting of the Experimental café.

1.2.4.2. Sessions

The experiment was conducted during the three days of the conference and sessions were conducted from: 11h00 to 15h00. Each day a new information condition was presented.

1.2.4.3. Experimental procedure and evaluation task

Each day attendees who came to the café were received by one of the three volunteers who presented the questionnaire. The questionnaire was divided in two sections (see Appendix 2):

1. First section: attendees were asked to indicate their level of hunger on a 9-point scale ranging from “I am not hungry at all” to “I am very hungry” and answer some sociodemographic questions.
2. Second section: attendees were asked to indicated their options for the protein and salads dishes the had freely selected and rate their liking on a 9-point hedonic scale ranging from “I do not like it at all” to “I like it a lot”.

1.2.5. Data analysis

Frequency analysis was conducted to analysis choice results. Mean liking scores for each dish were compared within the three experimental information conditions. Means were compared using either ANOVA (SPSS v.16, SPSS Statistics, Chicago, I).



Figure 2. Menus offered to the conference attendees each day: a) menu card presented day 1: name of the dish; b) menu card presented day 2: information about the food preparation method (more appealing description); c) menu card presented day 3: information of food preparation method + origin + sustainable claim.

1.3. Overview of the results

The number of conference attendees who came and participated to the Experimental Café varied from day to day:

1. D1: 63 participants
2. D2: 75 participants
3. D3: 50 participants

1.3.1. Food choice

1.3.1.1. Protein dishes choice:

In general, conference attendees choose more the salmon dish than the chicken and Mediterranean tart (Figure 3). 11 participants did not choose the protein option during the conference event.

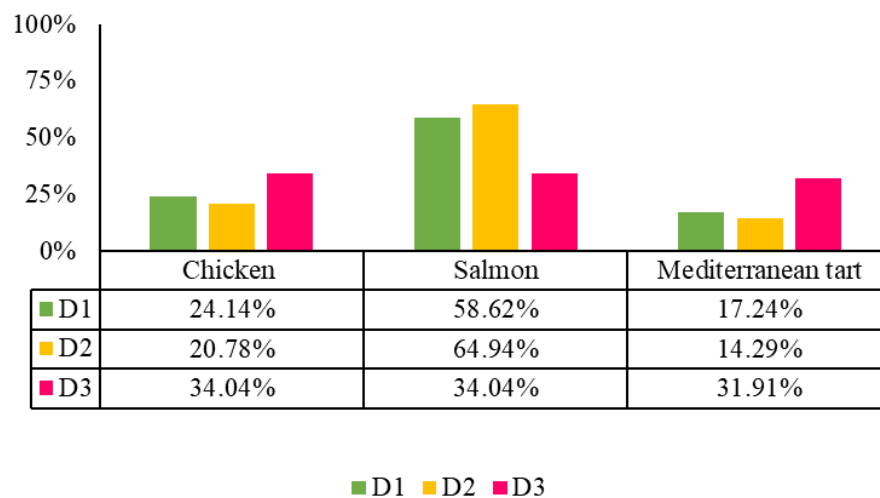


Figure 3. Distribution of participants (%) per protein dish option and day (D). D1: name of the dish; D2: information about the food preparation method (more appealing description); D3: information of food preparation method + origin + sustainable claim.

1.3.1.2. Salad dishes choice:

As regards the salad choice, the broccoli and lentils options were the most selected compare to the other dishes (Figure 4). For the salad options participants could choose several salad dishes at a time.

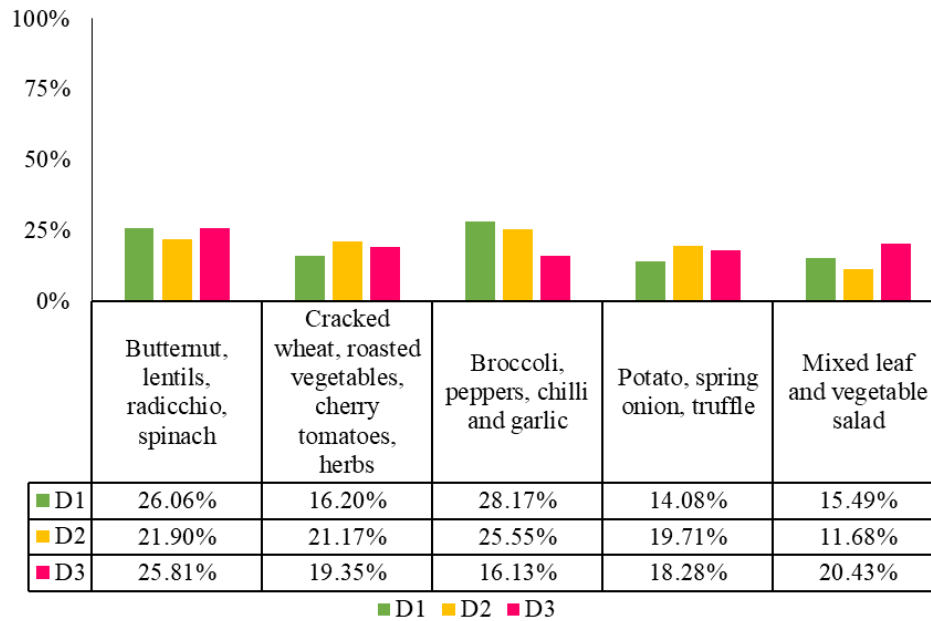


Figure 4. Distribution of participants (%) per salad dish option and day (D). D1: name of the dish; D2: information about the food preparation method (more appealing description); D3: information of food preparation method + origin + sustainable claim.

1.3.2. Liking

1.3.2.1. Protein dishes liking:

The liking scores of the protein dishes slightly decrease during the three days of conference (Figure 5). However, no significant differences were observed between the days for each protein option: spicy chicken ($F_{(1, 42)} = 0.266$; $p = 0.768$); roasted salmon ($F_{(1, 111)} = 1.728$; $p = 0.182$); Mediterranean tart ($F_{(1, 31)} = 0.983$; $p = 0.385$).

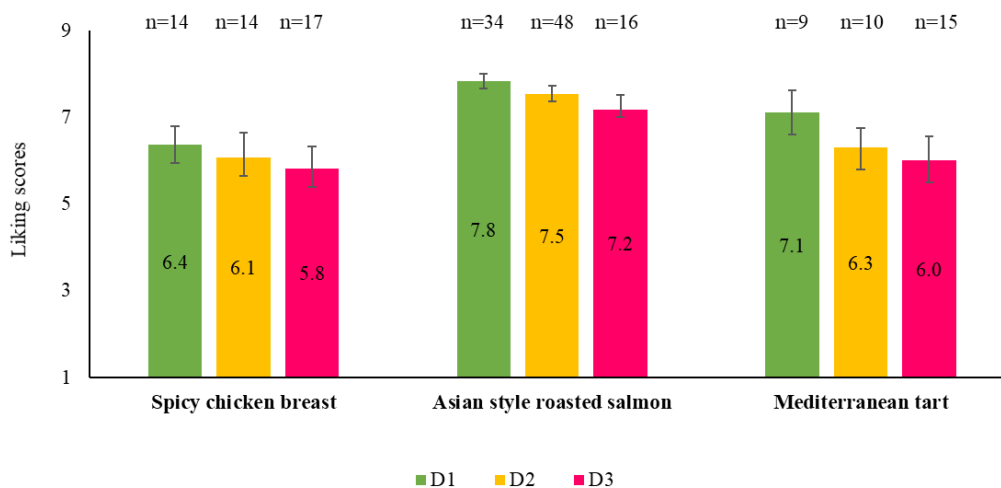


Figure 5. Comparison of mean liking scores (\pm SEM) for the different protein dishes. D refers to the days of the study and condition (D1: name of the dish; D2: information about the food preparation method (more appealing description); D3: information of food preparation method + origin + sustainable claim); n refers to the number of participants who tested each dish each day.

1.3.2.2. Salad dishes liking:

As regards the salad dishes, the liking scores also differed from day to day. Significant differences on liking scores were observed for the butternut ($F_{(1, 85)} = 4.276$; $p = 0.0017$) and mixed leaf salad dishes ($F_{(1, 54)} = 0.4944$; $p = 0.011$) whereas the rest of the salad options did not differ in liking: wheat salad ($F_{(1, 67)} = 0.877$; $p = 0.421$); broccoli salad ($F_{(1, 84)} = 1.877$; $p = 0.159$) and potato salad ($F_{(1, 62)} = 1.388$ $p = 0.257$) (Figure 6).

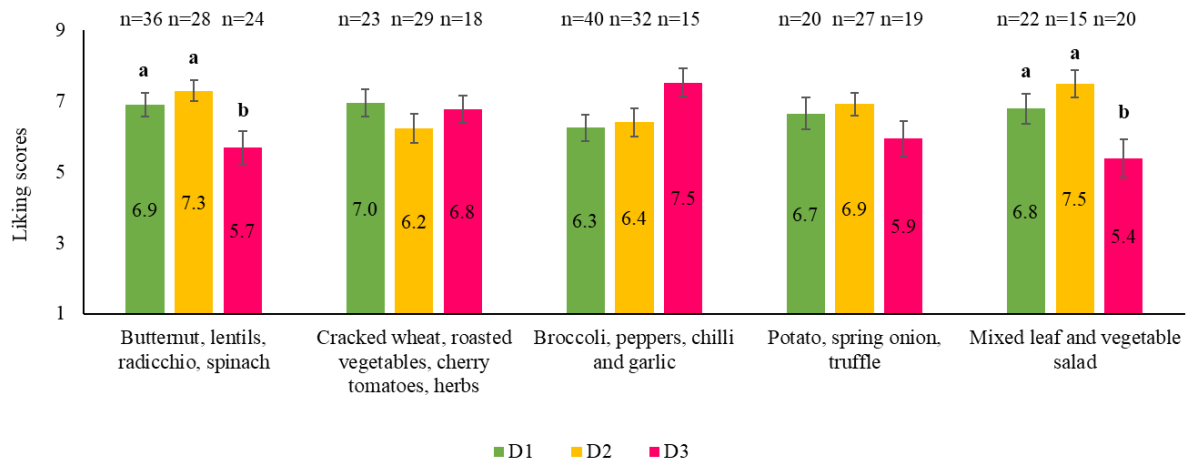


Figure 6. Comparison of mean liking scores (\pm SEM) for the different salad dishes. Letters above bars denote significant differences ($p < 0.05$) found between information conditions using Fisher (LSD)s post hoc analysis. D refers to the days of the study and conditions (D1: name of the dish; D2: information about the food preparation method (more appealing description); D3: information of food preparation method + origin + sustainable claim); n refers to the number of participants who tested each dish.

1.4. Discussion

The objectives of this study were to examine the effect of food information on consumers' choice and liking and to analyze the advantages and disadvantages of setting up a study like this in a natural consumption context.

Concerning the effect of information on consumers' choice, we observed that conference attendees did not pay attention to the information presented at the menu cards. When they came to the Experimental Café, conference attendees observed the food and they asked the catering service about it even if the menu cards were displayed on top of the food stand and tables. Therefore, as the results showed, the choice of food may have not been directly related to the given information. As Grunert (2011) describes, the need for food information not always lead to the perception of it. Consumers tend to select the information they are interested in and ignore the excess of it. In this type of events where attendees do not have a lot of time for lunch, this may have led them to simplify their food decisions by directly asking the catering service. Additionally, we should consider that conference attendees may have varied their choices within the 3 days of conference to avoid monotony (Köster, 2009;

Meiselman, 2006). Moreover, it is important to consider that the level of information change for all the dishes every day so this may difficult to disentangle the effect of information on the choice of a specific dish.

Overall the food offer was positively perceived apart from the fact that the dishes were cold and attendees expected to be warm. Looking at the liking scores we should consider that as conference attendees evaluated the food while eating, even if we asked consumers to rate individually each component of the dish, the fact of having a complete meal may have influence the liking scores of some of the meal components as previous studies have shown (Elzerman et al., 2015; Jimenez et al., 2015)

As occurs with the food choice and monotony, a lack in food variety can be translated in a decreased of the liking scores (Edwards & Hartwell, 2009; Meiselman, DeGraaf, & Leshner, 2000). We observed this effect on the liking scores of the protein dishes which slightly decreased from day to day. However, this effect did not occur in the case of the salad dishes where the liking scores followed a different pattern. Those effects can be related to the number of participants per day and choice. Conversely, significant results were obtained for two of the five different salads when longer descriptions about the dishes were presented (information of food preparation method + origin + sustainable claim). No clear explanation for such results can be found further than the monotony conference attendees may have perceived. Origin and sustainability have shown to have a positive impact on consumer hedonic evaluation (Hoogland, de Boer, & Boersema, 2007); nevertheless, this is related to personal values that in this study we could not assess. Besides, as the number of participants differed each day and for each choice it is difficult to may inferences related to that.

Concerning the advantages and disadvantages of setting up a study like this, it is important to highlight different aspects that may occur in natural consumption contexts. During the study, the catering service changed the cutlery from day one (wood) to day two and three (plastic). This may have an effect on participants' behavior and especially on liking (Piqueras-Fiszman et al., 2012). Moreover, participants aroused several concerns regarding the sustainability of the plastic cutlery as it was one of the key elements of the event and did not match with the concept of the Experimental Café. Additionally, the service of the food also varied from day to day - some of the food options were available before others due to some logistical issues in the kitchen – which may have affected the results regarding the food choices.

An additional element that we did not consider was that participants seemed to be surprised about the price of the menu because getting just one dish (one protein and not salad) had the same cost than get

3 dishes (protein + 2 salads) which may also have impact in the choice and liking of the dishes. Concerning the food offer, snacks (chocolate bars, chips) were also part of the offer at the Experimental Café. We noticed that a lot of consumers just grabbed a coffee and a snack instead of looking at the menu card (on which the experiment was focusing).

Regarding the experiment itself, it seemed that people were not fully able to realize that an experiment was going on, despite the logos and information on the site. Most of the attendees thought it was a commercial questionnaire related to the served food and unfortunately, we did not get many participants, especially on the third day where the numbers dropped quite significantly.

1.5. Conclusion

This exploratory study gave us some insights about how consumers behave in natural consumption contexts and how feasible an experiment of those characteristics entails.

In general, conference attendees did not pay attention to the presence of information on the menu cards. They were more focused on the appearance of the food when choosing their menu and, other contextual elements such as the cutlery used when evaluating the food than on the information provided. From this result, we can conclude that much more effort should be put on the way food information is presented in natural contexts. Besides, we should consider that depending on the type of setting, cafeterias or restaurant, consumers may behave in a different manner so the way to communicate about food should also differ.

Experiments in natural consumption contexts allow us to better understand consumer behavior and get direct feedback from the consumers. However, several factors external to the experiment (problems in the service of the food or the used cutlery) may occur biasing or making difficult the analysis of the results. Therefore, we suggest that an equal commitment between the internal validity of an experiment in controlled settings and the external validity of an experiment in natural settings should be found.

Conclusions PART B

Part B presented two preliminary studies that have helped to define some of the research and methodological questions related to the set-up of context studies in natural consumption contexts. The first chapter aimed at identifying the effects of environmental-related variables on consumer hedonic evaluation when product-related variables were standardized. Results showed that the standardization of the amount of served food and the food presentation among contexts (evoked, CLT and natural consumption contexts) - close to the presentation in the natural consumption situation – may have helped consumers to experience a similar eating situation reducing the differences between consumers' hedonic responses. Moreover, the presence of information about food preparation increased the consensus among participants in the natural consumption context (restaurant). The role of food-related information could be an interesting approach to focus consumers' attention to product characteristics in natural contexts as it occurs in controlled conditions. The presence of information could minimize the effect of other environmental-related variables on consumer hedonic evaluation.

The second chapter examined consumer decision-making and hedonic evaluation when different food-related information was displayed on a menu card in a natural consumption context (conference). The results of this study revealed that consumers did not pay special attention to the information given about food. They were more focused on the visual characteristics of the menu. This could mean that depending on the consumption context and situation, consumers may pay more or less attention to certain characteristics of the product. Then, when studying the effect of information on consumer hedonic evaluation, better ways to present such information should be explored if we expect to compare context studies.

From a methodological point of view, different aspects were underlined as a result of these two studies:

1. Environmental-related variables:

- These two preliminary studies have shown that there is a clear difference in consumer behavior when consumers are in a school restaurant and when they are in a conference restaurant. The foodservice differs, the environment differs, the population differs, so all those elements are going to influence the way in which consumers interact with the food, perceive it and judge it. Hence, when comparing context studies, **it is important to consider not just the physical situation but the actual behavior consumers have in those contexts and what they actually experience.**

2. Product-related variables:

- The first study showed that present food as close as it is presented in the natural consumption context could help consumers to project themselves eating that food in a particular context.
- The first study showed that it is important to pay attention to the eating reference unit that should be compared: snack, raw ingredient (apple) or a dish. Preparation, storage and presentation of dishes require much more control when comparing context studies that snack or raw ingredients. Moreover, the second study showed that liking scores of meal components may be influenced by the presence of other meal components. Therefore, it is suggested to work with dishes that included several ingredients but in a product as a whole like multicomponent dishes: quiche, cakes, pizzas, etc. instead of chicken with potatoes and salad, fish and chips, etc.
- These two preliminary studies showed different results with regards to the presence of information. **Consumers may not pay the same attention to food characteristics at a restaurant, conference or CLT. Hence, it is important to identify the best way to present food information depending on the context.**

3. Consumer-related variables:

- In the first study participants discussed if the dish presented was made by the chef or not, mentioning words such as: industrial or homemade. **Consumers' expectations about food and its preparation may be relevant when evaluating dishes in different contexts.** Hence, special attention should be put on this variable in order to gain more insights about consumers' mindset when comparing contexts.

4. Consumer-related variables:

- Regarding the studied variable, both studies showed that **liking may not be able to explain by itself the differences or not among consumers' hedonic responses when looking at context studies.** Instead, consumers' expectations and beliefs' towards the food served in those different contexts may offer more insights about the possible differences found when comparing context studies.

The following chapters will integrate and further explore those insights.

PART C. CONSUMER-RELATED
VARIABLES

Chapter 7. Consumers' mindset on consumption contexts

1. Introduction

This thesis aims at understanding the conditions under which context affects consumer evaluation of food products. The literature review (chapter 1) has shown that consumer-related variables such as consumers' beliefs and expectations play a major role in the way consumers' perceive and experience a product (Delwiche, 2012; Jo & Lusk, 2018; Schifferstein et al., 2019). Moreover, those beliefs and expectations towards a particular product may change depending on the context, modulating consumers' experiences and thus, product evaluation (Köster, 2003).

If we look at the pictures presented below (Figure 9), we may be able to identify different contexts of consumption and within each context, a particular environment and type of food. This may be related to our past experiences within those contexts or to the beliefs and expectations those contexts may elicited.



Figure 9. Pictures of different consumption contexts

Therefore, if the objective of this thesis is to understand the conditions under which contexts affects consumer evaluation, it is needed to understand how consumer experience is inscribed in those different consumption contexts, and **if it is influenced by consumers' representations about food in those different contexts.**

Looking at the literature review on ecological validity (chapter 2), most of the studies focused on natural context effects have been carried out in United States, United Kingdom or Northern European countries. The present work is inscribed in France where consumers are characterized by a gastronomic culture and history that may influence in a different way how consumers perceive food in different contexts (Corbeau, 1992; Fischler & Masson, 2008). Therefore, this difference arises the

need to explore how French consumers perceive and experience food in different contexts.

To achieve the objective of the present chapter, a qualitative study was conducted to obtain a large information about consumers' representations of food in different consumption contexts. Twelve focus groups were performed in two different regions, Paris and Lyon, with two different groups of population, students and non-students. Focus groups allow to collect more information than individual interviews as participants interact during the discussion sharing opinions and thoughts. Besides, the decision to compare two regions and two different type of populations allowed us to observe possible differences in the way consumers integrate contextual variables in their meal experience due to cultural differences related to gastronomy (Lyonnais cuisine versus a more global French cuisine); and due to consumption habits (students and non-students).

Questions were developed based on the literature review. The following topics were defined: food experiences in different contexts, contexts and food preparation and, food preparation and culinary skills. A focus group guideline (see Appendix 3) was implemented together with French colleagues from social sciences in order to set the right open-ended questions to avoid the possibility to get a yes/no responses. Moreover, basic principles regarding the role of the moderator were also examined (Lawless & Heymann, 2010).

Regarding the literature review the following hypothesis were formulated:

Hypothesis 1: context-related variables would have a different weight on consumer experience depending on the contexts of consumption.

Hypothesis 2: consumer-related variables towards different contexts would be intimately related to the served food.

Hypothesis 3: differences between the two regions would be observed in terms of context and product-related variables due to gastronomic cultural differences.

Hypothesis 4: differences between the two types of population would be observed in terms of consumer experience due to different consumption habits.

This work is presented in Article 2 (in writing)

2. Consumers' representations about food in different consumption contexts (Article 2)

Title:

Consumers' representations about food in different consumption contexts

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Abstract:

Context studies have shown that contextual variables influence consumer evaluation of food products. However, the moderating role of beliefs and expectations on this influence has been little explored. This study examines the effect of consumers' gastronomic culture on their meal experience according to the context. Gastronomic culture is defined by elements of the social and physical environment as well as characteristics of the food itself. Is the impact of these variables specific to a given situation? A qualitative study was conducted to understand how French consumers' representations about food in different consumption contexts may influence their experiences and their hedonic evaluation. Twelve focus groups (n=86) were performed in two different regions: Paris and Lyon, and with two different groups of populations: students and non-students. Attitudes towards contexts of consumption were intimately associated to consumers' attitudes towards food. Important differences between homemade and industrial products were discussed by consumers and associated to different consumption contexts. Different affective experiences were associated to different contexts. Conviviality was, with taste, among the most important criteria for consumers when eating out together. A quantitative analysis allowed to identify differences in the discourse among groups (related to specific themes) and identify different consumer experience factors relevant and characteristic to each group.

Keywords:

Consumer experience; contexts; food preparation; affective experience; expectations; beliefs

36 **1. Introduction**

37 French consumers and their gastronomy are well known since the XVIII century. French cuisine is
38 characterized by its “savoir-faire”, “gourmandize” and pleasure (Fischler & Masson, 2008). Food
39 rituals have been widely investigated in disciplines such as sociology and anthropology underlining
40 characteristics of the French meals such as the conviviality, and the structured organization of a meal
41 (Corbeau, 1992). Nevertheless, in the last decade changes in those rituals have been observed due to
42 the lack of time for cooking and eating, and the multiple options foodservices propose (GIRA Conseil,
43 2013).

44 The wide offer of eating out contexts such as brasseries, bistros, gastronomic restaurants or fast food
45 restaurants, is associated to different consumer experiences. Experiences that differ when consumers
46 go to eat at the workplace cafeteria or at the school cafeterias due to the differences in the food ritual
47 followed by the consumers (Corbeau, 1992). Those differences in meal experiences may be
48 constructed from different factors, such as contextual variables that may entail differences in the way
49 consumers perceived a particular consumption context and the food served in it (Edwards, 2013).

50 Contextual variables such as the physical context of a restaurant, the environment or the food served
51 have been found to influence consumers’ food perception so in turn, consumer experience and hedonic
52 evaluation (King, Meiselman, Hottenstein, Work, & Cronk, 2007; H.L. Meiselman, Johnson, Reeve, &
53 Crouch, 2000; Timothy, Yang, & Kim, 2016). When comparing context studies, differences are found
54 regarding consumer hedonic evaluation of a product or a dish depending on the context (Boutrolle,
55 Delarue, Arranz, Rogeaux, & Köster, 2007; De Graaf et al., 2005). This could be explained by the fact
56 that consumer experience changes due to the presence of different contextual variables from one
57 context to another as well as consumers’ beliefs and expectations towards that particular context.

58 Factors such as consumers’ beliefs and expectations towards a particular context have been associated
59 to differences in consumers’ food perception and a posteriori evaluation (Köster, 2003, 2009).
60 Moreover, those consumer-related variables have shown to influence consumer experience as well (Jo
61 & Lusk, 2018; Michel, Velasco, Gatti, & Spence, 2014). Do consumers’ beliefs and expectations
62 differ towards different consumption contexts, and if so, are those differences related to the food
63 served in that particular context? Studies have highlighted “food attributes” (ingredients, tastiness,
64 variety and quality) as key factors when consumers select to eat out in a particular restaurant (Ozdemir
65 & Caliskan, 2014; Timothy, Yang, & Kim, 2016). Hence, it could be hypothesized that consumers’
66 beliefs and expectations towards a gastronomic restaurant may be based on product-related variables
67 such as taste, quality and presentation; whereas in a workplace cafeteria, contextual-related variables
68 such as the environment may lead consumers’ expectations and in turn, consumer experience.

69 This study aims at understanding how consumers’ representations about food in different consumption
70 contexts may influence consumer experience and therefore, their hedonic evaluation. To do so, a
71 qualitative study was conducted within two different regions (Paris (n = 6) and Lyon (n = 6), and two

72 types of population students (n = 6) and non-students (n = 6). These two different regions were chosen
 73 in order to explore gastronomic differences within a country that may influence consumers' meal
 74 experience and consumer evaluation of food in different contexts (Fischler & Masson, 2008).
 75 Moreover, the two types of population were selected to further investigate context's effects on non-
 76 students' population (30-60 years old). Most of context studies are conducted within student's
 77 population (18-25 years old) who may have different criteria when it comes to meal experience
 78 evaluation (Urdapilleta, Dany, Boussoco, Schwartz, & Giboreau, 2016).
 79 We hypothesize that (i) context-related variables would have a different weight on consumer
 80 experience depending on the contexts and (ii) consumer-related variables towards different contexts
 81 would be intimately related to the served food. Moreover, (iii) differences between the two regions
 82 would be observed in terms of context and product-related variables due to gastronomic differences
 83 and (iv) differences between the two types of population would be observed in terms of consumer
 84 experience.

85

86 2. Methods

87 2.1. Consumers

88 Consumers were recruited from two consumers' databases: in Lyon, the Institut Paul Bocuse Center
 89 for Research and Hospitality, and in Paris, a market research agency. Twelve focus groups were
 90 conducted with a total of eighty-six French consumers. Table 1 shows the socio-demographic
 91 characteristics of the consumers. Six focus groups of non-students (n=41, mean age = 49) and six
 92 focus groups of students (n=45, mean age = 22) were conducted in Lyon (n=33) and in Paris (n=53)
 93 (three groups of each type of population per region). At recruitment stage, no information about the
 94 specific aim of the study was provided. Consumers were just informed about the duration of the
 95 discussion (between one hour and a half and two hours), the general topic (food consumption) and the
 96 remuneration they would get. Data were collected between May 2017 and November 2018.

97

98

99 **Table 1.** Characteristics of consumers: means (SD) or %.

Consumers	Lyon		Paris	
	Non students	Students	Non students	Students
Population				
Number of groups sessions	G1, G2, G3	G4, G5, G6	G7, G8, G9	G10, G11, G12
Sample size (n)	16	17	25	28
Female	81.2%	76.5%	52%	50%
Male	18.7%	23.5%	48%	50%
Age (year)	51.1 (9.78)	21.7 (2.29)	46.9 (8.96)	21.5 (2.19)
Dinning out frequency				
>5 times a month	6.2%	0%	28%	42.8%
Between 3-4 times a month	25%	47.0%	24%	42.8%

PART C. Consumer-related variables

1-2 times a month	62.5%	41.2%	20%	14.3%
<1 time a month	6.2%	11.8%	28%	0%
Never	0%	0%	0%	0%
Eating out time				
Brunch	0%	0%	0%	0%
Lunch	50%	11.8%	20%	28.6%
Dinner	50%	88.2%	80%	71.4%
Types of restaurants frequency				
Bar a tapas/wine	18.7%	52.9%	36%	39.3%
<i>Brasserie/Bistrot</i>	62.5%	58.8%	64%	67.8%
<i>Bouchon Lyonnais</i>	37.5%	47.0%	0%	3.6%
French cuisine	62.5%	58.8%	64%	35.7%
International cuisine	75%	64.7%	76%	82.1%
Fast food	18.7%	70.6%	40%	82.1%
Themed restaurant	25%	41.2%	36%	35.7%
Gastronomic restaurant	75%	47.0%	40%	25%
University/company restaurant eating frequency				
Between 4-5 times a week	6.2%	5.9%	24%	3.6%
Between 2-3 times a week	12.5%	17.6%	4%	7.1%
1-2 times a week	25%	5.9%	4%	14.3%
<1 time a week	12.5%	17.6%	20%	25%
Never	43.7%	52.9%	48%	50%
Lunch duration				
30 minutes or less	0%	0%	4%	7.1%
Between 30 – 45 minutes	43.7%	29.4%	28%	25%
Between 45 – 60 minutes	25%	17.6%	36%	39.3%
1 hour or more	31.3%	52.9%	32%	28.6%

100 G: refers to the focus group and the numbers (1, 2, 3, etc.) to the group session.

101

102

103 2.2. Focus groups

104 Consumers were involved in a semi-structured discussion about their eating out habits and food
105 representations at different consumption contexts.

106 Each session included from 5 to 10 consumers, for a total of 12 sessions conducted. Each session
107 lasted for about one hour and a half to two hours.

108 Sessions followed a pre-defined guideline structured as follows:

109 a. Introduction and consent form signature: Consumers signed a consent form before the
110 discussion started (see Appendix 4).

111 b. Pictures classification game: Consumers, in subgroups of 2 or 3 people randomly created were
112 asked to sort pictures of different consumption contexts following their own personal criteria.

113 24 pictures were presented including regular places of consumption: fast-food chains, tapas

114 restaurants, semi-gastronomic restaurants, gastronomic restaurants, school or workplace
 115 cafeterias, international restaurants, *brasseries*, etc. We also included pictures of consumer
 116 tests in order to collect information about what consumers think of those particular contexts.
 117 The pictures were selected in order to lead the consumers to familiarize with the activity and
 118 as a start point for the discussion. After 10-15 minutes, each group presented their own
 119 classification and they started the discussion for approximately one hour and a half.

- 120 c. Discussion: questions were asked by the moderator following the natural flow of the
 121 conversation. Three general themes were successively addressed:
- 122 i. Consumption contexts: personal experiences
 - 123 ii. Relationship between food preparation and consumption contexts
 - 124 iii. Relationship between food preparation and culinary skills
- 125 d. Short written questionnaire about eating out and culinary habits: filled out at the end of the
 126 session (see Appendix 5).

127 All focus groups were led by the same moderator who verified if the different topics set in the session
 128 guideline had been addressed.

129

130 **2.3. Data analysis**

131 All focus groups sessions were audio-recorded, and subsequently compiled and transcribed. Two
 132 complementary analyses were conducted to understand how consumers' representations about food in
 133 different consumption contexts may influence consumer experience:

- 134 1. *A thematic analysis* (Braun & Clarke, 2006): the corpus of each session was (i) vertically
 135 analyzed to identify the themes discussed within each session by each participant, and (ii)
 136 horizontally analyzed to identify how the themes were discussed within each session by all
 137 consumers. A horizontal comparison between the twelve focus groups sessions was then
 138 conducted to define the main themes.
- 139 2. *A lexicometric analysis*: this analysis aimed to identify the main differences in terms of
 140 discourse between the two main variables: the location (Lyon and Paris) and the type of
 141 groups (students and non-students) among the twelve groups (G) (Dransfield, 2004). This
 142 method is designed to analyze the lexical organization and association of the words used by
 143 the consumers and its semantic mapping (Cerisier, Haas, & Kalampalikis, 2017). To perform
 144 this analysis, each focus group session was coded and analyzed using iRaMuTeQ - a R
 145 interface for multidimensional text analysis and questionnaires - (iRaMuTeQ 0.7 alpha 2, ©
 146 2008-2014 Pierre Ratinaud). This software:
 - 147 a. Segmented the corpus using the punctuation marks presented in the corpus - in our
 148 case each segment was a line break - and coded the words using an internal
 149 dictionary (adjectives, verbs, nouns, etc.)

- 150 b. Reduced the words to their roots forms (Lemmatisation): verbs to the infinitive,
151 nouns to singular, etc.
- 152 c. Analyzed the text through: correspondence analysis (CA) to identify the words
153 opposition and associations; top-down hierarchical cluster analysis (Reinert
154 method (Reinert, 1983) to define the main themes.

155

156 Data from the questionnaire about eating out habits (Table 1) were analyzed using (XLSTAT
157 Addinsoft (2019), statistical and data analysis solution. Paris, France).

158 All the analyses were performed in French and the final analyses were translated into an English
159 version. Only the correspondence analysis is presented in French.

160

161 **3. Results**

162 **3.1. Pictures classification**

163 From the twelve focus group, a total of thirty-three subgroups (SG) of two and three consumers were
164 randomly created and asked to sort the pictures of the different eating locations. Table 2 shows the
165 criteria used by the consumers to categorize the pictures from most to least cited:

166

167 **Table 2.** Pictures' sorting criteria.

Criteria	Number of subgroups (SG)
Physical context	14
Decoration	5
Ambiance	4
Desire to go or not	3
Price	2
Conviviality	1
Like or dislike	1
Time management	1
Time management and price	1
Industrial food versus traditional food	1

168

169

170 As it can be observed 14 subgroups used elements of the physical context to sort the pictures, whereas
171 just 1 subgroup sorted them by type of served food.

172

173 **3.2. Thematic analysis**

174 Six themes emerged from the thematic analysis: consumers' attitudes towards different food
175 consumption contexts, consumers' attitudes towards food ingredients and processes, affective
176 experiences, sensory experiences, knowledge experience and consumption habits. A detailed

177 presentation of each theme is provided in the following sections.

178

179 3.2.1. Consumers' attitudes towards different food consumption contexts

180 The game of picture classification led participants to express what the different contexts evoked in
181 terms of environment and served food. In general, all contexts aroused both positive and negative
182 attitudes that differed in some contexts depending on the location (Lyon and Paris) and group (non-
183 students and students). Table 3 presents the main differences among consumers' attitudes regarding
184 three main criteria: physical context, price and menu's variety.

185 Past experiences helped consumers to describe their positive and negative attitudes towards contexts.
186 The physical context had an important impact on consumers' attitudes when it comes to eating out at
187 different contexts, especially for those from Paris. Within the physical contexts consumers discussed
188 about the influence decoration and hygiene have on the way they perceived a particular context. The
189 price was also relevant, especially for the students' groups that show positive attitudes towards fast
190 food restaurants even if the quality was not as expected but the price was affordable. Conversely, the
191 non-students' groups focused on the quality/price ratio showing negative attitudes towards fast food
192 restaurants and in some cases towards *brasseries* and *bistros*. Another aspect that contributed to the
193 positive or negative attitudes towards the contexts was the variety of the menu and the number of
194 dishes presented on it, especially for the groups of students, mainly for those from Paris. Consumers
195 highlighted the lack of variety on school or workplace cafeterias.

196

197 3.2.2. Consumers' attitudes towards food ingredients and processes

198 Together with the attitudes towards consumption contexts, consumers widely discussed about the food
199 served in different contexts. Consumers associated the use of certain ingredients and processes to
200 different degrees of food quality: "*Food products are never the same in a restaurant, in a*
201 *canteen ...As part of a study maybe, but in the daily basis no.*" (woman, G2). Consumers agreed that
202 depending on the prize of the menu, it is possible to determine the quality of the served food in a
203 particular context as it was previously described.

204 Table 4 shows consumers' attitudes towards food in different consumption contexts by looking at five
205 different criteria: food price, quality and context; homemade and industrial products; their uses in
206 different consumption contexts and their origin and traceability.

207 Consumers made an important difference between two groups of products and processes: homemade
208 products related to fresh, tasty and local ingredients and, industrial products and processes related to
209 additives, chemicals and public scandals. Consumers associated the use of those types of products to
210 different contexts of consumption. In general, all consumers agreed that attitudes towards food
211 ingredients differed depending on the consumption situation, being the consumers from Lyon,
212 especially the non-students one the most demanding in terms of the use of fresh and local ingredients.

213 Moreover, aspects like the *origin of ingredients* and the traceability were also discussed by some of
214 the groups underlining differences attitudes between local producers and food retailers.
215

Table 3. Consumers' positive (+) and negative (-) attitudes towards different food consumption contexts

Criteria	Food consumption contexts			Consumer tests
	University & workplace cafeterias	Fast food & food trucks	Brasseries & Bistros	
Physical context	(+) convenience: highlighted by all groups (+) hygiene: highlighted by all groups <ul style="list-style-type: none"> “... sometimes it can be an advantage if you need to leave quickly. At the canteen or the self, we do not necessarily eat an incredible meal but it is the collective spirit we like” (woman, G5) 	(-) hygiene: highlighted by the groups from Paris <ul style="list-style-type: none"> “There are also hygiene concerns. Cafeterias, especially public cafeterias, are forced to follow standards while the bistros they do not really care” (woman, G11) 	(+) decoration: highlighted by non-students' groups (+) open kitchens: highlighted by students' groups <ul style="list-style-type: none"> “See the chef preparing our dishes, it is more and more associated to high standard restaurants” (man, G11) 	No comments about it
	(-) decoration itself: highlighted by non-students' groups <ul style="list-style-type: none"> “We do not want to go to the self, to the cafeteria, or places at the highway, where they have large tables badly organized, because it is not very friendly, it's all white and artificial lights with tasteless tables.” (woman, G3) 	(+) cheap: all groups agreed for the cafeterias but disagreed for the fast foods (-) expensive: highlighted by non-students' groups regarding the quality of the food. <ul style="list-style-type: none"> “It's not expensive at first sight, but then it's double price. My kids take the big, big McDonald and after they are hungry so that means I have to cook at home... And that makes you fat.” (woman, G1) “The food trucks are better than the fast food anyway. Especially compared to the price and the quality.” (man, G8) 	(+) correct for the groups from Lyon. More heterogeneous attitudes for the groups from Paris <ul style="list-style-type: none"> “In Paris, I doubt that in the brasseries everything is homemade. If there are local people, good Frenchs who eat there, it gives an idea of the quality of the food. However, if there are only tourists, it feels the tourist trap.” (man, G7) 	(+) correct for all groups <ul style="list-style-type: none"> “I know it is good because the price justifies what I'm going to eat. In a gastronomic restaurant my steak is going to be 10 times more expensive because it's going to be better, I know it.” (man, G9)
Menu's variety	(-) lack of variety for cafeterias: highlighted by all groups (+) seasonal products: for all groups, especially those of students, food trucks offer higher variety on their menu usually related to seasonal products. However, in the case of fast food, the lack of variety does not impact consumers' attitudes.	(+ / -) number of dishes: highlighted by the groups from Paris and non-students <ul style="list-style-type: none"> “A good indicator to know if a restaurant is good or not is the number of dishes presented on the menu... if there are only 6 dishes, it would more likely have fresh products and the menu will regularly change. It can have seasonal ingredients” (woman, G8) 	No comments about it	No comments about it

Table 4. Consumers' positive (+) and negative (-) attitudes towards food ingredients and processes in different food consumption contexts

Criteria	Food consumption contexts			Consumer tests	
	University & workplace cafeterias	Fast food & food trucks	Brasseries & Bistros		Gastronomic restaurants
Food quality, price & context	<p>University & workplace cafeterias</p> <p>University & workplace cafeterias highlighted by all the groups. The quality of the food is low by using the price as a predictor of the expected quality.</p> <ul style="list-style-type: none"> “I think that when we go to the cafeteria and we pay 3 euros, we will not have a blue cheese sauce as stylist as the one we can find in a restaurant.” (woman, G4) <p>(+) ratio food quality/price: highlighted by non-students' groups. They agreed that some efforts have been done and that depending on the workplace cafeteria and the company the quality could be ok.</p> <ul style="list-style-type: none"> “I believe that the workplace cafeterias are related to the prestige of the society too, so a higher effort is done” (man, G6) 	<p>Fast food & food trucks</p> <p>Fast food & food trucks highlighted by all the groups. The quality of the food is low by using the price as a predictor of the expected quality.</p> <ul style="list-style-type: none"> “I think that when we go to the cafeteria and we pay 3 euros, we will not have a blue cheese sauce as stylist as the one we can find in a restaurant.” (woman, G4) <p>(+) ratio food quality/price: highlighted by non-students' groups. They agreed that some efforts have been done and that depending on the workplace cafeteria and the company the quality could be ok.</p> <ul style="list-style-type: none"> “I believe that the workplace cafeterias are related to the prestige of the society too, so a higher effort is done” (man, G6) 	<p>Brasseries & Bistros</p> <p>(-) / (+) heterogeneous responses: consumers from all groups discussed that quality is not always related to price when it comes to this type of contexts. Specially the groups from Paris.</p> <p>(-) price of products represent for a restaurant:</p> <ul style="list-style-type: none"> “For the cafeteria it's almost too expensive buy at METRO. It's for everyday restaurants, not gastronomic ones because they do not buy there, but the rest.” (woman G1) 	<p>Gastronomic restaurants</p> <p>(+) high quality: highlighted by all groups. The quality is high by using the price as a predictor of the expected quality</p> <ul style="list-style-type: none"> “I will trust more a gastronomic restaurant so I could take a steak tartare for the first time I go because I estimate the price of the restaurant is related to the quality” (woman, G4) 	<p>Consumer tests</p> <p>No comments about it</p>
Homemade products & processes	<p>(+) better taste and healthy: highlighted by all groups, especially those from Lyon and the group of non-students underlined the importance of this type of products and preparations independently of the context of consumption.</p> <ul style="list-style-type: none"> “When a cake is prepared from good and seasonal ingredients it tastes better! Because a strawberry salad in the month of December ... cherries in the month of January ... it bothers me somehow” (woman, G4) “For me homemade is important, it means that a product has been made from natural ingredients, no chemicals or industrial components, it concerns especially the pastry” (woman G1) 				
Industrial products & processes	<p>(-) consumers' trust: highlighted by all groups. The recent scandals food industry has gone through made all groups shared negative attitudes towards those products and processes.</p> <ul style="list-style-type: none"> “We have less confidence in the food industry because we do not see what is really inside the products... When products are already packaged, we do not know what have happened before” (man, G11) “Too many scandals, too much chemicals, we do not know what they put in the end: the flavor enhancers, the salt ... Today we are in the excess of the chemical, of the artificial, so we move completely away from the homemade” (woman, G2) 				

<p>(-) frozen, vacuum and canned processes. Highlighted by all groups due to the use of additives, flavor enhancers, and colorants etc. Associated to a lower taste compared to homemade products.</p> <ul style="list-style-type: none"> • <i>“There is the chemical used to make chemical reactions to have a particular result like gelatin, and there are all the chemical stuff that are used to preserve the vegetables, to make them prettier, additives or flavor enhancers because the classic taste is not appreciated, etc.”</i> (man, G12) 	<p>(+) Homemade products: highlighted by all groups. Consumers agreed that due to the price of the restaurant, it is difficult to imagine the use of industrial products. And if this is the case, they will be of a higher quality and just for the side dishes.</p> <ul style="list-style-type: none"> • <i>“Going to a restaurant is a party! it’s like going to the cinema. So eating industrial products at home is not that bad, we need to eat, to feed ourselves. But at the restaurant, I want to remember what I eat, so not industrial products.”</i> (man, G7) 	<p>No comments about it</p>
<p>Use of products in different food consumption contexts</p>	<p>(-) Industrial product and processes: highlighted by the groups from Paris.</p> <ul style="list-style-type: none"> • <i>“It depends, there are frozen products of certain quality and there are others of poor quality. I think that in more neat restaurants, they use some frozen ingredients but of better quality”</i> (woman G3) 	<p>(-) Industrial product and processes: highlighted by most of the groups due to the amount of food should be prepare and the timing</p> <ul style="list-style-type: none"> • <i>“At the cafeteria food is made with vacuum or frozen products, so you cannot have the same taste that a product that is fresh, that comes from the market. Something that is already transformed and that has been waiting for days and days in vacuum bags, it cannot have the same taste as a product that has been just harvest...”</i> (man, G2)
<p>Origin & traceability</p>	<p>(+) quality and taste: highlighted by all groups.</p> <ul style="list-style-type: none"> • <i>“It’s the quality of the original foods that makes the difference. You can have a food truck where everything is bought at the market, the meat of the farmer of the corner and another food truck where all products are bought in Auchan, Leclerc, the retailer brand so you are going to have two food trucks, the same menu, except that the food will not have the same quality”</i> (man, G2) 	<p>(+) consumers’ trust: highlighted by the students’ groups from Paris. They argued that in some cases they trust more the industry when everything is well specifying in the label, than certain products from the market where no information is given.</p> <ul style="list-style-type: none"> • <i>“I can trust the small producer if it is clear regarding the transformation of his products, but I can also trust the industrial if the products have been well followed. For me, traceability counts”</i> (woman, G11)

209 3.2.3. Affective experiences

210 The affective experience refers to the emotions evoked when eating out in different contexts.
 211 Consumers agreed that different contexts provoke different feelings depending on the environment,
 212 company and food. *“If I go to the restaurant with my boyfriend, we will take a bottle of wine and we
 213 will have fun because we are both of us and we will enjoy this moment. While when we go with friends,
 214 we will go to a pizzeria, something a little cheaper in price, because the conviviality is more important
 215 than the quality, it is a moment of sharing with friends!”* (woman, G2)
 216 Conviviality and warmth environments were highlighted as key variables to enjoy a particular food
 217 experience. Consumers, especially those from Lyon and the groups of students insisted on it.
 218 Nevertheless, in the case of the gastronomic restaurants, the conviviality was not evoked in terms of
 219 affective experiences but the food did (Table 5).

220

221 3.2.4. Sensory experience

222 a. Flavor: In general, all consumers considered the flavor as a key factor of the food experience
 223 when eating out independently of the context. However, they agreed about the fact of being
 224 less demanding about it at workplace cafeterias or at the hospitals; and they related this to
 225 their lower level of expectations. Moreover, the group of non-students insisted more about the
 226 importance of the flavor than the students' groups. Both, non-students from Lyon and Paris,
 227 considered the flavor as a synonym of the quality of the food and they associated it to the term
 228 “authenticity”. *“Have you seen Ratatouille? when he closes his eyes, there is an explosion of
 229 colors, so for me cooking is that! you must be greedy, it must be an explosion where each taste
 230 is a note of color!”* (man, G9); *“Today we are looking for the taste, the authenticity of the
 231 taste of the product. If carrots smell like strawberries there is something wrong, either cooked
 232 or raw carrot must taste like carrot.”* (man, G2).

233 b. Presentation: Visual aspects were also highlighted, especially when eating at gastronomic
 234 restaurants. In general consumers (mainly those from Paris) underlined the importance of the
 235 presentation as a potential attractor to consume a particular dish. *“It is like at home. At home
 236 when you make to yourself a great dish and it is beautiful you enjoy it a lot. If you put the
 237 leftovers in a tapper, and you eat it the day after, it would be less good. That's because of the
 238 visual.”* (man, G11)

239 c. Texture: it was also mention by the consumers, especially from the groups of non-students.
 240 Ingredients such as meat, fish and vegetables were the object of most of the discussions,
 241 especially for those dishes prepared at workplace cafeterias. *“In dishes with a long cooking,
 242 the frozen vegetables will become a paste if they are not good, in addition to losing their
 243 vitamins and their taste, they will not even have a beautiful texture. So for this kind of dishes,
 244 we have to use real vegetables, to ensure the taste and texture”* (man, G8).

245

Table 5. Consumers affective experiences depending on different food consumption contexts

Criteria	Food consumption contexts				
	University & workplace cafeterias	Fast food & food trucks	Brasseries & Bistros	Gastronomic restaurants	
Conviviality & warmth environments	<p>University & workplace cafeterias</p> <p>(+) feelings associated to conviviality: highlighted by the students' groups</p> <ul style="list-style-type: none"> • <i>It is more the idea of conviviality that attracts me in the fast food than the food itself. When I'm alone I focus more on food and so it bothers me if go alone to the fast food"</i> (woman, G12) <p>(-) feelings associated to warmth environment: highlighted by al groups</p> <ul style="list-style-type: none"> • <i>"It's nicer to eat when there's room than when you hear the kids screaming like in McDonald's."</i> (woman, G4) 	<p>Fast food & food trucks</p> <p>(+) feelings: highlighted by groups of Lyon, specially the students' groups.</p> <ul style="list-style-type: none"> • <i>"I like the warmth, authentic, familiar theme, common to the bistros"</i> (woman G1) • <i>"I think it's in this type of restaurants where we share the best moments because we already ate well, we were on vacation or in the weekend so necessarily we are in a setting where we are well, posed and quiet"</i> (woman, G4) 	<p>Brasseries & Bistros</p> <p>(+) feelings: highlighted by groups of Lyon, specially the students' groups.</p> <ul style="list-style-type: none"> • <i>"I remember very, very well what I ate because I had never eaten such things before and I will always remember the quality of what I ate. However, I do not remember the conviviality of the moment. We are extremely isolated. It's not human. It is as if we are all alone with what we like, facing our plate. We are very distant."</i> (woman, G4) 	<p>Gastronomic restaurants</p> <p>(-) feelings: highlighted by some students' groups.</p> <ul style="list-style-type: none"> • <i>"we are as guinea pigs and they will adjust according to what we say."</i> (woman, G2) • <i>"I would feel isolated while there are people next to me"</i> (woman, G4) • <i>"I think that since there is no particular context, we are in the booths, isolated, perhaps we focus more on the product than on the context"</i> (woman, G6) 	<p>Consumer tests</p>
Food	<p>University & workplace cafeterias</p> <p>No comments about it</p>	<p>Fast food & food trucks</p> <p>No comments about it</p>	<p>Brasseries & Bistros</p> <p>(+) feelings: highlighted by non-students' groups.</p> <ul style="list-style-type: none"> • <i>"In a gastronomic restaurant we find the flavors, the taste, that's what make the status of a great chef, when food is made with love, passion."</i> (man, G7) • <i>"When I go to a gastronomic restaurant, I want to see a piece of art. So just by seeing the food, it will be wow!;, it will be amazing, great, another level!"</i> (woman, G1) 	<p>Gastronomic restaurants</p> <p>(+) feelings: highlighted by non-students' groups.</p> <ul style="list-style-type: none"> • <i>"In a gastronomic restaurant we find the flavors, the taste, that's what make the status of a great chef, when food is made with love, passion."</i> (man, G7) • <i>"When I go to a gastronomic restaurant, I want to see a piece of art. So just by seeing the food, it will be wow!;, it will be amazing, great, another level!"</i> (woman, G1) 	<p>Consumer tests</p> <p>No comments about it</p>

244 3.2.5. Knowledge experience

245 All groups discussed about what different terms such as homemade, industrial and quality means. For
 246 the homemade definition, certain differences were observed between non-students and students'
 247 groups, being the latter less demanding about what the homemade definition entails. However, for the
 248 industrial product and process definition, there was a consensus among all the groups. Moreover,
 249 consumers related both concepts to different degrees of quality.

- 250 a. Homemade: In general, homemade was defined as *“something done from A to Z. I expect a*
 251 *certain standard in terms of quality of raw materials. It's not taking all the time the eggs, the*
 252 *flour, the milk at first price. If you do things with fruits, you use seasonal fruits, local. And the*
 253 *person who does it, does everything, buys them, prepares the dough, cooked, etc.”* (woman,
 254 G5). However, some consumers underlined that there was a controversy about the use of the
 255 term: *“There is an administrative nuance. It is said that when the products arrive and are*
 256 *assembled in the kitchen or at the lab they can be also considered as a homemade product”*
 257 (woman, G2).
- 258 b. Industrial: consumers described industrial products and industrial feeding as *“... transformed,*
 259 *canned products”* (man, G2); *“They are the frozen products”* (woman, G7); *“Industrial*
 260 *feeding are fast foods, self-service, catering and cafeterias usually associated with junk food.”*
 261 (woman, G9).
- 262 c. Quality: consumers associated those type of products and processes to the definition of quality;
 263 more specifically they associated homemade products to a higher quality whereas the
 264 industrial products to a lower quality: *“It's the fact of having homemade products, fresh*
 265 *products, with a chef behind, even if it's not a super chef, but who knows how to do the right*
 266 *dishes and not just the industrial reheating like plenty of restaurants in Paris do.”* (man, G8).
 267 Moreover, the term quality was also associated to the flavor of ingredients, the pleasure and
 268 the sensory experience, especially for the groups from Lyon *“In fact if we remember what we*
 269 *ate, it means that it was good! The quality was there, there was the homemade behind! There*
 270 *is the pleasure, it is a tasty experience!”* (man, G2).

271

272 Moreover, consumers associated those terms to the logistics of certain consumption contexts and the
 273 level of training of the chefs:

- 274 a. Contexts association: all groups associated the use of industrial products and processes to big
 275 consumption contexts such as fast food chains, cafeterias, or hospitals, due to the large volume
 276 of meals served. *“We wanted to eat at the cafeteria because the chef prepared for 80 people.*
 277 *You saw the trucks of fruits and vegetables arrived and it was super good. Then, 300 new*
 278 *employees arrived and everything change. We switched to processed food, to go fast. So no*
 279 *more the same cooking and staple foods.”* (woman G9).

280

281 b. Training level: some consumers questioned the expertise of chefs in institutional contexts and
 282 fast food chains. *“Even at the training level, I do not think people are trained to make bulk*
 283 *homemade dishes. I think most of the chefs who are in the university restaurants are not*
 284 *necessarily very well trained, or they are not necessarily really good chefs, with enough*
 285 *training that allows them to make many homemade dishes and desserts for everyone”*. (man,
 286 G11).

287

288 Another interesting aspect highlighted by the consumers was their knowledge about consumer tests.
 289 Most of the consumers (specially students) did not know what was exactly done in those contexts but
 290 some others (especially non-students) already had an idea about what are the objectives of those tests
 291 and how they actually work. *“There is either food or drink, and we compare 3 or 4 samples of the*
 292 *same product from different brands or suppliers, and that allows us to compare the same product. It is*
 293 *good to realize that within food manufacturers there are differences among the same product.”* (man,
 294 G8).

295

296 3.2.6. Consumption habits

297 Consumption habits were mainly related to culinary skills, the use of products at home and the eating
 298 occasions. Some differences were observed in terms of gender and between groups.

299 a. Culinary skills: consumers, especially non-students’ women from Lyon, discussed about the
 300 importance of cooking and the influence that this action has on the level of expectations and
 301 demands when eating in different contexts. *“I cook a lot at home, fresh for what I can. So if I*
 302 *go to the restaurant, I want the same quality or better. We also know how to judge a product.”*
 303 (woman, G1).

304 b. Products: consumers, especially those from Paris, reported to use industrial products at home
 305 even if they expressed negative attitudes towards them. The group of non-students argued that
 306 due to time constrains, this type of products is more convenient as family dinners can be
 307 prepared in a short period of time; whereas for the group of students there was also a question
 308 of price. *“There are certain products or vegetables that are well frozen. I use them from time*
 309 *to time and that's good. And sometimes we do not even have time to prepare so they are*
 310 *convenient”* (woman, G9). Conversely, all c agreed that they did not want to have those type
 311 of products at a restaurant because they consider the fact of go out to eat a special occasion:
 312 *“...go to a restaurant to eat 100% frozen products? no, thanks. I prefer to go to McDonald's*
 313 *because this is not what we expect when we go out.”* (woman, G2).

314 c. Occasions: Consumers’ food habits regarding different consumption contexts were associated
 315 to different occasions, company and time. *“I can go to medium standard restaurants when I*
 316 *am with a friend or friends, and I can go to a big and fancy restaurant for an event, a birthday,*
 317 *a family party, because I want to have a service of quality. If I'm all alone and I have a*

318 *craving, I go to McDonald's to have a burger, fries and a small beer and I love it too."*
 319 (woman, G3). Students, especially those from Paris, reported to go to the fast foods or
 320 bakeries at lunch break even if their attitudes towards this type of food were negative: "*It*
 321 *depends. Either I prepare the lunch the night before, or I go to a fast food, or sandwich bar"*
 322 (man, G10); "*We go to the bakery to grab sandwiches before going to class.*" (woman G11).
 323 They associated this type of contexts as convenience when they do not have time to eat or to
 324 prepare at home.

325

326 3.3.Lexicometric analyses

327 The software was able to analyze the 95.95% of the segmented corpus as expressions like "wow",
 328 "ehhh", "mmm" were not recognized. A correspondence analysis together with a top-down
 329 hierarchical cluster analysis was conducted giving as a result five different clusters. Figure 1 shows the
 330 associations and oppositions of the words used by the consumers and that contributed to the creation
 331 of the five clusters.

332 We can observe in Table 4 that 56.1% of the analyzed segments refers to what we named
 333 "consumption contexts and eating experiences" (clusters 2, 3 and 5) whereas 43.7% refers to what we
 334 named "food ingredients and food preparation" (clusters 1 and 4). Concerning the consumption
 335 contexts and eating experiences category, three clusters opposed to each other. Cluster 3 (22.6%) and
 336 2 (15.1%), named "affective experience" and "food quality & price" respectively, refer to consumer
 337 experience; whereas cluster 5 (18.4%), refers to "consumptions contexts". Concerning the food
 338 ingredients and food preparation category, we found two clusters. Cluster 1, named "food processes
 339 and preparation", represents a 25.4% of the segmented corpus and cluster 4, named "food ingredients
 340 and origin" represents a 18.3% of the segmented corpus. The chi-squared (X^2) of the significant
 341 vocabulary and variables (Lyon, Paris, students and non-students) that contributed to the creation of
 342 each cluster are also presented. The chi-squared represents the relationship between the words used in
 343 the creation of the cluster.

344 Cluster 3, 2 and 5 shows consumer experience when eating out in different consumption contexts.
 345 Clusters 3 and 2 are more oriented to the eating out experience whereas cluster 5 is more associated to
 346 the different contexts of consumption. Cluster 3 refers to the notions of affective experience. Two
 347 focus groups (G) from Lyon: G4_Student ($X^2 = 24.56$) and G1 (non-student) ($X^2 = 2.18$) contributed
 348 to the creation of this cluster. Verbs such as "go" ($X^2 = 132.89$), "eat" ($X^2 = 103.3$), "enjoy" ($X^2 =$
 349 80.43), refers to the fact of "go out" for eating. Moreover, nouns and adjectives such as "boyfriend"
 350 ($X^2 = 55.88$), context (51.84), appreciate (42.22), moment (40.5) also contributed to the creation of
 351 this cluster. Cluster 2, contrast with cluster 3 regarding the type of experience perceived by the
 352 consumers. Focus groups of students from Paris: G10 ($X^2 = 23.21$), G12 ($X^2 = 5.53$), and from Lyon:
 353 G5 ($X^2 = 12.46$) contributed to the creation of this cluster. "Price" ($X^2 = 361.03$) was a powerful
 354 semantic attracter together with "pay" ($X^2 = 315.74$), "euro" ($X^2 = 239.44$), and "expensive" ($X^2 =$

355 202.88). Those words were also related to the perceived “quality” ($X^2 = 98.26$), and the
356 “gastronomical” experience ($X^2 = 79.12$). Three focus groups from Paris, two of non-students: G8 (X^2
357 $= 21.07$) and G9 ($X^2 = 10.02$) and one of students, G12 ($X^2 = 4.68$), and two focus groups of students
358 from Lyon: G6 ($X^2 = 5.89$) and G4 ($X^2 = 2.44$) contributed to the creation of cluster 5. Cluster 5 was
359 characterized by the use of nouns and adjectives associated to different consumption contexts and the
360 ambiance those places evoke. Words such as “food truck” ($X^2 = 226.27$), “fast food” ($X^2 = 138.92$),
361 “consumer’s tests” ($X^2 = 68.99$), “bistro” ($X^2 = 63.22$) refers to contexts whereas “friendly” ($X^2 =$
362 59.15), “warmth” ($X^2 = 50.26$) refers to the ambiance.

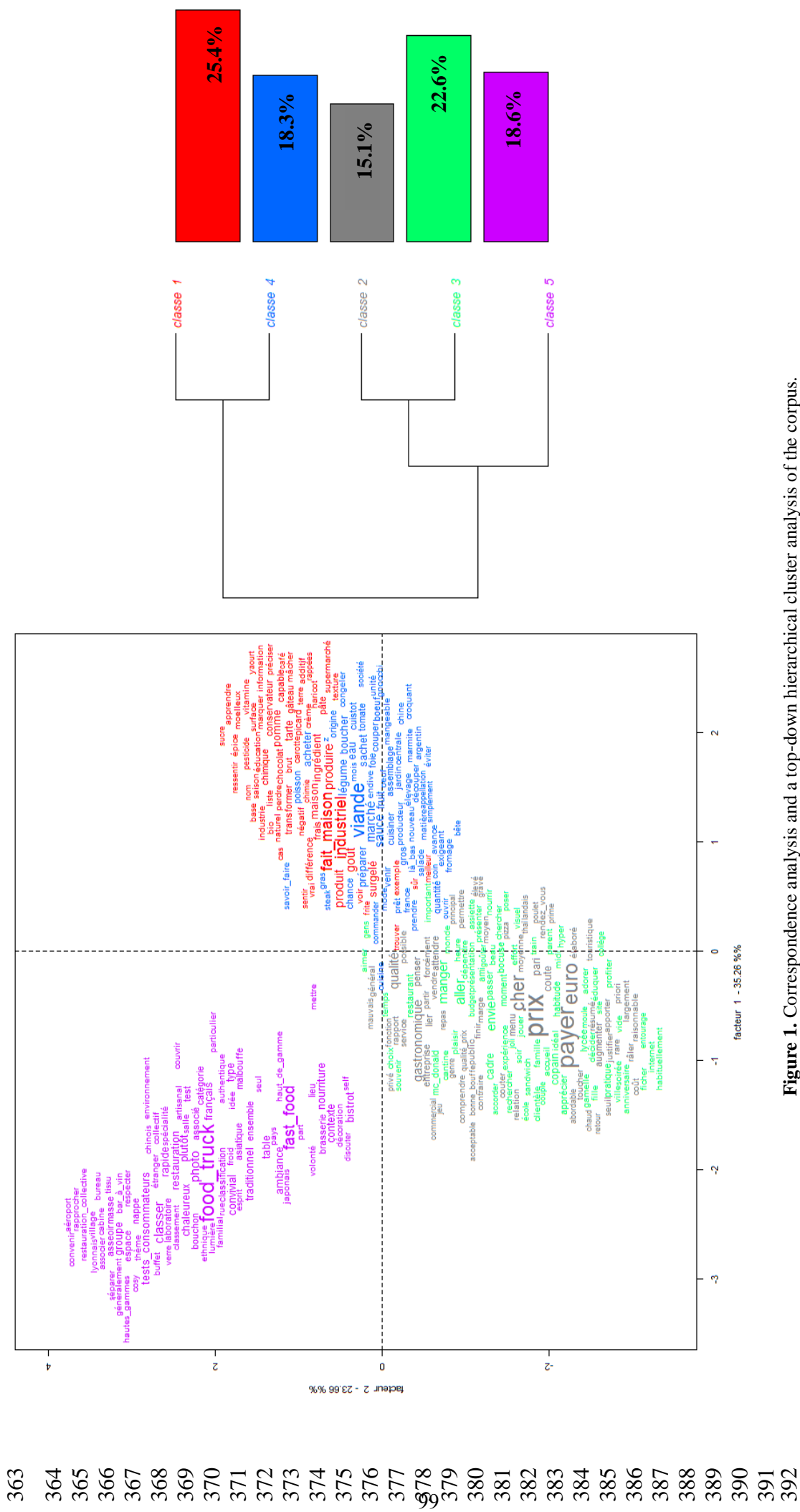


Figure 1. Correspondence analysis and a top-down hierarchical cluster analysis of the corpus.

393 Cluster 1 and 4 differed from clusters 3, 2 and 5 as they were associated to the food ingredients and
394 food preparation items. The three focus groups of non-students from Lyon, G1 ($X^2 = 2.68$), G2 ($X^2 =$
395 32.71) and G3 ($X^2 = 3.81$) contributed to the creation of cluster 1, and the focus group G2 ($X^2 = 6.09$)
396 contributed to the creation of cluster 4. In cluster 1 we found words associated to food processes such
397 as “homemade” ($X^2 = 149.3$), “industrial” ($X^2 = 141.05$), “produce” ($X^2 = 77.53$), “taste” ($X^2 = 74.02$),
398 “frozen” ($X^2 = 72.45$) that underline the differences consumers make when eating in different contexts,
399 and the attitudes towards those processes as well as the knowledge consumers have about them. In the
400 case of cluster 4, the use of nouns and verbs related to ingredients and origins characterized it. We
401 found nouns such as “meat” ($X^2 = 203.18$), “sauce” ($X^2 = 81.82$), “vegetable” ($X^2 = 63.45$), “market”
402 ($X^2 = 86.4$), “butcher” ($X^2 = 49.43$), and verbs such as “prepare” ($X^2 = 73.59$), buy ($X^2 = 40.21$), and
403 cut ($X^2 = 30.11$).

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430 **Table 6.** Summary of the global analyses performed by iRaMuTeQ.

		Clusters	Significance presences of words (X^2)	Variables (X^2)
Cluster organisation (95.95% segments analysed)	Consumption context & eating experience (56.1%)	Eating experience (37.7%)	Cluster 3: Affective experience (22.6%) Go (132.89), eat (103.3), envy (80.43), boyfriend (55.88), context (51.84), appreciate (42.22), spend (41.19), moment (40.53), practical (36.35), institute (35), friend (34.45), mc_donald (34.17), restaurant(32.45), habit (32.11), Bocuse (30.31)	G4_Lyon_Student (24.56), G1_Lyon (2.18)
		Cluster 2: Food quality & price (15.1%)	Price (361.03), pay (315.74), euro (239.44), expensive (202.88), quality (98.26), gastronomical (79.12), cost (55.45), bet (44.11), increase (39.38), expect (30.8), menu (30.63), company (30.21), associate (29.99), think (29.84)	G10_Paris_Student (23.21), G5_Lyon_Student (12.46), G12_Paris_Student (5.53)
	Consumption contexts (18.4%)	Cluster 5: Consumption contexts	Food_truck (226.27), fast_food (138.92), classify (90.03), picture (76.04), consumer_test (68.99), rather (67.77), bistro (63.22), restoration (62.93), food (62.68), friendly (59.15), fast (58.69), table (53.24), traditional (52.31) ambiance (52.18), warmth (50.26), group (48.41), type (47.39), French (45.58), context (44.3), bouchon (41.94), place (40.22), classification (38.44), laboratory (38.2), nap (38.2), space (35.16), mass (35.16), junk_food (34.92), Asiatic (33.88), category (33.88), associate (33.88), test (31.44), brasserie (31.27), sit (30.75), together (29.9), put (27.86)	G8_Paris (21.07), G9_Paris (10.02), G6_Lyon_Student (5.89), G12_Paris_Student(4.68), G4_Lyon_Student (2.44)
	Food ingredients & preparation (43.7%)	Cluster 1: Food process & preparation (25.4%)	Homemade (149.3), industrial (141.05), product (79.61), produce (77.53), taste (74.02), frozen (72.45), ingredient (52.93), apple (50.27), pie (49.33), home (48.98), Picard (42.93), fresh (41.06), difference (38.99), cake (38.37), preservative (36.75), dough (36.46), chocolate (32.77), transform (31.72), chemical (30.87)	G2_Lyon (32.71), G3_Lyon (3.81), G1_Lyon (2.68),
		Cluster 4: Food ingredients & origin (18.3%)	Meat (203.18), market (86.4), sauce (81.82), prepare (73.59), vegetable (63.45), bag (58.47), fruit (58.44), water (49.66), butcher (49.43), buy (47.5), origin (42.79), cook (40.21), fish (38.95), tomato (38.04), big (38.01), chef (34.6), assembly (34.29), come (33.15), foie (31.4), chance (30.65), cut (30.11), beef (29.88), quantity (28.86)	G2_Lyon (6.09)

431 G: refers to group; Numbers (1, 2, 3, etc.): refers to the group session

432

433 **4. Discussion**

434 The objective of this study was to understand how consumers' representations about food in different
 435 consumption contexts could influence consumers experience. This could help to assess the possible
 436 differences in hedonic responses found in context studies.

437 Overall, French consumers described a good meal experience as one that involves a convivial
438 environment, the use of natural and tasty food products, and a good quality and price ratio.
439 Conviviality was pointed out as one of the most important factors for French consumers' when
440 describing food experiences something that has been confirmed by Fischler & Masson (2008).
441 This study reveals that consumer experience in a given food consumption context integrates
442 environment and product-related variables in a way that is specific to that given context.
443 Environmental-related variables such as the physical context, environment and decoration, were
444 included as part of the consumer experience when evoking gastronomic and local restaurants together
445 with product-related variables such as presentation and preparation. Conversely, in contexts such as
446 workplace or school cafeterias, those variables (environmental and food-related) were not
447 spontaneously associated to consumer experience, except with regards to conviviality. Consumers
448 showed negative attitudes towards those contexts mainly related to the poor food variety and
449 presentation; and the poor physical characteristics of the context. Those results are in line with
450 previous studies that showed consumers' negative attitudes towards this type of institutions, referring
451 to them as "Institutional stereotyping" (Cardello, Bell, & Kramer, 1996; Edwards, 2013).
452 When looking at the role of conviviality on context studies, both positive (Muñoz et al., 2018) and
453 negative effects on consumer experience have been observed (Di Monaco, Giacalone, Pepe, Masi, &
454 Cavella, 2014). It should be highlighted that consumers underlined the lack of conviviality that
455 consumer tests convey and argued that those contexts cannot offer a full meal experience. This result
456 could explain why in controlled conditions consumers' hedonic responses tend to be lower compare to
457 more natural consumption contexts.

458 Beliefs and expectations towards consumption contexts were associated to different types of products
459 and processes. Consumers associated school cafeterias, fast food restaurants – and in the case of
460 Parisian groups, brasseries and bistros – to the use of industrial products including frozen, canned as
461 well as vacuum products. Consumers insisted that due to the volume of the served food and prices, it is
462 difficult to find fresh and natural ingredients in those contexts, especially in the school cafeterias and
463 food chains. Previous studies have associated consumers' negative attitudes and beliefs towards
464 institutional meals, arguing that good food quality cannot be expected when considering the volume of
465 the food produced and the low price of the menu (Cardello, Bell, & Kramer, 1996; Edwards &
466 Hartwell, 2009; Edwards, 2013). Conversely, small and gastronomic restaurants were associated to the
467 use of fresh, seasonal and local ingredients as well as homemade prepared dishes. Consumers believed
468 that due to the price they pay for the food, the quality of the ingredients and preparations have to be
469 accorded. They expected to find those ingredients when they go to a restaurant. From those results two
470 main findings could be highlighted. First, food value (associated to the price paid for food) seems to
471 have an important effect on consumers' meal experience related to consumer satisfaction. Consumers
472 expect to have a meal that corresponds to the fair price they have to pay for it (Timothy et al., 2016).
473 Second, those results confirm the actual trends that show a higher interest about natural, bio and local

474 ingredients (Agence Bio & Spirit Insight, 2019) not only in terms of consumer goods but in terms of
475 meal experiences. According to the food service study carried out in 2013 by GIRA Conseil (2013),
476 French consumers look at the quality of the ingredients more than before due to the scandals
477 associated to the food industry and they search to go back to the traditional processes. Considering
478 those two results consumers' expectations towards different consumption contexts may differ not only
479 with regards to the physical context but to the food value and ingredients they expect or think to find
480 in a particular context. Hence, in consumer tests, where no food value may be perceived and
481 consumers showed to have negative attitudes towards the products or ingredients used, it could be
482 assumed that consumers' hedonic responses may differ compared to other contexts.

483 Taste was also highlighted by the participants as one of the most important factors of the meal
484 experience. However, the role of taste on consumer experience seems to differ depending on the
485 context of consumption. In a workplace or school cafeteria taste was not as important as in a restaurant
486 like brasserie, bistro or gastronomic restaurant. It was the same for the visual aspects of the product
487 and texture. This arises the question about comparing hedonic responses between different
488 consumption contexts where consumers' product evaluation may differ depending on the context.

489 The lexicometric analysis showed clear differences regarding consumers' region and type of
490 population. The groups from Paris focused their discourse on context-related variables whereas the
491 groups from Lyon focused more on product-related variables. This could be explained by the
492 particularities of the "lyonnaise cuisine" compared to the more general "French cuisine" that can be
493 found in Paris (Fischler & Masson, 2008). Moreover, it should be mentioned that Lyon has a specific
494 gastronomic culture and environment that have been appropriated by the local population, as
495 participants have mentioned during the discussions. Clear differences were also observed in the
496 discourse students and non-students' groups built. Students groups highlighted the importance of
497 conviviality when eating out as well as the price, whereas the non-students underlined the quality of
498 the food and the authenticity of the ingredients. Those differences between what is important when
499 eating out could be explained by generational and consumption habits differences and preferences as
500 previous studies have shown regarding consumer behavior (Ferzacca et al., 2013; Urdapilleta, Dany,
501 Boussoco, Schwartz, & Giboreau, 2016).

502 As for any qualitative test the results of the study cannot be generalized but they reveal some
503 important insights about this regional groups and populations.

504

505 **5. Conclusion**

506 This study reveals that consumers' representations about food in different contexts contribute to
507 consumer experience. Beliefs and expectations towards a particular context of consumption are
508 intimately related to the beliefs and expectations towards the food served in that particular context.
509 Consumers expect to find natural, fresh, local ingredients in small and gastronomic restaurants,
510 whereas they expect or think to find processed food at workplace or school cafeterias and food chains.

511 Therefore, we could hypothesize consumers' expectations about food may influence their experience
 512 in a particular context and in turn, their evaluation. Additionally, this study shows that the relative
 513 contribution of contextual variables to consumer experience differ depending on the consumption
 514 context. Thus, context studies may pay careful attention on the inferences made about the presence or
 515 absence of contextual variables when comparing context studies as these variables may not have the
 516 same weight depending on the context and the studied population. Hence, it is important to identify
 517 and characterized the studied population and then, understand what are the contextual variables that
 518 matter for their consumer experience in each particular context in order to be able to explain context
 519 effects on hedonic responses.

520

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525

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- 597

3. Supplementary data

A similarity analysis was also conducted together with the correspondence analysis and top-down hierarchical cluster analysis. This analysis was also performed to iRaMuTeQ - a R interface for multidimensional text analysis and questionnaires - (iRaMuTeQ 0.7 alpha 2, © 2008-2014 Pierre Ratinaud). This analysis was conducted to understand how words were associated within participants' discourse and the differences between the groups variables: Lyon versus Paris, and students versus non students. This similarity analysis was performed base on co-occurrence (when two or more words are used simultaneously in the same statement).

Figure 1 shows the discourse structure of the groups from Lyon and Figure 2 the discourse structure of the groups from Paris. We observed that in Lyon “manger” that means “eat” and “aller” that means “go” are much closer than in the groups from Paris whereas both groups related “cantine” that means “canteen” to the verb “eat” (“manger”) whereas the verb “go” (“aller”) was related to “restaurant”. “Restaurant” was associated to the verb “penser” that means “think” by the groups from Lyon, whereas it was associated to the verb “voir” that means “see” by the groups from Paris. Regarding the verb “go” (“aller”), the groups from Lyon associated this verb to “qualité” that means “quality” and “quality” to “produit” that means “product”, whereas the groups from Paris associated this verb first to “product” and then to “quality”, and this to the notions of fast food and food trucks.

Figure 3 shows the discourse structure of the groups of non-students and Figure 4 the discourse structure of the groups of students. A clear visual difference regarding the structure of the discourse is observed between both groups. The groups of non-students discussed at the same time about “go” (“aller”) and “eat” (“manger”) whereas in the groups of students there is a clear distance between both verbs. Non-students associated “go” and “eat” to “restaurant” and from there they discussed about the “product” (“produit”) and the “quality” (“qualité”). Moreover, restaurant was associated to the word “chose” that means “thing” and this with the word “gout” that means “taste”, that was related at the same time to the word “sentir” that means “feel”. Conversely the groups of students, mainly discussed by using the verb “go” (“aller”) and from there they discussed about going to a “restaurant”; going to “eat” (“manger”) and going to the “cantine” (“cantine”). Additionally, the verb “go” was also associated to the verb “think” (“penser”). Moreover, contrary to the non-students' groups they discussed first about the “quality” that lead them to discuss about the “product” (“produit”) what was also related to “homemade” (“fait maison”).

Those results give an idea about how the different thinking process of the groups was built during the focus groups discussion.

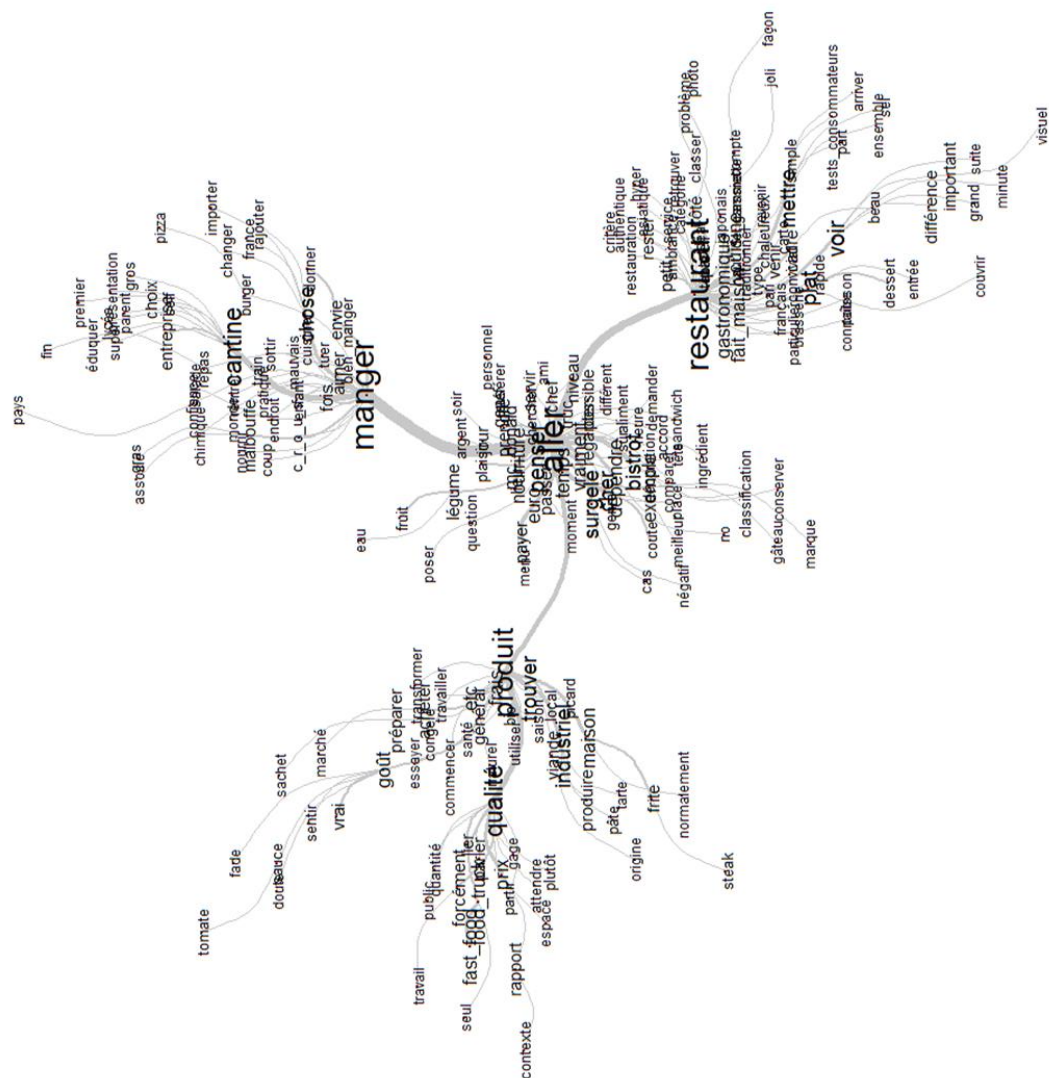


Figure 2. Similarity analysis for the groups from Paris.

4. Conclusion

The main objective of this chapter was to examine if consumer experience was influenced by consumers' representations about food in different consumption contexts.

To achieve this objective twelve groups of discussion (n = 86) were conducted in two different regions Paris and Lyon with two different populations: students and non-students.

Hypothesis 1: context-related variables could have a different weight on consumer experience depending on the contexts.

Differences in context-related variables were observed between contexts of consumption and they were associated with consumers' positive and negative attitudes. Conviviality was highlighted as one of the most important variables when eating out independently of the context of consumption. However, not all consumers experience it in the same way depending on the context, especially as regards gastronomic restaurants where some students described as cold environments. Decoration was highlighted and positively evaluated when consumers discussed about gastronomic restaurants whereas it was not the case for the workplace and school cafeterias, and fast food chains. Regarding consumer tests, consumers showed negative attitudes towards those contexts when discussing about food experience. Consumers agreed that such context cannot be described or considered as a food experience due to the lack of conviviality and served food.

Hypothesis 2: consumer-related variables could be intimately related to the served food in a particular context.

Differences in product-related variables were observed between contexts of consumption and they were associated to consumers' expectations and beliefs towards the served food. An important discussion between homemade and industrial products were set by the consumers who related the former to natural, local, seasonal and tasty ingredients; whereas the latter was associated to the use of chemical ingredients, food industry scandals and unhealthy ingredients. Consumers also associated the use of these two type of products and processes to different contexts of consumption according to the volume and price of the food offer. Local and gastronomic restaurants were associated to homemade preparations whereas workplace cafeterias and fast food chains were associated to industrial processes.

Hypothesis 3: differences between the two regions could be observed in terms of context and product-related variables due to gastronomic cultural differences.

The quantitative analyses allowed to identify differences among the groups from Paris and Lyon. The groups from Paris were more focused on different context experiences related to the decoration and to the price of the menus. Conversely, the groups from Lyon were more focused on product-related variables such as food preparation and the use of ingredients. Both regions agreed about the

importance of conviviality within the consumer experience.

Hypothesis 4: differences between the two groups of populations could be observed in terms of consumer experience due to consumption habit differences.

As in the case of the regions' comparison, the quantitative analysis showed differences in the discourse that students and non-students had when describing meal experiences. The students' groups were more focused on the affective experiences and the price that eating-out entails that non-students' groups who focused more on the quality of the food. Moreover, differences in terms of culinary skills were observed between both populations what may explain the difference in terms of consumer experience between the students and non-students' groups.

The present study shows that consumers' representations about food in different consumption contexts involves different contextual variables. In some contexts, consumers' representations about food may entail more product-related variables and price; whereas in others, environmental-variables such as the conviviality of the shared moment between friends may be more considered than the actual served food.

This reveals that when comparing context studies, consumer hedonic evaluation may be affected not only by the presence of contextual variables, but by the way in which those variables are integrated and matter for consumer experience.

This study also highlights the importance of consumers' beliefs and expectations towards the food served in a particular context. It shows that consumers associated different type of products to different type of contexts. Consumers, especially non-students, pay attention to the product characteristics, preparation and origin of the ingredients when eating out, considering those variables as part of the consumer experience. The negative attitudes consumers have shown towards industrial products and processes may not be fully considered when consumers perform a hedonic evaluation in a consumer tests. Therefore, special attention should be place on those variables when context studies comparisons are made.

PART D. EVALUATION TASK-
RELATED VARIABLES

Chapter 8. The role of the evaluation task on context studies

1. Introduction

The literature review (chapter 1 and 3) has shown that within the context effects, the evaluation task may play a major role on the way consumers evaluate and judge a product. However, in the studies looking at context effects, this variable has not aroused the same interest as other contextual variables such as environmental-related variables or product-related variables.

Differences in the type of evaluation task have shown to influence consumers' hedonic responses in controlled conditions. The number of questions (Prescott et al., 2011), order of presentation (Earthy et al., 1996) and formulation (Popper et al., 2004) have shown to influence consumers' perception so in turn, consumers' hedonic judgement. Those differences in consumers' hedonic judgement could be associated to framing effects where different characteristics of the food product may be highlighted depending on the way the evaluation task is presented (Kahneman, 2002). Then, consumers may point their attention towards those specific characteristics perceiving, and differently judging the food product according to the evaluation task.

Consumers' hedonic responses are usually collected through a global question about the overall liking of a product (synthetic evaluation task), or through a global question followed of a series of product' attributes ratings (analytical evaluation task). Those differences in the formulation of the hedonic evaluation task have shown controversial results regarding differences between hedonic responses (Figure 10). Some authors have found significant effects when analytical tasks are formulated (Earthy et al., 1996; Popper et al., 2004; Prescott et al., 2011), whereas others authors have not reported such effect (Gacula et al., 2008; Jaeger et al., 2013).

Those possible effects of the evaluation task on consumers' hedonic responses have interrogated sensory and consumer scientists. However, those questions have not been further investigated when it comes to context studies. Hence, if consumers' hedonic responses may be affected by the evaluation task in controlled conditions, **does the evaluation task influence hedonic responses in natural consumption context?**

This chapter aims to go a step further in the field of context studies and to bring some insights with regards to consumer hedonic evaluation in natural consumption contexts. As highlighted in the literature review (chapter 1): attention, experimental procedures and measurement tools are some of the evaluation task-related variables that may played a key role on consumer hedonic evaluation. One of the main differences related to the task between consumer tests in controlled conditions and natural

consumption contexts is the attention directed to the evaluation task in the former (Köster, 2009; Köster, 2003). Consumers in natural contexts may play indeed less attention to the evaluation task due to the presence of other contextual variables.

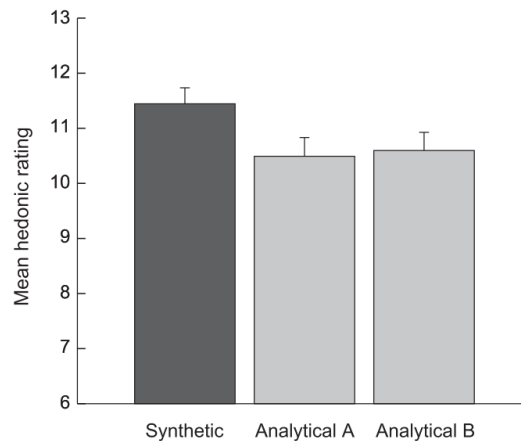


Figure 10. Mean ratings of overall flavor liking (and SEM) for a tea sample when comparing synthetic (overall liking only) and two analytical (overall liking plus attributes) evaluation tasks (Retrieved from Prescott et al., 2011).

Hence, when two different formats of the evaluation task (synthetic or analytical) would be presented in natural consumption contexts, larger differences between the hedonic responses of consumers should be found (Hypothesis 1).

Additionally, product-related variables have shown that culinary preparation had also an impact on consumer hedonic evaluation due to the changes on the sensory attributes of the product (De Graaf et al., 2005; Donadini, Fumi, & Porretta, 2012). Besides, as it was showed in the previous chapter, differences in the culinary preparation have been related to consumers' expectations for products or dishes in particular contexts. Thus, consumers may be more sensitive to potential differences originating from culinary practices.

Hence, the effect of explicitly asking consumer to rate sensory attributes in a natural consumption context would be even greater for products that involve culinary preparation than for ready-made products (Hypothesis 2).

To test this hypotheses, a comparison was made between two evaluation task formats (see Appendices 6 and 7): synthetic (overall liking scores) and analytical (overall liking scores plus sensory attributes ratings). Following a similar protocol of the one used by Prescott, Lee, & Kim, (2011), participants evaluated two products categories (pizza and bread) and three versions of a product within the same category (homemade, mixed, and readymade pizza) in a staff and university cafeteria.

This work is presented in Article 3 (short communication), submitted to Food Quality and Preference (April 2019).

- 2. Hedonic responses sensitivity to variations in the evaluation task and culinary preparation in a natural consumption context (Article 3)**

Title:

Hedonic response sensitivity to variations in the evaluation task and culinary preparation in a natural consumption context

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Abstract:

The potential influence of the presence of sensory attributes on hedonic responses has been subject to much debate recently. However, studies comparing task formats have been conducted in standardized contexts only. Conversely, context studies often overlook the nature of the evaluation task and its influence on consumers' hedonic responses. Following a protocol similar to the one used by Prescott, Lee, & Kim (2011), we aimed to assess whether synthetic and analytical evaluation tasks result in different hedonic responses when the test is conducted in a natural consumption context. To this aim, we compared the overall liking scores obtained either with a synthetic (hedonic question only) or with an analytical task (hedonic question plus intensity attributes) in a university cafeteria. Tested products were pizzas with different degrees of culinary preparation (homemade, industrial and a mixed of the two) as well as bread that served as a control. Liking scores of the homemade pizza were lower with the analytical task while the scores of the other two pizzas and the bread did not significantly change. This effect of the task format would lead to different product ranking and therefore to potentially different managerial decisions about which product to launch. Finally, these results suggest that hedonic responses to multicomponent products such as pizza were more sensitive to differences in the evaluation task than responses to bread. Expectations toward culinary prepared products may also be a mediating variable.

Keywords:

Consumer evaluation, hedonic response, synthetic task, analytical task, multicomponent food, culinary preparation

38 1. Introduction

39 Differences in hedonic responses to a given food product are often reported when comparing data
40 obtained in different evaluation contexts, such as laboratories, central location tests (CLT) or natural
41 consumption contexts (Galiñanes Plaza, Delarue, & Saulais, 2019). The effects of the physical
42 location, social facilitation or availability of food options are the most commonly suggested factors to
43 explain such differences. Köster has also suggested that the context of consumption could affect
44 consumers' sensitivity to product characteristics (Köster, 2009). Indeed, the differences in perception
45 may be more or less salient depending on the expectations and beliefs consumers may have towards
46 that particular context of consumption. In addition to this, consumers may experience dishes that have
47 undergone different degrees of culinary preparations depending on the context. For example, a regular
48 dish like "Bolognese pasta" may be differently cooked at home, at the cafeteria, or at the Italian
49 restaurant, which will in turn modulate the sensory characteristics of the product. This experience may
50 reinforce context-induced differences in perception arising from expectations and beliefs.

51 Test procedure and evaluation tasks may also contribute to the observed differences in the outcome of
52 hedonic test from one context to another. Indeed, studies considering hedonic responses in different
53 contexts do not always rely on comparable evaluation tasks and experimental procedures - hedonic
54 scales and questionnaires differ from one study to another and in some cases the procedure followed
55 also differs between contexts within the same study (e.g. at the CLT location the food is evaluated
56 after few bites, whereas at home the food is evaluated after a complete consumption) (García-Segovia,
57 Harrington, & Seo, 2015; Holthuysen, Vrijhof, de Wijk, & Kremer, 2017; Kozłowska et al., 2003;
58 Meiselman, Johnson, Reeve, & Crouch, 2000). This questions the nature and amplitude of context
59 effects themselves.

60 *Framing effects* - the fact that the responses to a question are linked to the way it is formulated
61 (Kahneman, 2002) - have been reported in several sensory studies. They include differences in
62 hedonic responses depending on: the number of questions (Jaeger et al., 2013; Spinelli, Masi, Dinnella,
63 Zoboli, & Monteleone, 2014), the order in which they are asked (Earthy, MacFie, & Hedderley, 1996)
64 or the way they are formulated (Popper, Rosenstock, Schraidt, & Kroll, 2004). Differences in the
65 formulation of the task have been related to differences in the accessibility to the attributes of the
66 evaluated product. This accessibility to differences attributes modulate the respondent's perception
67 and leads to different hedonic responses (Köster, 2003, 2009).

68 Common tasks for hedonic evaluation procedures typically require consumers either to make global
69 judgments (synthetic evaluation task) or to rate successively several sensory attributes in addition to
70 the overall liking score (analytical evaluation task). The choice of one task rather than another may
71 impact the hedonic evaluation itself. For example, Prescott et al., (2011) compared the hedonic
72 responses obtained either with synthetic or analytical evaluation of a product. They found that the
73 mean liking score was significantly higher when using a synthetic evaluation task than when using an
74 analytical evaluation task. The authors argued that asking several questions to consumers such as

75 rating sensory attributes may focus consumers' attention on specific product characteristics,
76 modulating their hedonic responses. However, such an effect has not always been observed (Gacula,
77 Mohan, Faller, Pollack, & Moskowitz, 2008).

78 It is thus worth noting that Prescott et al.'s results were observed in controlled testing conditions,
79 where consumers' attention is focused on the task, regardless of its complexity. It is not known
80 whether such effects would be similar in natural consumption contexts, where the attentional focus on
81 both the task and on products' characteristics may be less important. One can hypothesize that in such
82 conditions, the difference between synthetic and analytical evaluation tasks would be even larger
83 because of the additional cognitive cost of the latter. Moreover, we could assume that in a natural
84 consumption context, consumers would be more sensitive to potential differences originating from
85 culinary practices. Therefore, we could hypothesize that the effect of explicitly asking them to rate
86 those attributes in a natural consumption context would be even greater for products that involve
87 culinary preparation than for ready-made products.

88 In order to address these hypotheses, the first objective of this study was to assess whether the
89 differences between synthetic and analytical evaluation tasks replicate in a natural consumption
90 context. Following a protocol similar to Prescott, Lee, & Kim (2011) we examined consumers' liking
91 scores for food products using either a synthetic (overall liking) or an analytical evaluation task
92 (overall liking plus attributes intensity scale) in a student cafeteria. Secondly, the study aims to assess
93 the sensitivity of this effect to product type (i.e. culinary prepared or ready-made). The measures are
94 conducted on two products categories (pizza and bread) and three versions of a product within the
95 same category (homemade, mixed, and readymade pizza).

96 **2. Material and methods**

97 **2.1. Participants and procedure**

98 The study took place between the 8th of March and the 21st of March 2018 at the staff and student
99 cafeteria of the Ecole Centrale of Lyon, France (a higher education institute not related to food science
100 nor to consumer science). Participants in the study were recruited each day at lunchtime among the
101 consumers who had freely chosen one of the products (pizza and/or bread) that was the focus of the
102 study. At the checkout counter, they were asked whether they wanted to participate in a survey as part
103 of a research study, and if they could fill out a questionnaire on the food that they had freely selected.
104 A total of 456 questionnaires were collected at the end of the three days of study.

105

106 **2.4. Samples**

107 Two different products were selected to test the sensitivity of participants' responses to variations of
108 food preparation: bread and Margherita pizza. Bread was selected as a control product and it did not
109 suffer any changes as regards composition, weight and sensory characteristics during the study.
110 Conversely, Margherita pizza was selected because multiple modifications in terms of culinary

111 preparation could be done without altering its visual appearance. Moreover, the food service company
 112 running the cafeteria was also interested in their customers' opinion on pizzas.
 113 Three versions of Margherita pizza were prepared together with the chefs: a homemade Margherita
 114 pizza, a readymade Margherita pizza and an in-between 'mixed' Margherita pizza made with a
 115 readymade dough. These three types of pizzas were served respectively on three separate days to avoid
 116 any confusion in the preparation and potential comparison bias. Table 1 shows the differences among
 117 the three versions of pizza.

118

119 **Table 1.** Description of the main differences among the three versions of pizza.

	Day 1	Day 2	Day 3
Versions of pizza	Homemade	Mixed	Readymade
Dough	Prepared by the chef	Readymade	Readymade
Tomato sauce	Prepared by the chef	Prepared by the chef	Readymade

120

121

122 The evaluated samples consisted of 30g of bread (individual portion size) and 300g±5g of Margherita
 123 pizza (individual portion size). Each type of pizza was prepared and served in different days but
 124 following the same procedure. The homemade dough and tomato sauce were prepared a day before the
 125 service. From the homemade dough (four, yeast, water, salt), balls of 160g were cut to follow the same
 126 size of the readymade dough (*Mademoiselle Desserts St Renan, France*) and they were kept at 4°C in
 127 the fridge. For the tomato sauce, ingredients were mixed the day before (tomato, oregano, basil,
 128 pepper, olive oil) and they were also kept at storage at 4°C. The day of the study all preparations
 129 started at 6.30am. The oven was turned on at 350°C and set at speed of 2.5. Both types of dough
 130 (homemade and readymade) were kneaded by using a pizza dough "paver" and then placed on dishes
 131 where the tomato sauce, cheese and olives were added. The readymade pizza (*Marie surgelés, France*)
 132 followed the same last step of the protocol where the cheese and olives were added. The pizzas were
 133 cooked in the oven and stored in a refrigerator (4 °C) until the cafeteria was opened. Once the service
 134 started (11.30am) the pizzas were re-heated in the oven at 350°C and at speed 2 on demand.

135

136 **2.5. Evaluation task**

137 Following the protocol of Prescott, Lee, & Kim, (2011), we first asked participants about their liking
 138 on a 11-point hedonic scale with end-point descriptors (0 = dislike very much – 10 = like very much).
 139 For the analytical group, we also asked to evaluate a series of attributes related to the pizza or bread on
 140 a 11-point category scale with end-point descriptors (0 = very weak – 10 = very strong). The attributes
 141 asked were:

142

143

- 144 – Pizza: tomato flavor, saltiness, fattiness, cheese flavor, soft texture;
 145 – Bread: saltiness, yeast flavor, soft crumb texture, crispiness of the crust, crunchy dough.

146

147 2.6. Experimental design

148 Pizza and bread were available as part of the menu during the three days of study. However, the bread
 149 was only evaluated during the first two days. Each day, a comparison was made between the group
 150 receiving only the synthetic evaluation task and the group receiving the analytical evaluation task.
 151 Table 2 shows the design of the experiment regarding the products used and their respective culinary
 152 modification and the evaluation task.

153

154 **Table 2.** Experimental design.

	Day 1		Day 2		Day 3	
	Synthetic task	Analytical task	Synthetic task	Analytical task	Synthetic task	Analytical task
Pizza	Homemade		Mixed		Readymade	
Bread	No modification		No modification		No evaluation	

155

156

157 2.7. Procedure

158 Evaluations took place at the staff and student cafeteria of the Ecole Central of Lyon, France. Each
 159 evaluation was performed with a week apart. No information was given about the different versions of
 160 the pizza nor about the products concerned by the study and the cafeteria operated as usual without
 161 any change introduced. Participants arrived at the cafeteria from 11h30 to 14h00. The staff and
 162 students have the possibility to create their own lunch meal by choosing among three or four starters,
 163 four main dishes (pizza one of them) and several desserts. Once at the checkout counter, we spotted
 164 participants who had selected the concerned products on their trays and we asked them whether they
 165 wanted to participate in the study, and if they could fill out a questionnaire. Then, they were randomly
 166 given either a synthetic or an analytical version of the questionnaire. We told them to fill it while
 167 eating and to return it before leaving the cafeteria.

168

169 2.8. Data analysis

170 Liking data were analyzed using a two-way ANOVA with interaction, where the type of culinary
 171 preparation and the type of task were included as main effects. When the ANOVA showed a
 172 significant effect ($p < 0.05$), post-hoc LSD test was applied. Besides, for each product, the difference
 173 between the two types of task was tested separately using independent samples Student's t-test.
 174 (XLSTAT, Addinsoft (2019). statistical and data analysis solution. Paris, France).

175 Nota bene: we did our best to select different participants each day. However, as the study was

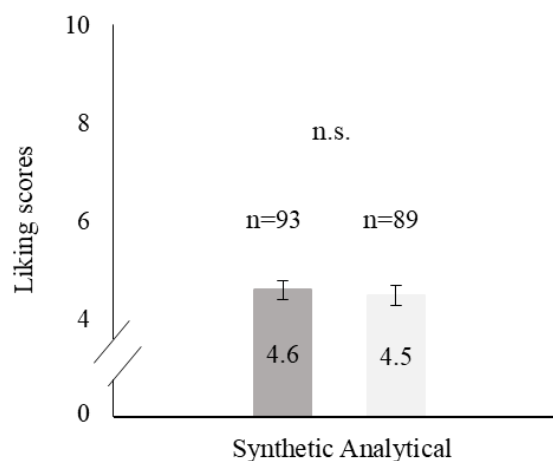
176 conducted in a natural consumption context, we cannot exclude that some participants took part of the
 177 study twice (e.g. on Day 1 and Day2). Should this have occurred, it would have been marginal. We thus
 178 treated the data from each day as independent groups.

179 3. Results

180 Figure 1 shows mean values for the liking scores for bread. There was no overall difference between
 181 the liking scores obtained with the two evaluation tasks ($t(180) = -0.435$, $p = 0.664$). Nor did we
 182 observe any session effect over the two days of study for both the synthetic ($t(87) = 1.039$, $p = 0.302$)
 183 and the analytical evaluation task ($t(91) = -0.959$, $p = 0.340$).

184 In the case of the Margherita pizza (Figure 2.A), there was no overall effect of the task format ($F(1,$
 185 $268) = 0.190$; $p = 0.663$). However, liking scores were significantly affected by the differences in the
 186 culinary preparation: the readymade version obtained the lowest liking scores ($F(1, 267) = 5.256$; $p =$
 187 0.006). The effect of the interaction between the culinary preparation and the task format was also
 188 significant ($F(1, 267) = 3.690$; $p = 0.026$): liking scores for the homemade version were significantly
 189 lower when participants performed the analytical evaluation task ($t(86) = 2.964$, $p = 0.004$). As a result,
 190 although the test was conducted in a pure monadic way, the final product ranking derived from such a
 191 test changes depending on the task format (Figure 2.B). Suppose a food service company tested their
 192 products with the synthetic task, they would have concluded that homemade was the best liked pizza,
 193 followed by the mixed (although not statistically different) and the readymade being the least liked.
 194 Whereas if they had used the analytical task they would have concluded that their regular ‘mixed’
 195 pizza would be liked significantly more than the other two.

196



197

198 **Figure 1.** Mean overall liking scores (and SEM) for the bread sample in the synthetic (overall liking only) and
 199 the analytical (overall liking plus attributes) groups. n refers to the number of participants in each testing
 200 condition. n.s. = not significant.

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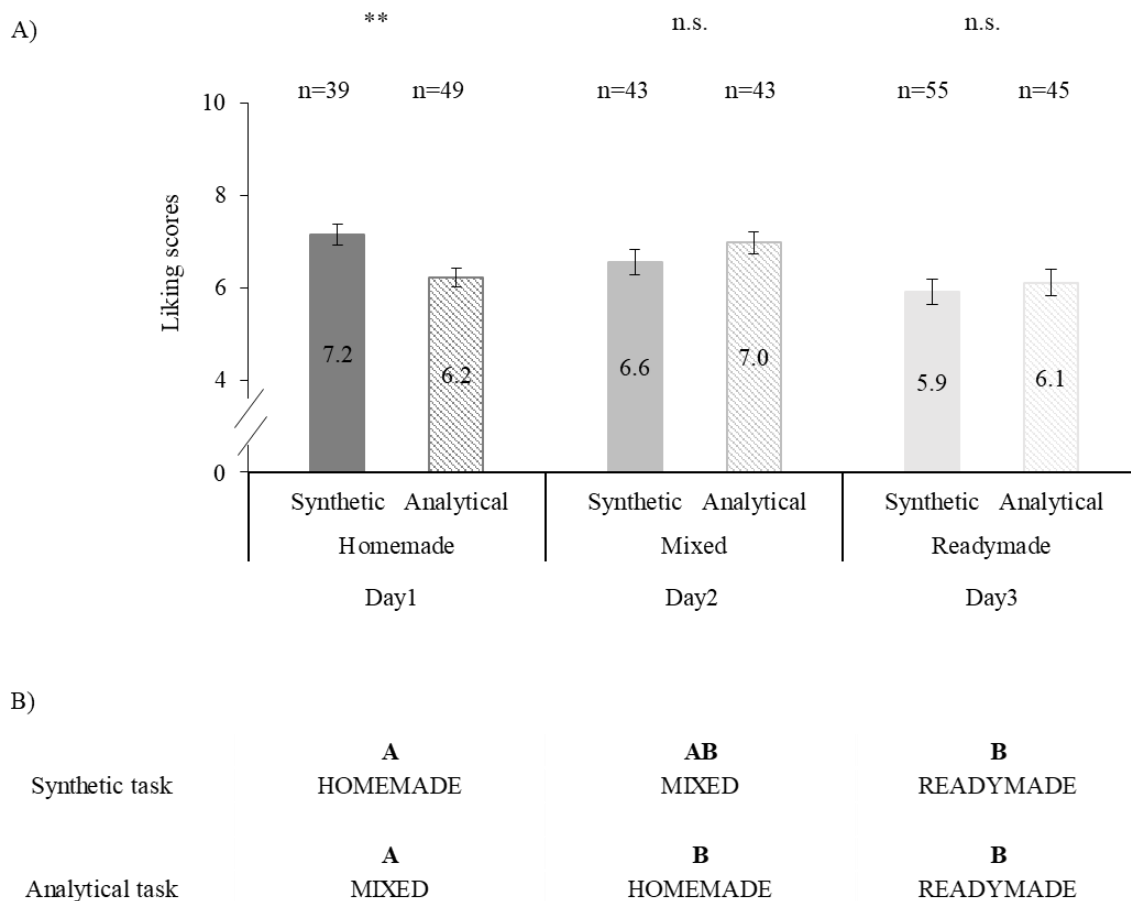


Figure 2A. Mean overall liking scores (and SEM) for the different pizza versions (homemade, mixed and readymade) in the synthetic (overall liking only) and the analytical (overall liking plus attributes) groups. n refers to the number of participants in each testing condition; n.s. = not significant; ** = $p < 0.01$. **B.** Rank order of the different pizza versions for the most liked to least liked according to each evaluation task. Letters above products denote significant differences ($p < 0.05$) found between each culinary preparation using post hoc LSD test.

203
204

205 4. Discussion

206 In the synthetic evaluation task the homemade version of the pizza was the most liked whereas in the
 207 analytical evaluation task the 'mixed' version was liked the most. This result is consistent with
 208 previous observations that liking scores are more sensitive to the task format for highly liked products
 209 than disliked products (Earthy et al., 1996; Popper et al., 2004). This could explain why, in our study,
 210 the task format did not affect liking scores for bread, which received much lower liking scores overall
 211 than pizzas. Moreover, bread was used as a control product that did not vary throughout the
 212 experiment and that, contrary to pizzas, was not subject to culinary preparation. We could thus
 213 hypothesize that participants evaluated it as a whole, regardless of the task.
 214 Thus, contrary to what was observed for bread, the task format did change the mean score for the
 215 homemade pizza. Pizza being a multicomponent food, it could be prone to analytical evaluation when
 216 attributes are provided on the evaluation form. This could be considered as a framing effect where the

217 participants' attention may have pointed towards particular characteristics of the product, such as the
218 dough or the tomato sauce, thereby modulating participants' liking scores (Cardello, 2017). Besides, it
219 should be noted that, the mixed pizza was the regular product that is usually served in this canteen.
220 Thus, participants may have paid less attention to specific attributes when evaluating this version than
221 the other two, which were less familiar. In particular, the homemade pizza may have exceeded
222 expectations overall and was scored higher with the synthetic task, but was scored lower when
223 participants' attention was focused on specific sensory attributes. Conversely, the liking scores of the
224 mixed and the readymade pizzas tended to be higher with the analytical task (although not significant).
225 This study reveals that differences in task format may affect participants' responses to liking scores in
226 the case of multicomponent products such as pizzas. Should this be confirmed with other product
227 categories, it would be of particular importance for the evaluation of dishes served in eating contexts
228 (such as restaurant, cafeterias, canteens) where different degrees of culinary preparation may be
229 performed and are to be expected. Thus, when conducting consumer tests in natural consumption
230 contexts where food is subject to culinary preparations, asking participants to rate attributes may
231 influence their attention, and therefore their perception of dishes' attributes.
232 Moreover, this study reveals that not only liking scores differ depending on the task format, but also
233 the final ranking of the products. This may indeed entail different managerial decisions for industrials
234 when it comes to the launching of a product. Here, the synthetic evaluation task would have concluded
235 that the homemade pizza was the best liked and the readymade being the least liked, while the
236 analytical evaluation task (which is more often used in satisfaction surveys in cafeterias) would have
237 concluded that the regular 'mixed' pizza would be liked significantly more than the other two. It
238 would be then interesting to test whether similar results would be obtained in a monadic sequential
239 way although proceeding this way in a natural consumption context would impair the ecological
240 validity of the design. Further studies on the effect of the evaluation task on consumers' hedonic
241 responses in natural consumption contexts would provide better understanding of which aspects of the
242 product matter to consumers when eating out and how those aspects are integrated in their sensory
243 evaluation.

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3. Limitations and methodological aspects

Initially the work presented in this chapter included two more products: a strawberry yogurt and a lemon pie with three different culinary preparations as occurred with the pizza. Those two products were selected together with the food catering company as they were frequently consumed, and in the case of the lemon pie, it was easy to prepare.

Those two more products could have helped us to confirm the impact of the task on consumer hedonic evaluation on natural consumption contexts, and the interaction between the culinary preparation and the analytical evaluation task. Moreover, with this design differences in consumer hedonic evaluation between product categories could have been identified. Nevertheless, two main limitations were observed when performing the study:

1. As consumers freely selected their food, the strawberry yogurt option was not selected as much as it was firstly estimated. Hence, not enough data was collected.
2. Regarding the lemon pie, the three lemon pie versions (homemade, mixed and readymade version) were validated with the chefs previous the performance of the study as well as the dates for the experiment. The recipes were set by considering the ingredients of the readymade version. Unfortunately, during the three weeks of experiment, the supplier of the readymade lemon pie changed, changing the initial recipe of the pie. Moreover, differences in the recipes were made during the culinary preparation of the homemade and mixed lemon pie version which hindered the comparison among the three versions of lemon pie.

It is important to highlight that on natural consumption contexts, giving consumers the freedom to choose the products they want to test may entail lower data collection. Moreover, if the tested products need a culinary preparation, it is important to consider that in a natural consumption context, where a food service is fast as in a student cafeteria, chefs do not have the same vision about what an experiment may entail, and that any variation on the original experimental protocol may have a direct impact on the results. More work should be done in collaboration between chefs and researchers when working in context studies in order to define a common objective.

4. Conclusion

The main objective of this chapter was to examine if consumers' hedonic responses in natural consumption contexts differed depending on the type of evaluation task. To achieve this objective two different evaluation tasks (synthetic and analytical) were performed by consumers in a staff and student cafeteria during their lunch time. Additionally, different type of product categories (bread and pizza) with different degrees of culinary preparation within the product category were tested (homemade, mixed and readymade).

Hypothesis 1: when two different formats of the evaluation task (synthetic or analytical) would be presented in natural consumption contexts, larger differences between the hedonic responses of consumers should be found.

Significant differences in consumers' hedonic responses were found for the homemade pizza version. This product was liked the most at the synthetic evaluation task, whereas the mixed pizza version was liked the most in the analytical evaluation task. No differences regarding consumers' hedonic responses depending on the evaluation task format were observed for bread and the readymade pizza.

Hypothesis 2: Hence, the effect of explicitly asking consumer to rate sensory attributes in a natural consumption context would be even greater for products that involve culinary preparation than for ready-made products.

Consumers' analytical hedonic evaluation of the homemade pizza version was affected by the presence of sensory attributes ratings. A significant difference between hedonic responses was found between the synthetic and analytical evaluation task, with lower liking scores on the latter. Conversely, liking scores of the mixed and readymade pizza versions tend to increase with the analytical evaluation task (although no significant).

This study reveals that differences in task format may affect consumer hedonic evaluation of multicomponent products such as pizzas in natural consumption contexts. Consumers may place their attention to those multicomponent ingredients due to the specific sensory attributes questions. The framing effects of the task may influence consumers' perception so in turn, consumer hedonic evaluation. It should be also mentioned that consumers' expectations towards products, especially those subjected to culinary preparations, may have influenced as well consumers' hedonic responses due to the context of consumption. Consumers may have not expected to find a homemade pizza at the school cafeteria. Therefore, further studies with different product categories and degrees of culinary preparation are suggested to confirm those results.

Moreover, this study reveals that the final ranking of the products also differed depending on the evaluation task. This may indeed entail different managerial decisions for industrials when it comes to the product launch. It would be then interesting to test whether similar results would be obtained in a monadic sequential way although this way would impair the ecological validity of the design in a natural consumption context. This aspect will be explored in chapter 9.

Further studies on the effect of the evaluation task on consumers' hedonic responses in natural consumption contexts would provide better understanding of which aspects of the product matter to consumers when eating out and how those aspects are integrated in their hedonic evaluation.

PART E. PRODUCT-RELATED
VARIABLES

Chapter 9. Framing the evaluation context

During the previous chapters it has been shown that product-related variables such as the amount of food, presentation and information may influence consumer evaluation (chapter 5 and 6). Moreover, consumers' expectations and beliefs towards different contexts have been intimately related to consumers' expectations and beliefs towards the served food in those contexts. Those consumer-related variables (expectations and beliefs) have shown to influence consumer experience and in turn, consumer evaluation (chapter 7). Additionally, chapter 8 has shown that consumer evaluation change depending on the format a task is presented. Hence, the present chapter integrate those previous results and insights, and aims to understand **how framing effects related to the task modulate consumer hedonic evaluation**.

To do so, two different studies will be presented:

1. Eating location as a reference point: differences in hedonic evaluation of dishes according to consumption situation (Article 4)
2. Associations between prior expectations towards meal experience and hedonic responses in the restaurant: the role of information (Article 5)

1. Introduction

During the previous chapters, the effects of context as a whole have been explored by looking at different level of contextual variables. Environmental and product-related variables have shown to influence the way in which consumers perceived a food in a particular context contributing to the creation of reference points that could be modulated through consumer-related variables such as beliefs and expectations. Moreover, evaluation task-related variables have shown to also influence the way in which consumers perceive a product within a context.

Chapter 3 showed that contexts effects have been further investigated in disciplines such as psychology and behavioral economics through the use of Prospect theory. However, to the author knowledge such theoretical framework has not been applied in the study of context effects when comparing context studies in the field of sensory and consumer science.

The present chapter proposes to go a step further by focusing on the interaction between the food and the consumer in a particular context, drawing consumers' attention to specific aspects of the product-related variables intimately associated to consumers' beliefs and expectations. By the use of product-related information, consumers' beliefs and expectations are expected to change the reference points created from environmental and product-related variables, helping to explain contexts effects on

consumer hedonic evaluation.

The first study (Article 4) presents a between-subject design where participants evaluated two variants of a given product (ham-olives cake) and they were asked to rate their liking and the level of fulfillment of their expectations in two contexts: a restaurant and a standard testing room (see Appendix 8). Additionally, in each context, half of the participants tested the products in non-informed conditions while the other half tested in informed conditions. By using the insights obtained from previous studies, the information tested was related to food quality, especially to food ingredients and processes: homemade and readymade. Moreover, the effect of the monadic sequential test discussed in chapter 8 was assessed.

The following hypotheses were posited.

- 1. In the restaurant, consumers liking scores would be higher than in the standard testing room.**
- 2. Information about homemade products would obtain higher rates than readymade products regardless of contexts.**
- 3. The impact of information regarding food quality would differ depending on the testing location.**

The second study (Article 5) also presents a between-subject design where participants first answered an online survey focused on consumers' expectations and beliefs towards the food they expected to find in a specific restaurant. Second, they came to the restaurant and were asked to rate their liking of a given dish (tartlets), the intensity perception and liking for different sensory attributes, and their satisfaction (see Appendix 9). Additionally, half of the participants tested the dish when consistent information about food-related factors was given (meeting consumers expectations) while the other half tested the dish when more inconsistent information was presented. In this study we also used the insights obtained from the focus groups regarding food-related variables (food preparation and origin of ingredients).

It was hypothesized that:

- 1. Consumers' expectations and beliefs towards food in a particular context would help to explain consumers' hedonic responses.**
- 2. "Consistent information" with consumers' expectations and beliefs would increase participants liking scores compare to "inconsistent information".**
- 3. Food-related factors would influence consumers' overall satisfaction.**

The main differences between both studies are:

1. In the first study:
 - a. two contexts and two products were tested
 - b. the fulfillment of consumers' expectations was assessed
 - c. no value for money was addressed

2. In the second study:
 - a. One context and one product were tested; just information change
 - b. Expectations were assessed prior consumption
 - c. Value for money was addressed

Those works are presented in Article 4 (accepted); and Article 5 (in writing).

- 2. Eating location as a reference point: differences in hedonic evaluation of dishes according to consumption situation (Article 4)**

Title:

Eating location as a reference point: differences in hedonic evaluation of dishes according to consumption situation

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Abstract:

Numerous studies have been conducted on the influence of physical context on consumer evaluation of food and its link with the ecological validity of sensory and consumer tests. Conversely, there has been little focus on the way context shapes attitudes and expectations towards food despite their likely influence on consumers' reference framework of evaluation. This study investigates the extent to which different aspects of the context (eating context, product context, information context) can act as reference points in consumers' judgement of food.

Following a between-subject design, we asked participants to rate their liking for two variants of a given food (ham-olives cake) as well as the level of fulfillment of their expectations in two contexts: an experimental restaurant (N=145) and a standard testing room (N=136). Additionally, in each context, half of the participants tested the products blind while the other half was informed about the quality of the food as related to the preparation conditions (readymade or homemade).

Participants rated products higher in the restaurant setting, regardless of the product version. Besides, information played a key role on participants' evaluation of the readymade version. Fulfillment of expectations scores followed a similar pattern. Furthermore, the order in which the two versions were presented had a significant effect on liking and on the fulfillment of expectations, revealing a possible contrast or disappointment when the readymade version was presented second. Observed inter-individual differences in both liking and expectations fulfillment scores suggest that the context effect on hedonic response is related to participants' prior beliefs and/or expectations.

Keywords:

context; product information; liking; expectations; evaluation framework

38 1. Introduction

39 In spite of numerous studies on the influence of context on consumers' evaluation of food products,
40 mechanisms underlying this influence are not well known. This limits the pursuit of ecological validity
41 of consumer tests of products, and in particular the attempts to contextualize controlled environments
42 (Galiñanes Plaza, Delarue, & Saulais, 2019). To date, most published studies on context have focused
43 on physical variables without addressing test participants' attitudes, expectations or mood states
44 (Edwards, Meiselman, Edwards, & Leshner, 2003; King, Weber, Meiselman, & Lv, 2004; Meiselman,
45 Johnson, Reeve, & Crouch, 2000; Stroebele & De Castro, 2004). Nevertheless, consumers' attitudes,
46 prior beliefs and past experiences have been highlighted as variables that may explain differences in
47 liking and behavior from one consumption context to another (Bernard & Liu, 2017; Cardello, Bell, &
48 Kramer, 1996; Edwards & Hartwell, 2009; Tuorila, Palmujoki, Kytö, Törnwall, & Vehkalahti, 2015).
49 This is because people and locations are most often confounded variables, which makes generalization
50 of measures to other contexts difficult (Delarue & Boutrolle, 2010). We may thus consider that
51 depending on the consumption context, consumers' prior beliefs or expectations toward the location
52 and the quality of the served food may predispose to a different state of mind, leading consumers to a
53 different evaluation and behavior.

54 This echoes the notion of reference point described by Tversky & Kahneman (1991) in their Prospect
55 Theory. It suggests that judgement and decision-making are reference-dependent. In other words,
56 individuals do not make absolute judgements but base their evaluation on reference points. Following
57 this theory, consumers can have a different reference point for each context, hence modifying their
58 framework of evaluation.

59 We conducted a preliminary focus group study on beliefs about the food served in different
60 consumption contexts. It revealed that consumers associate different eating places to different levels of
61 quality, price and product types, which was expected. Moreover, they also associate eating places to
62 different preparation modes: universities or company canteens, fast-food restaurants are strongly
63 associated to readymade products, whereas brasseries and gastronomic restaurants are associated to
64 'homemade' preparation (Galiñanes Plaza, Saulais, & Delarue, 2018). Consumers' representations
65 about the food preparation mode associated to each context may thus influence how food products are
66 perceived and liked.

67 Therefore, we can hypothesize that consumers evaluate food within a framework of reference that may
68 be determined by the consumption context itself. In this view, the purpose of this study was to
69 examine the influence of context on consumers' attitudes towards food, as related to their expectations.
70 In order to test this, we emphasized on the quality (readymade or homemade) of the served food with
71 the hypothesis that consumers' expectations would depend on the evaluation context. More
72 specifically, we were interested in the extent to which expectations (considered as reference points)
73 were met, or in other words, whether consumers were satisfied or dissatisfied by the food they were
74 served.

75 Following a between-subject design, we measured consumers' liking for two variants of a given food
76 (ham-olives cake) as well as the level of fulfillment of their expectations in two contexts: an
77 experimental restaurant and a standard testing room (STR). Additionally, in each context, we tested
78 the influence of information about the quality of the food (readymade or homemade).

79 Following the assumptions of prospect theory regarding reference points (Tversky & Kahneman,
80 1991), we hypothesized that (i) in the realistic consumption context, consumers liking scores would be
81 higher than in the controlled setting; (ii) information about homemade products would obtain higher
82 rates than readymade products regardless of context; (iii) the impact of information regarding food
83 quality would differ depending on the testing location.

84

85 **2. Material and methods**

86 **2.1. Participants**

87 Two hundred and eighty-three consumers were recruited via the database of the Research Centre of
88 the Institut Paul Bocuse, social networks and local newspapers. Each participant was randomly
89 appointed to either the "Living Lab" study (restaurant) or the standard testing room (STR) and within
90 each context, to the informed or the non-informed condition (each condition was tested on a different
91 day). One hundred and forty-five participants took part in the restaurant study, (57.2% were female
92 and 42.8% male; mean age 44.45 ± 9.92). One hundred thirty-eight participants took part of the
93 standard testing room (STR) study (61.6% were female and 38.4% male; mean age 43.86 ± 9.93).
94 Inclusion criteria were age (between 30 and 60 years old) and allergies (no known food allergy).
95 Cooking habits and eating out frequency responses were collected to better characterize the studied
96 population. Table 1 details their characteristics.

97 Participants were not financially compensated for their participation, but they were all invited to a free
98 dinner at the restaurant, either as part of the experiment (for the restaurant groups) or as a follow up to
99 the experiment (for the STR groups). Only the STR group knew, upon recruitment, that they would
100 formally participate in a taste test in a controlled condition before the dinner.

101 At the beginning of the test, participants signed a consent form and then were invited to access the
102 restaurant or to the central location test.

103

104 **2.2. Products**

105 Participants had to evaluate a ham-olives cake (Figure 1), which is a familiar appetizer product to
106 French consumers. Two versions of the product were tested: (i) an industrial, commercially available
107 version (referred to as readymade product in the rest of this article). From this readymade product, (ii)
108 a homemade version (referred to as homemade product) was developed by a professional chef for the
109 purpose of this experiment.

110

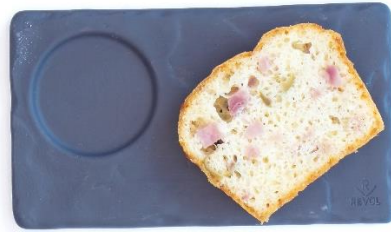


Figure 1. Ham-olives cake (Presentation of the product at the restaurant).

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Table 1. Characteristics of the participants in both studies: means (SD) or %.

Contexts	Restaurant	SRT
Sample size (n)	145	138
Informed	76	71
Non informed	69	67
Female	57.2%	61.6%
Male	42.8%	38.4%
Age (year)	44.45 (9.92)	43.86 (9.93)
Cooking frequency		
Every day	19.7%	23.6%
Between 3-4 times a week	10.7%	11.2%
1-2 times a week	10.3%	8%
<1 time a week	6.9%	3.3%
Never	2.1%	3.6%
Dinning out frequency		
>5 times a month	13.4%	12%
Between 3-4 times a month	6.9%	8.3%
1-2 times a month	15.9%	19.6%
<1 time a month	12.8%	9.4%
Never	0.3%	0.4%
Types of restaurants		
Bar a tapas/wine	14.1%	14.1%
Brasserie/Bistrot	32.4%	34.1%
Bouchon Lyonnais	20.7%	18.8%
French cuisine	39%	37%
International cuisine	30.3%	30.8%
Fast food	15.9%	12.7%

115

116 According to its label, the readymade product was composed of: cooked ham 21% (pork ham 19%,
117 water, salt, flavorings, glucose syrup, antioxidant: sodium erythorbate, preservative: sodium nitrate),
118 eggs 16.5%, wheat flour, canola oil, emmental cheese, green olives 7.9% (green olives 7.5%, water,
119 salt, acidifier: citric acid, antioxidant: ascorbic acid, preservative: potassium sorbate), bamboo shoots,
120 sugar, baking powder: Disodium diphosphate and sodium hydrogen carbonate, nutmeg, pepper.
121 Regarding the homemade version, the recipe was adapted using the following proportions: 150g ham
122 ($\approx 28.8\%$), 4 eggs ($\approx 1.54\%$), wheat flour, canola oil, Emmental cheese, 150g green olives ($\approx 28.8\%$),
123 milk and yeast. Slight differences in sensory properties between these two versions were detected in an
124 internal tasting session (notably, the readymade cake was perceived as drier than the homemade
125 version, and the olive taste was less strongly perceived). Cakes were served in slices (1cm) and care
126 was taken to make them equally thick in all conditions. The same quantity of product was thus served
127 in the restaurant and in the STR contexts in order to avoid influences of food quantity or differences in
128 the eating reference unit (Rozin & Tuorila, 1993). However, we did not measure the quantity of food
129 that participants consumed.

130 The readymade cakes used throughout the experimental campaign came from a single batch and were
131 stored in a cold chamber at 4.5°C. On each test day, five readymade cakes were removed from the
132 cold chamber and placed at room temperature half an hour before the beginning of the service.

133 The homemade cakes were prepared using the same pan model as the readymade version to ensure
134 that both variants had very similar appearance. They were made the same day and at the same hour for
135 each testing session in order to limit sensory variations due to ageing and drying out.

136 Each product sample was assigned a 3-digit code displayed by a sticker on the presentation plate. All
137 samples were presented sequentially at room temperature in a balanced and randomized order between
138 and within sessions.

139

140 **2.3. Settings**

141 To compare participants' responses in natural and in controlled situations, the experiment was
142 conducted in two settings: a restaurant setting (restaurant) and a standard testing room (STR).
143 Contextual variables such as portion size, presentation, cutlery, information, timing and social
144 interaction were considered in the experimental design.

145

146 **A. "Living Lab" restaurant**

147 The natural setting was that of the "Living Lab" restaurant of the Institut Paul Bocuse (Figure 2.A.)
148 This restaurant is a real commercial restaurant, open to the public and known locally as such. It is also
149 a living lab, in which a number of contextual and product variables can be controlled for, in order to
150 conduct research. Each day, the tables were organized according to the reservation list and set up
151 following a schema. Light and temperature were also set and controlled during each service. Once
152 participants signed the consent form they were welcomed to the restaurant and conducted to their table.

153 Before the dinner, a waiter proposed the cakes, presented as a set of two versions of an appetizer
 154 together with a drink, and indicated that participants would have to fill out a short questionnaire during
 155 and after the tasting. First of all, the drink (iced tea or water) was served and then the questionnaire
 156 was brought together with a pen. Prior to consumption, consumers had to indicate if they had any
 157 allergy or dietary restriction.

158 Appetizers were presented in a monadic sequential way. Once participants had rated the first sample,
 159 the second one was presented. Once the appetizer tasting was finished the rest of the dinner took place.

160

161 **B. Standard Testing Room (STR)**

162 Testing in the standard controlled environment took place in one of the classrooms adjacent to the
 163 Research Centre of the Institut Paul Bocuse. A picture of this STR can be seen in Figure 2.B.
 164 Participants were seated and instructions about the test were given by a researcher. The procedure was
 165 the same as in setting A, except that in this case, water was the only drink offered.

166



167
 168 **Figure 2.** Testing environments. A. Restaurant. B. Standard Testing Room.
 169

170

171 **2.4. Experimental design**

172 2.4.1. Information conditions

173 Two information conditions were tested in each setting. In the non-informed condition, consumers
 174 were provided the two versions of the product with no information about the differences between the
 175 two product versions. In the informed condition, homemade cakes were presented together with a label
 176 displaying “fait maison”, whereas the readymade version was presented with a label displaying
 177 “industriel”.

178

179 2.4.2. Sessions

180 The experiment followed a 2 (setting) x 2 (information condition) design. For all conditions, the two
 181 products were first evaluated and then, participants had a dinner at the “Living Lab” restaurant. The
 182 experimental campaign was conducted over the course of two weeks (one per setting), and sessions

183 were conducted at two time slots: 7pm and 7.30pm. This organization facilitated the service at the
184 restaurant and the balance presentation of the two cake versions per day. Participants in the first time
185 slot received the homemade version first, whereas in the second time slot participants received the
186 readymade version first. This order was balanced over the week.

187 The two experimental conditions (non-informed and informed) were conducted on separate days to
188 avoid confusion and uncontrolled information.

189

190 2.4.3. Experimental procedure and evaluation task

191 In all four experimental conditions, participants were presented with samples of the two product
192 versions. The order of presentation of the products was balanced across subjects in each group.

193 Participants were asked to rate their liking for the appetizer (ham-olive cake) on a 11-point hedonic
194 scale ranging from “dislike extremely” to “like extremely”, and to rate the extent to which the product
195 had met their expectations on a bipolar 11-point scale ranging from “lower than my expectations” to
196 “higher than my expectations” with a midpoint corresponding to “meets my expectations”. Finally,
197 consumers also rated their preference between the two versions together with an open-ended question
198 about their choice. All responses were collected using a paper form.

199 Demographic information (gender, age, and other consumers’ characteristics) was also collected at the
200 end of each questionnaire.

201

202 **2.5. Data analysis**

203 Liking and fulfillment of expectations data were analyzed using a multi-way analysis of variance with
204 the subject effect nested in each group (information condition, setting, presentation order). All testable
205 factors and interactions were tested and a step-by-step analysis was run to remove the non-significant
206 interactions using Matlab 2017. The best models to explain liking (after 11 rounds) and fulfilment of
207 expectations data (after 9 rounds) were selected and presented in the present paper. When the ANOVA
208 showed a significant effect ($p < 0.05$), Tukey’s test for pairwise comparisons was used (SPSS v.16,
209 SPSS Statistics, Chicago, I).

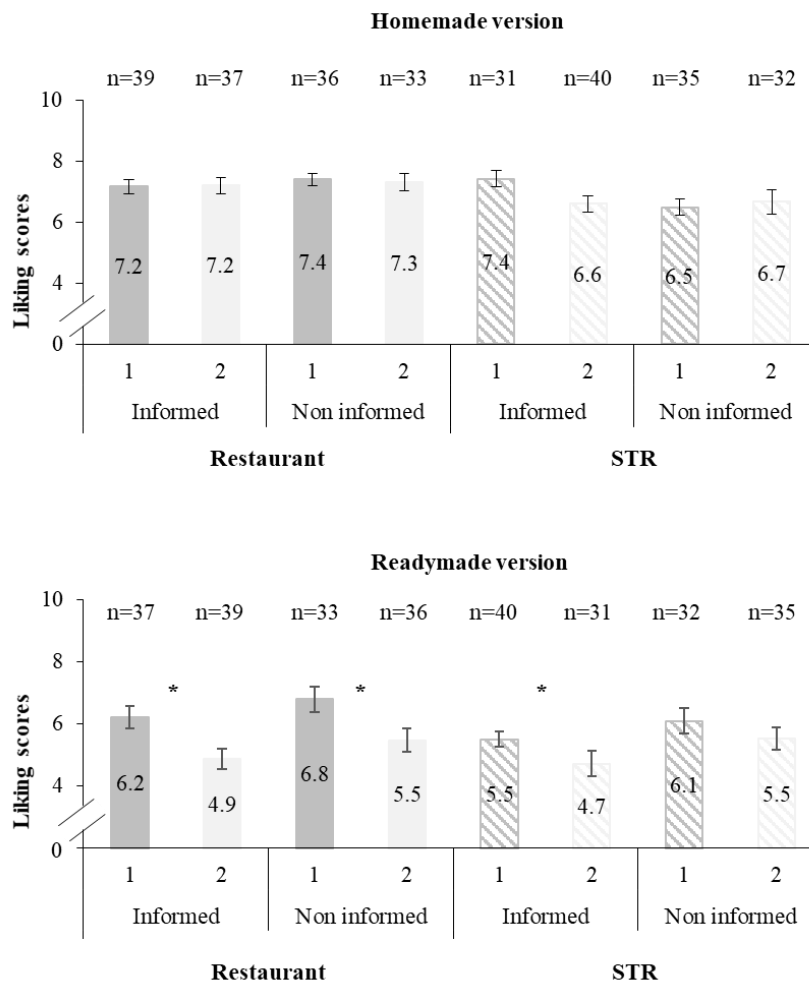
210 With regards to fulfilment of expectations data, scores ranging from “lower than my expectations” to
211 “meets my expectations” were converted in negative scores ranging from “-5” to “0” and those from
212 “meets my expectations” to “higher than my expectations” were converted in positive scores ranging
213 from “0” to “5”.

214 In order to explore inter-individual differences in liking for each version, we distinguished between
215 respondents who had reported that the product did not meet their expectations (they were named
216 “deceived” consumers for that specific product (scores < 0)) and those who reported that the product
217 met or exceeded their expectations (scores ≥ 0). They were named “satisfied” consumers, for that
218 specific product.

219 **3. Results**220 **3.1. Liking scores**

221 On average, the cakes were well liked by the participants in both settings (Figure 3). As expected, the
 222 homemade cake was more liked ($\bar{x} = 7.0 \pm 1.7$) than the readymade one ($\bar{x} = 5.6 \pm 2.2$) regardless of the
 223 experimental condition. The analysis of variance shows that the product version induced the most
 224 important differences in liking (Table 2). The liking scores also differed depending on the settings
 225 (scores being significantly higher in the restaurant than in the STR ($p = 0.005$)).

226



227

228 **Figure 3.** Comparison of mean liking scores (\pm SEM) for the two product versions depending on the context,
 229 information condition and order of presentation (1=tested first or 2=tested second). N refers to the number of
 230 participants in each testing condition. Participants who tested first the homemade product were the same of those
 231 who tested second the readymade product and vice versa. * $p < 0.05$

232

233

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237

238 **Table 2.** Summary of the effects of experimental factors on liking scores. Output from the final ANOVA model
 239 (calculated with type III sums of squares).

Source	d.f.	F	p-value
Consumers(Information Conditions, Settings, Presentation order)	279	1.25	0.031
Products	1	80.20	<0.001
Information conditions	1	3.16	0.076
Settings	1	7.94	0.005
Presentation order	1	7.76	0.006
Products*Information Conditions	1	6.18	0.014
Products*Presentation order	1	14.95	<0.001

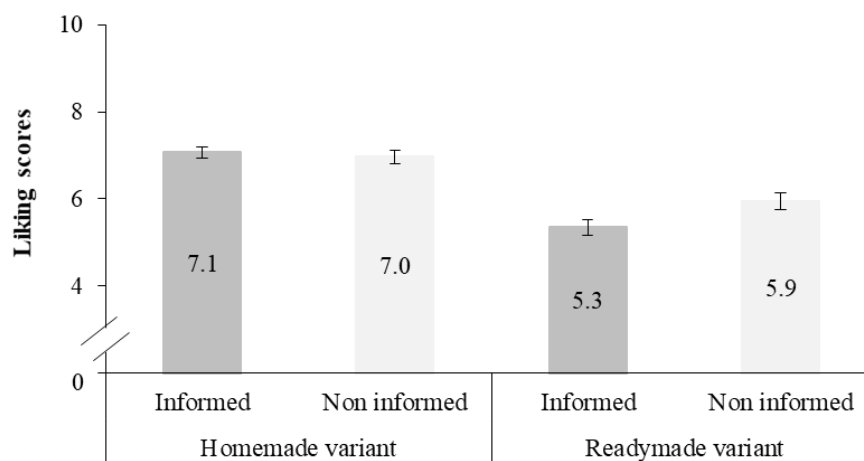
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241

242 3.1.1. Effects of information

243 The presence of information as a main effect did not significantly influence participants' overall liking
 244 scores ($F(1, 280) = 3.16$; $p = 0.076$). Although we hypothesized that information would affect the
 245 liking differently depending on the context, we did not observe such an interaction. Nevertheless, the
 246 presence of information affected the liking differently depending on the product version, as revealed
 247 by the significant product*information interaction ($F(1, 280) = 6.18$; $p = 0.014$). Post hoc Tukey
 248 (HSD) pair-wise comparison showed that the homemade version was not affected by the presence of
 249 information ($p = 0.964$) while the use of the label negatively affected the liking scores of the
 250 readymade version ($p = 0.024$) (Figure 4). As a result, the difference in liking scores between the
 251 homemade and the readymade cakes was larger (1.8 points on the hedonic scale) when information
 252 was given.

253

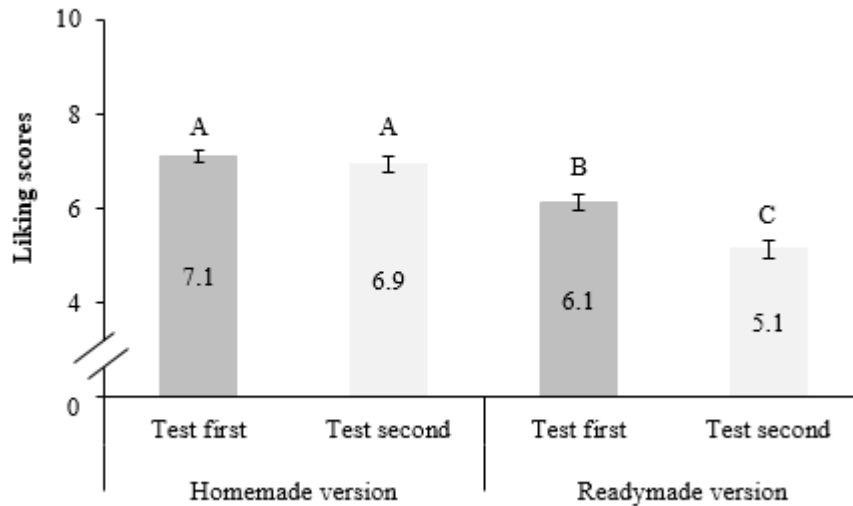


254

255 **Figure 4.** Comparison of mean liking scores (\pm SEM) for the two product versions and the two information
 256 conditions (informed, non-informed), regardless of the setting and order of presentation. Letters above bars
 257 denote significant differences ($p < 0.05$) found between information conditions using Tukey's test for pair-wise
 258 comparison. Participants who tested the homemade product in informed condition ($n = 147$) are the same of
 259 those who tested the readymade product in the informed condition and same for the non-informed condition ($n =$
 260 136).

261 3.1.2. Effects of sample presentation order

262 The order of sample presentation resulted in a significant difference in the overall liking scores of both
 263 product versions ($F(1, 280) = 7.76$; $p = 0.006$). However, only the readymade cake was significantly
 264 affected ($p < 0.001$) - with liking scores dropping 1 unit (on the 11-point hedonic scale) - when tested
 265 second, after the homemade cake (Figure 5).



266

267 **Figure 5.** Comparison of mean liking scores (\pm SEM) for the two product versions depending on the order of
 268 presentation (tested first or second), regardless of the setting and information condition. Letters above bars
 269 denote significant differences ($p < 0.05$) found between conditions using Tukey's test for pair-wise comparison.
 270 Participants who tested the homemade product first ($n = 141$) were the same of those who tested the readymade
 271 product second and vice versa ($n = 142$).

272

273

274

275 **3.2. Fulfillment of expectations**

276 After participants tasted each product, they were asked to rate the extent to which the product met their
 277 expectations or not. Results for the fulfillment of expectations scores showed a similar pattern as the
 278 liking scores. We observed a significant effect of product version, settings and order of sample
 279 presentation on the fulfillment of expectations scores (Table 3).

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289 **Table 3.** Summary of the effects of experimental factors on expectations scores. Output from the final ANOVA
 290 model (calculated with type III sums of squares).

Source	d.f.	F	p-value
Consumers(Information conditions, Settings, Presentation order)	278	1.31	0.011
Products	1	45.22	<0.001
Information conditions	1	2.01	0.158
Settings	1	8.05	0.005
Presentation order	1	4.65	0.032
Products*Information conditions	1	4.02	0.046
Products*Presentation order	1	3.54	0.061
Information conditions*Presentation order	1	0.10	0.750
Products*Information conditions*Presentation order	1	4.37	0.037

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293 Tukey (HSD) post hoc shows that participants' scores of fulfillment of expectations were significantly
 294 higher for the homemade version compared to the readymade one ($p < 0.001$). Participants also rated
 295 higher their fulfillment of expectations in the restaurant compared to the STR regardless of the product
 296 version, information condition and order of sample presentation ($p = 0.009$).

297

298 3.2.1. Effects of information

299 Participants' scores of fulfillment of expectations were not affected by the information conditions (F
 300 (1, 279) = 2.01; $p = 0.158$). Nevertheless, a significant interaction between product and information
 301 conditions was observed (F (1, 279) = 4.02; $p = 0.046$). Higher scores were obtained for the
 302 homemade version than for the readymade version regardless of the information condition.
 303 Homemade version met participants' expectations and even overcame participants' expectations as
 304 shown on Figure 6. However, in the case of the readymade version, participants' scores of fulfillment
 305 of expectations decreased when information was presented, meaning that participants' expectations
 306 were not even achieved (negative scores were obtained), whereas in non-informed conditions the
 307 readymade version met participants' expectations (Figure 6).

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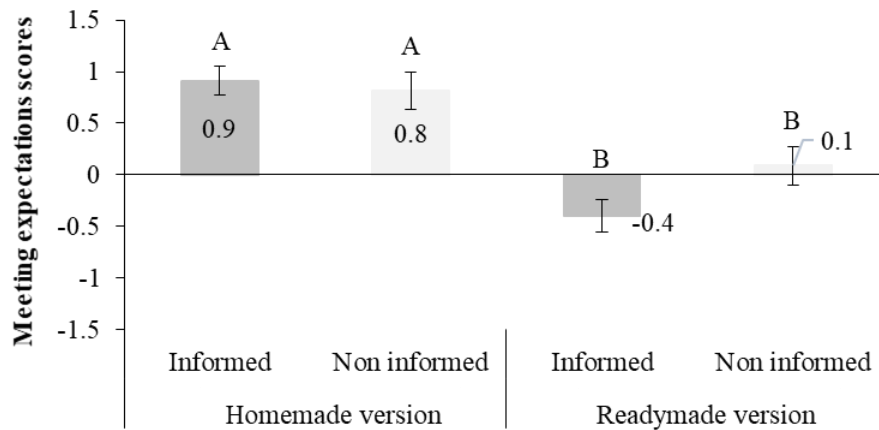
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318 **Figure 6.** Comparison of mean “meeting expectations” scores (\pm SEM) for the two product versions and the two
 319 information conditions (informed, non-informed), regardless of the setting and order of presentation. Letters
 320 above bars denote significant differences ($p < 0.05$) found between information conditions using Tukey’s test for
 321 pair-wise comparison. Participants who tested the homemade product in informed condition ($n = 147$) are the
 322 same of those who tested the readymade product in the informed condition and same for the non-informed
 323 condition ($n = 136$). In order to better reflect the actual data range, the axis was anchored from -1.5 to 1.5 instead
 324 of -5 to 5.

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3.2.2. Effects of sample presentation order

329 The sample presentation order also affected participants’ fulfillment of expectations scores ($F(1, 279)$

330 $= 4.65$; $p = 0.032$). Nevertheless, the two versions of the cakes were differently affected as Figure 7

331 shows. The order of sample presentation did not affect participants’ scores of fulfillment of

332 expectations for the homemade version ($p=0.998$). However, the scores of the readymade version were

333 significantly lower ($p < 0.001$) when this version was tested second. Moreover, the three-way

334 interaction product * information condition * presentation order was significant ($F(1, 279) = 4.37$; $p =$

335 0.037). It shows that the presence of information provoked even a higher deception among

336 participants who scored this product as much lower than their expectations (Figure 8).

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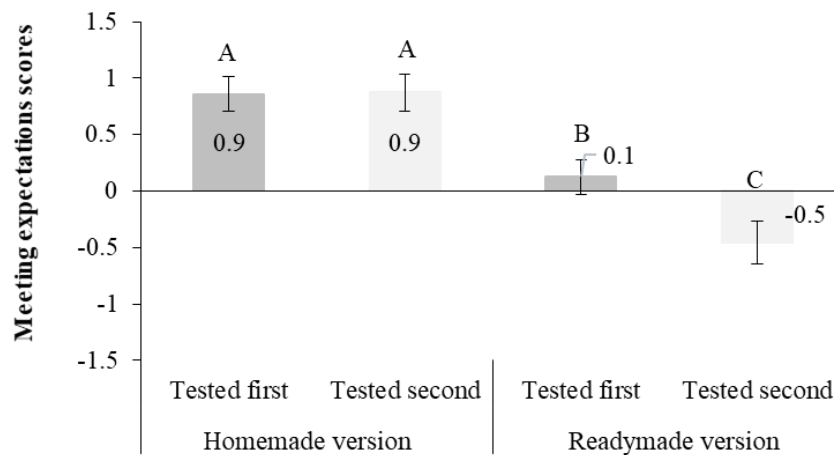
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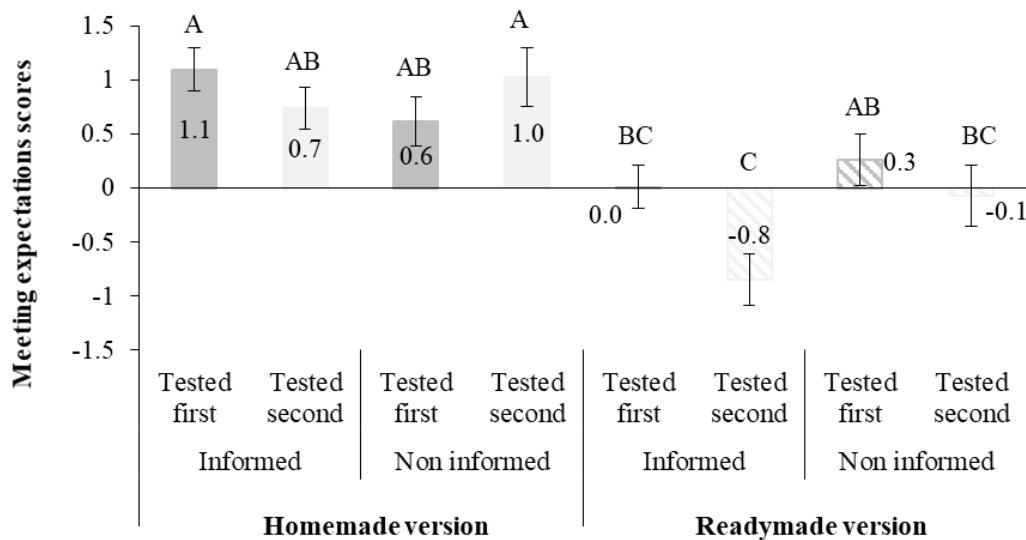
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350 **Figure 7.** Comparison of mean “meeting expectations” scores (\pm SEM) for the two product versions depending
 351 on the order of presentation (tested first or second), regardless of the setting and information condition. Letters
 352 above bars denote significant differences ($p < 0.05$) found between conditions using Tukey’s test for pair-wise
 353 comparison. Participants who tested the homemade product first ($n = 141$) were the same of those who tested the
 354 readymade product second and vice versa ($n = 142$). In order to better reflect the actual data range, the axis was
 355 anchored from -1.5 to 1.5 instead of -5 to 5.
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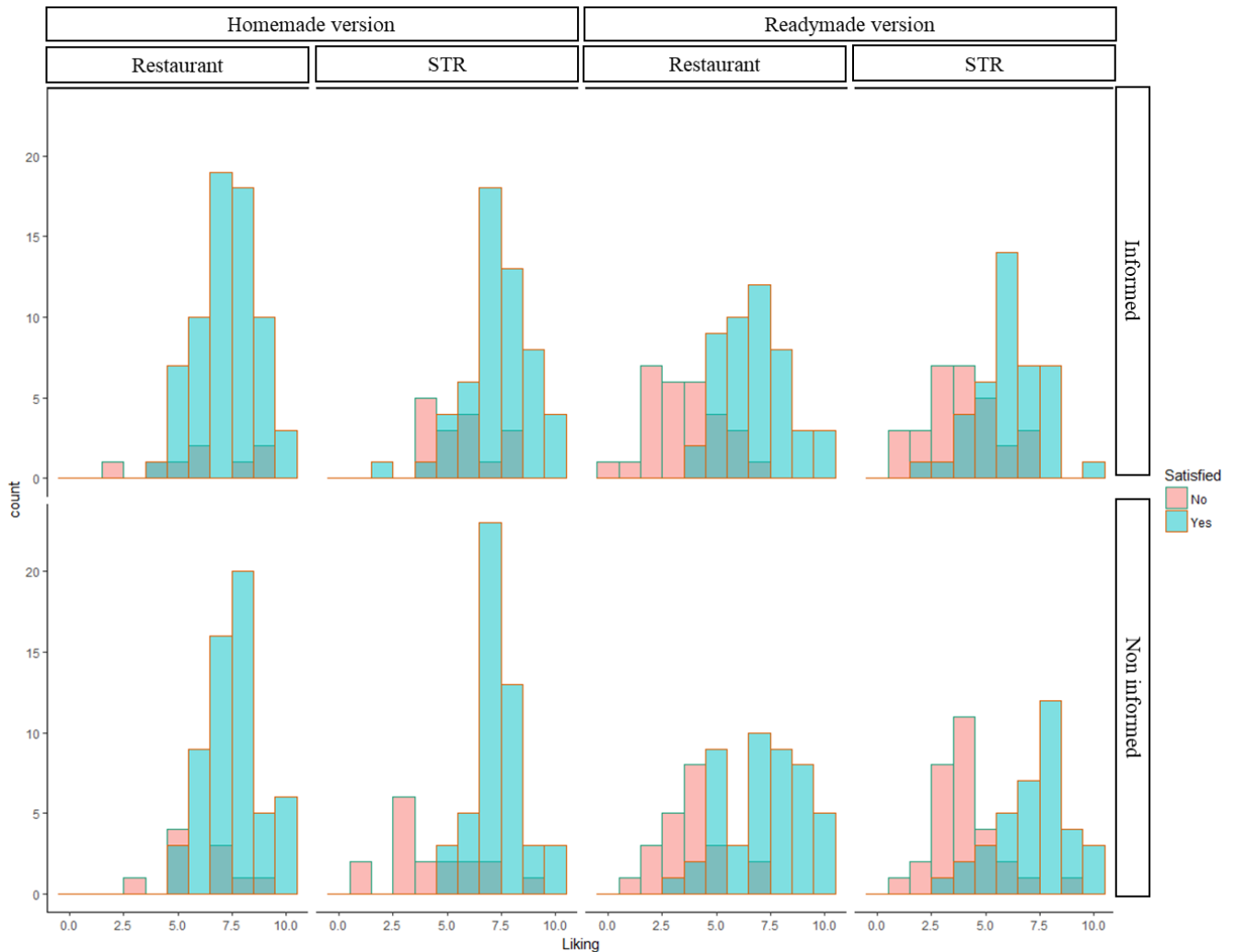
360 **Figure 8.** Comparison of mean “meeting expectations” scores (\pm SEM) for the two product versions in each
 361 information condition and order of presentation regardless of the setting. Letters above bars denote significant
 362 differences ($p < 0.05$) found between groups using Tukey’s test for pair-wise comparison. Participants who
 363 tested the homemade product in informed condition first ($n = 70$) are the same of those who tested the
 364 readymade product in informed conditions second and vice versa ($n = 77$). Participants who tested the
 365 homemade in non-informed condition first ($n = 71$) are the same of those who tested the readymade product in
 366 non-informed conditions second and vice versa ($n = 65$). In order to better reflect the actual data range, the axis
 367 was anchored from -1.5 to 1.5 instead of -5 to 5.
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373 3.2.3. Inter-individual differences: analysis of liking and scores of fulfillment of expectations

374 In Figure 9, the first thing to note is that the overall shape of the liking score distribution is different
375 for the homemade and the readymade versions. The homemade version shows a higher consensus on
376 the liking scores whereas the readymade version shows a bimodal distribution, especially at the STR
377 setting in non-informed condition.

378 In order to explain those differences, we highlighted participants whose expectations were not met.
379 We indeed classified participants' responses into two groups: "satisfied" (whose expectations were
380 met or exceed) represented in green and "deceived" (whose expectations were not met) in red. Overall,
381 satisfied participants outnumbered deceived participants (11.6% in the STR, 4.2% in the restaurant).
382 However, the readymade version gave rise to more deceived participants (31.9% in the STR condition,
383 31.3% in the restaurant condition) than the homemade version (12.3% in the STR, 8.3 in the
384 restaurant). Participants are satisfied with the homemade cake no matter where it was tested and
385 whether it was labelled or not. When this version is tested at the STR we can observed a slight trend of
386 increase of the scores which may indicate that participants obtained something that they did not expect
387 to find in that particular context (i.e. a homemade cake in a STR). However, in the case of the
388 readymade version, bimodal responses are observed in both contexts.

389



390 **Figure 9.** Distribution of liking scores with respect to their fulfillment of expectations. Respondents were
 391 classified into two groups: those who had reported that the product did not meet their expectations they were
 392 named “deceived” consumers for that specific product (red) and, those who reported that the product met or
 393 exceeded their expectations were named “satisfied” consumers, for that specific product (green).
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397 4. Discussion

398 The purpose of this study was to assess the influence of the evaluation context on consumers’
 399 expectations regarding the quality (readymade or homemade) of the served food and on its subsequent
 400 evaluation. We hypothesized that consumers’ prior expectations would depend on the evaluation
 401 context and that this would directly impact the liking scores.

402 4.1. Liking

403 Results indicate that participants liked the products significantly more in a natural consumption
 404 context than in a standard testing room (STR), supporting the notion that consumer product evaluation
 405 may be context-dependent (Boutrolle et al., 2007; Holthuysen et al., 2017; King et al., 2004;
 406 Meiselman et al., 2000). Some contextual variables such as the ambiance and social facilitation at the
 407 restaurant may also have influenced those results. The environment at the restaurant was warm and

408 friendly, whereas the ambiance at the STR was colder and participants did not have the possibility to
409 discuss with each other. Some of the participants in the STR stated that they “felt like they were sitting
410 in an exam” and this might have modulated participants’ mood and therefore their liking (Giboreau,
411 2017; Porcherot, Petit, Giboreau, Gaudreau, & Cayeux, 2015; Sester et al., 2013). Moreover, the way
412 products were consumed in each context could also explain differences in liking scores. In particular,
413 in the restaurant, participants had the possibility to drink ice tea while they ate the cakes. This factor,
414 which we consider as part of the context, could have contributed to the increase of liking scores in the
415 restaurant. Indeed, several studies have shown an increase in the liking scores when specific
416 combinations of food and drinks are consumed together (Di Monaco, Giacalone, Pepe, Masi, &
417 Cavella, 2014; Hersleth, Mevik, Næs, & Guinard, 2003). Yet, a closer look at the responses from the
418 32% of participants who preferred to drink water does not show such an effect, although this could not
419 be formally tested in our ANOVA model. Meanwhile, we cannot exclude that drinking ice tea could
420 have modulated participants’ perception of the cakes and therefore could have resulted in a
421 product*testing condition interaction.

422 Another hypothesis is that the evaluation task itself, and not only the product, may have been
423 perceived as different in those two contexts: participants may have integrated other aspects related to
424 the consumption experience (environment, occasion, social facilitation, etc.) to their evaluations,
425 increasing their scores at the restaurant regardless of the product versions. Conversely, at the STR,
426 participants were more discriminant towards the two versions. This could be related to a greater
427 attention placed on the sensory evaluation, and the lack of interaction with a drink (ice tea)
428 (Hetherington, Anderson, Norton, & Newson, 2006; Köster & Mojet, 2015).

429 As regards product evaluation, results show that the homemade version was rated higher than the
430 readymade one, regardless of the contexts and regardless of the information condition. As revealed
431 during the internal tasting session, the readymade cake was perceived to have a drier texture and a
432 weaker olive taste intensity, which was expected to be less appreciated even if these differences were
433 small. We also observed that independently of the context there was a higher consensus on the
434 evaluation and satisfaction of the homemade cake whereas the readymade product resulted in more
435 variety of opinions. Nowadays, consumers are much more concerned about the food industry and the
436 quality of processed food than they used to be (Asioli et al., 2017). During our preliminary focus
437 group study, consumers stated that they were able to differentiate a readymade product from a
438 homemade one, underlining the importance of the quality of the food when eating out. Consumers
439 expect to find certain type of quality (homemade) in a restaurant instead of a product they can have at
440 the supermarket or even at home. However, this is different when it comes to the standard tests where
441 consumers do not know what they are going to taste or tend to think that they will test industrial
442 products, so the reference point of evaluation may differ (Galiñanes Plaza et al., 2018).

443 Besides, the liking for readymade cake was significantly affected by the presence of information.
444 Several studies have shown the effect of information on consumers’ products evaluation as well as its

445 relation to consumers' attitudes and beliefs (Baer et al., 2017; Bernard & Liu, 2017; Schulte-
446 Mecklenbeck, Sohn, de Bellis, Martin, & Hertwig, 2013; van den Heuvel, van Trijp, Gremmen, Jan
447 Renes, & van Woerkum, 2006). Priming on certain type of information, in our case "industriel", can
448 make attitudes and beliefs about that particular information more salient, modifying the final response
449 of the participants (Reis, Alcaire, Deliza, & Ares, 2017; van den Heuvel et al., 2006). Moreover, a
450 significant effect of the order of sample presentation was also observed for the readymade version,
451 especially when it was tested after the homemade version. Lahne & Zellner, (2015) showed a similar
452 effect when comparing the liking scores of a dish after a good and a mediocre appetizer. The fact that
453 the homemade cake was higher rated could originate from a contrast effect between both cake versions
454 that was manifest when the readymade version was tested second. The sample presentation order is
455 known to have an effect on consumer hedonic evaluation (Boutrolle et al., 2007). However, to our
456 knowledge this effect has not been explored in natural consumption contexts where consumers do not
457 usually taste two similar products one after another. Conversely, in real life consumers may compare
458 the product they eat to a personal reference point. This would correspond to a pure monadic testing
459 mode. Here, having compared two similar products in a monadic way could have modulated
460 participants' reference points of comparison from one product to another as well as their expectations.

461

462 4.2. Fulfillment of expectations scores

463 Concerning the fulfillment of expectations results, higher expectation scores were fulfilled at the
464 restaurant compared to the STR. Cardello (1995) described how the perceived food quality and the
465 expectations about food quality of a same product may differ depending on the context of
466 consumption, underlining how important consumers' mindset about a particular context is when
467 evaluating a product.

468 In this study we considered those prior expectations about contexts and food quality as reference
469 points. In the case of this restaurant we may assume that the reference point as regards the physical
470 location was high because of its name associated to the prestige of Paul Bocuse. Consumers who came
471 to the restaurant test at the Institut Paul Bocuse usually expect to find high food quality associated to
472 the use of natural and local ingredients, tasty (and costly) food. However, in the STR the reference
473 point was more ambiguous. Consumers usually associate this type of context to the test of industrial or
474 processed products and not to a meal experience. Our data reflect these differences between the two
475 contexts as regards food quality: at the restaurant participants' expectations were fulfilled for the
476 homemade version whereas this was not always the case for the readymade version. Similar results
477 were obtained in the STR; however, the level of expectations in general in this context was lower as
478 participants came to the STR with a « lower » overall framework which may relatively impact their
479 evaluation. Cardello (2003) explains that when expectations are low - even if the perceived intrinsic
480 quality is high - liking scores will decrease as the perceived liking will assimilate the lower
481 expectation. This may explain the differences between both contexts and even more, the differences

482 when the readymade version was labelled and presented before or after the homemade version
483 (Cardello, 2003; Piqueras-Fiszman & Spence, 2015). The reference point created may have been
484 modulated for these two factors (product information and order of presentation), modifying the
485 fulfillment of expectations scores.

486

487 4.3. Inter-individual differences

488 As regards the analysis of inter-individual differences, we observed that the distribution of liking
489 scores differed depending on the product version and could be related to participants' fulfillment of
490 expectations. Overall, the homemade version met or exceeded participants' expectations no matter
491 where it was tested or how it was labelled; however, the readymade version was more disappointing
492 showing a bimodal distribution of the liking scores and fulfillment of expectations. A possible
493 explanation for this result is that a hedonic contrast between both versions and the product-context
494 (inappropriate situation) may occur (Cardello, Schutz, Snow, & Leshner, 2000; Lahne, Pepino, &
495 Zellner, 2017; Lahne & Zellner, 2015).

496 Conversely, some limitations should be noted and considered for further studies. This study was
497 conducted in a specific location, the Institut Paul Bocuse, a name associated to one of the major
498 references of gastronomy in France and worldwide. Participants came to the STR knowing that they
499 would take part of a study. The STR was located inside of the Institut Paul Bocuse which may have
500 contributed to create a certain degree of expectations that were not met in both contexts. Moreover, it
501 is important to consider that, in both settings, participants were invited to the diner. We have
502 previously mentioned that high food quality was related to higher prices. Thus, the fact that
503 participants did not pay for their dinner may have led them to a lower engagement in either settings,
504 which is a typical weakness of such hypothetical tests (as opposed to non-hypothetical tests
505 implemented in experimental economics). Those limits may contribute to explain the fact that we did
506 not observe any three-way interaction between the context, the product version and information.

507

508 **5. Conclusion**

509 The purpose of this study was to assess the influence of context on consumers' attitudes towards food
510 by emphasizing the quality (readymade or homemade) of the served food. We hypothesized that
511 consumers' prior expectations would depend on the evaluation context and that this would directly
512 impact participants' evaluation.

513 The homemade version obtained a 'higher' reference score on average. This seems to make it less
514 sensitive to variations of context than the less liked readymade version. Information about the product
515 version played a key role on participants' evaluation that may be related to participants' prior beliefs
516 and/or expectations. More generally, information may contribute to the modulation of participants'
517 reference points.

518

519 Our results suggest that reference dependent theory may be an interesting way to look at consumers’
 520 mind-set when performing a context comparative study. By modulating this reference point or
 521 framework of evaluation we might be able to explain certain differences between contexts that may
 522 not be related to the physical environment itself but to the attitudes or prior experiences consumers
 523 have had with the served food in a similar context. Moreover, an important finding is that the context
 524 of the evaluation task had an effect stronger than the actual context of consumption (restaurant and
 525 STR). In the case of natural consumption contexts such as restaurants, a monadic sequential
 526 presentation of the products may decrease the ecological validity of the results. Our data also showed
 527 that product order modulate participants’ hedonic evaluation as well as the fulfilment of their
 528 expectations. From a practical point of view, this result suggests that the task modulates the reference
 529 point from where consumers make their evaluation and set their expectations and should thus be
 530 carefully considered. Indeed, even in contextualized tests for the industry, resulting managerial
 531 decisions may depend on the evaluation task and test design.

532

533 **6. Acknowledgements**

534 The authors thank all collaborators of the Institut Paul Bocuse for their assistance in this experiment.

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536

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2.1. Article 4 Limitations

It is important to consider that in the present study consumers' prior beliefs and expectations were not directly assessed so, they were just assumptions built from previous experiments (chapter 7).

Moreover, no value for money was addressed which may have contributed to the lack of results concerning the hypothesis number 3. Consumers may have not perceived a higher loss when tasting readymade products in the restaurant than when they did it in the standard testing room.

Finally, the use of a monadic presentation of the two food versions may have compromised the ecological validity of the experiment as this rarely occurs in natural consumption contexts.

2.2. Article 4 Conclusion

This study assessed the influence of context on consumers' attitudes towards food by emphasizing the quality and processes (readymade or homemade) of the served food. According to the hypotheses enounced:

H1: In the restaurant, consumers liking scores would be higher than in the standard testing room.

Results showed that consumer liking scores in the restaurant were higher than those in the standard testing room. On average consumers liked most both products in the restaurant than in the standard testing room. This may be explained by fact that conviviality had an important effect on consumer experience, especially for French consumers. Besides, during the experiment at the standard testing room, consumers expressed to feel like if they were in an exam, which may have negatively influence consumer hedonic evaluation. Moreover, the presentation of the food also differed from one context to another. In the restaurant appropriate cutlery was used whereas in the standard testing room plastic cutlery was used.

H2: Information about homemade products would obtain higher scores than readymade products regardless of context.

Results showed that homemade products obtained higher scores than readymade products regardless of the contexts and information condition. This confirm prior results where consumers indicated that when eating out in restaurants like Bocuse, homemade products are expected to be used in kitchen.

H3: The impact of information regarding food quality would differ depending on the location.

No differences among information condition depending on the testing location were reported. It was expected to find lower liking scores of the readymade product in the restaurant, whereas higher liking scores of the homemade product in the standard testing room by following the loss-aversion principle of the Prospect theory. Unfortunately, that results were not observed. This could be related to the lack of value for money perceived by the consumers in both contexts.

The present study showed that product-related information played a key role on consumer hedonic evaluation regardless of contexts effects. This effect could be associated to the modulation of consumers' reference points by consumers' beliefs and/or expectations towards specific product characteristics within a context. The results suggested that framing on those consumer-related factors might help to explain certain differences between context studies that may go beyond the physical environment.

Moreover, a significant effect of the order of sample presentation was observed in both non-informed and informed conditions. This result should be highlighted as in natural consumption contexts consumers do not usually taste two versions of a product as they do in consumer tests. This direct comparison between products may inference wrong managerial decisions when it comes to the product launch as the characteristics of the first tested product may serve as reference for the second evaluated one.

3. Associations between prior expectations towards meal experience and hedonic responses in the restaurant: the role of information (Article 5)

Title:

Associations between prior expectations towards meal experience and hedonic responses in the restaurant: the role of information

Authors:

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Abstract:

Consumers' meal experience changes depending on the context of consumption as consumers' expectations and beliefs towards the food served in different contexts may do. Food-related factors have drawn the attention of consumers who have become more demanding when eating out. This study examines the extent to which different factors related to food (preparation and origin) influence consumers' hedonic responses and meal satisfaction in a natural consumption context. Following a between-subject design, participants (n=114) first answered an online survey focused on consumers' expectations and beliefs towards the meal experience they expected to find in a specific local restaurant. Second, participants came to that restaurant and were asked to rate their liking of a given dish (tartlet), the perception and liking for different sensory attributes, and their overall satisfaction. Half of the participants (n= 56) received consistent information about food-related factors that was congruent with consumers' expectations as elicited in the questionnaire prior to the test, while the other half (n = 58) received information that was inconsistent with these expectations. Consumers' prior expectations and beliefs towards the restaurant and the served food suggested to modulate consumer hedonic responses. Participants with consistent information about consumers' expectations towards food-related factors rated the tartlet higher than those who were presented with more inconsistent information. Furthermore, the presence of information influenced the ratings of sensory attributes (those related to the dough) for both intensity and liking scores. Consumers' food satisfaction and overall meal experience were significantly higher in the consistent information condition.

Keywords:

expectations; beliefs; product information; liking

38 **1. Introduction**

39 What do you expect to find in your plate when you eat out? Considering the variety of eating out
40 contexts, most consumers would probably answer this question with “it depends on the type of
41 restaurant”. Consumers’ expectations towards food differ depending on the context and situation, and
42 on the meal experience perceived in that particular context (Köster, 2003). Meal experience involves
43 several factors such as food and beverages, environment and, social and management factors (Muñoz
44 et al., 2018; Ozdemir & Caliskan, 2014). Within those meal experience factors, those related to food
45 such as taste, food presentation, or quality have shown to influence the meal experience the most,
46 especially consumer satisfaction (Timothy, Yang, & Kim, 2016). Consumers’ expectations if they go
47 to a fancy restaurant are therefore likely to differ from those if they go to a fast food chain.

48 French consumers are becoming more and more conscious about food authenticity, tradition and
49 terroir when it comes to eating out experiences (GIRA Conseil, 2013). Most consumers search for
50 “local ingredients” that associate to characteristics such as “fresh”, “seasonal” and “homemade” food
51 (Agence Bio & Spirit Insight, 2019). Another increasingly important factor is transparency regarding
52 the origin of food, production processes, and ingredients due to the scandals food industry has suffered
53 in the last years. In the restaurant sector, doubts about the use of processed food have increased
54 consumers’ concerns and distrust about the quality of the served food and their value (Filimonau &
55 Krivcova, 2017; GIRA Conseil, 2013). Additionally, the use of “local”, “fresh” and “homemade” food
56 have been positively associated to a better taste compare to processed food (Bernard & Liu, 2017;
57 Costa, Schoolmeester, Dekker, & Jongen, 2007; Spiller, 2012). This could be related to consumers’
58 beliefs and expectations that have been shown to influence consumers’ hedonic perception, and in turn
59 consumers’ hedonic responses (Fernqvist & Ekelund, 2014; Piqueras-Fiszman & Spence, 2015).

60 In response to these trends, an increasing number of restaurants in France have started to explicitly
61 signal their dishes as “homemade” on menu cards (GIRA Conseil, 2013). The effect of information
62 about food-related characteristics such as food origin or processes on consumer’s beliefs and
63 expectations has been widely investigated (Bernard & Liu, 2017; Jo & Lusk, 2018; van den Heuvel,
64 van Trijp, Gremmen, Jan Renes, & van Woerkum, 2006). Authors have attributed the effect of food-
65 related information on the fact that such information makes certain characteristics of the product more
66 salient to consumers. Therefore, consumers’ perception about the product is modulated and in turn,
67 consumers’ hedonic responses.

68 The purpose of this study was to examine the influence of the type of information provided on food
69 preparation and origin of ingredients on consumers’ hedonic responses to a product in a natural
70 consumption context. Based on previous works on information disclosure in the restaurant (Filimonau
71 & Krivcova, 2017; Shawn & Kim, 2015), and on consumers’ trust on food information (Agence Bio &
72 Spirit Insight, 2019; Kumpulainen, Vainio, Sandell, & Hopia, 2018) information consistent with
73 consumers’ beliefs and expectations (previously measured) will prompt more positive hedonic

74 responses than information evoking more uncertainty. The “consistent information” condition would
75 reinforce participants’ beliefs and expectations towards dishes, increasing the liking scores of the
76 products; whereas the “inconsistent information” condition would highlight certain characteristics of
77 the product such as the dish preparation and origin of the ingredients that would contrast with
78 participants’ expectations decreasing the liking scores (Piqueras-Fiszman & Spence, 2015).

79 To address this objective, an experiment was conducted in a restaurant setting with 114 consumers.
80 Prior to the restaurant visit, consumers’ expectations and beliefs towards the food served in that
81 restaurant were assessed through an online survey. Responses from the survey were used to control
82 consumers’ expectations and beliefs and validate the information conditions. The experiment
83 examined the effect of menu information regarding food preparation and origin of ingredients on
84 consumers’ hedonic responses to the food served in the restaurant as well as on sensory attributes
85 perception. The information was either consistent, in line with consumers’ expectations (N=56) or
86 inconsistent, in contradiction with consumers’ expectations (N=58). Consumers’ food satisfaction, and
87 overall experience satisfaction, were also measured.

88

89 **2. Material and methods**

90 **2.1. Participants**

91 One hundred and fourteen consumers were recruited via the database of the Research Centre of the
92 Institut Paul Bocuse, social networks, and local newspapers. Participants had to be aged between 18
93 and 35 years. Criteria of exclusion were pregnancy, breast-feeding, food allergies or intolerances,
94 specific diets and/or total aversion to legumes. Table 1 provides more details on their characteristics.

95 Participants were informed during the recruitment that the lunch was part of a study carried out at the
96 Research Center restaurant. Participants were not financially compensated for their participation and
97 they paid for their lunch at the “Living Lab” restaurant. The price of the menu (type catering classic
98 mid-range) was 15 € (or 7.5 € if participants came with another person) and included an appetizer,
99 starter, a main dish and a dessert.

100 Before coming to the restaurant, participants were asked to complete an online survey in order to
101 validate the registration process.

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110 **Table 1.** Characteristics of the participants in both studies: means (SD) or %.

Contexts	Restaurant	
	Consistent information	Inconsistent information
Sample size (n)	56	58
Female (%)	46.4%	55.9%
Male (%)	53.6%	44.1%
Age (year)	29.2 (4.28)	27.8 (4.01)

111

112

113 **2.2. Products**

114 One product familiar to the French consumers was selected for the experiment: tomato and goat
 115 cheese tartlet (Figure 1). This product is easily found as appetizer in the French culture. To prepare the
 116 dough for 30 tartlets, 410 g of wheat flour T55, 310 g of butter, 82 g of whole milk, 82 g of whole egg,
 117 5 g of caster sugar and 11 gr of fine salt were used. The flour and the butter were mixed in a planetary
 118 mixer equipped with a flat beater for 2 minutes at low speed. Then, the whole eggs, the sugar, the salt
 119 and the milk were added. All ingredients were mixed at low speed until the dough was homogeneous
 120 and smooth. Then the dough was filmed and kept for one hour in cold storage at 4°C. The dough was
 121 put between two sheets of greaseproof papers and flatten out with a rolling pin to 1.5 mm thickness
 122 and was kept 10 minutes in cold storage 4°C. Then the dough was shaped in the tartlet molds, 8 cm in
 123 diameter on 1.5 cm in height. The tartlets rested for 10 minutes in cold storage and then were baked
 124 for 17 minutes in a preheated oven at 150°C with medium ventilation on and open exhaust.

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133 **Figure 1.** Tomato and goat cheese tartlet.

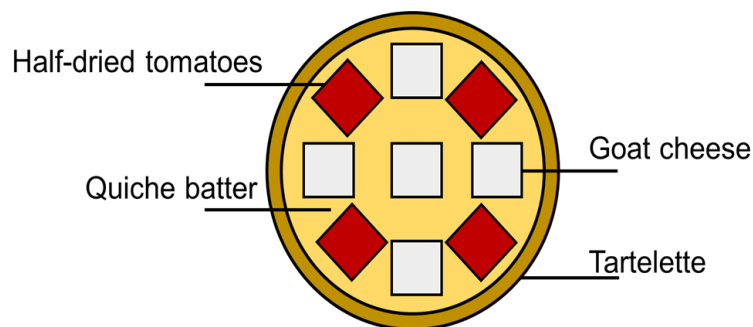
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136 For the filling, the following ingredients were used (for 30 tartlets): 240 g of half-dried cherry
 137 tomatoes (“*Délice Monde*”), 240 g of goat cheese (“*Matin d’Avril*”), 435 g of whole milk (“*lactel*”),
 138 110 g of whole egg (“*transgourmet France*”), 55 g of egg yolk (“*transgourmet France*”). Half-dried
 139 tomatoes were cut in dices of 2 g and the goat cheese in dices of 1.6 g. In order to make the quiche

140 batter, the milk, the whole egg and the egg yolk were whisked together in a bowl. Then four pieces of
 141 half-dried tomatoes (8 g in total/tartlet) and five pieces of goat cheese (8 g in total/tartlet) were
 142 homogeneously place in the tartlet as described the schema below (Figure 2). 20 gr of quiche batter
 143 were poured over the tartlet bottom. The tartlets were then placed on a pastry tray with a silpat mat and
 144 baked for 13 minutes at 180°C in a preheated oven with medium ventilation on and open exhaust until
 145 get a uniform golden-brown coloration. The tartlets were kept at room temperature on a wire rack for
 146 20 minutes, then placed and filmed in a cold storage 4°C for at least 1 hour. Finally, the tartlets were
 147 taken out from the cold storage 4°C and kept at room temperature for 30 minutes before the service.

148



149

150

Figure 2. Schema of the tartlet ingredients.

151

152 The tartlet dough was prepared, cooked and freeze 10 days before the experiment due to logistical
 153 constraints. As regards the filling of the tartlet, each day of experiment the filling was prepared and the
 154 tartlet were cooked following the same protocol. The product was served at room temperature in
 155 individual dishes. The choice of this product was made based on previous results from focus groups
 156 studies where consumers discussed about the difference between homemade and industrial products as
 157 regards the dough of tartlets and cakes as well as the use of local products. Moreover, in order to avoid
 158 interactions with other dishes, the tartlets options seemed the most appropriate as it was served at the
 159 beginning of the meal as an appetizer.

160

161 **2.3. Settings**

162 The experiment was conducted at the Living Lab restaurant of the Institut Paul Bocuse in Ecully,
 163 France (Figure 3). This restaurant is a real commercial restaurant called “Expérience”, open to the
 164 public and known locally as such (Douglas, Saulais & Giboreau, 2019). It is also a living laboratory,
 165 where research in consumer eating behavior is conducted. Each day, the restaurant was set up
 166 following the reservation list and a schema. Light and temperature were set and controlled during each
 167 service. Once participants signed the consent form they were welcomed to the restaurant and
 168 conducted to their table.



Figure 3. “Living Lab” restaurant.

169

170

171

172 **2.4. Experimental design**

173 2.4.1. Online survey

174 An online survey was created in order to collect consumers’ prior expectations and beliefs towards the
 175 “Living Lab” restaurant and the food served in it. The survey was divided into two sections (Table 2):
 176 (1) expectations and (2) participants’ opinions and beliefs. Questions related to the type of cuisine,
 177 origin of ingredients and food preparation consumers’ expected and thought to have were presented.
 178 These questions were formulated based on literature review that indicates that consumers search for
 179 homemade products and local ingredients when eating out (GIRA Conseil, 2013). The objective of this
 180 step was to (i) control consumers’ expectations and beliefs towards the restaurant (consumers mostly
 181 expected to find homemade products with ingredients from local suppliers”), and (ii) customize and
 182 validate the information conditions.

183

184 2.4.2. Information conditions

185 Two information conditions were tested related to consumer prior expectations and beliefs measured
 186 in the online survey: consistent information and inconsistent information. The menu of the day was
 187 presented to participants on a menu card. Some information about the dishes and ingredients was
 188 included next to the description of the dish for the appetizer. Depending on the information condition,
 189 the following information was presented:

- 190 • Consistent information condition: « *Homemade tartlet with confit tomatoes and goat cheese.*
 191 *Made from local suppliers’ ingredients, and ingredients from France.* »
- 192 • Inconsistent information condition: « *Tartlet with confit tomatoes and goat cheese. Made*
 193 *from EU ingredients and provided by our partner.* »

194

195

196

197 **Table 2.** Online survey questions.

Questions

Q1. Have you ever participated in a study at the “Living Lab” restaurant?

Yes

No

Expectations questions

Q2. What kind of cuisine do you expect to find at the “Living Lab” restaurant?

Gourmet cuisine

Traditional cuisine

Food chain cuisine

Collective catering cuisine

I do not know

Q3. What kind of dishes do you expect to find at the “Living Lab” restaurant?

Homemade dishes cooked on site

Already prepared dishes and just reheated on site

Semi prepared and finalized dishes on site

I do not know

Q4. According to you, with what types of products will be prepared the dishes that you will find at the “Living Lab” restaurant?

Mostly products purchased from local producers

Mostly products purchased from supermarkets

Mostly products purchased from specialized platforms

I do not know

Q5. What kind of plate presentation do you expect to find at the “Living Lab” restaurant?

(on a 5 point-scale from 1 = “very elaborated” to 5 = “not elaborated at all” (mean))

Q6. Do you expect to live an experience:

Mostly friendly to have a good time

Before anything else, with surprising dishes

Before anything else greedy, with good dishes

Above all, cheap, with a good price / quality ratio

Q7. You will be especially deceived if

You eat dishes that you could have found in another restaurant

You eat dishes with frozen products

The ingredients used are not first quality

The price / quality ratio is bad

The atmosphere is not friendly

It's not good

Opinion and beliefs questions

(on a 5-point scale ranging from 1 = “totally agree” to 5 = “totally disagree” (mean))

Q1. Homemade products include local and seasonal ingredients

Q2. Homemade products include industrial ingredients

Q3. Homemade products include frozen ingredients

Q4. Homemade products taste better than readymade products

Q5. Homemade products can be found in all types of consumption places (university restaurant, company restaurant, brewery, bistro, gourmet restaurant, street food, ...)

Q6. Homemade products can only be found in certain places of consumption

198

199

200 2.4.3. Sessions

201 The experiment followed a 1 (setting) x 2 (information condition) design and it was conducted during
 202 one week in the month of July at midday. The two experimental conditions (consistent and
 203 inconsistent information) were conducted in separate days to avoid confusion and uncontrolled
 204 information.

205

206 2.4.4. Experimental procedure and evaluation task

207 Participants had to complete an online survey to register their booking at the restaurant one week
 208 before the booked date. Each participant was given a code during the booking process that was used
 209 for the online survey and at the restaurant.

210 • Online survey: Participants get an email of confirmation together with a code and a link to
 211 complete the survey. The responses obtained allowed us to validate the information conditions
 212 and relate hedonic responses in the “Living Lab” with these results through the information
 213 condition, while guaranteeing their anonymity.

214 • “Living Lab” restaurant: Once participants signed the consent form at their arrival to the
 215 restaurant, they were shown to their table. The table already had the code of each participant
 216 so they were asked to sit in their correspondent code. Once they at the table, the waiter arrived
 217 and gave the menu card (with either consistent or inconsistent information, depending on the
 218 condition), together with a questionnaire. The waiter asked participants to read it and to start
 219 completing the first questions of the questionnaire, related to their familiarity to the type of
 220 appetizer that would be served (6-point scale ranging from 0 = “not familiar at all” to 5 =
 221 “very familiar”), and their liking for this type of product (11-point hedonic scale, ranging from
 222 0 = “I do not like it at all” to 10 = “I like it a lot”). After a couple of minutes, the waiter
 223 arrived with the appetizer and presented it to the participants repeating the information given
 224 in the menu (consistent or inconsistent depending on the condition). Participants were then
 225 asked to rate their liking for the presentation of the appetizer and their overall liking on a 11-
 226 point hedonic scale (ranging from 0 = “I do not like it at all” to 10 = “I like it a lot”). Then,
 227 participants rated the intensity perceived of the five specific sensory attributes of the product
 228 (11-point scale ranging from 0 = “very weak” to 10 = “very strong”) and their liking of such

229 attributes (ranging from 0 = “I do not like it at all” to 10 = “I like it a lot”). The attributes
 230 evaluated were: tomato flavor, cheese flavor, buttery dough flavor, salty flavor, crusty dough.
 231 Finally, questions related to participants’ satisfaction were also collected on a 6-point scale
 232 (ranging from 0 = “not satisfied at all” to 5 = “very satisfied”). All responses were collected
 233 using a paper form.

234

235 **2.5. Data analysis**

236 Descriptive analyses were conducted on the online survey data (XLSTAT Addinsoft (2019). statistical
 237 and data analysis solution. Paris, France). Comparisons between proportions were performed using a
 238 z-test when differences between groups were observed.

239 Liking data of the product, intensity and liking data of the sensory attributes and satisfaction questions
 240 were analyzed using Student t-tests.

241

242 **3. Results**

243 **3.1. Online survey data**

244 85.5% of the participants had no previous experience at the “Expérience” restaurant. Nonetheless, they
 245 had expectations towards the type of cuisine and the dishes offered. Table 3 shows the results for the
 246 different questions related to participants’ expectations as well as participants’ opinions and beliefs.
 247 Results are presented according to the information condition in which participants were assigned.
 248 Differences were observed between the groups regarding the kind of dishes (Q3), with a larger
 249 proportion of consumers expecting already prepared dishes in the “inconsistent information” group.
 250 Moreover, differences were also observed regarding consumers’ deception (Q7), with a larger
 251 proportion of consumers deceived if frozen products would be served in the “consistent information”
 252 group; whereas a larger proportion of consumers indicated to be deceived if the taste was not good in
 253 the “inconsistent information” group. However, no significant differences between percentages were
 254 observed between the two information conditions: Q3 ($z = -0.479$; $p = 0.316$); Q7 (i) ($z = 1.519$; $p =$
 255 0.936) and (ii) ($z = -1.629$; $p = 0.052$). In general, both groups expected to find a gourmet cuisine
 256 (57.3%), with homemade dishes (89.7%), mostly prepared with products from local producers 64.1%
 257 and, a very elaborated presentation (56.4%).

258

259 **Table 3.** Online survey responses for expectations questions: means (SD) or %.

Conditions	Consistent information	Inconsistent information
Participants	56	58
Q1. Previous experience		
Yes	17.86%	11.86%
No	82.14%	88.14%

Expectations questions		
Q2. Kind of cuisine		
Gourmet cuisine	58.93%	55.93%
Traditional cuisine	25.00%	23.73%
Food chain cuisine	0.00%	0.00%
Collective catering cuisine	1.79%	3.39%
I do not know	14.29%	16.95%
Q3. Kind of dishes		
Homemade dishes cooked on site	89.29%	89.84%
Already prepared dishes and just reheated on site	1.79%	5.06%
Semi prepared and finalized dishes on site	7.13%	3.39%
I do not know	1.79%	1.71%
Q4. Type of products used		
Mostly products purchased from local producers	64.29%	62.71%
Mostly products purchased from supermarkets	1.78%	3.39%
Mostly products purchased from specialized platforms	21.43%	20.34%
I do not know	12.50%	13.56%
Q5. Dish presentation		
(on a 5 point-scale from 1 = “very elaborated” to 5 = “not elaborated at all” (mean))	2.04	2.36
Q6. Type of experience		
Mostly friendly to have a good time	28.57%	18.64%
Before anything else, with surprising dishes	51.78%	59.32%
Before anything else greedy, with good dishes	16.07%	20.34%
Above all, cheap, with a good price / quality ratio	3.57%	1.69%
Q7. You will be deceived if		
You eat dishes that you could have found in another restaurant	16.07%	11.86%
You eat dishes with frozen products	44.64%	28.81%
The ingredients used are not first quality	16.07%	16.95%
The price / quality ratio is bad	1.79%	1.69%
The atmosphere is not friendly	5.36%	10.17%
It's not good	16.07%	30.51%
Opinion and beliefs questions		
(on a 5-point scale ranging from 1 = “totally agree” to 5 = “totally disagree” (mean))		
Q1. Homemade products include local and seasonal ingredients	2.04	2.17
Q2. Homemade products include industrial ingredients	3.77	3.64
Q3. Homemade products include frozen ingredients	3.66	3.98
Q4. Homemade products taste better than readymade products	1.46	1.52

Q5. Homemade products can be found in all types of consumption places (university restaurant, company restaurant, brewery, bistro, gourmet restaurant, street food, ...)	2.30	2.39
Q6. Homemade products can only be found in certain places of consumption	3.32	3.05

260

261

262 In regards of their opinions and beliefs towards homemade products, consumers agreed that
 263 homemade products included local and seasonal ingredients (32.5% totally agree and 41% agree);
 264 disagreed that homemade products included industrial ingredients (24.8% totally disagree and 35.9%
 265 disagree); disagreed that homemade products included frozen ingredients (32.5% totally disagree and
 266 33.3% disagree); and agreed that the homemade products tasted better than the readymade dishes
 267 (68.4% totally agree).

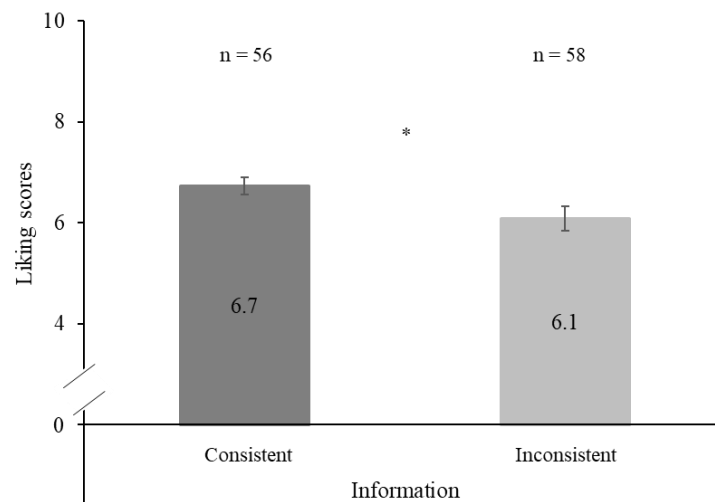
268

269 3.2. Living Lab restaurant

270 3.2.1. Overall liking scores of the tartlets

271 The Student t-test revealed significant differences in liking across information conditions ($t = 2.127$; p
 272 $= 0.036$). Consumers who had the “consistent information” gave significantly higher liking scores (\bar{x}
 273 $= 6.7 \pm 1.3$) than those who had the “inconsistent information” ($\bar{x} = 6.1 \pm 1.8$) as it is showed in Figure 4.

274



275

276 **Figure 4.** Mean overall liking scores (and SEM) for the tartlets depending whether consistent or inconsistent
 277 information was given. n refers to the number of participants in each testing condition; * = $p < 0.05$.

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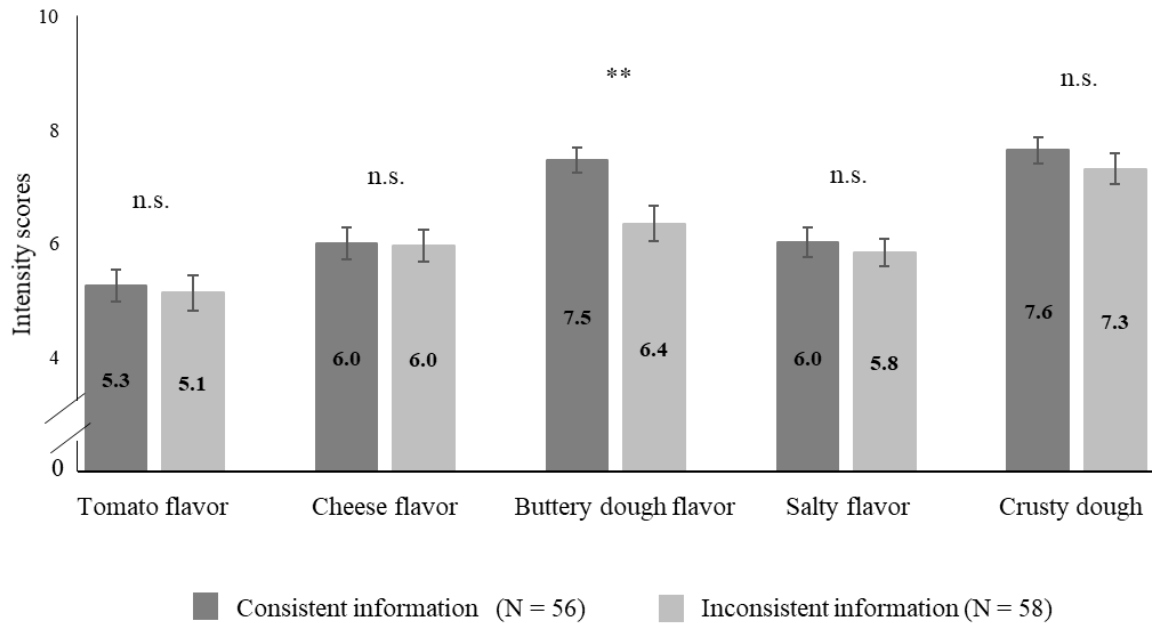
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282 3.2.2. Sensory attributes

283 3.2.2.1. Intensity scores of the sensory attributes

284 Significant differences on the intensity scores of the sensory attribute buttery flavor of the dough were
 285 found between information conditions ($t = 2.888$; $p = 0.005$). However, no differences on the intensity

286 scores were observed for the rest of the sensory attributes when different information was presented:
 287 tomato flavor ($t = 0.311$; $p = 0.756$); cheese flavor ($t = 0.086$; $p = 0.932$); salty flavor ($t = 0.487$; $p =$
 288 0.627) and crusty dough ($t = 0.920$; $p = 0.360$) (Figure 5).

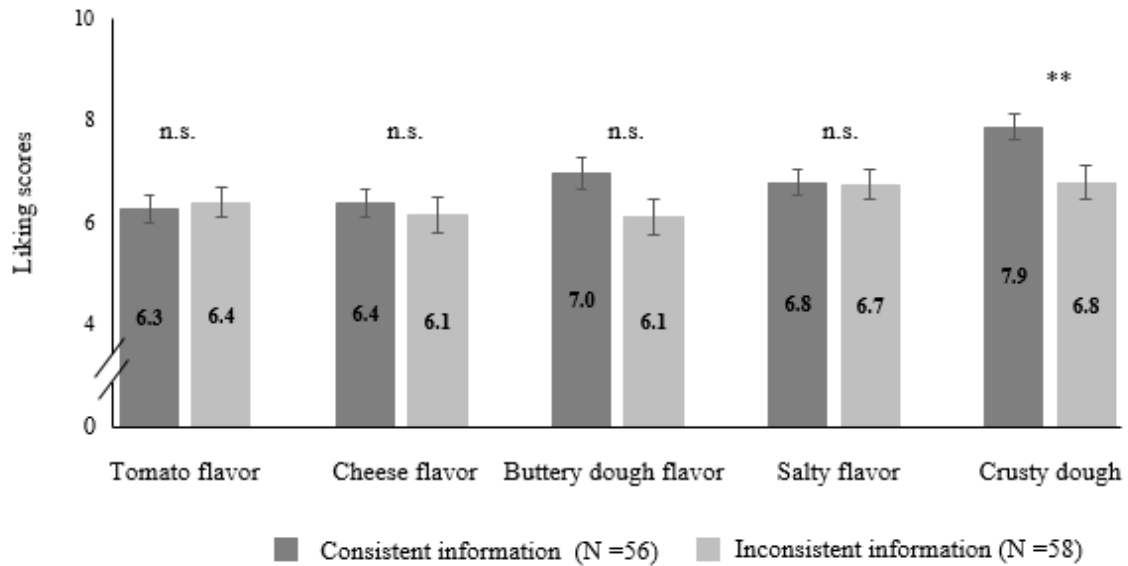


289 **Figure 5.** Mean intensity scores (and SEM) for each sensory attribute depending whether consistent or
 290 inconsistent information was given; ** = $p < 0.01$; n.s. = non-significant; N = number of participants in each
 291 testing condition.
 292
 293

294
 295
 296

297 3.2.2.2. Liking Scores of the sensory attributes

298 The Student t-test showed significant differences in the liking scores of the attribute “crusty dough” (t
 299 $= 2.697$; $p = 0.008$) across conditions, whereas the liking scores of the rest of the sensory attributes did
 300 not vary with the information condition: tomato flavor ($t = -0.337$; $p = 0.737$); cheese flavor ($t = 569$; p
 301 $= 0.571$); buttery flavor of the dough ($t = 1.876$; $p = 0.063$) and salty flavor ($t = 0.113$; $p = 0.910$)
 302 (Figure 6).



303

304 **Figure 6.** Mean intensity scores (and SEM) for each sensory attribute depending whether consistent or
 305 inconsistent information was given; ** = $p < 0.01$; n.s. = non-significant; N = number of participants in each
 306 testing condition.

307

308 3.2.3. Participants' satisfaction

309 Questions related to food and overall experience satisfaction were compared between both information
 310 conditions. The analysis of variance showed significant differences in food satisfaction ($t = 2.642$; $p =$
 311 0.009). When consistent information was given participants rated food satisfaction higher ($\bar{x} = 3.6 \pm 1.0$)
 312 than when inconsistent information was presented ($\bar{x} = 3.1 \pm 1.0$). Additionally, significant differences
 313 in overall meal satisfaction were also observed ($t = 2.413$; $p = 0.018$); higher scores were obtained
 314 when consistent information was given ($\bar{x} = 3.9 \pm 0.8$) than when inconsistent information was presented
 315 ($\bar{x} = 3.4 \pm 1.1$).

316

317 4. Discussion

318 This study assessed the effect of information on consumers' hedonic responses when evaluating a
 319 product in a particular context. In order to validate the two information conditions, the online survey
 320 revealed that participants' expectations towards a specific restaurant were associated to a certain
 321 degree of food quality. Participants expected to find a gastronomic cuisine where homemade dishes
 322 would be elaborated together with local ingredients, and would be deceived if frozen ingredients
 323 would be used, or if the taste of the dishes would not be good. These results confirmed the trends
 324 highlighted in the study of GIRA Conseil, (2013) that underlines the importance of food quality for
 325 consumers when eating out, and associates it to the use of local ingredients and homemade
 326 preparations – related at the same time to a better taste -. Participants agreed about the characteristics
 327 of homemade products related them to the use of local and seasonal ingredients, and a better taste.

328 These results are in line with previous studies who attributed consumers' beliefs towards the use of
329 local ingredients to the positive perception of products (Bernard & Liu, 2017; Spiller, 2012).
330 Conversely, participants did not associate homemade products to the use of industrial or frozen
331 ingredients. Since 2013, the label "*fait maison*" (homemade) has been subjected to an important
332 debate due to the discontent of some restaurateurs who argued about the unfair competition existing
333 between restaurants where the use of readymade products allows to offer lower price menus (GIRA
334 Conseil, 2013). This discontent is also translated to consumers who search the food value and trust
335 when eating out; factors that are associated to the quality of ingredients (Timothy, Yang, & Kim,
336 2016). The online survey results suggest that consumers' expectations and beliefs towards a particular
337 context are associated to a type of cuisine and food quality. From these results we could validate the
338 information conditions tested in the "Living Lab" restaurant.

339 When looking at the effect of the type information on participants' hedonic responses, two main
340 effects were observed: an assimilation effect was observed when "consistent information" was given,
341 and a contrast effect was observed when "inconsistent information" was given. As it was hypothesized
342 the "consistent information" condition may have reinforced participants' expectations and beliefs
343 towards homemade product characteristics, increasing the liking scores of the tartlets; whereas the
344 "inconsistent information" condition may have highlighted certain characteristics of the product such
345 as the origin of the ingredients and dish preparation that contrasted with participants' expectations
346 decreasing the liking scores of the tartlets. The online survey studies may confirm those results as
347 participants declared to expect homemade and local ingredients, instead of readymade products.
348 Although, a 30.51% of the participants in the "inconsistent information" condition declared to be
349 deceived if the taste of the product was not good, 62.71% declared to totally agreed and 28.84%
350 agreed that homemade products taste better than the readymade products. Thus, we can hypothesize
351 that participants' uncertainty with regards to the given "inconsistent information" (*provided by our*
352 *supplier and ingredients from the EU*) may have had an impact on their expectations and beliefs
353 towards the product, modulating participants' liking scores. Moreover, Kumpulainen, Vainio, Sandell,
354 & Hopia, (2018) argue that the use of unknown or global origins information negatively impact
355 consumers' trust, influencing product experience. Thus, participants may have associated the
356 "inconsistent information" to the use of readymade products with global ingredients origin, decreasing
357 their evaluation.

358 Moreover, the type of information about food preparation and origin of the ingredients had a
359 differentiated effect on the evaluation of sensory attributes and their respective liking. Participants
360 perceived and evaluated differently those attributes related to the tartlet's dough. Even if the dough
361 was the same in both information conditions, the presence of information about the process may have
362 framed participants' beliefs towards those specific sensory attributes (buttery and crusty dough)
363 modulating their perception and in turn, their evaluation (Bernard & Liu, 2017; van den Heuvel et al.,

364 2006). In fact, the tartlets' dough involves a certain preparation that may be related to the search for
365 homemade dishes participants declared to expect. We could hypothesize that the presence of
366 "inconsistent information" may also have an influence on the perception and posterior evaluation of
367 certain sensory attributes.

368 Finally, this study reveals that providing different types of information about food-related factors such
369 as food preparation and origin led to differences in food satisfaction and overall meal experience
370 satisfaction. Those results are in line with previous studies that reported that food is one of the most
371 influential criteria for restaurant selection and a determinant of consumer satisfaction (Ozdemir &
372 Caliskan, 2014; Timothy et al., 2016). In this study, participants who received "consistent
373 information" declared to be more satisfied with the food and rated their overall experience higher than
374 those who were presented with "inconsistent information". A possible explanation is that participants
375 paid for their food, and therefore assessed the value for money differently between the information
376 conditions, affecting consumer satisfaction.

377

378 **5. Conclusion**

379 The present study showed that providing different information consistent or inconsistent with
380 consumer's expectations and beliefs influence consumers' hedonic responses in a natural consumption
381 context. The online survey showed that participants associated a specific restaurant to the use of
382 homemade products and local ingredients; and these to a better taste. The actual meal experience
383 seemed to be also influenced by the type of information given about product preparation and origin of
384 ingredients. Consumers' beliefs and expectations towards the type of served food could help to explain
385 those results. Further studies should be performed in different contexts in order to explore differences
386 in consumers' beliefs and expectations on food-related factors and their influence on consumers'
387 hedonic responses.

388

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393

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3.1. Article 5 Conclusion

The purpose of this study was to examine the extent to which different factors related to food (preparation and origin) influence consumers' hedonic responses and meal satisfaction in a natural consumption context. Moreover, the role of consumers' beliefs and expectations were also assessed.

The hypotheses posited were:

H1: Consumers' expectations and beliefs towards food in a particular context would help to explain consumers' hedonic responses.

Online survey results on consumers' expectations and beliefs towards the food served in the restaurant helped to explain consumers' hedonic responses when different type of information was given.

H2: "Consistent information" would increase participants liking scores compare to "inconsistent information".

The "consistent information" condition reinforced participants' beliefs and expectations towards homemade dishes, increasing the liking scores of the tartlets; whereas the "inconsistent information" condition may have highlighted certain characteristics of the product such as the origin of the ingredients and dish preparation that would contrast with participants' beliefs and expectations decreasing the liking scores of the tartlets.

H3: Food-related factors would influence consumers' overall satisfaction.

Information about food preparation and origin of ingredients influenced consumer satisfaction of food and meal experience. A possible explanation is that participants payed for their food, and therefore assessed the value for money differently between the information conditions, affecting consumer satisfaction.

The present study highlights that context arise expectations and beliefs towards the served food that may help to explain differences in consumers' hedonic responses. Further studies should be performed in different contexts in order to explore differences in consumers' beliefs and expectations on food-related factors and their influence on consumers' hedonic responses.

Conclusions PART E

The purpose of this chapter was to understand how framing effects related to the task modulate consumer hedonic evaluation. In the first study, it was observed that information about product-related variables had an effect on consumer hedonic evaluation but that this effect was product-dependent. Readymade products conveyed a lower consensus among consumers in terms of liking that seemed to be slightly modified when information was presented. Nevertheless, the most significant result obtained from this study from a methodological point of view, was the effect of the order of sample presentation in the evaluation of the products both in informed and non-informed conditions. Even if in natural consumption contexts consumers do not taste two versions of a same product in a monadic sequence, the present results showed an important effect of a first product on the hedonic evaluation of a second product. Effects that increased when food information was presented. This experimental design may have influenced the ecological validity of the results. However, important learnings should be drawn in terms of the methodological approach. In consumer tests, several products are evaluated in a monadic sequential way, what may influence the reference point from which consumers evaluate the second product. Instead, in natural consumption contexts, consumers evaluate products from their own personal reference point that may be associated to environmental, product and consumer-related variables. The interaction between the product and the order of sample presentation showed to have a higher effect on consumer hedonic evaluation than the actual context effect.

Regarding the second study, methodological insights were also drawn from the obtained results. In this study, beliefs and expectations towards food were assessed before the actual hedonic evaluation of a product in a natural consumption context. Those consumer-related variables helped to interpret consumers' hedonic responses when different information (consistent or not with consumers' expectations and beliefs) about food-related variables was presented. Considering the Prospect theory principle 1 and 2, consumers may have created a reference point within the context of consumption that was modulated by information directly associated to consumers' beliefs and prior expectations. Moreover, as food value was assessed, consumers may have perceived the outcomes of their evaluations as gains and losses depending on the information condition in which they were divided. Those results suggest that consumers' beliefs and expectations towards a particular context may be related to food-related variables, facilitating the interpretation of different hedonic responses when looking at context studies.

GENERAL DISCUSSION

GENERAL DISCUSSION

Introduction

Since Meiselman in 1992 argued that eating behavior cannot be studied without the consideration of “real food” in “real” contexts, works have been carried out in an effort to improve the ecological validity of consumer data used in sensory and consumer science (Andersen et al., 2018; Edwards et al., 2003; Hersleth et al., 2015; Sester et al., 2013). However, how and to which degree context influences consumer hedonic evaluation is still unclear. We pointed out that the lack of a theoretical framework behind context studies makes it difficult to understand the role played by contextual variables in consumer hedonic evaluation.

Within this context, this thesis aimed to contribute **to understand the conditions under which context affects consumer hedonic evaluation of food products**. Through a **multidisciplinary approach grounded in Prospect Theory** (Kahneman & Tversky, 1979), we proposed a theoretical framework to explain the empirical observations about contexts effects on consumer hedonic evaluation, and to further formalize the effects of context to ensure a better reliability of consumer tests.

Six experimental studies have been presented in this thesis. Each study has been performed in order to explore each of the four categories in which we classified the contextual variables: environment, consumer, evaluation task and product. The first part of the discussion will summarize the responses obtained to the different research questions that we enounced from the two different approaches proposed. We will also discuss about some of the unresolved and new questions that were aroused from the experimental studies to set some perspectives.

Learnings from the experimental studies

1. Classical approach: contextual variables

1.1. Advantages and Limitations of studying hedonic responses in natural consumption contexts

Most of the context studies conducted in the last years have focused on the use of new contextual methodologies such as evoked, immersive or virtual reality. However, little research has been conducted in natural consumption contexts except for Home Use Test (Boutrolle et al., 2005; Boutrolle, Delarue, Arranz, Rogeaux, & Köster, 2007; Mörlein et al., 2015; Soerensen, Waehrens, &

Byrne, 2015; Stolzenbach, Bredie, Christensen, & Byrne, 2016). A possible explanation to that is the loss of control over the contextual variables that a natural consumption context entails questioning the reproducibility and transferability of the results. Nevertheless, context and consumer experience of food products cannot be disentangled. Likewise, the context cannot be disentangled from expectations and beliefs towards the product experience.

Chapters 5 and 6 of this thesis represented a necessary preliminary phase of this research. These two chapters included two studies that examined the effect of different contexts on consumer hedonic evaluation and choice. Moreover, consumer and product-related variables were also investigated through the use of information.

The first study (chapter 5) compared consumer hedonic evaluation of a Lebanese Tabbouleh in three different contexts at the Institute Paul Bocuse: Central Location Test (CLT), evoked context and restaurant. In this study, food-related variables such as the amount of served food and the presentation were standardized among contexts. No differences among the three contexts were observed in terms of hedonic evaluation. Neither the effect of information influence consumer hedonic evaluation despite the increasing consensus observed on consumers' hedonic responses in the restaurant when information was given. The second study (chapter 6) explored whether consumers considered information about food-related variables when choosing food, and if this information influenced their hedonic evaluation. A three-day experiment was conducted during a food conference event in the United Kingdom. In the case of the hedonic evaluation, significant differences were obtained for two salad dishes only.

Although the number of consumers per study and conditions was not enough to firmly conclude, methodological insights were underlined from both studies. Regarding the first study and the standardization of the food-related variables (chapter 5), the literature has shown that portion size (Brunstrom & Shakeshaft, 2009; Havermans, Janssen, Giesen, Roefs, & Jansen, 2009; Rozin & Tuorila, 1993; M. Spence et al., 2016) and food presentation (García-Segovia, Harrington, & Seo, 2015; Michel et al., 2014; Piqueras-fiszman et al., 2012; Rowley & Spence, 2018) had an impact on consumer hedonic evaluation. Most studies carried out in controlled conditions do not usually offer a full portion size of a food product and do not present it in the same way it will be consumed in a natural consumption context. This could be associated to the cost that represents to offer full portion sizes to a big number of consumer in controlled conditions. However, presenting smaller portion size may bias the response of consumers depending on the tested product. With regards to the portion size, it is also important to make a difference between the evaluation of a dish and a standardize product such as a cookie, beer, juice, etc. Studies that compared dishes (e.g. cannelloni, salad, lasagna, etc.) in different contexts found that the liking scores of those dishes were lower in CLT (where the amount of served food was lower) than in more natural contexts. In some cases, they did not even consider the

results obtained in the CLT due to the small portion size used (King et al., 2007, 2004). It could be then hypothesized that **the way to evaluate a dish may not be the same to evaluate a standardized product in terms of portion size**. A snack can be eaten in a small number of bites whereas a dish requires longer time of degustation (Rozin & Tuorila, 1993). This difference in terms of degustation may represent a drawback in terms of logistics when running a test in controlled conditions due to time constraints. Nevertheless, this aspect should be further investigated in order to get more insights about the way dishes should be tested in controlled conditions.

With regards to food presentation, our first study (chapter 5) used the same dish presentation in the three contexts. This could have contributed to the obtained results where no differences in consumer hedonic evaluation were observed. However, it is important to highlight that this was possibly due to the characteristics of the natural consumption restaurant. In the restaurant, food was indeed presented in paper or plastic cups together with plastic cutlery, that is to say a material that is currently used in consumer tests in controlled conditions. Thus, consumers may have been provided inadvertently with a frame of reference that helped them to project themselves in a natural consumption situation as they did in the restaurant. Besides, other studies had shown that the use of incongruent elements to test food in controlled conditions could lower the hedonic response (Petit & Sieffermann, 2007). García-Segovia et al., (2015) showed that when comparing different table settings (plastic tray, home style, gourmet), consumers did not like the gourmet presentation in the CLT whereas they did in the naturalistic settings, and opposite results were obtained when plastic tray presentation was used. This means that even if presentation has an important role on consumer hedonic evaluation, special attention should be put in the way this food-related variable is used in context studies comparison.

As regards the effect of information, our results contradict our expectations as well as results from the literature. We indeed observed (chapter 5) that hedonic scores in blind condition were slightly higher in the CLT and evoked context than in the restaurant. One of the possible explanations to this result was the fact that consumers showed special interest for the experiment; some of them even discussed about the type of questions formulated and the fact that they wanted to give more feedback about the dish when being at the CLT and evoked context. It is important to underline that the consumers in this study were students from culinary arts which may explain their interest about the tested dish. Conversely, at the restaurant consumers showed to be less involved and interested about the questionnaire. This could be related to time constraints also observed in the study carried out in the United Kingdom where consumers did not want to participate in the study due to the lower time they have for lunch. This raises questions about consumers' mindset when performing a hedonic evaluation depending on the context.

As regards the information conditions, no differences in hedonic responses were observed in the two preliminary studies (chapter 5 and 6). This could be related to the lack of given information or wording used (gourmet caterer) as well as the low number of participants per condition and study. In the case of the first study (chapter 5), only CLT and restaurant contexts were compared but both were inscribed in the frame of the Institute Paul Bocuse. Thus, consumers may not have expected to find differences in terms of food quality regardless of the context and condition. Even if no differences in hedonic responses were observed, the consensus among consumers' responses in the restaurant increased. This rose the question that **the presence and type of given information could frame consumer evaluation towards a particular characteristic of the product**. At the same time, the presence of food information could be related to consumers' beliefs and expectations, modulating the interaction between the product and consumer, and "reducing" the interaction with other contextual variables such as environmental ones. Actually, during the experiment in controlled conditions (chapter 5), consumers discussed about the wording used (gourmet caterer) and the situational appropriateness of a dish like that. They associated the tested dish (tabbouleh) with different contexts according to the given information, so this may explain the low of consensus among participants. Conversely, at the restaurant, consumers may have actually experience that "situational appropriateness" associated to the dish, relating their hedonic evaluation in a given context to the given information; what may help to increase the consensus among consumers' responses. This underlines two different questions: (1) **certain products may be able to pass across contexts (standardized products), whereas others may not**, as it could be the case of food dishes or product that require a certain level of preparation (Hathaway & Simons, 2017); (2) **depending on the context and the characteristics of the product** (food quality information), **consumer hedonic evaluation may differ according to the situational appropriateness perceived**. Edwards et al., (2003) showed that a similar dish (Chicken à la King and Rice) prepared from the same ingredients and a standard recipe, was differently evaluated depending on the consumption context. That is, a readymade tabbouleh can be appreciated at home or at a student cafeteria; while in a restaurant it may not. Two important elements are highlighted by these results, one related to the appropriateness of the dish perceived by the consumers in a particular context, and the other related to consumers' expectations towards that particular dish in a specific context. Those two aspects will be further discussed in the following section (2.1.2.) when consumers' mental representations about food will be addressed.

Additionally, in regards of the nature of information that is given, we observed that consumers in the second study (chapter 6) did not pay attention to the information presented at the menu cards. Instead, they observed the food stand and asked the catering service about it even if the menu cards were displayed on top of the food stand and tables. As Grunert (2011) describes, the need for food information does not always lead to its perception. Consumers tend to select the information they are interested in and ignore the rest. In this type of events where attendees do not have a lot of time for

lunch, this may have led them to simplify their food decisions by directly asking the catering service. Fernandes et al., (2016) argue that differences in the type of foodservice (cafeteria, restaurant, etc.) induce different behavior so **the presence of information may lower or improve consumer responses depending on the context of consumption.**

From these two first studies we observed how consumers differently behaved depending on the context and how different contextual variables could be interrelated. Moreover, as the objective was to determine the advantages and limitations of a hedonic evaluation study setup in a natural condition, some insights were drawn from those experiences. Table 1 summarizes the critical points of each context by looking at each of the four categories of contextual variables. Besides, as several contexts were tested during this thesis, their advantages and limitations are also included in the table. Studying hedonic responses in natural conditions allowed us to observe the natural behavior of consumers in different consumption contexts. Moreover, when consumers actually paid for their food, food value could be also addressed as part of the consumer experience. Nevertheless, introducing a questionnaire changes these conditions, which may modulate consumers' attention and hedonic responses. Furthermore, not all consumers appreciated having to answer a questionnaire while eating, due to time constraints in the case of the conference event and university cafeteria, what could influence as well consumer experience and in turn, hedonic responses. With regards to the product-related variables, the main limitation offered by the natural conditions was the lack of control over the preparation of the food in contexts such as the conference event and university cafeteria, where food caterers were the main stakeholders, so modifications in terms of food preparation were more difficult to conduct and to control.

Table 1. Advantages (green) and limitations (red) of studying hedonic responses in natural conditions compare to CLT and evoked contexts in this thesis.

Natural conditions					
Context	Environment	Consumer	Evaluation task	Product	Comments
Restaurant (fast food type) (chapter 5)	(+) Possibility to collect higher amount of data (+) Conviviality	(+) Students' natural behavior was observed (+) Neither recruitment /nor incentives (natural situation)	(+) Inclusion of a questionnaire may modulate consumers' actual attention to the product, modulating consumers' hedonic responses (-) Hedonic responses may include other factors related to the meal experience	(+) Regular amount of served food as well as presentation (-) Lower control over the product service	In this study a readymade product was used so the actual preparation of the dish was not affected. Nevertheless, during the service it was needed to verify that no modification on the product was made (seasonings). A good communication between the chef and the researcher was needed.
Food conference event (chapter 6)	(+) Possibility to collect higher amount of data (+) Food choice	(+) Conference attendees' natural behavior was observed (+) Neither recruitment / nor incentives (natural situation) (+) Food value addressed		(+) Regular amount of served food as well as presentation	In this study several setbacks took place. The cutlery used changed among days, food options were ready at different times. Even if the characteristics of the recipes were set, no control in the preparation from day to day were checked.

(-) No control over the environmental-related variables such as light, temperature
 (-) Conference attendees did not appreciate the fact of answering a questionnaire while eating due to time constraints
 (+) Inclusion of a questionnaire may modulate consumers' actual attention to the product, modulating consumers' hedonic responses

(+) Hedonic responses may include other factors related to the meal experience

University cafeteria (chapter 8)

(+) Possibility to collect higher amount of data
 (+) Conviviality
 (+) Food choice
 (+) Neither recruitment / nor incentives (natural situation)
 (+) Food value addressed

(+) Regular amount of served food as well as presentation
 (+) Certain control over food preparation was obtained
 In this study a total of four products were assessed. Nevertheless, due to the free choice option and problems with the suppliers, the hedonic responses of two products could not be evaluated.
 Moreover, the shifts between the staff made that some of the recipes were not followed as indicated compromising the data collection

(-) No control over the environmental-related variables such as light, temperature
 (-) Some students and staff did not appreciate the fact of answering a questionnaire while eating
 (-) Risk of obtain lower responses for the target product due to the free choice possibility
 (-) Inclusion of a questionnaire may modulate consumers' actual attention to the product, modulating consumers' hedonic responses
 (-) Lack of control over logistics within the university cafeteria: staff, suppliers

(-) Hedonic responses may include other factors related to the meal experience

Experimental restaurant (chapter 9)	<p>(+) Control over the environmental-related variables such as lights, temperature</p> <p>(+) Conviviality</p> <p>(+) Consumers natural behavior was observed</p> <p>(+) Food value addressed (chapter 9, 2nd study)</p>	<p>(+) Regular amount of served food as well as presentation was kept</p> <p>(+) Control over food preparation</p> <p>variables such as amount of served food, presentation and preparation.</p>
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(-) No food choice

(-) Recruitment

(-) Not food value addressed

(-) Inclusion of a questionnaire may modulate consumers' actual attention to the product, modulating consumers' hedonic responses

(-) Hedonic responses may include other factors related to the meal experience

Controlled conditions

CLT (chapter 5 and 9)	<p>(+) Control over the environmental-related variables such as lights, temperature</p>	<p>(+) Regular amount of served food as well as presentation (chapter 5)</p> <p>(+) Control over food preparation in all studies</p> <p>1. Surprise in the case of students (chapter 5)</p> <p>2. Stress like if they were in an exam in the case</p>
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of the adults (chapter 9)

- (-) No conviviality
- (-) Consumers natural behavior cannot be observed
- (-) No food choice
- (-) Different presentation between restaurant and CLT (chapter 9: cakes study)

Evoked context (chapter 5)

- (+) Control over the environmental-related variables such as lights, temperature
 - (+) Consumers focused on the evaluation task
 - (+) Regular amount of served food as well as presentation
 - (-) No conviviality
 - (-) Students natural behavior cannot be observed
 - (-) No food choice
- In this study students easy identify the context of consumption as the type food, presentation and evoked context was familiar

1.2. The influence of mental representations on consumer experience and hedonic evaluation

Studies comparing natural contexts argue that differences in consumer hedonic evaluation could be explained in part by beliefs and expectations that consumers may bring to a particular context (Cardello, 1995; Cardello et al., 2000; Edwards et al., 2003). Consumer-related variables such as consumer' beliefs and expectations play indeed a major role in the way consumers perceive and experience a product (Delwiche, 2012; Jo & Lusk, 2018; Schifferstein et al., 2019). Boutrolle (2007) affirms that each of us has a personal experience with a product that allows us to determine what a product is, how it tastes and where we would have it just by seeing it. This is due to the mental representations consumers form after several exposures to a product in a particular context (Sester, 2013). Then, once consumers have set mental representations (knowledge and beliefs) about a product or context, these will create expectations that will modulate consumer experience, and in turn, consumer hedonic evaluation (Piqueras-Fiszman & Spence, 2015).

Although context studies refer to expectations to explain differences in consumer hedonic evaluation, those studies do not evaluate prior expectations towards contexts in order to determine the possible relation with their hedonic data. As mental representations can create expectations, the second objective of the thesis was to examine if consumer mental representations about food in different contexts could influence consumer experience (chapter 7). A qualitative study was carried out with a total of 86 consumers from two different regions (Paris and Lyon) and two different types of population (students and non-students). The results showed that consumer mental representations towards food were intimately associated to the context of consumption and different contextual variables. Important differences between homemade and industrial products were discussed by consumers and associated to different consumption contexts. Different affective experiences were also associated to different contexts and conviviality was, with taste, among the most important criteria for consumers when eating out. This reveals that when comparing context studies, **consumer hedonic evaluation may be affected not only by the presence of contextual variables, but also by the way in which those variables are integrated and matter for consumer experience.**

From this third study, we realized that it is important to make a difference between two concepts when comparing context studies: product experience and meal experience. Product experience has been described by Desmet & Hekkert (2007) as “all affective responses that can be experienced in human-product interaction” (p.13). These authors considered three dimensions of the product experience: aesthetic experience (perception), experience of meaning (cognitive processes), and emotional experience (affective phenomon) (Figure 11).

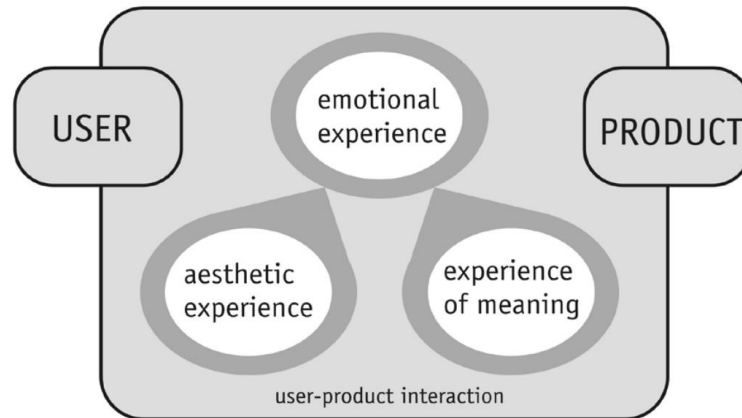


Figure 11. Framework of product experience (Retrieved from Desmet & Hekkert, 2007).

However, when looking at consumer mental representations about food in different natural consumption contexts, we realized that different dimensions were also underlined by the consumers, such as the service or the logistics at the restaurant. These results correspond more to the Edwards & Gustafsson (2008) five model factor where aspects like room, management and meeting (contact with the service) are also considered as part of the meal experience (Figure 12).

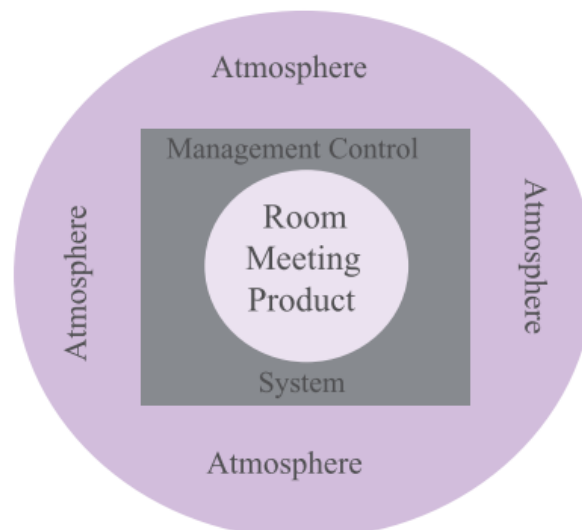


Figure 12. Five Aspects of the Meal Model (Retrieved from Edwards & Gustafsson, 2008).

When looking at context studies we may then consider that not only environmental or product-related variables may influence consumer hedonic evaluation. Variables such as the service or the management at the restaurant can also influence consumer experience (especially in restaurants) due to the mental representations consumer may have created through personal experiences.

Furthermore, as it was reported in chapter 7, consumers agreed that meal experience cannot be perceived in a sensory booth as the context of consumption is missing. Although some consumers agreed that test products in a sensory booth could be an interesting experience, most of the consumers agreed that this type of experience make them feel like “if they were in an exam” or like if they were “laboratory rats”. Then, we may consider that **consumers’ mindset when coming to a consumer test in controlled conditions may differ from consumers’ mindset when going to a restaurant, what could already influence the way in which consumers are going to perceive and evaluate a product.**

Additionally, from this third study we realized that consumers differently evaluate the presence of contextual variables, especially food-related variables. In most of the context studies conducted in natural conditions, it is almost impossible to disentangle the influence of different contextual variables on consumer hedonic responses. However, these variables may have higher or lower effect on consumer hedonic evaluation depending on the context and meal or product experience. For example, consumers highlighted that in workplace or school cafeterias, conviviality plays a major role on the meal experience compared to other contexts where food becomes the central part of the meal experience, such as gastronomic restaurants. This difference among contexts was associated to the food value perceived by consumers. In fact, consumers associated the quality of the served food in different contexts to the price paid for it. This is a key element that context studies rarely considered when comparing consumer hedonic evaluation in different context, although it has shown to have an impact on consumer experience and satisfaction (Ozdemir & Caliskan, 2014; Timothy, Yang, & Kim, 2016).

Concerning food value and the perceived quality of food products, chapter 7 showed that consumers associated the perceived quality of food to different consumption contexts. These results are not new as previous studies have shown the negative image about food, consumers have in contexts such as institutional restaurants or hospitals (Cardello, Bell, & Kramer, 1996; Edwards, Hartwell, & Brown, 2013). However, we found that the quality of products was associated to the origin of ingredients and preparation method, especially to the use of readymade and homemade products. This could be related to the category of products consumers taste: standardized product or a product (dish) that requires a preparation. The literature review (chapter 1) showed that food preparation has not been widely explored when comparing context studies. However, a dish prepared in the laboratory may taste different from another one prepared in another context, due to the effect of the preparation in the sensory properties of a product and to the consumers’ expectations and beliefs towards those contexts. Related to this issue, we observed that consumers have different levels of expectations and beliefs depending on the context of consumption and the quality of the served food. In workplace and school cafeterias, together with fast food chains and certain *bistros* or *brasseries* consumers expected to find

readymade products or processed food such as canned or ready-to-heat dishes; whereas in small restaurants and gastronomic restaurants consumers expected to find homemade dishes made from local ingredients and seasonal products. Once again, consumers we interviewed related this to the value perceived. Moreover, they discussed about the different levels of quality of processed food and their acceptability towards those differences depending on the context of consumption. For example, in a gastronomic restaurant, consumers would not mind to have certain side dishes made from frozen ingredients as they considered the quality of those ingredients would be higher than the one in a workplace cafeteria. - Yet, it is important to make the difference consumers made between frozen fresh ingredients and frozen processed food -. It is here, when the relevance of certain contextual variables intervenes and could be related to the concept of situational-appropriateness mentioned in the previous point (2.1.1.). Food-related variables may have more “weight” in places where consumers already expect to find a certain level of food quality, whereas environmental-related variables may count more in other contexts. This means that **each context may create a frame of reference from where consumers are going to evaluate food products**. This reference frame could be associated to the concept of situational appropriateness that refers to the perceived degree of fit between products and different usage situations (Cardello, & Meiselman, 2018). Several studies conducted on situational appropriateness have shown that consumers associate different products to different eating situations and contexts, and those associations are influenced by cultural norms and expectations, as well as consumption habits (familiarity with the product) (Arruiz, Sosa, Martı, Hough, & Mucci, 2005; Cardello et al., 2000; Giacalone et al., 2015). Those studies could help to explain the differences we observed between the two regions comparison (Paris and Lyon) and the two types of population (students and non-students).

Therefore, when comparing context studies, we suggest to look at consumers’ mental representations towards the studied contexts in order to set the frame of reference from where consumer’s hedonic responses will be compared. It is also important to consider that contextual variables may not have the same relevance in different contexts so it may be difficult to determine the direct influence of specific contextual variables on consumer hedonic evaluation.

2. Prospect theory approach: evaluation task and reference points

2.1. The influence of the evaluation task on consumer hedonic responses

The role of the evaluation task has been widely explored in the fields of psychology and experimental economics (Harrison & List, 2004). How consumers perceive and perform a task can help to explain the results obtained in an experiment. In sensory science, different measurement tools (questionnaires and scales) have been developed in order to assess consumer hedonic evaluation. Methods such as

hedonic scaling, labeled magnitude scales, Just-About-Right Scales or CATA questions have been used showing controversial results on consumer's hedonic responses depending on the type of task performed (Hein, Jaeger, Tom Carr, & Delahunty, 2008; Jaeger et al., 2013; Popper et al., 2004; Prescott et al., 2011). However, as it was described in the literature review (chapter 1 and 3), the role of the evaluation task has not been explored in natural consumption contexts.

Generally, when we evaluate a product, without any evaluation task demanded, we express a spontaneous and global judgement that usually corresponds to: "I like it", or "I do not like it". This could be interpreted as a *synthetic evaluation*. However, when we focus on the sensory attributes of the product: "it is not too salty", "it is too sweet", we perform a more *analytical evaluation*. The fact of introducing a questionnaire in natural conditions has already shown to have an impact on consumer behavior towards the task. However, how the type of evaluation task influences consumers' hedonic responses in natural conditions it was still unclear.

Chapter 8 presented a fourth study conducted in a university cafeteria where consumers' hedonic responses towards different products were assessed by using synthetic and analytical evaluation task. Two different type of products were used: pizza with different degrees of culinary preparation (homemade, industrial and a mixed of the two) and bread that served as a control. Liking scores of the homemade pizza (the most liked version) were lower with the analytical task while the scores of the other two pizzas and the bread did not significantly change. This fourth study revealed that **differences in task format may affect participants' responses to liking scores in the case of multicomponent products** such as pizzas. The fact of asking participants to rate sensory attributes may influence their attention, and therefore their perception of dishes' attributes. However, this should be confirmed with other product categories, especially dishes served in eating contexts (such as restaurant, cafeterias, canteens) where different degrees of culinary preparation may be performed and are to be expected.

As we mentioned before (point 2.1), these results also suggest that consumers may differently evaluate standardized products (in the case of this study, bread) compared to those that need certain preparation in a natural consumption context (in the case of this study, pizza). The evaluation of the different sensory attributes in the analytical evaluation task showed that consumers differently rated the attributes of the three different pizzas, which could be related to the different degrees of culinary preparation involved and, the task performed. Nevertheless, it could be interesting to repeat this study in natural and also controlled conditions in order to observed the stability of the results within the same culinary preparation (for example, homemade). We observed that in the case of the standardized product, bread, similar results were obtained during the two days of study for both tasks, while in the case of the pizzas this was not possible. It could be then interesting to see if consumer hedonic responses towards multicomponent products are also constant within the same task or not.

Moreover, even if consumers' expectations were not assessed in this study and no information was given about the culinary preparation, we could hypothesize that consumers did not expect to find a homemade pizza at the university cafeteria context. As we discussed in chapter 7, consumers do not associate this type of preparation to this type of context. Therefore, the fact of explicitly ask consumers about the sensory attributes of the homemade pizza may have increased consumers' attention towards the characteristics of the product. The sensory attributes perception may have contrasted with what consumers expected to find in the cafeteria, that is, the mixed pizza (frame of reference for consumers in this study) or readymade pizza, decreasing consumers' hedonic responses. Conversely, when a more global question was asked (synthetic evaluation task), these mismatch between expectations and actual liking may did not have occurred.

This fourth study also revealed that not only liking scores differed depending on the task format, but also the final ranking of the products. Although consumers' preferences were not assessed in this study, looking at the global picture of the products evaluation (Figure 13), we observed that the ranking of the products changed depending on the evaluation task performed. This result could be explained by the difference in the number of consumers per condition but also, it suggest that **the use of different evaluation task may entail different managerial decisions for industrials when products are tested in context studies**. Additionally, it could be interesting to repeat this experiment by changing the order of sample presentation in both natural and controlled conditions. Even if a pure monadic presentation was carried out, consumers were familiar to this product, so they could have compared the readymade pizza of the last experimental week to the mixed pizza version from the previous week, and this, to the homemade one.

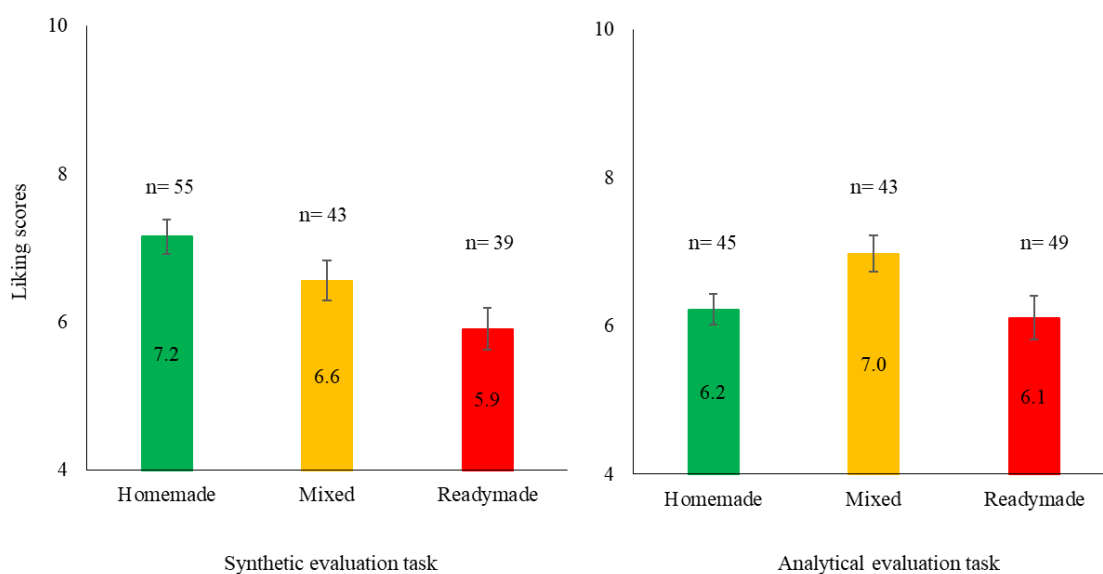


Figure 13. Liking scores of the three pizza versions depending on the evaluation task format (n refers to the number of participants per condition).

It is possible that in natural consumption contexts, a synthetic evaluation task will be close to the natural and spontaneous consumer judgement we previously described. The fact of asking more questions about the product, may frame consumers' attention to particular characteristics of the product that in natural conditions consumers may not perceive. We could suggest that we "created" a sensory booth environment within the natural context of consumption. Thus, the question would be to know what is the point of performing a synthetic or analytical evaluation task in a natural consumption context where multiple contextual variables may influence consumer responses. Maybe, the fact of focus consumers' attention to the task, could reduce the bias set by environmental-related variables. Nevertheless, the ecological validity expected to achieve in a natural consumption context could be compromised. Additionally, as we previously mentioned (point 2.1), some consumers did not appreciate the fact of answering a questionnaire while eating. So, the fact of answering a longer questionnaire could also influence consumer hedonic evaluation as previous studies have shown (Earthy et al., 1996; Popper et al., 2004).

These results suggest that when different information is presented about the same issue (hedonic evaluation), different aspects of the outcomes may occur. This could be related to the notion of framing effects widely explored by psychologists and behavioral economics (Kahneman, 2002). As sensory scientists have done when comparing different measurement tools in controlled conditions, it could be interesting to know, how consumers in more natural conditions evaluate food products depending on the type of evaluation task. As Köster (2003) argued, we are not sure about how consumers understand a specific evaluation task. However, we try to increase the realism of consumer tests in order to ensure the ecological validity of the data. Thus, we suggest that **further research on framing effects in more natural consumption contexts should be conducted in order to understand if consumers perform the evaluation task as they do in control conditions and, from a practical point of view, if consumers choices would differ depending on the formulation of the evaluation task in natural contexts.**

2.2. Framework of reference on consumer hedonic evaluation

Consumer evaluation takes place within a context. Therefore, the context determines the reference on which consumers base their evaluation. However, it is still unknown what is the framework of reference when consumers evaluate a product in different contexts. The literature review (chapter 1) showed that context effects have been widely studied in the fields of psychology and behavioral economics through Prospect theory. This theory posits that the outcomes of our decisions are defined by losses versus gains with respect to a reference point (Tversky & Kahneman, 1991).

Reference points are considered as the status quo or current state from which consumers make the evaluation of outcomes (Kahneman & Tversky, 1979). Outcomes that can be differently perceived if the reference point changes or is manipulated (Jervis, 2004), through expectations, norms, and social comparisons (Tversky, 1992). According to that, we could imagine that this could occur when consumers evaluate or choose a product, and certain characteristics of it will be more or less easily accessible, determining the reference of evaluation.

The studies conducted in this thesis, suggested that consumption contexts set reference points from where consumers are going to evaluate a food. Moreover, we observed that consumers' expectations and beliefs towards a particular context are related to certain characteristics of the product, especially to the quality of ingredients and food process (homemade versus processed food). In the study performed in chapter 8, we also observed that consumers perceived the difference between three culinary preparations in a student cafeteria and that the results were in line with the results observed in the discussions groups (chapter 7), and the literature: homemade products are better considered than more processed food (GIRA Conseil, 2013). However, we did not know if this attention consumers place to those characteristics is the same in every context or for every product.

Therefore, considering that reference points can be manipulated by expectations, and expectations are built from mental representations, chapter 9 tried to explain how task-related framing effects modulate consumer hedonic evaluation. We wanted to explore if the framework of evaluation (reference dependence) could help to explain why some products seem to be more affected than others by context variations. In order to answer this objective, two experimental studies (fifth and sixth) were conducted.

In the fifth study ("cakes study", chapter 9.2), we investigated the role of variations of preparation method (homemade and readymade) in setting reference points in different evaluation contexts (central location test (CLT) and restaurant). We hypothesized that expectations in association with context would induce a frame of reference for evaluation that would explain differences in sensitivity to context. In the sixth study ("quiche study", chapter 9.3), we investigated the influence of the type of information (consistent or inconsistent with consumers' expectations and beliefs) provided on food preparation and origin of ingredients on consumer hedonic evaluation to a product in a natural consumption context.

In the fifth study (chapter 9.2) we observed that consumer hedonic responses in the restaurant setting were higher, regardless of the product version. These results were in line with previous studies that reported lower liking scores in controlled conditions compare to natural consumption contexts (King et al., 2007; Meiselman et al., 2000). However, as the first study showed in chapter 5, this is not a constant result. This could be explained by the differences in the consumer population: in the first study (chapter 5), consumers were students of culinary arts (18-20 years old), whereas in this fifth

study (chapter 9.2), consumers were adults among 30-60 years old. Or, this could be explained by the difference in product and meal experience related to consumers' expectations. The students in the first study (chapter 5), may have perceived the CLT product experience as something new, interesting and fun related to their "professional activity", while answering the questionnaire at the restaurant during lunch may be perceived as something uncomfortable to do due to time constraints. However, in this study (fifth study, chapter 9.2), consumers who evaluated the products at the restaurant may have perceived this as part of the meal experience, interesting and fun (also due to the characteristics of the "Living Lab" restaurant), while those who came to the CLT and were informed that they would have to evaluate a product in controlled conditions, may have perceived the product experience as something stressful or less fun due to the prior expectations. We could suggest that in this study **people came to the CLT with a "lower" overall framework, and this could relatively impact consumer hedonic evaluation.**

Besides, with could also note that information played a key role on consumer evaluation of the readymade version. This could be related to the fact that **products with an overall 'high' reference score (homemade) seem less affected by variations of context than less appreciated products or products with more uncertainty** as it could be the case for the readymade labelled product. As it has been shown in chapter 7, consumers are less prone to have this type of products (readymade or processed food) when eating out and negative attitudes have been reported towards them (GIRA Conseil, 2013). These negative attitudes may become more salient by the presence of information and directly impact consumer evaluation as previous studies have shown (Jo & Lusk, 2018; Lee et al., 2006; Stolzenbach, Bredie, Christensen, & Byrne, 2013). However, those effects were not observed for the homemade version as the presence of information did not increase consumers' hedonic responses what could be explained by the match between what they expected to have and what they actually had regardless of the context.

Finally, one of the most important results from this thesis was the significant effect the order of presentation (monadic sequential and pure monadic) on liking and on the fulfillment of expectations that we observed in the fourth and fifth study (chapter 8 and 9.2). This, reveals a possible contrast or disappointment when the homemade version was presented first. The order of sample presentation has shown to have an effect on consumer hedonic evaluation (Boutrolle et al., 2005, 2007). However, this effect has not been further explored in natural consumption contexts. A logical explanation to that, is the fact that consumers do not usually taste two similar products one after another in natural consumption contexts. Conversely, they compare the product to a personal reference point what could correspond to the pure monadic mode (fourth study, chapter 8). In fifth study, we modulated the framework of evaluation and consumers compared two versions of a product in a monadic sequential mode. This could modulate the reference point of comparison from one product to another as well as

the expectations. The results showed that **the context of the evaluation task had an effect stronger than the actual context of consumption (CLT and restaurant)**. In the case of natural consumption contexts such as restaurants, a monadic sequential presentation of the products may decrease the ecological validity of the results. Nevertheless, depending on the type of product tested - standardized (snacks) or a product that requires a preparation – the type of methodology applied may have higher or lower effects.

The fifth study (chapter 9.2) did not assess consumers' expectations and beliefs. However, in the last study (sixth study, chapter 9.3), we controlled those variables. Consumers showed to have specific expectations and beliefs towards the restaurant food offer: homemade dishes made with local ingredients. From those results information conditions were set and used to see the influence of information on consumer hedonic evaluation. In this study we investigated if variations in the type of information modulate consumers' reference points in a particular context. Consumers with consistent information about expectations towards food-related factors, rated the product higher than those who were presented with more inconsistent information. Moreover, consumers scored higher their satisfaction when the information was consistent with their expectations and beliefs. We should underline that in this last study consumers also paid for their menu what may include the food value variable in the evaluation. Bringing back Prospect theory, the second principle of this theory posits that it is harder to lose than it is good to gain (Kahneman & Tversky, 1979). All consumers expected to find a certain quality related to homemade dishes from local ingredients. However, those who received the inconsistent information may perceive a loss compared to those who received the consistent information even if the product was exactly the same. This raises several questions: **is liking a good indicator when comparing context studies?** and **what is the minimum level of food acceptability (liking) at different context of consumption?** As in controlled conditions, consumer hedonic evaluation rarely included the food value variable, studies in natural consumption contexts with similar environmental-related variables could help to answer those questions.

New questions raised by our experimental studies: Perspectives

The present work has arisen new questions regarding the effects of context on consumer hedonic evaluation.

1. Product categories: Standardized products versus products that require preparation

We have observed that certain products may be able to pass across contexts whereas others may not, as it could be the case of food dishes or products that require a certain level of preparation. Familiarity

with the products could help to explain those differences as previous studies have related unfamiliar products to a more context-dependent effect (Giacalone et al., 2015; Jaeger et al., 2017; Jaeger, Roigard, Blond, Hedderley, & Giacalone, 2019). Nevertheless, further research should be performed in order to understand the differences between standardized products and those that require a certain level of preparation, and contexts effects; including methodological aspects as the portion size and presentation. Recent research has been conducted with regards to the use of products as ingredients in the preparation of different dishes. In this type of studies, the same principle as in situational appropriateness is applied, but instead of measure the appropriateness of a product in a particular occasion, they measure the appropriateness of a product as ingredient on a recipe (Spinelli et al., 2019).

2. Consumers mindset

We underlined that consumers' mindset when coming to a consumer test differ from consumers' mindset when going to a restaurant, what may already influence the way in which consumers are going to perceive and evaluate a product. When consumers perform a hedonic evaluation in a controlled condition, we consider that consumers will have expectations towards it and that these expectations could modulate their evaluations. Besides, when comparing context studies, we consider that expectations towards a particular consumption context will influence consumer hedonic evaluation. However, we do not measure the expectations consumers may have toward the laboratory conditions. Therefore, we suggest that research should be conducted in this area in order to have a global picture regarding consumers' expectations towards all contexts, when comparing context studies.

3. Food value and consumer hedonic evaluation

The role of food value on consumer hedonic evaluation has risen different questions regarding the comparison between contexts studies. In general, food value is not addressed in controlled conditions, whereas in natural consumption contexts consumers usually pay for their food. The value perceived by the consumers has shown to influence product and meal experience (Ozdemir & Caliskan, 2014; Saulais & Ruffieux, 2012). The match between what consumers expect to have and what they obtain for a price, influence their food evaluation. For example, low quality food that yet meets expectations may be preferred to high quality food that doesn't. However, how can we accurately predict the match between expectations and actual experience regarding food value still needs further research.

4. Prospect theory and consumer hedonic evaluation

It has been shown that to study context effects, assessing interactions of sensory and non-sensory factors is crucial. However, to determine what impact does environment have on the liking of products is still unclear, as other factors such as the context itself and people may also influence. In this thesis,

we decided to explore the mechanisms that may help to explain how and not why, consumer hedonic evaluation is affected by contexts effects. As it was enounced in the literature review (chapter 3), solid theoretical principles from disciplines such as psychology and behavioral economics could help to explain some of the questions sensory and consumer scientists arise regarding the effects of context on consumer hedonic evaluation. The use of Prospect Theory especially, the principles of reference points and loss-aversion, together with the notion of framing effects, have helped to explain, in part, the possible effects contexts may have on consumer hedonic evaluation through a theoretical framework. Although I could not go too far in this research question, I started to look at aspects that have not been or little explored in the studying on contexts effects. If we want to understand how contexts influence consumer hedonic evaluation, we need to understand how consumers evaluate products in natural consumption contexts. And to do so, we need to understand how the actual evaluation task could influence consumer hedonic evaluation.

We have observed that depending on the evaluation task format, consumer hedonic evaluation changes, and this seems to be product-dependent. Boutrolle (2007), highlighted that differences in diagnostic questions already induced differences in consumer responses between CLT and HUT studies. As we mentioned before, further studies should be conducted with different product categories, especially dishes served in eating contexts where different degrees of culinary preparation may be performed and are to be expected. Moreover, the role of the evaluation task could be crucial for industrials and food caterers to understand how products behave in different contexts and the managerial decisions involved depending on the results obtained with the different tasks.

Regarding the framework of evaluation, we realized that consumers create reference points from contexts and products experiences. These reference points can be modulated by expectations and beliefs, social norms, etc. When looking at contexts studies, we realized that even if hedonic responses are needed as an indicator of performance for product development, they do not explain the meaning of the differences observed on consumer evaluation in contexts studies. Instead, expectations and beliefs towards contexts have shown to influence those hedonic responses by the modulation of consumers' reference points. Prospect theory lays the foundations from which contexts effects on consumer hedonic evaluation could be understood. By establishing consumers' common reference points for a context, and modulating those reference points through expectations and beliefs, we could try to determine how contexts effects modulate consumer hedonic evaluation. Behavioral economics applies the theory behind reference points to understand differences in consumer behavior, especially regarding consumer decision-making, through the use of framing effects (Lagerkvist, Normann, & Åström, 2015, 2017; Uyang, Damowicz, & Eeman, 2006). From a practical point of view, we want to know if consumers are going to like a product, but also if they are going to choose it over another product in a particular context. This relies on the question what is the relation between hedonic

responses and willingness to choose? We could then imagine a first step from where the hedonic responses of different products could be collected, setting a reference point. Then, by the use of framing effects, different contexts and/or experiences could be differently formulated (as evoked contexts do) by priming on consumers' beliefs and expectations. This may modulate consumers' reference points towards products depending on the given context. The deviation of the reference points between each context may then help how consumer hedonic evaluation changes from a theoretical framework. Furthermore, this could be also conducted in natural consumption contexts where real food value could be also addressed.

To conclude, regarding context effects on consumer hedonic evaluation, the question that still remains is: to what extent does the absence of realism invalidate the consumer hedonic data?

CONCLUSION

CONCLUSION

In this dissertation we examined how different contextual variables influenced consumer hedonic evaluation in context studies. The literature review showed that context influences consumer hedonic evaluation through different mechanisms implied by several contextual variables. Contextual variables that we classified according to the criteria used to define the ecological validity of an experiment: environment, product, consumer and task.

The lack of standardization in the way contextual variables should be used or interpreted in context studies is related to the lack of a theoretical framework behind those studies. Disciplines as psychology and behavioral economics, have further explored the effects of context from the perspective of Prospect Theory which considers the effects of context on consumer evaluation through the notion of framing effects and reference points. However, those effects have not been considered in context studies in the field of sensory and consumer science.

In this perspective, this thesis aimed to contribute to understand the conditions under which context affects consumer hedonic evaluation of food products. Through a multidisciplinary approach grounded in Prospect Theory (Kahneman & Tversky, 1979), we proposed a theoretical framework to explain the empirical observations about contexts effects on consumer hedonic evaluation, and to further formalize the effects of context to ensure a better reliability of consumer and sensory studies.

We first examined the advantages and disadvantages of studying consumer hedonic responses in natural consumption contexts. The lack of data about studies in these type of contexts difficult the understanding of context effects on consumer behavior and hedonic evaluation. A preliminary study phase was set. Two studies were conducted in different contexts and within different information conditions in order to address the effect of consumers' expectations and beliefs towards contexts and product-related variables. No differences on consumer hedonic responses among contexts was observed. The results suggested that the standardization of product-related variables (portion size and presentation) could contribute to reduce the effect of context on consumer hedonic evaluation. Additionally, food-related information seemed to increase the consensus among consumers when evaluating a product in natural consumption context. However, this effect was context-dependent.

The second objective of this dissertation was to assess consumer mental representations about food in different contexts to explore how the different contextual variables were integrated in consumer experience. Twelve focus groups (n = 86) were conducted between Paris and Lyon, and students and non-students' population. Results showed that consumers have different mental representations about contexts and those are related to product-related variables. Food quality, conviviality and taste were

highlighted together as price as key elements of consumer experience. However, the ranking of these variables differed depending on the context of consumption. Moreover, differences were observed between regions and type of population due to gastronomic cultural and consumption habits differences.

Once we obtained a global picture of the effects of context on consumer hedonic evaluation; the third and fourth objective of this work were based on Prospect theory. The third objective of this dissertation was to assess the influence of different evaluation tasks on consumer hedonic evaluation in a natural consumption context. While studies in controlled conditions have observed differences in consumer hedonic responses depending on the task performed, the literature does not provide enough data on this issue. We compared two different evaluation tasks (synthetic and analytical) in a student cafeteria. Moreover, we tested the effect of the task on two different product categories: standardized product (bread) and a product subjected to three different degrees of culinary preparation (pizza: homemade, readymade and mixed of both). Results revealed that differences in task format could affect consumers' hedonic responses in the case of multicomponent products such as pizzas. However, this results should be confirmed with other product categories, especially dishes served in eating contexts (such as restaurant, cafeterias, canteens) where different degrees of culinary preparation may be performed and are to be expected. Additionally, the ranking of the three pizzas also differed depending on the task format suggesting that different evaluation task may entail different managerial decisions for industrials when products are tested in context studies.

Finally, the last objective of this dissertation was to explore if the framework of evaluation (reference dependence) could help to explain why some products seem to be more affected than others by context variations. In order to address this objective, two experimental studies were conducted. In the first study we investigated the role of variations of preparation method (homemade and readymade) in setting reference points in different evaluation contexts. In the second study we investigated the influence of the type of information (consistent or inconsistent with consumers' expectations and beliefs) on consumer hedonic evaluation to a product in a natural consumption context. We hypothesized that expectations in link with context would induce a frame of reference for evaluation that would explain differences in sensitivity to context. The results showed that hedonic responses differed depending on the context and that those differences could be related to a "lower" overall framework of evaluation depending on the context. Moreover, the presence of information showed that products with an overall 'high' reference score seem less affected by variations of context than less appreciated products or products that induced more uncertainty. Those results suggested that prospect theory and particularly, reference dependence, may be an interesting way to look at consumers' mind-set when performing a context studies. By modulating this reference point or framework of evaluation we might be able to explain certain differences between contexts that may

not be related to the physical context itself but to the consumers' attitudes or prior experiences towards a particular context and served food.

Throughout this work, we investigated methodological and theoretical issues that had not been previously considered in the literature. However, we just open the door to further research in context studies by using a multidisciplinary approach grounded on psychology and behavioral economics: Prospect Theory. We consider that the theoretical principles used in behavioral economics offer greatest insights about consumer evaluation methodologies for new product development and could help to improve the reliability of context studies.

This work only addresses a small part of a much larger research question that consumer and sensory practitioners try to answer since 1992: to what extent does the absence of realism invalidate the consumer hedonic data in controlled conditions?

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APPENDIX

Appendix 1: Preliminary study questionnaires (Experiment 1)

Appendix 2: Food Matters Live questionnaires (Experiment 2)

Appendix 3: Focus groups guideline (Experiment 3)

Appendix 4: Consent form focus groups of Lyon and Paris (Experiment 3)

Appendix 5: Students and non-students' focus groups questionnaires (Experiment 3)

Appendix 6: Synthetic and analytical questionnaire for bread (Experiment 4)

Appendix 7: Synthetic and analytical questionnaire for pizza (Experiment 4)

Appendix 8: Laboratory and restaurant questionnaires (Experiment 5)

Appendix 9: Restaurant questionnaire (Experiment 6)

Appendix 1: Preliminary study questionnaires (Experiment 1)

Date :

Aujourd'hui, vous êtes invités à déguster un Taboulé Libanais et à répondre à un court questionnaire.
Avant et après dégustation, nous vous demanderons de répondre à quelques questions.

Votre participation nous est d'une grande aide.

Veillez à répondre à toutes les questions.

Avant la dégustation du taboulé Libanais

Q1. Avez-vous des allergies alimentaires ?

Oui Non

Si NON, merci de continuer avec la dégustation.

Q2. A quel point avez-vous faim ?

Je n'ai pas du tout faim J'ai extrêmement faim

Après la dégustation du taboulé Libanais

Q3. A quel point avez-vous apprécié ce taboulé Libanais proposé par notre traiteur gourmand ?

Je n'ai pas du tout aimé J'ai beaucoup aimé

Pour terminer, quelques questions sur vous

Q4. Quel âge avez-vous ?

Q5. Vous êtes :

Un homme Une femme

Q6. Vous êtes étudiants de l'institut (précisez quel groupe) :

.....

Q7. Vous êtes de nationalité (précisez si double) :

.....

Merci de votre participation !!

Date :

Aujourd'hui, vous êtes invités à déguster un Taboulé Libanais proposé par notre **traiteur gourmand** et à répondre à un court questionnaire. Avant et après dégustation, nous vous demanderons de répondre à quelques questions.

Votre participation nous est d'une grande aide.

Veillez à répondre à toutes les questions.

Avant la dégustation du taboulé Libanais

Q1. Avez-vous des allergies alimentaires ?

Oui Non

Si NON, merci de continuer avec la dégustation.

Q2. A quel point avez-vous faim ?

Je n'ai pas du tout faim J'ai extrêmement faim

Après la dégustation du taboulé Libanais

Q3. A quel point avez-vous apprécié ce taboulé Libanais ?

Je n'ai pas du tout aimé J'ai beaucoup aimé

Pour terminer, quelques questions sur vous

Q4. Quel âge avez-vous ?

Q5. Vous êtes :

Un homme Une femme

Q6. Vous êtes étudiants de l'institut (précisez quel groupe) :

.....

Q7. Vous êtes de nationalité (précisez si double) :

.....

Merci de votre participation !!

Date :

Aujourd'hui, vous êtes invités à déguster un Taboulé Libanais et à répondre à un court questionnaire.
Avant et après dégustation, nous vous demanderons de répondre à quelques questions.

Votre participation nous est d'une grande aide.

Veillez à répondre à toutes les questions.

Avant la dégustation du taboulé Libanais

Q1. Avez-vous des allergies alimentaires ?

Oui Non

Si NON, merci de continuer avec la dégustation.

Q2. A quel point avez-vous faim ?

Je n'ai pas du tout J'ai extrêmement faim

"Imaginez que vous dégustez ce produit au repas de midi dans un restaurant à service rapide comme **Square Flaveur**. Ce taboulé Libanais vous est proposé dans le menu du jour, en accompagnement d'un sandwich et d'un dessert."

Après la dégustation du taboulé Libanais

Q3. A quel point avez-vous apprécié ce taboulé Libanais proposé par notre traiteur gourmand ?

Je n'ai pas du tout aimé J'ai beaucoup aimé

Pour terminer, quelques questions sur vous

Q4. Quel âge avez-vous ?

Q5. Vous êtes :

Un homme Une femme

Q6. Vous êtes étudiants de l'institut (précisez quel groupe) :

.....

Q7. Vous êtes de nationalité (précisez si double) :

.....

Merci de votre participation !!

Date :

Aujourd'hui, vous êtes invités à déguster un Taboulé Libanais proposé par notre **traiteur gourmand** et à répondre à un court questionnaire. Avant et après dégustation, nous vous demanderons de répondre à quelques questions.

Votre participation nous est d'une grande aide.

Veillez à répondre à toutes les questions.

Avant la dégustation du taboulé Libanais

Q1. Avez-vous des allergies alimentaires ?

Oui Non

Si NON, merci de continuer avec la dégustation.

Q2. A quel point avez-vous faim ?

Je n'ai pas du tout faim J'ai extrêmement faim

"Imaginez que vous dégustez ce produit proposé par notre **traiteur gourmand** au repas de midi dans un restaurant à service rapide comme **Square Flaveur**. Ce taboulé Libanais vous est proposé dans le menu du jour, en accompagnement d'un sandwich et d'un dessert."

Après la dégustation du taboulé Libanais

Q3. A quel point avez-vous apprécié ce taboulé Libanais ?

Je n'ai pas du tout aimé J'ai beaucoup aimé

Pour terminer, quelques questions sur vous

Q4. Quel âge avez-vous ?

Q5. Vous êtes :

Un homme Une femme

Q6. Vous êtes étudiants de l'institut (précisez quel groupe) :

.....

Q7. Vous êtes de nationalité (précisez si double) :

.....

Merci de votre participation !!

Appendix 2: Food Matters Live questionnaires (Experiment 2)

Date :

ID Code :

Welcome to the Experimental Café

Join us to find out what makes your food choice different!

The Centre for Food and Hospitality Research of the Institute Paul Bocuse is pleased to welcome you to this unique live experiment, in which we will observe how food choices available at these events influence your decision.

All you need to do is complete this questionnaire about your meal.

The information collected is completely anonymous. The data will be used exclusively for research purposes, and confidentiality is guaranteed.

Enjoy your meal, and thank you for your participation!

First of all: 5 questions before you start to eat

1. How hungry are you?

I am not hungry at all I am very hungry

2. Are you? A man A woman

3. What is your year of birth? _ _ _ _

4. What is your country of origin? _____

5. In which country do you currently live? _____

Now you can enjoy your food!

Please turn the page once you have finished eating

Once you have eaten

6. Please indicate the dishes you chose, and rate how much you liked it:

	I chose this (check box)	I like it
		Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Morning Offer		
Smoked trout, avocado, sour dough, spring onion and lime dressing	<input checked="" type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Dipped Egg toast, plums, yoghurt	<input type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Poached egg, spinach, muffin, hollandaise	<input checked="" type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Lunch		
Proteins		
Spicy chicken breast	<input checked="" type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Asian style roasted salmon	<input type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Mediterranean tart	<input checked="" type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Salad bar		
Butternut, lentils, radicchio, spinach	<input checked="" type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Cracked wheat, roasted vegetables, cherry tomatoes, herbs	<input type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Broccoli, peppers, chilli and garlic	<input checked="" type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Potato, spring onion, truffle	<input type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Mixed leaf and vegetable salad	<input checked="" type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Afternoon		
Salt beef bagel, mustard mayonnaise, lettuce, pickles and tomato	<input checked="" type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
“Cheese on toast”, lettuce, tomato, sour dough	<input type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot

7. According to you, has this meal met your expectations?

Far below my expectations Met my expectations Well above my expectations

8. How much did you like this meal, overall?

Not at all A lot

9. How hungry are you?

I am not hungry at all I am very hungry

10. Do you have any additional comments about your meal, or the experiment?

Thank you for your participation!

Date :

ID Code :

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Now you can enjoy your food!

Please turn the page once you have finished eating

Once you have eaten

6. Please indicate the dishes you chose, and rate how much you liked it:

	I chose this (check box)	I like it
		Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Morning Offer		
Hot smoked trout, smashed avocado, sour dough toast , spring onion and lime dressing	<input type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
French toast , spiced plums, honey Greek yoghurt	<input type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Poached egg Florentine - baby leaf spinach, egg, toasted English muffins, hollandaise	<input type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Lunch		
Proteins		
Harissa and coriander yoghurt grilled chicken breast	<input type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Ginger, soya and honey roasted salmon	<input type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Wilted Spinach, sundried tomato and goat's cheese tart	<input type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Salad bar		
Roasted butternut, lentils, radicchio and baby leaf spinach	<input type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Cracked wheat, roasted vegetables, cherry tomatoes, micro herbs	<input type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Roasted broccoli, fire roasted peppers, chilli and garlic	<input type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Boiled new potato, spring onion and truffle mayonnaise	<input type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Mixed leaf and vegetable salad	<input type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Afternoon		
Salt beef bagel, American mustard mayonnaise, shredded lettuce, pickles and tomato	<input type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot
Blue cheese and walnut ' rarebit ', shredded lettuce, tomato, sour dough	<input type="checkbox"/>	Not at all <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> A lot

7. According to you, has this meal met your expectations?

Far below my expectations Met my expectations Well above my expectations

8. How much did you like this meal, overall?

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4. What is your country of origin? _____

5. In which country do you currently live? _____

Now you can enjoy your food!

Please turn the page once you have finished eating

Appendix 3: Focus groups guideline (Experiment 3)

Merci de votre présence et de votre participation...

- **Présentation**

Vous êtes aujourd'hui réunis afin que vous puissiez discuter ensemble, en petit groupe, de quelque chose que vous rencontrez tous au quotidien : manger. Ce travail s'inscrit plus largement dans le cadre d'une thèse que je réalise actuellement au sein de AgroParisTech et le centre de recherche de l'Institut Paul Bocuse

- **Concernant le déroulement de cette discussion :**

Les échanges dureront 1h30. Il sera principalement question de vos façons de voir la nourriture dans différents contextes de consommation, ce qu'elle évoque pour vous et les réactions qu'elle peut impliquer chez vous. Ce sont donc vos avis qui m'intéressent. Vous n'avez pas été réunis pour l'expertise que vous avez ou non dans ce domaine mais plus pour les expériences quotidiennes que vous vivez dans différents lieux. Chacun est libre de prendre la parole et mon rôle sera justement de m'assurer que chacun puisse s'exprimer librement. Je vais vous proposer de commencer pour l'évaluation de ces photos. Cela facilitera la discussion. Puis dans une seconde partie, on discutera de différents aspects et on finira pour remplir un questionnaire. Il s'agit davantage d'une discussion entre vous. Je suis simplement là pour animer cette rencontre.

- **Enregistrement et anonymat :**

Cet échange anonyme est enregistré et filmé afin de me permettre de le revoir, de le réécouter, et de l'analyser plus tard. En aucun cas je ne divulguerai les noms des participants à cette discussion. Ceci permet une plus grande liberté de parole pour les participants. De plus, comme je vais rencontrer d'autres groupes, il est préférable pour le bon déroulement de cette étude que les autres participants ne soient pas tenus au courant de ce que nous allons faire ensemble aujourd'hui.

Si vous n'avez pas de question, nous allons commencer.

- **Photos :**

J'aimerais vous présenter quelques photos sur différents types des lieux de consommation. Je voudrais que par groupes de 2 ou 3 personnes vous classiez ces photos comme vous voulez, selon vos critères personnels. Il n'y a pas des bons ou de mauvais critères. Vous pouvez faire autant de classifications que vous voulez.

- **Discussion :**

Consumption contexts: personal experiences

Pouvez-vous me parler des dernières fois où vous êtes allés au restaurant ?

- Quel type de restaurant ?
- C'était comment ? Avec qui étiez-vous ?
- Qualité/ prix ?
- Quel est le plat que vous avez le plus préféré ?
- Y a-t-il quelque chose qui vous a dérangé ?

- Et au niveau du travail, vous mangez au restaurant, à la cantine ou vous préparez vous-même votre repas ?
- Dans ces lieux, comment est la nourriture ?
- Qu'est-ce que vous préférez manger là-bas ?
 - Si sandwich ou snacks : c'est à cause du timing ?
- Vous mangez seuls ou avec des collègues ?
- Qu'est-ce que vous pensez des tests consommateur ?

Relationship between food preparation and consumption contexts

- Qu'est-ce que vous pensez de ces différents modes de préparation : fait maison, prêt à manger, ready-to-heat, surgelés ?
- Comment vous sentiriez vous si vous trouviez ces plats dans un restaurant ou à la cantine ?
- Si vous deviez choisir un restaurant, sur quels critères vous basez-vous ?

Relationship between food preparation and culinary skills

- Vous aimez cuisiner et innover des recettes ? Ou c'est une obligation pour vous ?
- A quoi faites-vous attention quand vous achetez des produits ou cuisinez ?
 - Type de produit, valeur nutritionnelle, prix, goût, préparation ?

CONCLUSION

Nous avons terminé la séance. Je vous remercie de m'avoir accordé votre temps.
 Avant partir, j'aimerais savoir si vous pouviez remplir ce questionnaire ?
 Avez-vous d'autres commentaires ou remarques ?
 Est-ce que vous auriez aimé discuter d'autres aspects ? Lesquels ?
 Je vous remercie à nouveau de votre participation. Merci

Appendix 4: Consent form focus groups of Lyon and Paris (Experiment 3)

Autorisation pour l'enregistrement audio/vidéo et l'exploitation des données enregistrées et formulaire de consentement

L'équipe scientifique du Centre de Recherche de l'Institut Paul Bocuse mène des travaux sur les comportements alimentaires et les liens entre l'homme et son alimentation. Les projets portent sur les choix, les perceptions et les pratiques des convives lors de leur repas au restaurant expérimental. Ils s'appuient sur l'analyse de données acquises sur la scène du repas, que ce soit des réponses à un questionnaire et/ou des images recueillies par caméra. L'acquisition de ces données est réalisée sans contrainte, sans simulation, auprès de participants volontaires.

Ces recherches ne sont possibles que grâce au consentement des convives du restaurant qui acceptent d'être enregistrés. Par conséquent, nous vous demandons votre autorisation à procéder à la passation de questionnaires et à l'enregistrement audio/vidéo, les données recueillies étant définies selon les études en cours.

➤ Autorisation

Je soussigné(e) _____

- autorise par la présente le Centre de Recherche de l'Institut Paul Bocuse à enregistrer en vidéo tout ou partie de mon repas au Restaurant Expérimental du Centre de Recherche,
- autorise l'utilisation de ces données, sous leur forme enregistrée et sous leur forme transcrite et anonymisée :

a) à des fins de recherche scientifique (mémoires, articles scientifiques, exposé congrès...).

b) à des fins d'enseignement universitaire.

c) pour une diffusion dans la communauté des chercheurs, sous la forme d'éventuels échanges et prêts de corpus à des chercheurs, moyennant la signature d'une convention de recherche.

- prends acte que pour toutes ces utilisations scientifiques les données ainsi enregistrées seront anonymisées : ceci signifie

a) que les transcriptions de ces données utiliseront des pseudonymes et remplaceront toute information pouvant porter à l'identification des participants ;

b) que les bandes audio qui seront présentées à des conférences ou des cours (généralement sous forme de très courts extraits ne dépassant pas la minute) seront « beepées » lors de la mention d'un nom, d'une adresse ou d'un numéro de téléphone identifiables (qui seront donc remplacés par un « bruit » qui les effacera) ;

c) en revanche, pour des raisons techniques, le projet ne peut pas s'engager à anonymiser les images vidéo mais s'engage à ne pas diffuser d'extraits compromettant les personnes filmées.

Lieu et date: _____

Signature : _____

➤ **Si vous souhaitez participer à d'autres études et faire partie de notre base de données, veuillez nous laisser votre adresse email :**

_____ @ _____

et/ou votre numéro de téléphone :

MERCI !

Autorisation pour l'enregistrement audio/vidéo et l'exploitation des données enregistrées et formulaire de consentement

L'équipe scientifique du Centre de Recherche de l'Institut Paul Bocuse mène des travaux sur les comportements alimentaires et les liens entre l'homme et son alimentation. Les projets portent sur les choix, les perceptions et les pratiques des convives lors de leur repas. Ils s'appuient sur l'analyse de données acquises sur la scène du repas, que ce soit des réponses à un questionnaire et/ou des images recueillies par caméra. L'acquisition de ces données est réalisée sans contrainte, sans simulation, auprès de participants volontaires.

Ces recherches ne sont possibles que grâce au consentement des convives qui acceptent d'être enregistrés. Par conséquent, nous vous demandons votre autorisation à procéder à la passation de questionnaires et à l'enregistrement audio/vidéo, les données recueillies étant définies selon l'étude en cours.

➤ Autorisation

Je soussigné(e) _____

- autorise par la présente le Centre de Recherche de l'Institut Paul Bocuse à enregistrer en vidéo tout ou partie de mon entretien à AgroParisTech,
- autorise l'utilisation de ces données, sous leur forme enregistrée et sous leur forme transcrite et anonymisée :

a) à des fins de recherche scientifique (mémoires, articles scientifiques, exposé congrès...).

b) à des fins d'enseignement universitaire.

c) pour une diffusion dans la communauté des chercheurs, sous la forme d'éventuels échanges et prêts de corpus à des chercheurs, moyennant la signature d'une convention de recherche.

- prends acte que pour toutes ces utilisations scientifiques les données ainsi enregistrées seront anonymisées : ceci signifie

a) que les transcriptions de ces données utiliseront des pseudonymes et remplaceront toute information pouvant porter à l'identification des participants ;

b) que les bandes audio qui seront présentées à des conférences ou des cours (généralement sous forme de très courts extraits ne dépassant pas la minute) seront « beepées » lors de la mention d'un nom, d'une adresse ou d'un numéro de téléphone identifiables (qui seront donc remplacés par un « bruit » qui les effacera) ;

c) en revanche, pour des raisons techniques, le projet ne peut pas s'engager à anonymiser les images vidéo mais s'engage à ne pas diffuser d'extraits compromettant les personnes filmées.

Lieu et date: _____

Signature : _____

MERCI !

Appendix 5: Students and non-students' focus groups questionnaires (Experiment 3)

Date :

Aujourd'hui, vous avez participé à une discussion sur l'appréciation des repas dans différents contextes de consommation. Afin de mieux connaître vos habitudes, je vous invite à répondre à un court questionnaire sur vos pratiques alimentaires.

Votre participation nous est d'une grande aide.

Veillez à répondre à toutes les questions.

Q1. A quelle fréquence allez-vous au restaurant ? (1 seule réponse possible)

- Entre 5 et plusieurs fois par mois
- Entre 3-4 fois par mois
- 1 à 2 fois par mois
- Moins d'un 1 fois par mois
- Jamais

Q2. À quel(s) moment(s) de la journée êtes-vous le plus susceptible d'aller au restaurant ?

- Le matin (brunch)
- Le midi (déjeuner)
- Le soir (dîner)

Q3. Quel(s) type(s) de restaurant fréquentez-vous ?

- | | |
|--|---|
| <input type="checkbox"/> Bar à tapas/ vin | <input type="checkbox"/> Cuisine du monde |
| <input type="checkbox"/> Brasserie - Bistrot | <input type="checkbox"/> Fast-food |
| <input type="checkbox"/> Bouchon Lyonnais | <input type="checkbox"/> Restaurant à thème |
| <input type="checkbox"/> Cuisine française régionale | <input type="checkbox"/> Restaurant gastronomique |

Q4. A quelle fréquence allez-vous au restaurant universitaire ? (1 seule réponse possible)

- Entre 4 et 5 fois par semaine
- Entre 2 et 3 fois par semaine
- 1 à 2 fois par semaine
- Moins d'un 1 fois par semaine
- Jamais

Q5. De combien de temps disposez-vous en moyenne pour le repas du midi ? (1 seule réponse possible)

- 30 minutes ou moins
- Entre 30 – 45 minutes
- 45 minutes -1 heure
- 1 heure ou plus

Veillez à répondre à toutes les questions

Q6. Quel âge avez-vous ?

Q7. Vous êtes : Une femme Un homme

**Merci de vérifier que vous avez répondu à toutes les questions.
Je vous remercie pour votre participation.
A bientôt !**

Date :

Aujourd'hui, vous avez participé à une discussion sur l'appréciation des repas dans différents contextes de consommation. Afin de mieux connaître vos habitudes, je vous invite à répondre à un court questionnaire sur vos pratiques alimentaires.

Votre participation nous est d'une grande aide.

Veillez à répondre à toutes les questions.

Q1. A quelle fréquence allez-vous au restaurant ? (1 seule réponse possible)

- Entre 5 et plusieurs fois par mois
- Entre 3-4 fois par mois
- 1 à 2 fois par mois
- Moins d'un 1 fois par mois
- Jamais

Q2. À quel(s) moment(s) de la journée êtes-vous le plus susceptible d'aller au restaurant ?

- Le matin (brunch)
- Le midi (déjeuner)
- Le soir (dîner)

Q3. Quel(s) type(s) de restaurant fréquentez-vous ?

- | | |
|--|---|
| <input type="checkbox"/> Bar à tapas/ vin | <input type="checkbox"/> Cuisine du monde |
| <input type="checkbox"/> Brasserie - Bistrot | <input type="checkbox"/> Fast-food |
| <input type="checkbox"/> Bouchon Lyonnais | <input type="checkbox"/> Restaurant à thème |
| <input type="checkbox"/> Cuisine française régionale | <input type="checkbox"/> Restaurant gastronomique |

Q4. A quelle fréquence allez-vous au restaurant d'entreprise ? (1 seule réponse possible)

- Entre 4 et 5 fois par semaine
- Entre 2 et 3 fois par semaine
- 1 à 2 fois par semaine
- Moins d'un 1 fois par semaine
- Jamais

Q5. De combien de temps disposez-vous en moyenne pour le repas du midi ? (1 seule réponse possible)

- 30 minutes ou moins
- Entre 30 – 45 minutes
- 45 minutes -1 heure
- 1 heure ou plus

Veillez à répondre à toutes les questions

Q6. Quel âge avez-vous ?

Q7. Vous êtes : Une femme Un homme

Q8. Avez-vous des enfants : Oui Non

**Merci de vérifier que vous avez répondu à toutes les questions.
Je vous remercie pour votre participation.
A bientôt !**

Appendix 6: Synthetic and analytical questionnaire for bread (Experiment 4)

Date :

Bonjour, vous avez été sélectionné(e) de façon aléatoire pour participer à une étude sur l'offre alimentaire dans les restaurants universitaires.

Cette étude fait partie des travaux de recherche d'une thèse sur les contextes de consommation. Les données recueillies seront exclusivement destinées à ces travaux et leur confidentialité est garantie.

Votre participation nous est d'une grande aide.

Merci de répondre à toutes les questions.

Vous avez choisi du pain. Merci de le goûter et d'indiquer votre appréciation à l'aide de l'échelle ci-dessous.

1. Quel est votre appréciation du goût de ce pain ?

(0 = je n'aime pas du tout ; 10 = j'aime énormément)

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. A quelle fréquence mangez-vous ce type de pain au restaurant universitaire ?

Entre 4 et 5 fois par semaine

1 à 2 fois par semaine

Entre 2 et 3 fois par semaine

Moins d'une fois par semaine

3. Avez-vous déjà mangé ce type de pain au restaurant universitaire cette semaine ?

Oui Non

4. A quel point êtes-vous satisfait(e) de votre pain aujourd'hui ?

(0 = extrêmement insatisfait(e) ; 10 = extrêmement satisfait(e))

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Comment trouvez-vous la qualité de ce pain ?

(0 = très mauvaise ; 10 = très bonne)

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

POUR TERMINER

6. Aujourd'hui en arrivant au restaurant universitaire j'avais :

- Trop faim Un peu faim, l'appétit vient en mangeant
 Juste faim, comme d'hab Pas tellement faim

7. Aujourd'hui je me sens :

- Au top Bof bof
 Ça va bien Ça ne va vraiment pas

8. Aujourd'hui :

- Je n'avais pas beaucoup de temps pour manger J'avais beaucoup de temps pour manger

9. Aujourd'hui :

- J'ai mangé seul(e) J'ai mangé avec des amis (collègues, clients)

10. Comment avez-vous perçu l'ambiance dans le restaurant universitaire aujourd'hui ?

(0 = très bruyante ; 10 = très calme)

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. Comment avez-vous perçu le temps passé dans la file d'attente aujourd'hui ?

(0 = extrêmement long ; 10 = extrêmement court)

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. Quel âge avez-vous ?

13. Vous êtes : Un Homme Une Femme

14. Quelle est votre nationalité ?

15. Quelle est votre catégorie socio-professionnelle

- Etudiante(e) Ouvrier(e)
 Employé(e) Cadre ou profession libérale
 Autre : _____

**Merci de vérifier que vous avez répondu à toutes les questions.
Je vous remercie pour votre participation.**

Date :

Bonjour, vous avez été sélectionné(e) de façon aléatoire pour participer à une étude sur l'offre alimentaire dans les restaurants universitaires.

Cette étude fait partie des travaux de recherche d'une thèse sur les contextes de consommation. Les données recueillies seront exclusivement destinées à ces travaux et leur confidentialité est garantie.

Votre participation nous est d'une grande aide.

Merci de répondre à toutes les questions.

Vous avez choisi du pain. Merci de le goûter et d'indiquer votre appréciation à l'aide des échelles ci-dessous.

1. Quel est votre appréciation du goût de ce pain ?

(0 = je n'aime pas du tout ; 10 = j'aime énormément)

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. A quelle intensité percevez-vous ces différentes caractéristiques ?

(0 = très faible ou absent ; 10 = très intense)

Saveur salée

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Goût levure

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Texture moelleuse de la mie

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Texture croustillante de la croûte

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Croquant de la pâte

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. A quelle fréquence mangez-vous ce type de pain au restaurant universitaire ?

Entre 4 et 5 fois par semaine

1 à 2 fois par semaine

Entre 2 et 3 fois par semaine

Moins d'une fois par semaine

4. Avez-vous déjà mangé ce type de pain au restaurant universitaire cette semaine ?

Oui Non

5. A quel point êtes-vous satisfait(e) de votre pain aujourd'hui ?

(0 = extrêmement insatisfait(e) ; 10 = extrêmement satisfait(e))

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. Comment trouvez-vous la qualité de ce pain ?

(0 = très mauvaise ; 10 = très bonne)

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

POUR TERMINER

7. Aujourd'hui en arrivant au restaurant universitaire j'avais :

- Trop faim Un peu faim, l'appétit vient en mangeant
 Juste faim, comme d'hab Pas tellement faim

8. Aujourd'hui je me sens :

- Au top Bof bof
 Ça va bien Ça ne va vraiment pas

9. Aujourd'hui :

- Je n'avais pas beaucoup de temps pour manger J'avais beaucoup de temps pour manger

10. Aujourd'hui :

- J'ai mangé seul(e) J'ai mangé avec des amis (collègues, clients)

11. Comment avez-vous perçu l'ambiance dans le restaurant universitaire aujourd'hui ?

(0 = très bruyante ; 10 = très calme)

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. Comment avez-vous perçu le temps passé dans la file d'attente aujourd'hui ?

(0 = extrêmement long ; 10 = extrêmement court)

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. Quel âge avez-vous ?

14. Vous êtes : Un Homme Une Femme

15. Quelle est votre nationalité ?

16. Quelle est votre catégorie socio-professionnelle

- Etudiante(e) Ouvrier(e)
 Employé(e) Cadre ou profession libérale
 Autre : _____

**Merci de vérifier que vous avez répondu à toutes les questions.
Je vous remercie pour votre participation.**

Appendix 7: Synthetic and analytical questionnaire for pizza (Experiment 4)

Date :

Bonjour, vous avez été sélectionné(e) de façon aléatoire pour participer à une étude sur l'offre alimentaire dans les restaurants universitaires.

Cette étude fait partie des travaux de recherche d'une thèse sur les contextes de consommation. Les données recueillies seront exclusivement destinées à ces travaux et leur confidentialité est garantie.

Votre participation nous est d'une grande aide.

Merci de répondre à toutes les questions.

1. Indiquez qu'est-ce que vous avez choisi comme plat principal :

.....

Merci de le goûter et d'indiquer votre appréciation à l'aide de l'échelle ci-dessous.

2. Quel est votre appréciation du goût de ce plat ?

(0 = je n'aime pas du tout ; 10 = j'aime énormément)

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. A quelle fréquence mangez-vous ce type de plat au restaurant universitaire ?

Entre 4 et 5 fois par semaine

1 à 2 fois par semaine

Entre 2 et 3 fois par semaine

Moins d'une fois par semaine

4. Avez-vous déjà mangé ce type de plat au restaurant universitaire cette semaine ?

Oui Non

5. A quel point êtes-vous satisfait(e) de votre plat aujourd'hui ?

(0 = extrêmement insatisfait(e) ; 10 = extrêmement satisfait(e))

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. Comment trouvez-vous le rapport qualité/prix de ce plat ?

(0 = très mauvaise ; 10 = très bonne)

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Date :

Bonjour, vous avez été sélectionné(e) de façon aléatoire pour participer à une étude sur l'offre alimentaire dans les restaurants universitaires.

Cette étude fait partie des travaux de recherche d'une thèse sur les contextes de consommation. Les données recueillies seront exclusivement destinées à ces travaux et leur confidentialité est garantie.

Votre participation nous est d'une grande aide.

Merci de répondre à toutes les questions.

1. Indiquez qu'est-ce que vous avez choisi comme plat principal :

.....

Merci de le goûter et d'indiquer votre appréciation à l'aide des échelles ci-dessous.

2. Quel est votre appréciation du goût de ce plat ?

(0 = je n'aime pas du tout ; 10 = j'aime énormément)

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. A quelle intensité percevez-vous ces différentes caractéristiques ?

(0 = très faible ou absent ; 10 = très intense)

Saveur tomate

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Saveur salée

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Gras

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Goût fromage

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Texture moelleuse

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. A quelle fréquence mangez-vous ce type de plat au restaurant universitaire ?

Entre 4 et 5 fois par semaine

1 à 2 fois par semaine

Entre 2 et 3 fois par semaine

Moins d'une fois par semaine

5. Avez-vous déjà mangé ce type de plat au restaurant universitaire cette semaine ?

Oui Non

6. A quel point êtes-vous satisfait(e) de votre plat aujourd'hui ?

(0 = extrêmement insatisfait(e) ; 10 = extrêmement satisfait(e))

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Comment trouvez-vous le rapport qualité/prix de ce plat ?

(0 = très mauvaise ; 10 = très bonne)

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

POUR TERMINER

8. Aujourd'hui en arrivant au restaurant universitaire j'avais :

- Trop faim Un peu faim, l'appétit vient en mangeant
 Juste faim, comme d'hab Pas tellement faim

9. Aujourd'hui je me sens :

- Au top Bof bof
 Ça va bien Ça ne va vraiment pas

10. Aujourd'hui :

- Je n'avais pas beaucoup de temps pour manger J'avais beaucoup de temps pour manger

11. Aujourd'hui :

- J'ai mangé seul(e) J'ai mangé avec des amis (collègues, clientes)

12. Comment avez-vous perçu l'ambiance dans le restaurant universitaire aujourd'hui ?

(0 = très bruyante ; 10 = très calme)

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. Comment avez-vous perçu le temps passé dans la file d'attente aujourd'hui ?

(0 = extrêmement long ; 10 = extrêmement court)

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. Quel âge avez-vous ?

15. Vous êtes : Un Homme Une Femme

16. Quelle est votre nationalité ?

17. Quelle est votre catégorie socio-professionnelle

- Etudiante(e) Ouvrier(e)
 Employé(e) Cadre ou profession libérale
 Autre : _____

**Merci de vérifier que vous avez répondu à toutes les questions.
Je vous remercie pour votre participation.**

Appendix 8: Laboratory and restaurant questionnaires (Experiment 5)

Date :

Code :

Aujourd'hui, vous êtes invité(e) à déguster deux versions d'un cake jambon-olives et à répondre à un court questionnaire.

Avant et après dégustation, nous vous demanderons de répondre à quelques questions.

Votre participation nous est d'une grande aide et nous vous en remercions.

Veillez à répondre à toutes les questions.

Avant la dégustation

Q1. Avez-vous des allergies alimentaires ?

Oui Non

Si vous avez répondu oui, merci de nous faire signe avant la dégustation.

Vous pouvez maintenant déguster le premier cake.

Après la dégustation du premier cake (112)

Q2. A quel point avez-vous apprécié ce cake ?

Je n'ai pas du tout aimé J'ai beaucoup aimé

Q3. A quel point ce cake a-t-il répondu à vos attentes ?

Très inférieur
à mes attentes

Conforme
à mes attentes

Très supérieur
à mes attentes

Vous pouvez maintenant déguster le second cake

Après la dégustation du deuxième cake (233)

Q4. A quel point avez-vous apprécié ce cake ?

Je n'ai pas du tout aimé J'ai beaucoup aimé

Q5. A quel point ce cake a répondu à vos attentes ?

Très inférieur
à mes attentes

Conforme
à mes attentes

Très supérieur
à mes attentes

Pour terminer

Q6. Quel produit préférez-vous ? 112 233

Q7. Pouvez-vous nous expliquer pourquoi ?

Merci de votre participation !!

Appendix 9: Restaurant questionnaire (Experiment 6)

Q3. A quel point appréciez-vous la présentation de la tartelette que nous vous proposons aujourd'hui ?
(0 = je n'aime pas du tout ; 10 = j'aime beaucoup)

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Date : ___ / ___ / ___ Code consommateur : _____

Aujourd'hui votre repas au Restaurant Experimental est l'occasion de prendre part à une étude menée par le Centre de Recherche.

Les données recueillies sont exclusivement destinées aux travaux du Centre de Recherche et votre anonymat est garanti.

Votre participation nous est d'une grande aide.

Nous allons vous servir un petit amuse-bouche.

*Cette tartelette maison est aux tomates confites et au fromage de chèvre.
Elle est faite à partir de produits achetés auprès de nos producteurs locaux, et d'ingrédients provenant de France.*

Avant de commencer votre dégustation

Q1. A quel point les tartelettes, tartes salées ou quiches sont-elles pour vous des produits familiaux ?

(0 = pas du tout familiaux ; 5 = très familiaux)

0	1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q2. En général, à quel point appréciez-vous ce type de produit ?

(0 = je n'aime pas du tout ; 10 = j'aime beaucoup)

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Après votre dégustation

Pour rappel, cette tartelette maison est aux tomates confites et au fromage de chèvre. Elle est faite à partir de produits achetés auprès de nos producteurs locaux, et d'ingrédients provenant de France.

Q4. A quel point avez-vous apprécié ce produit ?

(0 = je n'ai pas du tout aimé ; 10 = j'ai beaucoup aimé)

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Nous allons à présent vous demander d'évaluer différentes caractéristiques de ce produit. Pour chaque caractéristique, pouvez-vous évaluer son **intensité** (à quel point cette caractéristique est-elle présente) dans le produit, et nous indiquer votre **appréciation** (à quel point l'avez-vous appréciée) ?

A quel point cette caractéristique est-elle présente, selon vous, dans le produit ?

Intensité (0 = très faible ou absent ; 10 = très intense)

A quel point l'avez-vous appréciée ?

Appréciation (0 = je n'ai pas du tout aimé ; 10 = j'ai beaucoup aimé)

Saveur tomate

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intensité										
Appréciation										

Saveur fromage

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intensité										
Appréciation										

Saveur beurrée de la pâte

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intensité										
Appréciation										

Saveur salée de la tartelette dans son ensemble

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intensité										
Appréciation										

Texture croustillante de la pâte

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intensité										
Appréciation										

Pour finir

Q5. Habituellement, ce type de produit est vendu 1.50 € dans un restaurant comme celui-ci. Selon vous, quel serait le juste prix de ce produit ?

Moins d'1€	1€	1.50€	2€	2.50€	Plus de 2.50€
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q6. A quel point êtes-vous satisfait(e) avec le mode de préparation du produit et les ingrédients ?

(0 = pas du tout satisfait(e) ; 5 = très satisfait(e))

0	1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q7. A quel point êtes-vous satisfait(e) avec l'ambiance du restaurant ?

(0 = pas du tout satisfait(e) ; 5 = très satisfait(e))

0	1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q8. Comment évalueriez-vous cette expérience de consommation ?

(0 = pas du tout satisfaisante ; 5 = très satisfaisante)

0	1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Merci de vérifier que vous avez répondu à toutes les questions.

L'Équipe du Centre de Recherche vous remercie pour votre participation.

A bientôt !

Date : ___ / ___ / ___ Code consommateur : _____

Aujourd'hui votre repas au Restaurant Expérimental est l'occasion de prendre part à une étude menée par le Centre de Recherche.

Les données recueillies sont exclusivement destinées aux travaux du Centre de Recherche et votre anonymat est garanti.

Votre participation nous est d'une grande aide.

Nous allons vous servir un petit amuse-bouche.

Cette tartelette est aux tomates confites et au fromage de chèvre.

Elle est faite à partir des produits et d'ingrédients provenant de l'UE, fournie par notre partenaire.

Avant de commencer votre dégustation

Q1. A quel point les tartelettes, tartes salées ou quiches sont-elles pour vous des produits familiaux ?

(0 = pas du tout familiaux ; 5 = très familiaux)

0 1 2 3 4 5

Q2. En général, à quel point appréciez-vous ce type de produit ?

(0 = je n'aime pas du tout ; 10 = j'aime beaucoup)

0 1 2 3 4 5 6 7 8 9 10

Q3. A quel point appréciez-vous la présentation de la tartelette que nous vous proposons aujourd'hui ?

(0 = je n'aime pas du tout ; 10 = j'aime beaucoup)

0 1 2 3 4 5 6 7 8 9 10

Après votre dégustation

Pour rappel, cette tartelette est aux tomates confites et au fromage de chèvre. Elle est faite à partir des produits et d'ingrédients provenant de l'UE, fournie par notre partenaire.

Q4. A quel point avez-vous apprécié ce produit ?

(0 = je n'ai pas du tout aimé ; 10 = j'ai beaucoup aimé)

0 1 2 3 4 5 6 7 8 9 10

Nous allons à présent vous demander d'évaluer différentes caractéristiques de ce produit. Pour chaque caractéristique, pouvez-vous évaluer son **intensité** (à quel point cette caractéristique est-elle présente) **dans le produit**, et nous indiquer votre **appréciation** (à quel point l'avez-vous appréciée) ?

A quel point cette caractéristique est-elle présente, selon vous, dans le produit ?

Intensité (0 = très faible ou absent ; 10 = très intense)

A quel point l'avez-vous appréciée ?

Appréciation (0 = je n'ai pas du tout aimé ; 10 = j'ai beaucoup aimé)

Saveur tomate

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intensité										
Appréciation										

Saveur fromage

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intensité										
Appréciation										

Saveur beurrée de la pâte

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intensité										
Appréciation										

Saveur salée de la tartelette dans son ensemble

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intensité										
Appréciation										

Texture croustillante de la pâte

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intensité										
Appréciation										

Pour finir

Q5. Habituellement, ce type de produit est vendu 1.50 € dans un restaurant comme celui-ci. Selon vous, quel serait le juste prix de ce produit ?

Moins d'1€	1€	1.50€	2€	2.50€	Plus de 2.50€
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q6. A quel point êtes-vous satisfait(e) avec le mode de préparation du produit et les ingrédients ?

(0 = pas du tout satisfait(e) ; 5 = très satisfait(e))

0	1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q7. A quel point êtes-vous satisfait(e) avec l'ambiance du restaurant ?

(0 = pas du tout satisfait(e) ; 5 = très satisfait(e))

0	1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q8. Comment évalueriez-vous cette expérience de consommation ?

(0 = pas du tout satisfaisante ; 5 = très satisfaisante)

0	1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Merci de vérifier que vous avez répondu à toutes les questions.

L'Équipe du Centre de Recherche vous remercie pour votre participation.

A bientôt !

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RESUME EN FRANÇAIS

INTRODUCTION GENERALE

Pourquoi les produits ne sont-ils pas autant appréciés à la maison, au restaurant ou dans un laboratoire de tests consommateurs ?

Quel est le rôle du contexte ? Du produit ? Du consommateur ?

Ces questions constituent le point de départ de ce travail. Le contexte influence l'évaluation des aliments par les consommateurs et implique de multiples facteurs difficiles à démêler. Un produit peut parfaitement être adapté et accepté dans un contexte particulier alors qu'il peut ne pas être adapté et accepté dans un autre. Cela peut s'expliquer par le contexte physique (lieu de consommation), par les différences de préparation des aliments ou enfin par les attentes et les croyances des consommateurs à l'égard d'un produit particulier dans un contexte particulier.

La question de l'importance du contexte a été formulée par Meiselman en 1992 à propos des études sur le comportement alimentaire. Il a fait valoir que le comportement alimentaire ne pouvait pas être étudié sans la prise en compte de « vrais » aliments dans un « vrai » contexte et avec de « vrais » consommateurs. Dans le cadre d'un « vrai » contexte de consommation, les décisions alimentaires des consommateurs peuvent être influencées par des « contraintes économiques, sociales, et liées à la situation » que les études dans des conditions contrôlées, telles que celles de laboratoires, ne peuvent pas inclure (Meiselman, 1992, p. 50). En 2017, Jaeger et al. ont identifié la prise en compte du contexte parmi les perspectives les plus importantes pour l'avenir des sciences sensorielles et de la consommation (Jaeger et al., 2017). En règle générale, les tests hédoniques réalisés lors d'études consommateurs sont effectués dans des conditions contrôlées. Cependant, le manque de réalisme de ces tests a été associé à un manque de validité écologique de l'évaluation du consommateur (défini comme la mesure dans laquelle l'environnement expérimenté par le sujet dans une enquête scientifique possède les propriétés supposés ou assumés par l'investigateur (Brofenbrenner, 1977)) ce qui peut induire une fiabilité moindre des données. Ainsi, la généralisation des données issues de tests auprès de consommateurs dans des conditions contrôlées à des « vrais » contextes ou contextes « réels » est discutable (Köster, 2003).

Les nombreux échecs de lancement de nouveaux produits sur le marché ont été attribués à cette absence de conditions écologiques dans les tests réalisés par les consommateurs (Köster & Mojet, 2012a). Le fait qu'un produit soit apprécié lors d'un test ne garantit pas que ce produit soit acheté et consommé. Comme Meiselman l'a expliqué à propos du comportement alimentaire des consommateurs, des facteurs liés au contexte peuvent être pris en compte afin de comprendre comment et quand les produits sont consommés. Les entreprises agro-alimentaires lancent chaque jour des produits sur le marché. Cependant, dans les pays occidentaux, entre 80 et 90% des nouveaux

produits lancés sur le marché des aliments et des boissons sont retirés du marché en l'espace d'un an (Köster & Mojet, 2012a). Au niveau de l'Union Européenne, en 2016/2017, ces entreprises ont investi 2.9 milliards d'euros dans la recherche et développement des aliments et boissons (R & D) (FoodDrink Europe, 2018). Par conséquent, les entreprises ne peuvent négliger l'énorme perte d'argent et de temps que ces échecs de lancement peuvent causer. Le débat sur les conditions écologiques des tests de consommation n'affecte pas seulement la recherche, mais aussi l'industrie agro-alimentaire.

Au cours de la dernière décennie, plusieurs méthodologies contextuelles ont été développées afin de gagner en validité écologique et d'accroître la généralisation des données expérimentales (Jaeger & Porcherot, 2017). Les contextes évoqués (Hein, Hamid, Jaeger et Delahunty, 2010), les scénarios immersifs (Hathaway et Simons, 2017) ou l'utilisation de la réalité virtuelle (Andersen, Kraus, Ritz et Bredie, 2018) font partie des approches de renforcement du contexte utilisées par les praticiens sensoriels. Ces approches apportent au laboratoire un contexte réaliste (ou des éléments contextuels) et contribuent à mieux évaluer le succès des produits.

Cependant, on comprend encore mal comment et dans quelle mesure le contexte influence l'évaluation des consommateurs. L'absence de cadre théorique pour les études de contexte rend difficile la compréhension du rôle joué par les variables de contexte dans l'évaluation. En particulier, les consommateurs peuvent avoir un cadre de référence différent selon la situation de consommation, et ce à différents niveaux : au niveau de l'environnement, du produit ou du consommateur. Ces différences dans le cadre d'évaluation peuvent avoir un impact direct sur le jugement hédonique des consommateurs. En outre, on constate que le rôle de la tâche n'est rarement (ou jamais) pris en compte dans les études portant sur le contexte même si elle peut avoir un impact sur la généralisation des résultats.

Ce projet de thèse, démarré en février 2016, est une initiative conjointe d'AgroParisTech, du Centre de recherche de l'Institut Paul Bocuse (IPBRC) et de la Société scientifique d'hygiène alimentaire (SSHA), qui a financé le projet. L'objectif théorique est de comprendre et d'examiner les conditions dans lesquelles le contexte affecte l'évaluation des produits alimentaires par les consommateurs. Ce travail est basé sur la théorie des perspectives (Kahneman & Tversky, 1979) qui considère les effets du contexte sur le jugement à travers la notion de points de référence. L'objectif appliqué de cette recherche est d'accompagner les professionnels et les scientifiques qui utilisent des évaluations hédoniques dans l'inclusion du contexte à chaque étape du développement d'un produit.

PROBLEMATIQUE ET QUESTIONS DE RECHERCHE

La littérature suggère que le contexte influence le jugement hédonique du consommateur par le biais de différents mécanismes impliquant des variables contextuelles. Nous avons classé ces variables contextuelles en fonction des critères utilisés pour définir la validité écologique d'une expérience. Cependant, la manière dont ces variables contextuelles affectent le jugement hédonique du consommateur n'est toujours pas claire car il n'y a pas de normalisation dans la manière dont les variables doivent être utilisées ou interprétées. Cela ne permet pas de déduire des mécanismes sous-jacents des effets du contexte sur l'évaluation du consommateur. Par conséquent, pour accroître la validité écologique des données obtenues lors des tests consommateurs, il est essentiel de comprendre les conditions dans lesquelles le contexte affecte l'évaluation hédonique des produits alimentaires.

En ce qui concerne les différentes variables contextuelles susceptibles d'affecter la validité écologique, la plupart des études sur le contexte se sont concentrées sur les variables liées à l'environnement, aux produits et au consommateur (« approche classique »). Ces variables pourraient représenter le premier niveau d'effets de contexte pouvant influencer sur l'expérience du consommateur. Cependant, lorsque les consommateurs forment un jugement hédonique explicite, cela signifie qu'une tâche d'évaluation a été effectuée. Par conséquent, la tâche d'évaluation devrait également être considérée comme une variable contextuelle clé, en particulier dans le cadre du présent travail dont l'objectif est de comprendre les conditions dans lesquelles les contextes affectent l'évaluation hédonique du consommateur. En particulier, en ce qui concerne la question de la validité écologique des données collectées dans des conditions contrôlées, il est important de comprendre si la tâche effectuée dans un contexte est représentative et pertinente dans le contexte d'intérêt.

La revue de la littérature a également montré un manque de cadre théorique pour les études de contexte. Cela rend difficile la compréhension du rôle joué par les effets de contexte dans l'évaluation du consommateur. En outre, dans des disciplines telles que la psychologie et l'économie comportementale, les effets de contexte sont explorés du point de vue de la théorie des perspectives qui considère les effets du contexte sur l'évaluation du consommateur à travers la notion d'effets de cadrage et de points de référence (Kahneman & Tversky, 1979). Les effets de cadrage peuvent en effet expliquer des différences de comportement lorsqu'un ensemble donné d'options est présenté ou formulé différemment aux consommateurs. Cependant, ces effets n'ont pas été pris en compte dans les études sur le contexte dans le domaine de l'analyse sensorielle et de la science de la consommation. Ceci malgré les études menées dans des conditions contrôlées indiquant que les formats de tâches d'évaluation pourraient affecter le niveau d'appréciation des consommateurs. Afin de répondre à cette question, nous avons pris pour cadre de réflexion la théorie des perspectives.

Ayant identifié quatre grandes catégories de variables contextuelles et défini un cadre théorique, nous avons délimité quatre objectifs principaux (Figure 1) pour la présente thèse. Pour chaque objectif, les hypothèses de recherche spécifiques et le plan expérimental sont détaillés ci-dessous.

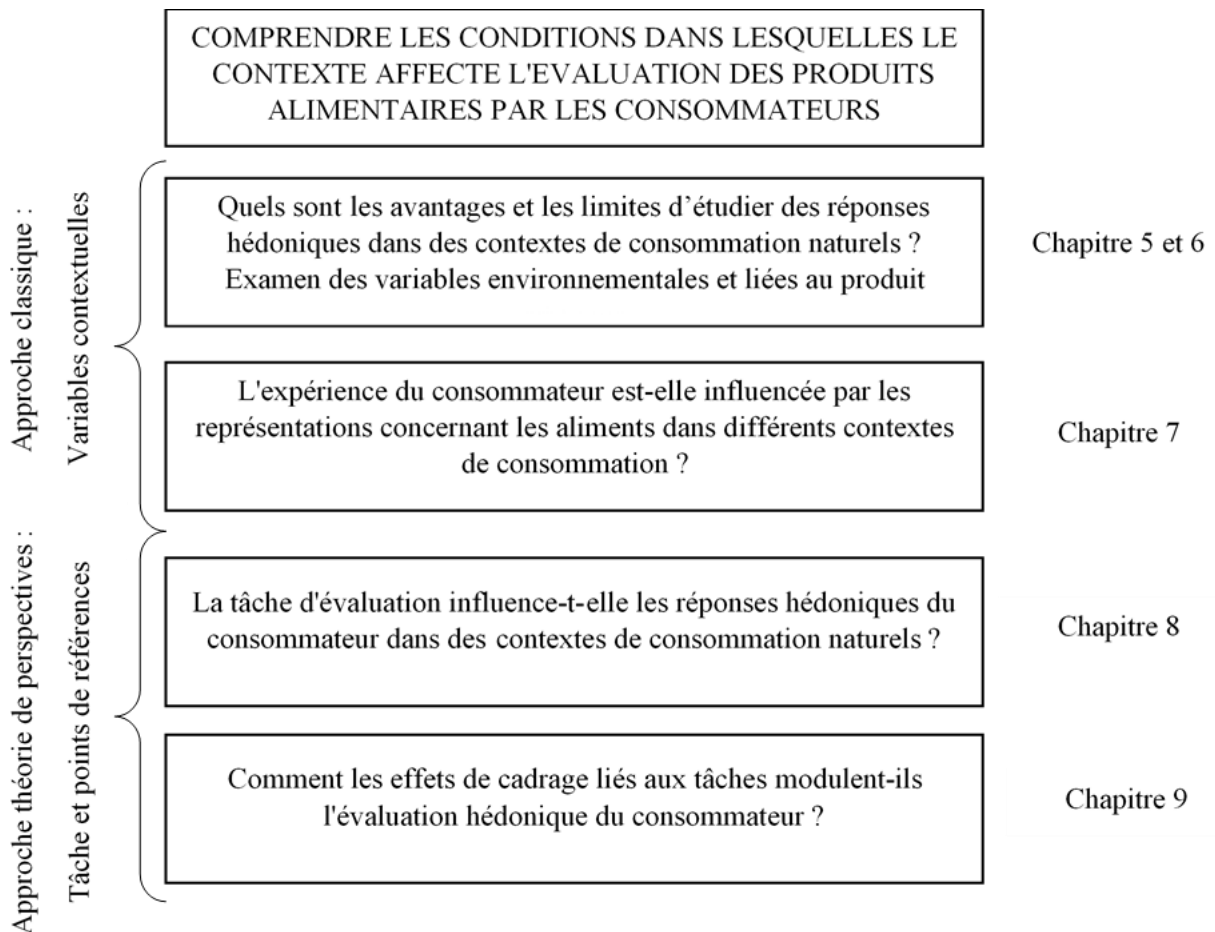


Figure 1. Résumé sur les questions de recherche pour la présente thèse.

PARTIE B. ETUDES PRELIMINAIRES (Chapitres 5 et 6)

1. Introduction

L'expérience du consommateur en matière de produits alimentaires ne peut être dissociée du contexte de consommation. De même, le contexte de consommation ne peut être dissocié des attentes et des croyances à l'égard de l'expérience produit. Toutefois, dans l'industrie, les produits alimentaires sont généralement évalués dans des conditions contrôlées où ces variables liées à la consommation sont considérées comme inexistantes ou neutralisées. De plus, dans ces conditions contrôlées, les croyances

et les attentes du consommateur peuvent ne pas être exprimées de la même manière que dans des contextes de consommation plus naturels.

Cela soulève des questions sur la transférabilité et la validité écologique des résultats de tests effectués par les consommateurs dans des conditions contrôlées dans des contextes de consommation naturels. La revue de la littérature que nous avons menée (Galiñanes Plaza et al., 2019) a recensé de nouvelles approches méthodologiques développées pour gagner en validité écologique. Cependant, mis à part très peu d'études (Holthuysen, Vrijhof, de Wijk et Kremer, 2017), ces approches n'ont pas été comparées à des contextes de consommation véritablement naturels. Ce manque d'éléments de comparaison pourrait être lié aux aspects méthodologiques et logistiques qui impliquent la mise en place d'une expérience dans des contextes naturels. Ainsi, le manque de recul sur l'évaluation hédonique du consommateur dans des contextes de consommation naturels rend difficile la compréhension des variables contextuelles qu'il faudrait prendre en compte pour améliorer les tests effectués dans des conditions contrôlées. Par conséquent, le premier objectif de cette thèse est d'explorer quels sont les avantages et les inconvénients d'étudier le niveau d'appréciation du consommateur dans des contextes de consommation naturels. À cette fin, deux études exploratoires ont été menées dans des contextes différents et dans des conditions différentes. Dans les deux études, nous avons testé le rôle de l'information. Des études précédentes ont montrées l'influence de l'information sur les croyances et les attentes du consommateur modifiant son évaluation hédonique et son comportement (choix) vis-à-vis des produits testés (Bernard, Duke et Albrecht, 2019 ; Fernandes et al., 2016 ; Jo & Lusk, 2018 ; Mcfadden & Lusk, 2015). Le fait de souligner un aspect particulier d'un produit, oriente l'évaluation du consommateur sur ces caractéristiques qui deviennent plus saillantes. Considérant que le contexte de consommation ne peut être dissocié des attentes du consommateur et de ses croyances quant à l'expérience du produit, l'utilisation de l'information semblait être un bon outil pour évaluer cette possible interaction. De plus, cela nous a permis de déterminer si le consommateur percevait l'information de la même manière, en fonction du contexte.

2. Standardisation des variables liées au produit dans les études de contexte (chapitre 5)

2.1. Objectifs et méthodes

Ce chapitre visait à identifier comment les variables liées à l'environnement influenceraient l'évaluation hédonique du consommateur lorsque les variables liées au produit seraient standardisées (quantité d'aliment et présentation). Nous avons évalué le niveau d'appréciation des consommateurs (n = 151) dans trois contextes différents (test de localisation central (CLT) ; contexte évoqué ; restaurant). De plus, différentes conditions d'information ont été testées (aveugle et informé) concernant le mode

de préparation (« préparée par un traiteur gourmand »). Les hypothèses formulées ont été :

- Hypothèse 1 : Des notes hédoniques plus élevés seraient observés dans le contexte naturel (restaurant) et dans le contexte évoqué par rapport au contexte de test standardisé (CLT).
- Hypothèse 2 : Les informations sur la préparation des aliments modifieraient l'importance des croyances et des attentes des consommateurs et, par conséquent, les notes hédoniques des consommateurs par rapport à la condition aveugle.

2.2. Résultats et discussion

Nous n'avons observé aucune différence significative concernant le niveau d'appréciation des participants entre les trois contextes. Néanmoins, les notes hédoniques ont été légèrement plus élevées en CLT et dans le contexte évoqué. Ces résultats diffèrent de ceux obtenus par Meiselman, Johnson, Reeve et Crouch (2000), où les notes hédoniques au laboratoire étaient inférieures à celles obtenues dans les restaurants. De plus, en ce qui concerne les contextes évoqués et les contextes CLT, aucune différence dans les notes hédoniques n'a été obtenue. Ces résultats correspondent aux ceux obtenus par Lusk, Hamid, Delahunty et Jaeger (2015) lorsque des notes hédoniques ont été comparés. En ce qui concerne les études comparant le CLT à de nouvelles approches contextuelles en tant que contextes évoqués et naturels, aucune comparaison avec des études antérieures ne peut être faite car il s'agissait, à notre connaissance, de la première étude ayant procédé à cette comparaison. Néanmoins, contrairement aux résultats obtenus par Holthuysen et al. (2017), nos résultats n'ont révélé aucune différence significative entre les contextes. Cela pourrait s'expliquer par le fait que les variables liées au produit, telles que la quantité d'aliments servis et la présentation, ont été standardisées d'un contexte à l'autre et conservées de la même manière que les participants l'avaient dans leur contexte de consommation naturelle. Selon la revue de la littérature, ces variables ont eu un impact sur le jugement hédonique du consommateur. De plus, en ce qui concerne le contexte évoqué observé précédemment par Hersleth et al. (2015), les informations contextuelles véhiculées dans le contexte évoqué peuvent avoir un impact positif sur l'évaluation du consommateur.

L'information sur la préparation des aliments a eu un léger impact sur le niveau d'appréciation des participants. Cela peut être lié à un manque de clarté dans l'information donnée ou au libellé même (« traiteur gourmand »), ainsi qu'au faible nombre de participants par condition. De plus, les participants ne s'attendaient peut-être pas à trouver des produits prêts à l'emploi dans le cadre de l'Institut Paul Bocuse où avaient été mis en œuvre ces deux contextes. Néanmoins, on pouvait observer que la présence d'information sur la préparation des aliments avait tendance à réduire la dispersion des notes hédoniques des participants, en particulier dans le cas du contexte de consommation naturelle. Nous pourrions alors émettre l'hypothèse que la présence d'informations pourrait orienter l'évaluation du consommateur vers une caractéristique particulière du produit qui pourrait être liée aux croyances et

attentes du consommateur, réduisant ainsi l'interaction avec d'autres variables contextuelles telles que les variables environnementales.

3. L'impact de l'information liée aux aliments dans des contextes de consommation naturels (chapitre 6)

3.1. Objectifs et méthodes

Dans ce chapitre nous avons examiné si le consommateur prenait en compte des informations sur les variables liées aux aliments lors du choix du repas et si ces informations avaient influencé son évaluation hédonique. Les réponses des consommateurs (n = 188) ont été obtenues lors d'une conférence sur l'alimentation au Royaume-Uni. Différents niveaux d'information ont été testés au cours des trois jours de la conférence.

3.2. Résultats et discussion

En ce qui concerne l'effet de l'information sur le choix du consommateur, nous avons observé que les participants à la conférence n'étaient pas attentifs aux informations présentées sur les cartes de menu. Lorsqu'ils sont venus au café expérimental, les participants ont observé la nourriture et ont interrogé le service de restauration à ce sujet, même si les cartes de menu étaient affichées sur le buffet et des tables. Par conséquent, les choix d'aliment n'ont été vraisemblablement pas ou peu conditionnés par l'information fournie. Comme Grunert (2011) l'a décrit, le besoin d'informations sur les aliments ne conduit pas toujours à la perception de ces informations. Le consommateur a tendance à sélectionner les informations qui l'intéresse et à en ignorer l'excès. Dans ce type d'événements où les participants n'ont pas beaucoup de temps pour le déjeuner, cela les a peut-être amenés à simplifier leurs décisions en matière de restauration en demandant directement sur le menu au service de restauration. De plus, nous devrions considérer que les participants à la conférence peuvent avoir varié leurs choix au cours des 3 jours de la conférence pour éviter la monotonie (Köster, 2009 ; Meiselman, 2006). De plus, il est important de considérer que le niveau d'information changeait tous les jours pour tous les plats. Il est donc difficile de démêler les effets de l'information sur le choix d'un plat spécifique.

Dans l'ensemble, l'offre alimentaire a été perçue positivement, mis à part le fait que les plats étaient froids et que les participants s'attendaient à ce qu'ils soient chauds. Nous pouvons également considérer que le fait d'avoir un repas complet sur l'assiette a pu avoir une influence sur les réponses à certains composants bien que nous ayons demandé aux participants d'évaluer individuellement chaque composant du plat (Elzerman et al., 2015 ; Jimenez et al., 2015).

En ce qui concerne les avantages et les inconvénients de la mise en place d'une étude de ce type, il est important de souligner différents aspects susceptibles de se présenter dans des contextes de consommation naturels. Au cours de l'étude, le service de restauration a changé les couverts entre le premier jour (bois) et le deuxième et troisième jour (plastique). Cela peut avoir un effet sur le comportement des participants et en particulier sur leur perception du goût (Piqueras-Fiszman et al., 2012). En outre, les participants ont soulevé plusieurs préoccupations concernant la durabilité des couverts en plastique, l'un des thèmes-clés de l'événement. De plus, le service de la nourriture variait également d'un jour à l'autre - certaines options de restauration étaient disponibles avant d'autres en raison de problèmes logistiques dans la cuisine - ce qui peut avoir affecté les résultats en matière de choix d'aliments.

PARTIE C. VARIABLES LIEES AU CONSOMMATEUR (Chapitre 7)

1. Introduction, objectifs et méthodes

L'examen de la littérature a montré que les variables liées au consommateur, telles que ses croyances et ses attentes, jouent un rôle majeur dans la façon dont le consommateur perçoit et expérimente un produit (Delwiche, 2012 ; Jo & Lusk, 2018 ; Schifferstein et al., 2019). De plus, ces croyances et attentes peuvent différer en fonction du contexte, modifiant l'expérience de consommation, la perception et l'évaluation hédonique du consommateur (Köster, 2003). Toutefois, à notre connaissance les études portant sur le contexte n'ont pas exploré la manière dont les attentes vis-à-vis d'un contexte particulier peuvent influencer l'évaluation hédonique du consommateur, même si elles sont indiqués en tant que facteurs responsables des différences de contexte. Par conséquent, le chapitre 7 cherche à comprendre si l'expérience du consommateur est influencée par ses représentations mentales concernant les aliments dans différents contextes de consommation.

En outre, la plupart des études sur les effets de contexte (notamment celles comparant des contextes de consommation contrôlée et de consommation naturelle) ont été menées aux États-Unis, au Royaume-Uni et dans les pays d'Europe du Nord. Cette thèse s'est déroulée essentiellement en France, un pays qui peut différer dans la façon dont le consommateur perçoit et expérimente l'alimentation dans des contextes différents en raison de sa culture gastronomique.

Pour atteindre l'objectif du présent chapitre, une étude qualitative a été menée afin de mieux comprendre les représentations du consommateur concernant les aliments dans différents contextes de consommation. Douze groupes de discussion ont été organisés dans deux régions différentes, Paris et Lyon, avec deux groupes de population différents, étudiants et non étudiants. Les groupes de discussion permettent de collecter plus d'informations que les entretiens individuels car les participants

interagissent pendant la discussion pour échanger des opinions et des réflexions. Par ailleurs, la décision de comparer deux régions et deux types de population différents nous a permis d'observer de possibles différences dans la manière dont le consommateur intègre des variables contextuelles dans son expérience de repas en raison de différences culturelles liées à la gastronomie (cuisine lyonnaise versus une cuisine française plus globale) ; et en raison d'habitudes de consommation (étudiants et non-étudiants).

Les questions ont été élaborées à partir de la revue de littérature et les sujets de discussion suivants ont été définis : expériences alimentaires dans différents contextes, contextes et préparation de la nourriture et, préparation de la nourriture et compétences culinaires. Un guide de discussion a été mis en place avec des chercheurs français en sciences sociales afin de définir les questions ouvertes permettant d'aborder les thèmes choisis. Les discussions ont ensuite été conduites selon les principes de base concernant le rôle du modérateur (Lawless & Heymann, 2010).

En ce qui concerne la revue de la littérature, les hypothèses suivantes ont été formulées :

- Hypothèse 1 : les variables liées au contexte ont un poids différent sur l'expérience du consommateur en fonction du contexte de consommation.
- Hypothèse 2 : les variables liées à la consommation dans différents contextes sont intimement liées à la nourriture servie.
- Hypothèse 3 : des différences entre les deux régions devraient être observées en termes de contexte et de variables liées au produit en raison de différences culturelles gastronomiques.
- Hypothèse 4 : des différences entre les deux types de population devraient être observées en termes d'expérience du consommateur en raison d'habitudes de consommation différentes.

Les discussions ont été soumises à une analyse thématique ainsi qu'à une analyse lexicométrique.

2. Résultats et discussion

L'objectif principal de ce chapitre était d'examiner si l'expérience du consommateur était influencée par ses représentations mentales concernant les aliments dans différents contextes de consommation. Pour atteindre cet objectif, douze groupes de discussion (n = 86) ont été conduits dans deux régions différentes, Paris et Lyon, avec deux populations différentes : les étudiants et les non-étudiants.

Des différences dans les variables liées au contexte ont été observées entre les contextes de consommation et ont été associées aux attitudes positives et négatives des consommateurs. La convivialité a été mise en avant comme l'une des variables les plus importantes de l'expérience du consommateur. Cependant, tous les consommateurs ne le ressentent pas de la même manière, en fonction du contexte, notamment en ce qui concerne les restaurants gastronomiques où certains

étudiants ont décrit ces contextes comme des environnements froids. La décoration a été évoquée et évaluée positivement lorsque les consommateurs ont discuté de la restauration gastronomique, alors que ce n'était pas le cas pour les lieux de travail, les cantines scolaires et les chaînes de restauration rapide. En ce qui concerne les tests de consommation, les consommateurs ont montré une attitude négative à l'égard de ces contextes lorsqu'ils ont discuté de l'expérience alimentaire. Les consommateurs ont convenu que ce contexte ne peut être décrit ou considéré comme une expérience de repas en raison du manque de convivialité et du service.

Des différences dans les variables liées aux produits ont été observées entre les contextes de consommation et elles ont été associées aux attentes et aux croyances des consommateurs à l'égard des aliments servis. Les consommateurs ont ouvert une discussion importante entre les produits faits maison et les produits industriels. Les produits faits maison étaient associés à des ingrédients naturels, locaux, saisonniers et savoureux. Alors que les produits industriels étaient associés à l'utilisation d'ingrédients chimiques, à des scandales dans l'industrie alimentaire et à des ingrédients malsains. Les consommateurs ont également associé l'utilisation de ces deux types de produits et de processus à différents contextes de consommation en fonction du volume et du prix de l'offre alimentaire.

L'analyse lexicométrique a permis d'identifier des différences entre les groupes de Paris et de Lyon. Les groupes parisiens étaient plus concentrés sur différentes expériences de repas liées à la décoration et au prix des menus. À l'inverse, les groupes lyonnais étaient davantage axés sur les variables liées au produit, telles que la préparation des aliments et l'utilisation d'ingrédients. Les groupes issus des deux régions ont convenu de l'importance de la convivialité dans l'expérience du consommateur. Comme dans le cas de la comparaison des régions, l'analyse lexicométrique a montré des différences dans le discours des étudiants et des non-étudiants lorsqu'ils décrivaient des expériences de repas. Les groupes d'étudiants étaient plus concentrés sur les expériences affectives et le prix que sur les aliments pris au restaurant tandis que les groupes de non-étudiants se concentraient davantage sur la qualité des aliments. De plus, des différences en termes de compétences culinaires ont été observées entre les deux populations, ce qui peut expliquer la différence en termes d'expérience de consommation entre les groupes d'étudiants et de non-étudiants.

La présente étude montre que les représentations mentales du consommateur concernant les aliments dans différents contextes de consommation impliquent différentes variables contextuelles. Les représentations du consommateur peuvent impliquer davantage de variables liées aux produits dans certains contextes ou davantage de variables environnementales – telles que la convivialité du moment partagé entre amis – dans d'autres. Cela révèle que, lors de la comparaison d'études contextuelles, l'évaluation hédonique du consommateur peut être affectée non seulement par la présence de variables contextuelles, mais également par la manière dont ces variables sont intégrées et influencent l'expérience du consommateur.

Cette étude souligne également l'importance des croyances et des attentes du consommateur à l'égard des aliments servis dans un contexte particulier. Il montre que le consommateur associe différents types de produits (fait maison et industriel) à différents types de contextes. Par conséquent, une attention particulière doit être accordée à ces variables lorsque des études de contexte sont comparées.

PARTIE D. VARIABLES LIEES A LA TACHE (Chapitre 8)

1. Introduction, objectifs et méthodes

La revue de la littérature a montré que, dans les effets de contexte, la tâche d'évaluation peut jouer un rôle majeur dans la façon dont le consommateur évalue et juge un produit. Différentes notes hédoniques ont été obtenues lors de la modification de la tâche d'évaluation dans des conditions contrôlées. Köster (2003) a déjà souligné que les différences dans le niveau d'appréciation des consommateurs pourrait être liées au fait que les consommateurs peuvent percevoir le produit différemment ou peuvent percevoir la tâche différemment. De telles différences dues à la tâche peuvent être liées à une différence entre « la compréhension de l'instruction » ou « l'utilisation d'une stratégie différente pour résoudre le problème » (Köster, 2003, p. 360). Cependant, dans les études portant sur les effets de contexte, cette variable n'a pas suscité le même intérêt que les variables environnementales et liées au produit. Par conséquent, le troisième objectif de la thèse vise à comprendre si la tâche d'évaluation a une influence sur le niveau d'appréciation du consommateur dans un contexte de consommation naturelle. Le niveau d'appréciation du consommateur est généralement collecté par le biais d'une question globale sur l'attrait général d'un produit (tâche d'évaluation synthétique) ou par une question globale suivie d'une série de notations des attributs du produit (tâche d'analyse analytique). Ces différences dans la formulation de la tâche d'évaluation hédonique ont montré des résultats controversés concernant les différences entre les notes hédoniques (Gacula, Mohan, Faller, Pollack et Moskowitz, 2008 ; Prescott et al., 2011). À cette fin, deux tâches d'évaluation différentes (synthétique et analytique) ont été réalisées dans différents produits (pain et pizza) avec un degré de préparation culinaire différent (faite maison, prête à chauffer et mélange des deux (mixte)) dans une cafétéria universitaire. Les notes hédoniques des consommateurs (n = 457) ont été comparées entre les deux tâches et les produits. En outre, la sensibilité aux variations de la préparation des aliments et de la tâche a été évaluée. Selon la littérature, les hypothèses suivantes ont été émises :

- Hypothèse 1 : lorsque deux formats différents de la tâche d'évaluation (synthétique ou analytique) sont présentés dans des contextes de consommation naturels, des différences plus grandes entre les notes hédoniques des consommateurs seraient observées.

- Hypothèse 2 : demander explicitement aux consommateurs d'évaluer les attributs sensoriels dans un contexte de consommation naturelle aurait un effet majeur sur les notes hédoniques pour les produits impliquant une préparation culinaire que pour les produits prêts à l'emploi.

2. Résultats et discussion

L'objectif principal de ce chapitre était d'examiner si le niveau d'appréciation du consommateur dans des contextes de consommation naturels différait selon le type de tâche d'évaluation.

Des différences significatives dans le niveau d'appréciation des participants ont été trouvées pour la version pizza faite maison. Ce produit a été le mieux noté lors de la tâche d'évaluation synthétique, alors que la pizza mixte a été la plus mieux notée lors de la tâche d'évaluation analytique. Aucune différence concernant le niveau d'appréciation des participants en fonction du format de la tâche d'évaluation n'a été observée pour le pain et la pizza prête à chauffer.

Les notes hédoniques pour la pizza faite maison ont été affectées par la présence d'évaluations des attributs sensoriels (tâche analytique). En effet, une différence significative entre le niveau d'appréciation a été constatée entre les tâches d'évaluation synthétique et analytique, les notes hédoniques étant plus faibles pour cette dernière. Inversement, les notes hédoniques des versions de pizza mixte et prête à chauffer ont tendance à augmenter avec la tâche d'évaluation analytique (bien que les différences soient non significatives).

Cette étude révèle que les différences dans le format des tâches peuvent affecter le niveau d'appréciation aux produits à composants multiples tels que les pizzas dans des contextes de consommation naturels. Le consommateur peut accorder son attention aux différents ingrédients en raison des questions spécifiques relatives aux attributs sensoriels. Les effets de cadrage de la tâche peuvent influencer sur la perception du consommateur, de même que sur son évaluation hédonique. Il convient également de mentionner que les attentes du consommateur à l'égard des produits, en particulier ceux soumis à des préparations culinaires, peuvent également avoir influencé le niveau d'appréciation en raison du contexte de consommation. Les participants ne s'attendaient peut-être pas à trouver une pizza faite maison à la cafétéria de l'école. Par conséquent, des études supplémentaires avec différentes catégories de produits et différents degrés de préparation culinaire sont suggérées pour confirmer ces résultats.

En outre, cette étude révèle en conséquence que le classement final des produits différait en fonction de la tâche d'évaluation. Cela peut avoir une importante implication en terme décisionnel pour les industriels lors du lancement du produit. Il serait alors intéressant de vérifier si des résultats similaires seraient obtenus pour une évaluation de manière séquentielle monadique (même si ce mode d'évaluation est susceptible de nuire à la validité écologique des résultats dans un contexte de

consommation naturelle). D'autres études sur l'effet de la tâche d'évaluation sur le niveau d'appréciation du consommateur dans des contextes de consommation naturels permettraient de mieux comprendre quels aspects du produit importent pour le consommateur lorsqu'il mange au restaurant et comment ces aspects sont intégrés dans son évaluation hédonique.

PARTIE E. VARIABLES LIEES AU PRODUIT (Chapitre 9)

1. Introduction

Le point de référence est l'un des principes fondamentaux de la théorie des perspectives. Ce principe postule que le consommateur effectue ses jugements en fonction d'un point de référence, considéré comme le statu quo ou l'état actuel à partir duquel le consommateur évalue des résultats (Tversky, 1992). Les jugements et les décisions peuvent être différents si le point de référence change ou est manipulé (Jervis, 2004), par le biais d'aspirations, d'attentes, de normes et de comparaisons sociales (Tversky & Kahneman, 1991). Le présent chapitre intègre les résultats précédents et teste des hypothèses basées sur la théorie des perspectives pour expliquer les influences contextuelles sur l'évaluation des produits alimentaires pour le consommateur. Les objectifs de ce chapitre sont de comprendre comment les effets de cadrage liés aux tâches d'évaluation modulent l'évaluation hédonique du consommateur.

Il a été démontré que les variables liées à l'environnement et aux produits impactaient la manière dont le consommateur perçoit un aliment dans un contexte particulier, ce qui contribue à la création de points de référence modulables par les croyances et les attentes du consommateur. Le présent chapitre propose d'aller plus loin en mettant l'accent sur l'interaction entre l'aliment et le consommateur dans un contexte particulier, en attirant l'attention du consommateur sur des caractéristiques particulières du produit associées aux croyances et aux attentes du consommateur. En raison de l'utilisation d'informations relatives au produit, les croyances et les attentes du consommateur devraient modifier les points de référence créés à partir de variables environnementales et liées au produit, en aidant à expliquer les effets du contexte sur l'évaluation hédonique du consommateur. Pour démontrer cet effet, ce chapitre comprend deux études différentes.

2. Lieu de restauration comme point de référence : différences dans l'évaluation hédonique des plats en fonction de la situation de consommation (étude « cake »)

2.1. Objectifs et méthodes

Le but de cette étude était d'examiner dans quelle mesure différents aspects du contexte (contexte physique, du produit, de l'information) pourraient contribuer à former des points de références dans l'évaluation hédonique du consommateur. Deux contextes (CLT et restaurant) et deux versions d'un produit (cake aux jambon-olives, prêt à manger ou fait maison) ont été testés. Le niveau d'appréciation des consommateurs (n = 283) ont été évalués ainsi que le niveau de satisfaction de leurs attentes. De plus, deux conditions d'information différentes ont été testées (aveugle et informé). Les hypothèses suivantes ont été formulées :

- Hypothèse 1 : Dans le restaurant, les notes hédoniques seraient plus élevées que dans le test en CLT.
- Hypothèse 2 : En condition informée, le cake fait maison obtiendrait des notes hédoniques plus élevées que le cake prêt à manger.
- Hypothèse 3 : L'impact des informations concernant la qualité des aliments (fait maison et prêt à manger) varierait en fonction du lieu de test.

2.2. Résultats et discussion

Les résultats ont montré que le niveau d'appréciation des participants dans le restaurant était supérieur à celui du CLT. En moyenne, les participants ont préféré les deux produits au restaurant plutôt que dans le test en CLT. Cela peut s'expliquer par le fait que la convivialité a eu un effet important sur l'expérience du consommateur, en particulier pour les consommateurs français. En outre, lors de l'expérimentation en CLT, les participants ont eu l'impression de se sentir comme s'ils étaient dans un examen, ce qui pourrait avoir eu une influence négative sur leur niveau d'appréciation. De plus, la présentation des aliments différait également d'un contexte à l'autre. Au restaurant, on a utilisé des couverts propres au restaurant, tandis que dans le test en CLT, on a utilisé des couverts en plastique.

Les résultats ont montré que les cakes faits maison obtenaient des notes plus élevées que les cakes prêts à manger, quels que soient le contexte et la condition de l'information. Cela confirme les résultats précédents menés dans cette thèse (étude sur les groupe des discussions) selon lesquels les consommateurs ont indiqué que lorsqu'ils vont au restaurant (des restaurants comme celui du Living Lab de l'Institut Paul Bocuse), les produits faits maison devraient être utilisés.

Nous n'avons observé aucune différence entre les conditions d'information en fonction du lieu de test. On s'attendait à ce que dans le restaurant les notes hédoniques étaient moins élevées pour le cake prêt à manger, alors que des notes hédoniques plus élevées pour le cake fait maison étaient attendues dans le test en CLT. Ces résultats n'ont pas été observés.

La présente étude montre que les informations relatives aux produits jouent un rôle clé dans le niveau d'appréciation du consommateur, quels que soient les effets du contexte. Cet effet pourrait être associé à la modification des points de référence du consommateur par ses croyances et / ou ses attentes à l'égard de caractéristiques de produits spécifiques dans un contexte donné. Les résultats suggèrent que le fait de prendre en compte ces facteurs liés au consommateur pourrait aider à expliquer certaines différences entre les études de contexte pouvant aller au-delà de l'environnement physique. De plus, un effet significatif de l'ordre de présentation de l'échantillon a été observé dans des conditions à la fois non informées et informées. Ce résultat doit être souligné car, dans les contextes de consommation naturelle, le consommateur ne goûte généralement pas deux versions d'un produit comme il le fait lors de tests de consommation. Cette comparaison directe entre produits peut entraîner des décisions erronées du point de vue managérial lors du lancement du produit car les caractéristiques du premier produit testé peuvent servir de référence pour le second produit évalué.

3. Associations entre les attentes et les réponses hédoniques au restaurant : le rôle de l'information (étude « quiche »)

3.1. Objectifs et méthodes

Le but de cette étude était d'examiner l'influence du type d'information fournie sur la préparation des aliments et l'origine des ingrédients sur le niveau d'appréciation du consommateur sur un produit dans un contexte de consommation naturelle. Les attentes et les croyances des consommateurs (n = 114) à l'égard d'un contexte spécifique (restaurant), ainsi que le niveau d'appréciation de ces consommateurs dans ce restaurant spécifique ont été évaluées. En outre, deux conditions d'information différentes ont été testées en fonction des attentes des consommateurs. Les hypothèses suivantes ont été formulées :

- Hypothèse 1 : Les attentes et les croyances des consommateurs à l'égard de la nourriture dans un contexte particulier aideraient à expliquer le niveau d'appréciation des consommateurs.
- Hypothèse 2 : Une information cohérente avec les attentes et les croyances des consommateurs augmenterait le niveau d'appréciation des consommateurs par rapport à une information incohérente.
- Hypothèse 3 : Des facteurs liés à l'alimentation impacteraient la satisfaction globale des consommateurs.

3.2. Résultats et discussion

Les résultats d'un sondage en ligne sur les attentes et les croyances des consommateurs à l'égard des aliments servis au restaurant ont permis d'expliquer leur niveau d'appréciation lorsque différents types

d'informations étaient donnés. La condition « information cohérente » renforçait les croyances et les attentes des participants à l'égard des plats faits maison, augmentant ainsi le nombre de personnes aimant les produits testés (quiches) ; tandis que la condition « information incohérente » peut avoir mis en évidence certaines caractéristiques du produit, telles que l'origine des ingrédients et la préparation du plat, qui contraste avec les croyances et les attentes des participants réduisant les nombres des réponses plus positives (notes hédoniques plus élevés). Les informations sur la préparation des aliments et l'origine des ingrédients ont influencé la satisfaction des participants à l'égard de l'expérience des aliments et des repas. Il faut noter que les participants ont payé leur nourriture, et ont donc peut être évalué le rapport qualité-prix différemment entre les conditions d'information, affectant ainsi leur niveau de satisfaction.

La présente étude souligne que le contexte crée des attentes et des croyances à l'égard des aliments servis qui peuvent aider à expliquer les différences entre le niveau d'appréciation du consommateur. Des études complémentaires devraient être menées dans différents contextes (cantines scolaires, cafeterias) afin d'explorer les différences de croyances et d'attentes du consommateur concernant les facteurs liés à l'alimentation et leur influence sur l'évaluation hédonique.

CONCLUSION

Dans cette thèse, nous avons examiné comment différentes variables contextuelles ont influencé l'évaluation hédonique du consommateur dans les études de contexte. La revue de la littérature a montré que le contexte influence l'évaluation hédonique du consommateur à travers différents mécanismes impliquant plusieurs variables contextuelles. Nous avons classé ces variables contextuelles en quatre catégories [ou selon quatre critères] déterminantes pour la validité écologique d'une expérience : l'environnement, le produit, le consommateur et la tâche.

Le manque de standardisation dans la manière dont les variables contextuelles doivent être utilisées ou interprétées dans les études contextuelles a été associé à l'absence de cadre théorique derrière ces études. Grâce à une approche multidisciplinaire fondée sur la théorie des perspectives (Kahneman et Tversky, 1979), nous avons proposé un cadre théorique pour expliquer les observations empiriques relatives aux effets des contextes sur l'évaluation hédonique du consommateur, pour formaliser davantage les effets du contexte afin de garantir une meilleure fiabilité des résultats dans des études sensorielles.

Tout au long de ce travail, nous avons étudié des questions méthodologiques et théoriques qui n'avaient pas encore été examinées dans la littérature. Nous avons défini des avantages et des inconvénients à l'heure de travailler dans des contextes naturels de consommation. Nous avons

soulevé le fait que l'évaluation hédonique du consommateur peut être affectée non seulement par la présence de variables contextuelles, mais également par la manière dont ces variables sont intégrées dans l'expérience du consommateur. En outre, nous avons observé que l'état du consommateur lorsqu'il est dans un test dans des conditions contrôlées peut différer de celui qui va au restaurant, ce qui pourrait déjà influencer la façon dont le consommateur va percevoir et évaluer un produit. En fait, chaque contexte peut créer un cadre de référence à partir duquel le consommateur va évaluer les produits. Nous avons aussi constaté que les différences dans la tâche d'évaluation peuvent affecter le niveau d'appréciation du consommateur dans le cas de produits à plusieurs composants (pizza) et que cela peut impliquer différentes décisions de gestion pour les industriels lorsque les produits sont testés dans des études de contexte. Finalement ce travail a mis l'accent sur le rôle des attentes et des croyances du consommateur vis-à-vis du contexte de consommation en utilisant de l'information afin de moduler le point de référence créé par le consommateur.

Cette thèse ouvre la porte à d'autres recherches sur les études de contexte en utilisant une approche multidisciplinaire fondée sur la psychologie et l'économie comportementale : la théorie des perspectives. Nous considérons que les principes théoriques utilisés en économie comportementale offrent un éclairage précieux sur les méthodologies d'évaluation du consommateur pour le développement de nouveaux produits et pourraient contribuer à améliorer la fiabilité des études de contexte.

Ce travail n'aborde qu'une petite partie d'une question de recherche beaucoup plus vaste à laquelle tentent de répondre les chercheurs et les praticiens de l'évaluation sensorielle depuis 1992 : dans quelle mesure l'absence de réalisme invalide-t-elle les données hédoniques du consommateur dans des conditions contrôlées ?

Titre : Propositions méthodologiques pour comprendre les effets du contexte sur l'appréciation des aliments par les consommateurs

Mots clés : effets de contexte, évaluation hédonique, points de référence, préparation des aliments, attentes, information

Résumé : Le contexte de consommation module la perception des aliments par les consommateurs et leur évaluation, soit directement soit par le biais de croyances et d'attentes induites par le contexte. Parallèlement, les méthodologies d'évaluation des produits alimentaires requièrent souvent des conditions standardisées afin de tenter de neutraliser ces éventuels effets de contexte. Mais ce gain en contrôle peut remettre en question la généralisation des mesures obtenues à des contextes naturels de consommation.

Cette thèse examine les conditions dans lesquelles le contexte affecte l'évaluation des produits. Ce travail s'appuie sur la théorie des perspectives, qui considère les effets du contexte sur le jugement à travers la notion de points de référence.

Les travaux visaient d'abord à comprendre comment les perceptions des consommateurs et leur évaluation des produits sont influencées par leurs représentations concernant les produits dans différents contextes de consommation. Une étude qualitative (12 groupes de discussion ; N = 86) a révélé que les croyances et les attentes des consommateurs à l'égard d'un contexte particulier sont associées à différents types de produits et de méthodes culinaires, et que les facteurs externes ont un poids différent selon le contexte de consommation.

Le deuxième objectif était de comprendre en quoi l'évaluation par les consommateurs d'un produit alimentaire dans des contextes naturels de consommation pouvait différer selon la nature de la tâche d'évaluation. Les évaluations hédoniques de produits présentant différents degrés de préparation culinaire (pain = contrôle ; pizza = fait maison, industriel et assemblé) ont été

comparées (N = 457) entre deux tâches différentes lors d'une expérience conduite en cafétéria. Les résultats ont montré que les produits à plusieurs composants soumis à différents degrés de préparation culinaire (pizza fait maison) étaient en effet plus sensibles au type de tâche d'évaluation que des produits plus standardisés (pain).

Le dernier objectif de la thèse était d'explorer les facteurs contribuant à la formation de points de référence pour expliquer les influences contextuelles sur l'évaluation des consommateurs. Deux expériences ont comparé les évaluations hédoniques dans (i) deux contextes (CLT et restaurant ; N = 283) en condition informée et non informée sur les degrés de préparation culinaire d'un produit (cake salé) ; et (ii) dans un seul contexte (restaurant ; N = 114) en condition informée sur les degrés de préparation culinaire et l'origine des ingrédients (quiche) ; où les croyances et les attentes des consommateurs à l'égard des aliments servis changent. Les résultats ont montré que les effets de facteurs externes pouvaient être réduits par un contrôle minutieux des convictions et des attentes des consommateurs dans un contexte donné.

Cette thèse contribue à la compréhension des effets des contextes sur l'évaluation hédonique des consommateurs et propose un cadre théorique pour étudier ces effets à travers des points de référence. Les résultats pourraient être utiles pour élaborer des lignes directrices pour les industriels et chercheurs utilisant des évaluations hédoniques pour inclure le contexte de manière adéquate à chaque étape du développement du produit.

Title: Methodological insights to understand the effects of context on consumer hedonic evaluation of food products

Keywords: context effects, hedonic evaluation, reference points, food preparation, expectations, information

Abstract: Environmental factors modulate consumers' perception and in turn, consumers' evaluation of food in a given context, either directly or through context-induced beliefs and expectations. However, food products are usually evaluated in standardized conditions in an attempt to neutralize possible context effects on consumer evaluation. This questions the generalization of such measures to more natural consumption contexts.

The aim of this research was to examine the conditions under which context affects consumer evaluation of food products. This work is grounded in Prospect Theory, which considers the effects of context on judgement through the notion of reference points.

The first objective was to understand how consumer' experiences and subsequent product evaluations are influenced by consumers' representations about food in different consumption contexts. A qualitative study (12 focus groups; N =86) revealed that consumers' beliefs and expectations towards a particular context are intimately associated to different types of products and culinary methods, and that external factors have a different weight depending on the consumption context.

The second objective was to understand how consumers' hedonic responses in natural consumption contexts may differ depending on the type of evaluation task. The hedonic responses of products with different degrees of culinary preparation (bread = control;

pizza = homemade, industrial and mixed) were compared (N = 457) between two different tasks in a student cafeteria. The results showed that multicomponent products subjected to a different degrees of culinary preparation (homemade pizza) were indeed more sensitive to the type of evaluation task compared to more standardized products (bread).

The last objective of the thesis was to test hypotheses based on Prospect Theory to explain contextual influences on consumers' food evaluation. Two experiments compared hedonic evaluations in (i) two contexts (CLT and restaurant; N= 283), in blind and informed conditions about the degree of culinary preparation of a product (ham-olive cake); and (ii) in one context (restaurant; N = 114) in informed conditions about the degree of culinary preparation and origin of the ingredients (quiche); where consumers' beliefs and expectations towards the food served were modified. Results showed that the effects of external factors could be reduced through careful control of consumers' beliefs and expectations in a given context.

This thesis contributes to the understanding of context effects on consumer hedonic evaluation and it proposes a theoretical framework to investigate those effects by means of reference points. The results could be valuable to develop guidelines for industrials and researchers using hedonic evaluations to include context adequately at each stage of product development.