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Master's Thesis

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EMBRACE-ME BOWL: An assessment of a new plate-ware designed to improve nutrition and commensality

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Synopsis

This Master's Thesis focuses on nutrition, commensality and food design. The project is based upon the holistic perspective of Integrated Food Studies. The study uses quantitative data collected during laboratory experiments at the Food Scape Lab in Aalborg University Copenhagen as the point of departure. The overall vision is to design and test new configurations and ways of eating that can guarantee a good health and nutrition but also reassure the social interaction during mealtime. An eating object was tested in the project to incorporate more information of how to develop new methods of eating practices that ensure a significant improvement on health and nutrition while not losing the meaning of commensality and the social aspects of eating together.

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For my loving parents, Olga Lidia and J Jesús

What is this project about?

The Master of Science in Integrated Food Studies, at Aalborg University in Copenhagen, served as the most basic stand for this thesis project. The educational program is based on three different areas of research, approaching food studies from different perspectives: Meal Science and Public Health Nutrition, Design and Gastronomy, and Food Policy Innovation Networks (Aalborg, 2014). The objective from this holistic perspective is to examine the impacts of existing practices, negotiate complex decisions, and finally produce solutions for both private and public sectors. It attempts to enclose some of the challenges in the food sector, addressing health, sustainability and modern consumption at material, political, societal and individual levels. The education integrates social, natural and design oriented sciences, so does this final project. Therefore, this work demonstrates a multidisciplinary approach towards food and follows the essence of the academic program.

The paper presents an exploratory study of a previous research where Food Design was focused along with the sociological aspects of eating behaviour present at the meal table incrusted with health nutrition challenges. The study is an investigation into the potentials for improvement. It discusses what can be learnt from these different perspectives to help progress and bring the solutions to Public Health Nutrition related problems.

This was done by identifying and mapping the problems with a brief description of current circumstances around commensality, by a critical assessment of a specific plate-ware through a pilot study in a controlled scenario – laboratory intervention – followed by an examination of what is relevant to address in relation to eating behavioural problems. And finally, a discussion about the viabilities and obstacles of the application proposed with the use of social theories.

CONTENTS

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This Master's Thesis is written by one person, but a number of other people have been involved since the beginning of this venture.

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THESIS STRUCTURE

The first chapter, ‘INTRODUCTION’, is about identifying the project’s field and theme as well as planning and creating a common understanding of the project. The second chapter, ‘LITERATURE REVIEW’ aims to provide relevant information of what has been done in the past related to the different topics expressed in this study. In the third chapter, ‘RESEARCH FRAMEWORK’, the philosophical background and theoretical framework is presented with the objective to give the support and academic structure of this study. Later in the fourth chapter, ‘EXPERIMENTAL’, is the core of this investigation; the results and methodologies of the experiment are presented in a systematic manner. Right after, ‘IMPLEMENTATION’, discusses the results of the experiments together with the theories with the aim to portray potential applications. Finally, ‘OUTRO’, concludes the study and also offers some reflections and future perspectives.

INTRODUCTION

Increasingly, there has been a growing alarm about the effects of eating behaviours on nutritional status[1]. Based on this concern was the notion that eating patterns corresponded merely to the consumers' food choices, each individual's lifestyle; where other relevant stakeholders had been excluded from the responsibilities occasioned by the consumption of unhealthy foods (Nestle, 2002). Based on scientific research, the impacts of nutritional problems include not solely the actual consumers' responsibility but similarly the innumerable actors who have a stake on the food production and consumption chains. Thus, there has been a rising need to understand the resolutions taken from the private industry and public governments that aim nutritionally healthier practices in unhealthy environments – a total paradox in the food system (Young, 2003).

These set of trends, all together, have resulted in nutrition problems at a population level, leading the authorities around the world to proceed with measures that could tackle nutritional challenges such as taxation of unhealthy foods interventions, media campaigns and different programs across the diverse public institutions (Swinburn, 2011). However, the effectiveness of several measures are debatable if considered that, for instance, health and nutrition campaigns hardly compete in resources if compared to the means destined from private companies that do not necessarily promote healthy foods (Nestle, 2002). However, nowadays the public sector is finding more opportunities to collaborate closely with the private sector. Since private companies are finding commercial potential in certain healthy food products, public-private partnerships seem to be an option (EPODE, 2014). Arranging a partnership is truly a challenge, especially when nutrition is at stake with many different stakeholders and profit is frequently a priority.

In addition, some sociologists have already pointed out that nutrition is not just affected by the actual tangible foods. Consequently, other factors affect it in a direct or indirect manner. Norms, rules and representations associated with food are multifaceted structures that often are not related to anything biologically in function by means of eating; it is relatively easy to forget in the nutrition spheres that eating it is not just a matter of digestion and absorption of nutrients but also a matter of food habits and self-identity (Fischler, 2011). Fundamentally, social practices that inherently are a part of food consumption –

procurement, preparation and/or cooking, ingestion and even waste disposal routines (Warde, 1994).

“Commensality is eating with other people, and commensal eating patterns reflect the social relationships of individuals” (Sobal, 2003). Moreover, sharing meals with other people often creates complications. Nowadays, people tend to have different diets due to different problems portrayed at population levels (Fischler, 2013). Obesity, diabetes, and allergies are some of the difficulties that humanity is currently facing – just to mention a few – and are definitely being carried over to future generations (Williams, 2008; Milagro, 2013). Regardless of the positive or negative work done by the public and private sectors (Stier, 2013) – scientists, policy makers and public health nutritionists –, it was personally considered that the creative work done in the area of commensality still has a potential to be achieved. This, despite the several creative experiments/crafts made from designers and/or food specialists (Wansik, 2006; Piqueras-Fiszman B., 2011).

New food ways are being incited in each individual’s table during mealtime. Eating alone has been considered the ‘new normal’ as such. Not just food items have been evolving but also the ways they are processed, packaged and finally eaten have tended to favour more individual rather than communal consumption of meals (Fischler, 2013).

Overall, the goal of this investigation is to use design as the principal ingredient for solutions that can definitely contribute to the eating experiences. The goal is also to investigate how design can create more meaning in the sense of community, but also in connection between consumer and its own meal and thereby prevent nutritional complications in the long term.

UNDERSTANDING THE CONTEXT

Before continuing through this investigation, a general comprehension of the context can always provide sense to the explanations of each chapter and section. The following section aims to explain the milieu where this study falls and in a brief manner it also intends to capture some relevant concepts touched through the paper. The first part provides an overview of the background of relatively new terms such as ‘foodscapes’ and ‘food design’. Finally, the origins of this research study are described in the second part of this section.

Foodscapes and food design

Recently new words have appeared in combination with the suffix '-scape'. Until now, it has been usually utilised to represent spatially arranged artefacts in the different surroundings, perhaps constructed under the influence of landscape – spaces or settings from a given perspective (Aldrich, 1966). Although the use of this perception has been used in different fields, from social to natural sciences, this approach is useful when understanding the complexities of environments. Foods are not the exception, as they serve as materials and spaces that connect with humans forming sorts of complex food systems that are now popularly addressed as foodscapes. Even though the term 'foodscapes' is often related to 'actual sites where food can be found' (Freidberg, 2010), foodscape is potentially more than the material and its form in itself (Adema, 2007). 'Foodscape' is more complex and it can turn out to be very abstract. In other words, food can represent meaning and ideas that are interconnected to the tangible and spatial features carried in it, e.g., the media, where food is referenced and communicated and only works as an intangible matter (Panelli, 2009).

A constructivist approach to this term is that food "moves further than the physical aspects" (Dolphjin, 2004). According to this idea, foodscapes are constantly changing based on the meaning gained from the users' interactions; continuously in a process of evolution based on the ways food affects and is affected and the ways individuals coexist with food and all the activities embedded, from production, distribution, to consumption, etc.

Another possible option for this term is one that gathers different perspectives for foodscapes and finds a systematic order to structure and to better understand the term (Mikkelsen, 2001). This option presents different levels that vary in significance depending on the conditions and circumstances of a given focus. The perspectives are divided into macro, meso and micro levels – based on the ecological system theory (Bronfenbrenner, 1979). At the macro level economy, political systems, culture, nationality and society construct the foodscape. At the meso level, foodscapes interact more in a local or regional context – the community view. Food moves around urban areas where it is produced, circulated and made available. Finally, at the micro level foods are accentuated by the physical appearances; the plates they are served from, the table at which they are eaten,

the room in which it is served, etc. Furthermore, foodscapes can also be catalogued into four types at the micro level which can be encompassed as the ‘mealscape’, all this in a micro geographical context that involves the entire scenario of a meal: roomscape, tablescape, platescape, foodscape (Wansik, 2007)[2].

Additionally, food design – a relatively new discipline that specializes in the analysis and conception of materials/practices related to food – has as an objective to create concepts and solutions to topics generally focused on the perspectives of the mealscapes, mainly considering micro and meso levels[3].

Materials as a mean to influence nutrition

This project makes use of a previously designed plate-ware in order to study whether these designs could have any effect on actual food intake. The research encompassed the design and production of plate-ware in ceramic materials with the objective to explore new ways of consumption and how food design can influence commensality and, consequently, nutrition. In this particular case and as expressed above, the focus of this study was in ‘Design for Food’ – it centred on the tangible things that are used to prepare, distribute and communicate the food. They are able to carry, contain, present, conserve, keep, cook, etc. the food.

Therefore, this study focuses on the foodscapes at ‘micro level’ belonging to the platescape sphere from the context on ‘mealscape’. The aim of the design was originally to place special focus on the ‘platescape’ design by rethinking the possible reactions and behaviour linked to the interaction design from the features attached to the ceramic plate-ware. It was an exploratory study of how food design could actively be put into practice with the goal to offer a solution to a problem; the creative process of design presented in the plate-ware is an important example of how social interaction could be influenced during the meal. As an ingredient, ‘critical design’ was implemented [plate-ware] as a catalyst feature to trigger social interaction during commensality[4].

The project resulted with the creation of ‘Critical Plate-ware’ through an anticipated – imagined process – meal experience portrayed in a scenario where commensals are

presented with subtle obstacles and difficulties that would make them interact more with each other and reflect upon themselves and their food. Typically, a designer would test a prototype. Here, the prototypes developed were never tested in a normal setting, such as people sharing a meal with the plates at the same time and place, before the actual objects were finally designed and produced. In simpler words, a clearer understanding of the implications of commensality and social behaviour was imagined through an abductive reasoning process based on an envisioning design method (Nathan, 2008).

The academic work after that process served as a basis to investigate between the gaps that separate food design, social interaction and commensality. 'Critical Plate-ware' proved that there is a slight potential thanks to four informal demonstrations in a design studio in Copenhagen, Denmark[5]. However, after that occasion, it was considered that running a formal experiment with the plate-ware was a priority, with the aim not just to test this new interactive concept and form of eating, or to discover the real potentials behind the design but to actually include nutrition, an important discourse in commensality, as an essential prospect to ultimately perform a full connection between the various angles and put into practice the Integrated Food Studies approach.

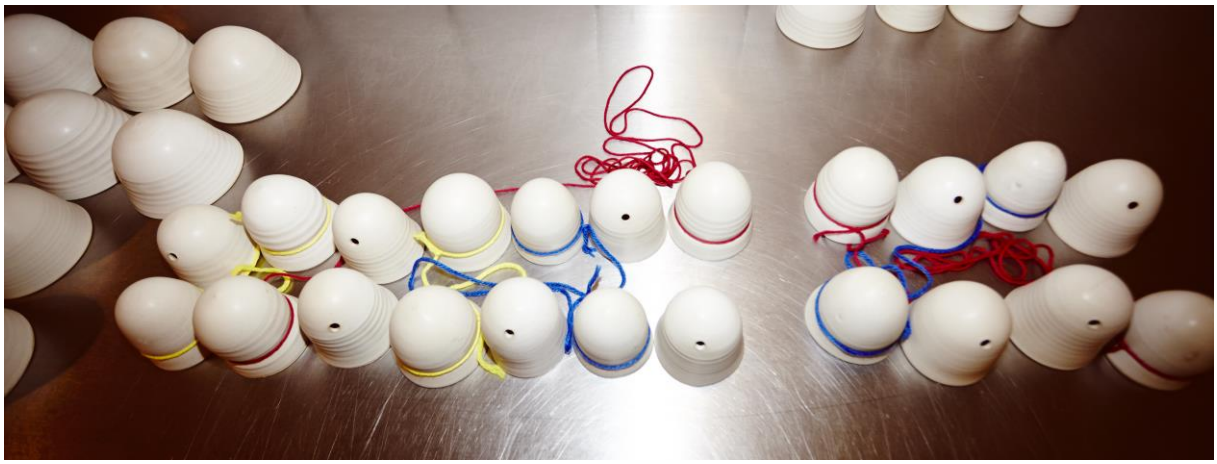

Fig. 1 - Critical Plate-ware originally consists of one bowl for eating or drinking purposes, the 'embrace-me bowl'; and two cups for drinking, the 'trouble-maker cup' and 'the power-is-in-the-finger cup'.

It is crucial to stress that the ‘Critical Plate-ware’ project was an experimental process; in fact it is still an exploration in ‘pilot’ stage, although in this case commensality-nutrition is the main objective of this study through the objects previously designed and produced.

In conclusion, the aims of the present study were to evaluate the reactions of consumers eating from the ‘Critical Plate-ware’. It is important to clarify that it was decided to choose just one object from the designed plate-ware for a laboratory intervention. Because it is the embrace-me bowl’ that has the most opportunities for experimental tests, the cups have been left out for this actual investigation.

Fig. 2 - ’Critical Plate-ware’ in scene during the Social Act #9 at I’m a KOMBO.

RESEARCH QUESTION

It is considered that the precise areas of nutrition, eating behaviour and the understanding of the contextual influence of design on commensal eating patterns is often ignored and abandoned in design research and practice. There is a need for amalgamation among the topics mentioned on knowledge, practice and research. Current investigations and practices related to design require more understanding of the foodscape and how its design can impact decisions, behaviour and social practices around and during the meal. In this section, there are three bases from where the problem of this project is derived. The first is commensality and its challenges. The second is the link between the consumer and its own food. And the third is the quality of nutrition and consumption of vegetables.

Unfolding the problem

It is important to note that a previous study has shown that people tend to eat more when in the company of others compared with eating alone (Redd, 1992). Furthermore, another suggests that it usually happens with friends but not with strangers (Shide, 1991). The reasons why people would eat more when eating with others are still in discussion due to the fact that there are many variables that may affect, directly or indirectly, food intake. These factors that can mediate the effects of eating together can go from determinants like taste, the duration of the meal, social implications, to more environmental factors like the atmosphere where a meal is eaten, or the accessibility of perhaps more foods, etc[6].

Unfortunately, eating alone is becoming the 'new normal' in society, an individualized progression in terms of commensality (Fischler, 2013). Eating patterns and behaviours are evolving for many different reasons like allergies, religion, regimes, food insecurity, language, cultural differences, etc. (Fischler, 2011). Thus, commensality can be established as an important actant –as regulator – to health nutrition.

To name another challenge, it can be said that a lot of things can occur between the actual distance that separates the mouth of the consumer and the food/plate. Studies on how distraction affects food intake have not provided concrete explanations, but many hypotheses explain why distractions influence food intake. For instance, individuals may 'lose connection' when occupied in a different task than eating (Janna, 2009). Distractions may lead to prolonged mealtimes or reduced time (de Castro, 1990). Even environmental factors such as number and sorts of choices, portion sizes, location, time of day, meal duration, number of people to eat with, presence of music, etc. can influence the consumer's ability to react to signals of satiety and fullness and be translated to food selection and intake (Bell, 2003; Harrar, 2011; Krishna, 2007; Piqueras-Fiszman, 2012; Wansik, 2007).

Those last two points have started to raise the question on how individuals can connect more with others during meals, and – also in case people eat alone – how individuals can connect more with their food. Yet, the importance of the quality of the meals from a health and nutrition perspective is also to be considered.

Following the path of health and nutrition, several epidemiological studies have shown that moderate to high consumption of vegetables contributes to good nutrition, good quality of health and pays off with a decreased development of overweight and obesity and other chronic diseases including cardiovascular disease, type '2' diabetes and some cancers (Epstein, 2001; Serdula, 1996; Ness, 1997)[7].

Very recently, in Denmark the dietary guidelines have been specified to recommend six servings of fruit and vegetables per day (Fødevaredirektoratet, 2003). It is recommended that older children and adults daily consume 600 grams of fruit and vegetables, excluding potatoes (Astrup, 2005; Hallund, 2007).

However, in the latest Danish national food survey the average daily consumption of vegetables was 162 g for adults (Pedersen, 2010)[8, 9]. This is approximately fifty percent below the level recommended by Danish authorities[8]. Thus, this shows that there exists the necessity for further measures on what could potentially increase vegetable intake at the macro and meso levels. Henceforth, it is obvious that vegetable consumption also has to be addressed at a micro level, and this is why it is into this direction where this paper prepares to depart.

Hypothesis

The hypothesis of this research is that the results from a laboratory intervention on eating patterns together with the design of some aspects of the platescape will eventually expand and cultivate valuable understanding of the changes in social and cultural contexts and, have the possibility to address and assess public health nutrition in more comprehensive and efficient methods. Only with the employment of a holistic approach on eating practices commensals can possibly enhance their meal experiences by linking their foods closer to and among themselves.

The hypothesis undoubtedly affirms that design has the potential to improve public health nutrition related problems by understanding the social aspects of eating behaviour and practices, and by changing and purposely designing the meal experience of a given

scenario. The results should express a positive change in food consumption and enhanced social interaction with the ‘embrace-me bowl’ in practice.

The bowl from ‘Critical Plate-ware’ is a clear response and proposal to the insistence of finding new ways that could reassure commensality (Fischler, 2013).

Problem statement

How can the design of the ‘embrace -me bowl’ – possibly influence the amount of vegetable soup consumed and the social interaction by university students at a laboratory setting?

Fig. 3 – The bowl is unstable by nature and requires to be embraced.

Delimitation and aims

It is vital to mention the intention of this study. Therefore, this section on delimitations clearly defines the goals and explains the terms included in this report.

The purpose of the research carried out has been to achieve a broader understanding of the impact of food design and the ways in which it can be applied in foodscapes at a micro level. In so doing, it is important to comprehend the terms ‘commensality’ and the social aspects of eating, design and the role materials play in everyday practices, and finally, nutrition from an angle inclined to behavioural eating.

The paper attempts to dissect the design factors that may infer directly or indirectly to a healthier nutrition based on the commensal patterns from a laboratory intervention with university students. A subject of particular interest throughout the entirety of the research has been to explore the opportunities that a holistic approach can offer around a complex subject such as eating and its consequences. By testing the features attached to the plate-ware design, it is intended to gain a clearer understanding of the implications of its functionalities and by the results from each of the participants during the laboratory interventions. It must be clarified that this research did not set out to investigate issues such as economic viability and marketing strategies of the actual design. But rather, to look at the potentials of future explorative projects with the data collected from this report. The amount of vegetable intake and the level of interaction among the participants served as parameters to assess the potentials behind the design of the ‘embrace-me bowl’.

Lastly, since 162 grams is the average amount of vegetables consumed in Denmark among adults (Pedersen, 2010), it was intended to investigate if the design proposed can contribute to the increase of vegetable consumption. Therefore, an increase of 20% in vegetable intake was set as a goal.

NOTES

1. - Nutritional status is the current body status (Body Mass Index – BMI) of a person or population related to their state of nourishment (Gibney, 2004).

2. - Mealscape categorized in four expressions (Sobal, 2007):
   - Roomscape – the overall venue where a meal is eaten, e.g. kitchen, dining room, park, office, forest, etc.
   - Tablescape – the frame that individuals use to repose and eat their meals, e.g. table, counter, floor, car seat, a tree, chairs, bench, bed, etc.
   - Platescape – the container or carrier of food when eating, e.g. fingers, hands, plates, spoon, glass, cup, bowl, etc.
   - Foodscape – is the actual food in itself. The presentation can vary depending on the recipe and way of cooking preparation e.g. popcorn, fruit, vegetables, pizza, ice-cream, etc.

3. - Food design can be catalogued in 6 areas (IFDS, 2013):
   - Design with Food – Cooking, combining and transforming the raw foods into new products. Can be seen as the alchemy of a kitchen where a cook designs new recipes.
   - Food Product Design – Represents the production at a more industrial way with a high level of serial and mass production of foods.
   - Design for Food – It centres on the tangible things that are used to prepare, distribute and communicate the food. They are able to carry, contain, present, conserve, keep, cook, etc. the food.
   - Design About Food – It is concerned about the design of the inedible but directly linked to food. It serves as communication, branding, marketing and creation of meaning and identity.
   - Food Space Design – Entails the interior design for food. The spaces and structures where a meal or food is eaten.
   - Eating Design – Can be referred to as the way and manners people eat. It can be alone or with others in a particular situation or place.

4. - Critical design can be explained as “design that asks carefully crafted questions and makes users think, is just as difficult and just as important as design that solves problems or finds answers” (Dunne, 2001).

5. - The meal experiences took place at the ‘Social Act #9’ event arranged by ‘I’m a KOMBO’, a food design studio based in Copenhagen (KOMBO, 2014). During functions from the 22nd to the 25th of January, 2014, the plate-ware was showcased to 76 guests and explored the possibilities to bridge commensality, interaction and design.

6. - Determinants in Public Health Nutrition are factors that can impact nutrition and health. Influential factors such as physical activity, ageing, socioeconomic status, education, etc. (McNaughton, 2012).
7. - Epidemiology is the study of the distribution and determinants of diseases and other health outcomes in human populations. Epidemiology also deals with the natural history of diseases and it can provide evidence that contributes to their prevention (Gibney, 2004).

8. - That study considered fresh and processed vegetables, excluding potatoes and including, for example, frozen, canned, dried leguminous vegetables and ketchup (Pedersen, 2010).

9. - Adults eat more vegetables than children, and women eat more than men, but intake is lower than desirable for all groups. Most eat vegetables every day (Pedersen, 2010).

10. - There should be remarked that the study considered the average grams of vegetables eaten per day not per meal, which in most cases a normal day in Denmark usually entails three meals a day (Pedersen, 2010).

LITERATURE REVIEW

STATE-OF-THE-ART & ANALYSIS

In this study, much of the literature review was conducted purposely to obtain relevant information of what has been done in the past related to the different topics expressed in this study. Some of the literature was accessed electronically through various libraries now available on the web and database sources of distinct scientific profiles. Specifically, the literature review was used to gather and map information on the concepts of food design, commensality, design and public health nutrition related problems. For instance, *Science Direct* was among some of the databases leading to certain editorials concerned on eating behaviour and nutrition, e.g. *Elsevier* and its different journals like: *Appetite, Physiology and Behavior*, the *Journal of Nutrition Education and Behavior*, etc (Direct, 2014). On social science, the editorial *Sage* has been of great help with its journal of *Social Sciences Information* (Sage, 2014). And finally, the *International Journal of Design* and the *Design Research Society* nurtured the study with a 'designerly' and aesthetic perspective for solution implementations (IJDesign, 2014; Design Research, 2014).

The current chapter on 'Literature Review' consists of five segments. First, '*the influence of illusions and perceptions on food intake'* provides a description of different studies made on eating behaviour and nutrition. This part has an inclination to public health nutrition with some design allusions. Next, '*external determinants affect food intake*' continues giving an explanation of environmental factors identified by some researchers that may affect eating behaviour, better referred to as "external cues". Then, an account of different studies on aesthetics and design associated to interaction in general and in some cases to food and eating is presented in *'interaction design and nudging'.* Subsequently, a fragment still related to public health and nutrition but with an inclination to sociology, *'commensality: effects on health nutrition'*. And finally, *'choice of concept'* analyses and closes with a justification and explanation of why this academic study is relevant in Integrated Food Studies. This interdisciplinary approach attempts in fact to cross-cut the different themes: design, health and nutrition and the socio-cultural characteristics of eating.

The influence of illusions and perceptions on food intake

One factor that may contribute to the global problem of obesity is an increased energy intake that could be caused by the increase of food portion sizes in the past decades (Young, 2002). Larger portion sizes have distorted perceptions as to what amount of food is the appropriate for consumption at a meal (Wansik, 2007;Young, 2003). Together with an inability to adequately estimate caloric intake, both can result in over-consumption, which can then become a major contributor to obesity.

This phenomenon has been described as 'portion distortion'[1]. The distortions are now accessible in almost all foodscapes possible. If one takes a look at the different levels of the foodscapes, it can be established that most of the times wherever food is present – from eating places to the actual plates that serve as the physical containers where they are reposed and ready to be eaten – it is hard to dictate a normal amount to eat.

These studies have suggested that portion size influences food intake, although it is still not fully clear with regards to plate sizes. Research on plate size effects has not been investigated sufficiently, although the few studies performed on the subject show that people serve themselves more food when they serve onto large plates or bowls than when they serve onto small plates or bowls (Sobal, 2007). Consequently, since people tend to eat most of what they serve themselves, they end up consuming more food. In addition, some researchers on this topic recommend that food portions should vary according to the healthfulness of the food; a small increase in the size of dishware potentially results in a substantial increase in energy available to consume (Pratt, 2011). Therefore, it may be feasible to increase intake of healthy foods that are not particularly preferred among children and the elderly by serving in larger containers (Wansik, 2005).

Whilst portion size influences the consumers' expected satiety and actual food intake (Wansik, 2007), the characteristics of the tablescapes and platescapes also play an important function in the estimation of foods served and consumed. Individual serving devices such as plates, cutlery, and containers have proved to influence not only food intake but also the senses. This has been demonstrated by modifying platescapes used at the meal table (Harrar, 2011; Piqueras-Fiszman B., 2011, 2012).

A similar research done with containers such as cups and bottles showed to modify people's perception of the contents, for instance, by modifying weight, colours, textures and other sensations of instruments such as taste and experiences (Hine, 1995). In other words, the investigation suggests that the containers in which food products are consumed have a major impact on the way a food product is experienced and evaluated (Schifferstein, 2009)

However, contrary to what has been mentioned, a study found that a small plate did not show a significant reduction of consumption, in other words no effect of plate size was detected on energy intake (Rolls, 2007). This finding clearly questions the influence on food intake that several research studies have performed on sizes, portions and perceptions in general. Undoubtedly, it can be a window of opportunities for further investigations on these particular themes. Furthermore, socioeconomic status and education level of consumers have not been shown to aid in counteracting some of these illusions such as portion distortion (Wansik, 2006).

External determinants affect food intake[2]

People tend to believe that the amount of food they eat is directly proportional to the taste of food. Nonetheless, as mentioned in the last section, a wide range of competing environmental influences—such as serving sizes, distractions, acquaintance and the presence of others—may increase food intake (Smith, 2009). One study suggested that, while in distracting environments such as a movie theatre, people can be influenced by container size and portion size even when the food does not even taste good (Wansik, 2001). This indicates that in terms of consumption, the quality of a food may be less influential than the environmental factors around the foodscape. In this context, those environmental factors affecting eating behaviour are better referred as "external cues" (Herman, 2005; Levitsky, 2005). Or put in another way, people usually eat the main part of the portions from their plates especially when distractions or external cues occur around the meal scenario (Rozin, 1998)[3].These findings again highlight the role that external cues, in fact, have an impact on food consumption.

Another somewhat relevant external cue identified is the social factor, such as, the presence and behaviour of others in eating scenarios, i.e., commensality. Under normal circumstances, individuals tend to consume more when they eat with friends and family (de Castro, 1994) than when they eat alone – with no distractions such as television, presumably because the absence of distracting effects of other activities may cause satiation – or with strangers. The reason for eating more in company might have to do with the longer time usually spent eating when being in a group (Bell, 2003; de Castro, 1990, 1992, 1994; Pliner, 2006). Contrariwise, another quite interesting study shows that meal durations are generally extended but do not necessarily represent, in all cases, a significant increase on the amounts of food consumed (Hetherington, 2006). As well, there are also circumstances in which lonely eaters can eat more, a clear example of this determinant in particular can be attributed to single people or even more exact, people that live alone (Pliner, 2009).

Interaction design and nudging

Various designers have been experimenting with objects and materials with the aim to provide meaningful experiences and emotional connections between object-user. Some designers, for instance, have used ceramics as materials and have explored the possibilities an object can promote in order to influence the user, as an example, ergonomics that would give the object a particular identity in a manner that will always allow meaningful interaction (Lacey, 2009).

Fig. 4 - If positioned correctly, the 'Click cup' rocks from a tilted to an upright position when liquid is poured in, integrating a surprise within the user experience (Lacey, 2009).

A quite good illustration of this could be the particular function of the ‘Click cup’ design (Fig. 4). It is its theatrical performance that provides meaning to the experience; the cup has the element of ‘surprise’ attached as one of its unique elements.

Within the same context, a research study encourages designers to use the aesthetic experience as a design mechanism. Furthermore, it is established that in order for an aesthetic design to be successful it has to involve the whole human being by making the dynamic form explicit to satisfy the user (Ross, 2010).

Hitherto, designing behaviour and interaction has certain challenges included. Aesthetics is already a challenge[4]. For instance, when touching upon the concept of taste, beauty enters into a ‘world’ of subjectivity. Thus, as soon as a designer considers the aesthetics of interaction and behaviour of an object, automatically social and ethical conflicts become an important concern; because what is black for one individual for another may not be the same tone.

So, the dynamics of an object influences the user and has social implications (Verbeek, 2005). As an example, the adoption of mobile phones has definitely shaped the practices of how social relations communicate nowadays (Ling, 2004). It is important to realise that materials cannot have any morality, because they are lifeless, “they have no intentions of their own hence cannot make choices” (Hassenzahl M., 2013). In an ideal world, good design is meant to provide solutions to every-day problems; it should improve the user’s experience (Buchanan, 1989).

From its many dimensions, choice architects or designers in general can influence different variables in play in order to alter the behaviour of the consumer and/or improve a product’s functionality. Nevertheless, designers require the knowledge to understand users and their attitudes towards a situation. They also require the right skills to materialize predefined intentions and expectations into new design solutions. A tool such as ‘nudging’ is a good example of how constructing and influencing people’s choice is nowadays a possibility on changing actions and practices at public levels. It is an instrument, now widely used to change behaviour (Thaler, 2009)[5].

Commensality: Effects on Health Nutrition

As described in the beginning of this paper, commensality is eating with others at the same time and place. Although, perhaps it is more than just the fact of sharing a meal with others; commensality often involves inter-dependence, equality on commitment and involvement between the commensals (Fischler, 2011). It can also be both inclusive and exclusive. The spaces and materials can manifest reciprocity or hierarchies (round/rectangular table; who gets served first). Commensality is the scenario where manners are introduced and in turn nurture culture, social skills and social ethics. Likewise, social and behavioural limitations are imposed upon by the norms and regulations of society (Elias, 1969).

It was contended that food cannot be considered as a 'commodity' and just a mere form of consumption. In reality, the process of 'privatization' is perhaps what nutrition and public health have involuntarily been contributing, perhaps due to the lack of interdisciplinary assessments (Fischler, 2011):

> "Medicalization and individualization of food, for instance, are global trends affecting most cultures in the developed world as well as some emerging countries. Much of the health-policy effort to improve people's nutrition has been based on the implicit assumption that information about nutrients, energy and exercise delivered to each and every individual should be able to optimize eating behaviour. But thinking of food and eating in terms of nutrients and responsible individual choice does not seem to be helping much. If anything, the spread of obesity seems to point to the opposite, i.e. that it actually makes things worse, apparently contributing to privatizing, de-socializing and individualizing the relationship to food and eating."

To elaborate more on this controversial statement, in another analysis a comparison was made about the individualization of food in America, where the relation choice-freedom is more important – it is up to individuals to make the right decisions according to their own health and nutrition necessities and based on reliable information available. Whereas in the Mediterranean, eating is more communal – the regulations and norms imposed by the social circles dictate indirectly the choices available for food intake.

An example of this is portrayed in a story of a French-Italian mother cooking for her family and the families of her children. Since most of her children-in-law have different diets or

just differ in food preferences, she resolves the problem with no room for any kind of dialogue; she describes the situation as (Fischler, 2013)[6]:

> "… If someone cannot digest gluten, or if another cannot stand garlic… for my family's respect, I prepare the dishes that we have always eaten and that my children adore... In general, I never say what is it that I am going to offer at the table, each of them will manage their own way".

The impacts on nutritional problems between France and United States, for instance, are significantly different and a study has suggested that eating practices play a significant role (Fischler, 2008). Therefore, commensality patterns can eventually serve as regulator – in order to decrease obesity, for example, in cultures where food patterns are less structured and more open to individual choices.

Choice of concept

The previous reviews performed on commensality and health nutrition show in general that most research identifies only the direct importance of food by an approach to nutrition or by an approach to social behaviour. The research existing, possibly involving commensality, relates directly to qualitative research through theories of sociology in general, whereas knowledge on nutrition and eating behaviour tend to incline toward quantitative research. Although more recently, research has merged these perspectives identifying overlaps on food intake. Still, design has not gained much importance in the panorama of commensality, eating behaviour and nutrition. There is apparently plenty to study and investigate considering the need to amalgamate the different perspectives with the simple objective to grow a better understanding of a complex phenomenon such as eating and its consequences.

"Will we still eat together tomorrow?"[6] This question opens an interesting discussion (Fischler, 2013), and addresses the issue with an interdisciplinary approach. This is a vision that not only targets the cultural and social factors of eating but one that also includes those of health and nutrition. Individualization of eating carries its own values: good nutrition, freedom of choice, intelligent and healthy choices. Whereas commensality has quite different values and is essentially social: it can be inclusive or exclusive, it is hierarchical, and it inculcates manners and social values. The problem seems to include

the boundaries of individualization among modern societies where the discovery of each individual's taste appears to be more relevant than ever before and seems to point to a new way of socializing (Fischler, 2011).

> "Is this individualistic approach going to refuse any form of commensality or will it be capable of crafting new forms and processes, being potentially feasible and sufficiently supple and flexible but ritualized enough to offer sense to the communal table experience?" (Fischler, 2013)[6].

The last concern was the starting point, perhaps the main inspiration since the conception of the 'Critical Plate-ware'. It was due to the persistence of coming up with new options that can encourage commensality. Always with the goal to improve the interconnectedness among the commensals and their meals, and as a result, guarantee the health and nutrition of the individuals.

Nevertheless, regulating and imposing new configurations for commensality is a matter beyond mere creativity and imagination. There are always several variables to take into consideration when constructing novel artefacts. For instance, when an object/process/interaction is invented or manipulated, risk is an added ingredient and becomes more evident at the moment it enters in practice (Hassenzahl M., 2013). That means that there is a constant responsibility embedded in the object from the designer. Experiential consequences of whatever produced, intentionally or unintentionally, will always be present; they are unavoidable. If removed implicitly, they do not simply disappear by excluding them from design or keeping them indistinguishable. They will become visible at any moment the user starts to connect with the design (Hassenzahl M., 2013):

> "The gun is neutral; it is people who pull the trigger (or not)…the material will inevitably create certain experiences (i.e., actions, feelings, thoughts). Whether we want them or not, experiences are a part of the artefact".

Indeed, designing is a serious subject. There are important issues that should concern every designer, moral and ethical, and the problem of how to evaluate the experiences from the relation between users and the design in practice. That is the reason why one, as

a designer, cannot just charge the users. It is clear that there is a shared responsibility between user and designer.

While keeping in practice these principles, experimentation and exploration of new commensality configurations make a more cautious and conscious design process. It may never stop at the end of its construction, but it certainly consummates at the moment the user it begins to interact with it.

Fig. 5 - A laboratory assessment was necessary in order to prove if the ‘embrace-me bowl’ had a significant potential to increase the connection between consumers and their meals, while keeping social interaction and commensality.

NOTES

1. Portion distortion – the inability to estimate the appropriate amounts a person eats (Schwartz, 2006).

2. Nutritional status is determined by internal factors – age, sex, nutritional intake, physical activity, diseases, etc. – and external factors – food safety, availability of foods, income, cultural and social situations. In this case, external determinants account for circumstances unrelated or indirectly linked to the consumer (Gibney, 2004).

3. Even though that study is not directly connected to external cues but to memory and its relation to food intake, it was considered relevant to refer to that source due to the fact that it is particularly believed that distractions and memory can be influenced by cognitive factors (Rozin, 1998).

4. Aesthetics can briefly be explained as a discipline linked to philosophy integrated by taste, beauty and art. It studies sensorial and emotional values, commonly referred to as judgments of sentiment and taste (Zangwill, 2014).

5. Nudging is a tool used to influence choices and behaviour in an expected manner without restraining the original choice set, or by making alternative choices more costly in terms of time, trouble, social sanctions, etc. (iNudgeYou, 2014).

6. Translation from French to English has been executed by the author of this paper.

RESEARCH FRAMEWORK

PHILOSOPHICAL BACKGROUND

This section aims to briefly explain the philosophical perspectives along with the methodologies used during the research study presented in this paper. This section describes the philosophical approach applied across the entire study. Specifically, it describes the philosophical methods used in data collection.

As mentioned earlier, two methods were used to collect data for this research: literature review and a laboratory experiment. The laboratory experiment involved interventions with university students while the literature review involved reviewing relevant books and academic resources.

To continue, this section is fragmented in two pieces. First, ‘philosophy of science’ provides a clarification of the scientific approaches of this thesis work. And finally, the ‘philosophical methodology’ complements the former explaining how quantitative data was obtained.

Philosophy of science

It is important to note that the philosophical approaches that address this research are not predisposed just to one rational paradigm. In fact, because this study preaches a multidisciplinary doctrine, it is fundamental not label it as exclusive and absolutist of one in specific. Conversely, it is believed by the author that there is no absolute truth; therefore it is not dogmatic. This paper supports the idea that paradigms and its models are malleable, permitting that the “different philosophical schools can learn from each other and have the capacity to be influenced from each other” (Guba, 1994).

The ontology and epistemology of this investigation might give the first impression to be under the logic of positivism. In fact it is, for the reason that some of its methodologies are dependent on the quantitative results collected from experimental interventions in a laboratory. The facts are quantified and the results are therefore measurable e.g. food weights and subject to objective evaluation via through statistical tests.

It is well understood that positivism focuses its perspective through verified evidence; only scientific knowledge is the true knowledge of the world perceived – observable phenomenon. This approach cannot rely on subjectivity and constructivism, obviously dissimilar to design and architecture traditions (Cohen, 2007). Nevertheless, this investigation, as mentioned earlier, holds a multidisciplinary philosophy that simply cannot be limited itself to the inherent values of positivism.

On the other hand, reality and social phenomena are constructed by individuals, its activities and practices (Guba, 1994). For instance, the “truth” from a positivistic approach cannot be isolated from the reality out there in society for the simplest reason that practices are in constant change and evolution (Schatzki, 1996). In other words, in an experimental intervention external cues of a specific subject in study are naturally constant bias, and to have absolute control of all cues seems to be impossible. Therefore, social science in this study is represented with some constructivist approaches within the observations, questionnaires, and analysis of the results based from the data collected during the experimental interventions. The discussion of the applications and

implementation in real life is, undoubtedly, of a social nature but to some extent reliant and linked to the results provided from the natural approaches.

Finally, the hermeneutic and the phenomenological approaches are employed and used to just create knowledge and understanding. The aim is to recognize a phenomenon in the actual context and evaluate any final assumption – mere interpretation process – and not to claim the absolute truth of reality based on the results from the laboratory interventions.

Due to the nature of this investigation, there is a great potential to interlink the different traditions inherent to this case study resulting in a richer and more comprehensive perspective from any of its viewpoints, design-health-and-nutrition-social-practices.

Philosophical methodology

The project focused primarily on how to measure food consumption among students at Aalborg University Copenhagen and their interaction while sharing a meal with the use of the 'embrace-me bowl'. The tools used were structured questionnaires, observations, sophisticated equipment suitable for laboratory interventions and software that allowed visual data management, coding, analysis and reporting. The iBuffet, were among the technologies used to collect data, along with SAS for statistical analysis[1].

Moreover, the researcher took the role as observer when running the intervention, a sort of ethnography on site. 'Peripheral membership' is a kind of observation where the researcher is present but does not have participation whatsoever (Angrosino, 2007). This type of observation has raised the study to better criticize and analyse the evidence and results yielded for further research in the field.

Actor network theory and social construction of technology analysis were considered to determine the 'actants' and the relevance of the object, the bowl, as a technology to influence health and nutrition, and commensality. It was vital to have good quality records for the data collection so as to gain a better insight from various angles on the topic of commensality and the connectedness with the food. However, social practice theory has come across in parallel to actor network theory with the aim to challenge each other's

convictions and open a discussion of the potentials of the object to be implemented in real life scenarios.

To conclude, the instruments and methods used have contributed to a more eclectic research study in terms of its philosophical views. It could be argued that by following these combined methods, the research might result with a feeble outcome. It is completely valid to judge in a way as such. Though, special emphasis has been made to narrow down the different perspectives and its methods. The effects are more visible at the ‘Implementation’ chapter through discussion and diagnostics of the merged disciplines.

THEORETICAL FRAMEWORK

A description of selected concepts and theories are presented in the next paragraphs. The chapter is divided in three sections, in parallel to the holistic approach from the academic program. First, a section disposed only for ‘public-health nutrition’ incorporates a tool widely used in lab interventions, the core of the laboratory experiment. After, a section selected for ‘design’ serves only to describe a general frame of how to asses and evaluate design and how objects may gain meaning – a semiotic analysis of objects serves as a bridge to social theories from a design perspective. The section on ‘social innovations and networks’ aims to provide the final tools to conclude the framework. The theories presented in that last section sponsor the final discussion and suggest these theories for future evaluation of this investigation in conjunction with the results of the laboratory experiments.

Health and Nutrition

The following tools serve to justify the public-health nutritional approach of this investigation. One theory and one experimental design method are explained in this section: the 'Dual Process Theory' and the 'Crossover Trial'. The former provides a brief background and opens this section to enable a better comprehension of the interpretation of the laboratory results. The latter is the method used to collect the empirical data from the laboratory experiments – more about the results in the 'Experimental' chapter.

The reason for only presenting one natural science theory and not two – for comparison purposes – is due to the fact that the questionnaires and design of the laboratory interventions fit and enhance the theory chosen. In fact, it is through the results and statistics of the interventions where this theory can continuously be challenged and questioned.

Dual Process Theory

Some theoreticians have claimed that reasoning takes the form of different modes of thought that eventually make events to occur (Osman, 2004). Although, two distinguished kinds of processes have been consistent through the years among different scientists; one that occurs automatically and unconsciously and the other that occurs consciously and can be controlled. This theory divides reasoning into two systems (Evans, 1996):

- System 1 is implicit, automatic, associative and unconscious. It is based on prior experiences, beliefs, and background knowledge and achieves goals reliably and efficiently without necessarily accompanying awareness.
- System 2 is explicit, sequential, logical, ruled based, controllable. It makes high demands of working memory and it is capable of achieving solutions to logical problems.

Therefore, when taking decisions, individuals can engage in fast and automatic reasoning processes – System 1. Or else, they can engage in slow but deliberative processes, forming beliefs, desires, attitudes and intentions which are – System 2. Though, deliberative thinking is cognitively costly, so people tend to engage in it only when they face a difficult problem (Osman, 2004).

There are various models that can portray the dual process theory. In fact, some of them depict how complex the theory can be and it can vary depending on the different disciplines and applications used.

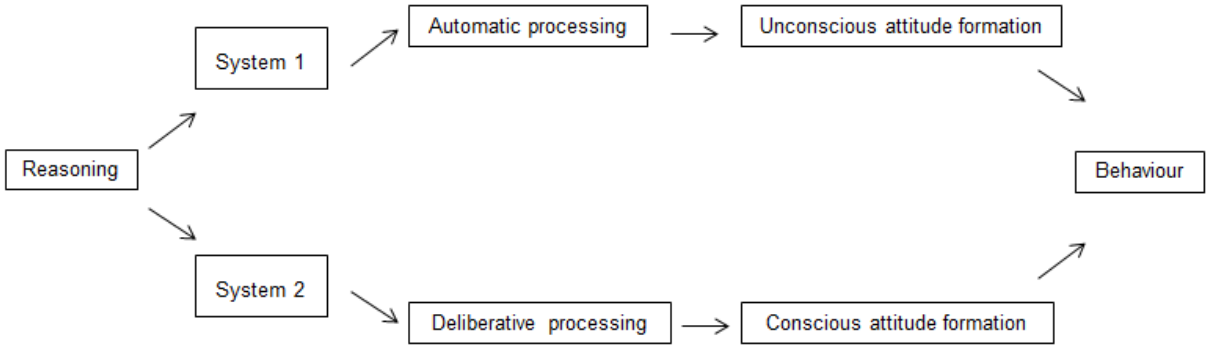

Fig. 6 - A quick view to understand the 'Dual Process Theory' (adapted (Kahneman, 2003)).

By manipulating objects, a choice architect or designer can create the chance of increasing the intentions of a subject towards a specific behaviour and in consequence, increase the probability of the subject actually performing it. Likewise, it is interesting to note that there might be many factors out of the control of the designer that can both influence intention and behaviour in a direct or indirect manner – such as the external cues. As stated before, other factors can also influence behaviour without being part of the intentions of the designer. The limitation for predicting actions, in this case health-nutrition behaviour can possibly be reduced with the help of other tools from qualitative sciences, such as observational studies.

Crossover Trial

A crossover design study comprises of two or more treatments which are consecutively performed in each participant recruited for the study. The main characteristic of this experimental design is to provide a basis for separating treatment effects from period effects. This is done separating the treatment effects in two sequence groups formed via randomization. This type of trial has a low influence of confounding factors; this is reduced because each subject serves as control. Also, because the study is statistically efficient it requires fewer subjects. However, a couple of disadvantages would be that crossover subjects run the risk of "carrying-over" the effects of the previous treatment to subsequent treatment, although this can be avoided with a well-planned and longer washout. Another

important limitation is the "learning" effect; that is, subjects can learn the effects of a treatment too early in a study, but this can be avoided if the execution of treatments are placed in the right order; for instance, control treatment before the stimuli intervention (Wellek, 2012).

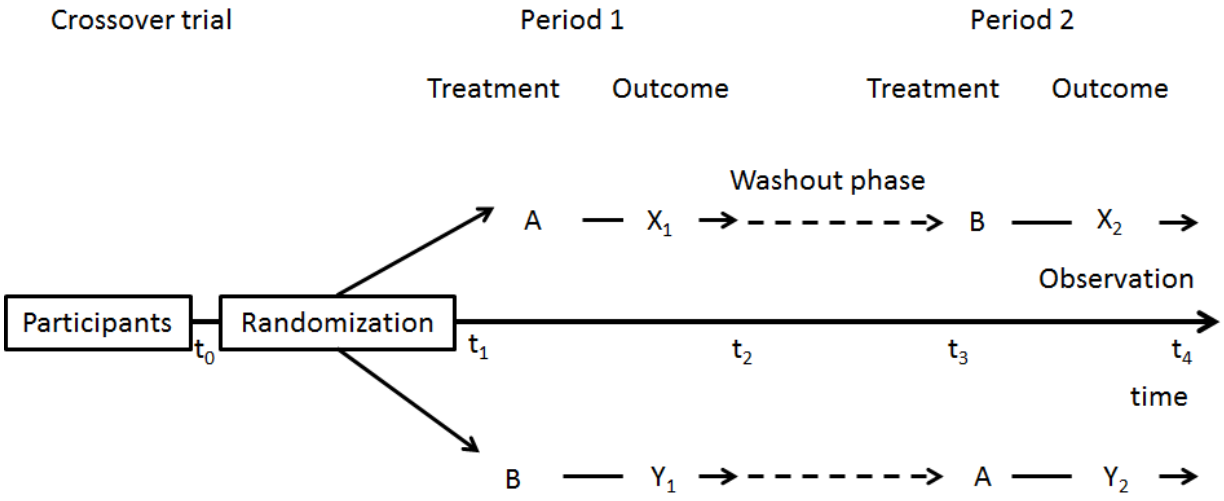

Fig. 7 - Design of a crossover trial (Wellek, 2012).

Design

The next section displays two models that enabled the analysis of the materiality of the object in question. First, the 'analysis ellipsis', a simple but objective tool, helps to judge more accurately on very subjective disciplines such as design and architecture. Later, the 'semiotic analysis model' elaborates more on the former, nonetheless with a distinctive scope to analyse the connotations and significance of design objects.

Analysis Ellipsis

The next is a model originally meant to examine product design, graphic design and architecture. It is a practical tool to describe, analyse, evaluate and discuss the structures of a chosen design (Riis, 2001). The 'analysis ellipsis' model is composed of three elements: inner and outer dimensions, and the context. The model offers the opportunity for qualified evaluations and in depth examination of a given design[2].

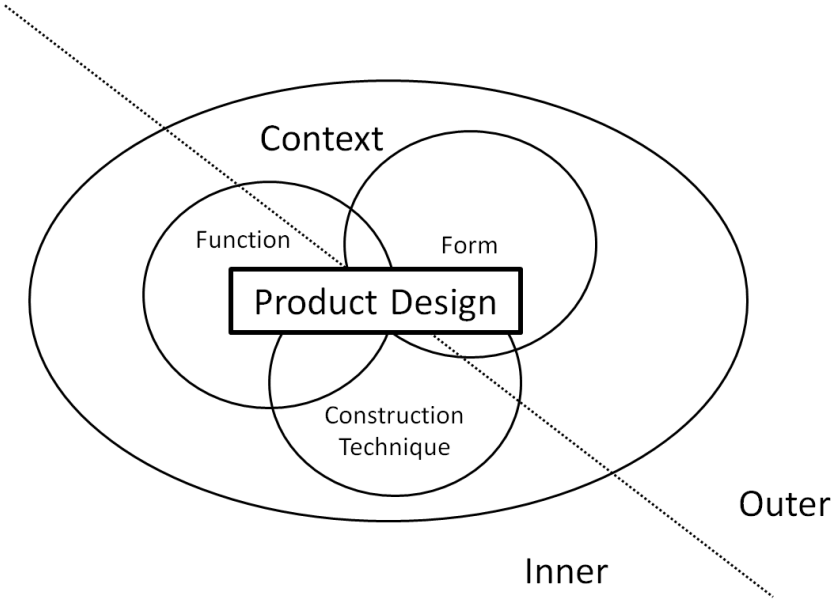

Fig. 8 - Analysis Ellipsis model (Riis, 2001).

However, the model has the limitation on explaining how the product design or object may be assembled in practice. It considers the context but it lacks clarity on how other actors of objects in the context may shape the object in practice. For that reason, the next model served to comply with these limitations of this model.

Semiotic Analysis of Objects

The next model allows analysing an object, not as much in a descriptive or aesthetic manner as, on how it is related to concepts and representations that have the potential to provide significance to the users of the object[3].

> "A knife is a knife since it forms a relation with other actors in a certain way: it cuts and is made to cut, indeed its shape enables cutting, i.e. penetration, even if only superficially, into other bodies, but at the same time its shape allows also grasping, envelopment into another body" (Mattozzi, 2009).

The latter relies on two assumptions; an object is a body – objectual – and an intersecting point in a network of relations – objective – (Latour, 1992). The two elements combined can be explained in three steps and serve to provide meaning to a given object: 'intra-objectual relations', 'inter-objectual relations', and 'inter-objective relations'[4].

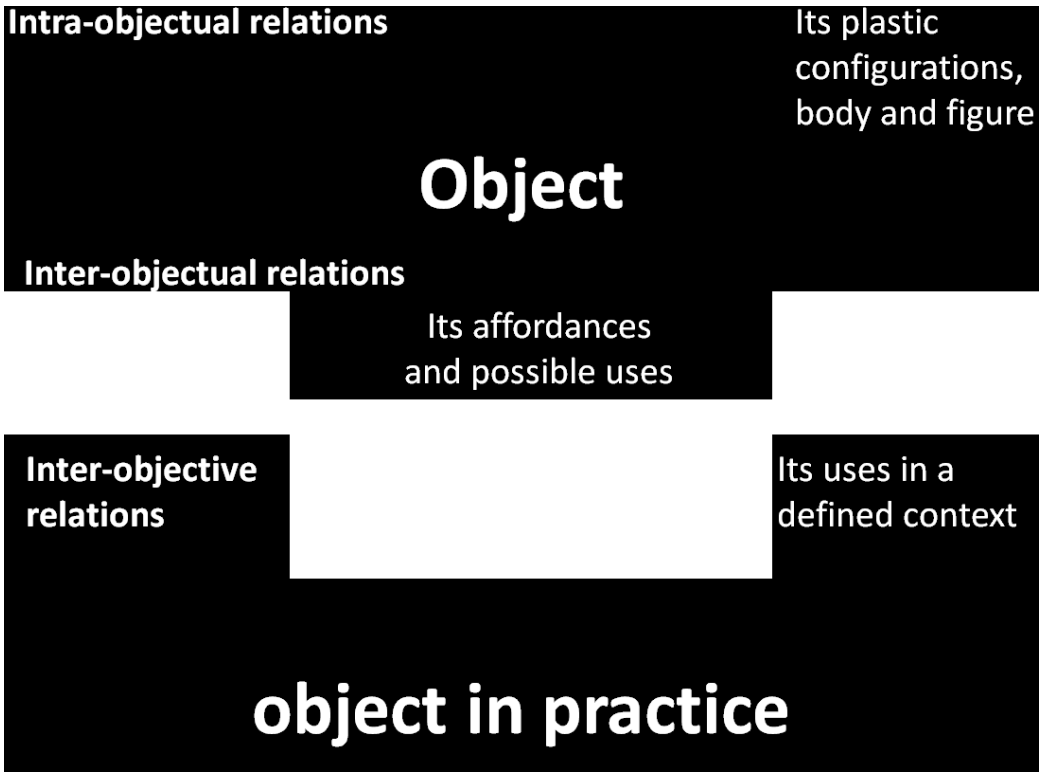

Fig. 9 - Adapted model for the 'Semiotic Analysis of Objects' (Mattozzi, 2009).

Continuing with the knife example and portraying it with the model above, a metallic sharp element is part of a cooking knife; a body that penetrates another body which, in turn, envelops the end of the former (Mattozzi, 2009). The silhouette of this object is evident enough to agree that it is a knife. In practice, it predisposes a relation with a human hand

and, for example, an onion. Therefore, the practice of preparing food can be manifested with the relation ‘knife-hand-onion’. Another example could be pictured with the relation ‘bottle-cork’. Based on the materials and forms of each object, in association they could serve the practices of preserving, containing or carrying any kind of liquid.

To conclude this section, it is important to clarify that the last two theoretical models on design presented are secondary in the analysis. It was considered important to include them in the theoretical framework in order to serve just as the milieu where the social theories finally enfold the holistic approach. The next section provides a better understanding of the role objects can play in society.

Social Innovation and Networks

At this stage design and natural science perspectives are covered; then it is also pertinent to include the social scientific approach to this research. To begin, the 'Social Construction of Technology' analysis serves to link the last section on creativity and design to the actual development and implementation of technologies built by social networks. And finally, two relevant social theories, 'actor network theory' from a Latourian angle and 'social practice theory' from philosopher Theodore Schatzki, were considered to open a final discussion on the possible functionality, applicability and implementation of the object in discussion – the 'embrace-me bowl' – in social and real scenarios.

Social Construction of Technology

This theory is necessary for the reason that the 'embrace-me bowl' is subject to be shaped in the future by the social structures around it. The approach towards this theory is a combination of the original conceptual framework (Bijker, 1987, 1995) with a complementary and more or less recent review, which provides clarification on structural influences shaping phenomena (Klein, 2002). Nowadays, these structural concepts are applied to the study of the design, development, and transformation of any technology to better understand social shaping of technology. Originally, the theory consisted of four related components, although, 'wider context' makes the fifth based on a critique with the argument that the original frame failed to conceptualize social structures (Klein, 2002):

- Relevant social groups – from the makers and assemblers to the users and their problems designers are solving. This component identifies and assesses the most relevant social bodies towards a problem or topic.
- Interpretive flexibility –multiple interpretations need to be negotiated and adjusted in order to gain common understanding to get to a final technology.
- Closure and stabilization – the design or technology continues until all conflicts are resolved and the artefact no longer poses a problem to any relevant social group.
- Wider context – external factors that condition the development of the technology; cultural or political issues, differences in resources, power, etc.
- Technological frame – the "point of reference", relevant enough to the groups, which establishes the limits and standards of an artefact in development.

Actor Network Theory versus Social Practice Theory

The theory of 'Actor Network' is a process in which the 'script' – scenario – of an actor is explained in a determined situation, that is, its relation to relevant elements and the

transformation of its relations when these elements interact – “network of mediations” (Latour, 2005). These elements can be human or non-human. Moreover, the ways they relate and communicate – based on their roles, constraints, competences, actions, sanctions (Latour, 1992) – interpret into other schemes of meanings and intentions. These schemes are translated in a specific location in the network with valuable information about its definition, its most important routes and targets towards other elements – actors, situations, objects, actants, discourses.

Therefore, this theory aims to explain the relations that compose an actor and how it organizes those links. However, as described in lines above, materials or objects are indispensable and active elements – actors – of human practice. According to the theory, they should be granted citizenship as a human actor (Latour, 2005). In simpler words, since an object does something only then it is meant to perform; an object exists – it is as alive as any other human actor – only as long as it takes part in action.

Though, the extreme opposite of these ideas in terms of objects, actors and practices is shown by ‘Social Practice Theory’ where objects gain meaning only within practices, but never gain the same citizenship as a human actor (Schatzki, 1996). This theory argues that it is within practices that the relations that constitute a certain object and that are deployed by it are expressed. This approach has offered a very illustrative concept of social practices that helps to better understand social phenomena and issues such as organization, normativity, agency and materiality (Nicolini, 2013). Specifically, it is in this last topic that this section gives its focus, practices and its relations to materials.

It is important to briefly explain a model based on social practice theory. From a specific point of view, practices are “open-ended spatial-temporal manifolds of actions” (Nicolini, 2013). This is where actions perpetuate and continually extend practices temporally, which can carry irregularities and unexpected elements – possibly meaning that coincidences are also elements that shape practices. Therefore, practices are more than routines. Described in another simpler mode, practices are a set of doings and sayings, which are composed of tasks and projects (Schatzki, 1996). For example, several tasks are performed in an organized way to accomplish a specific project. Following a cooking

recipe is, for instance, a practice composed of actions that follow a certain direction for a specific end. Practice is composed of actions interconnected and organized between each other through four mechanisms (Nicolini, 2013):

- Practical understanding – that is actions within a certain practice that most participants agree or understand, meaning that an action from one person is intelligible by another person. This feature makes human actors as active carriers of practices.
- Explicit rules – accounts for principles and instructions that keep actions together in order to achieve a project. Again, a cooking recipe is a clear example. Rules have the capacity to specify how to proceed even in complex arrangements, and have the purpose of orienting and determining the future course of activity.
- Teleo-affectiveness – the fact that practices develop according to a specific objective, or 'how they should be performed' or 'what it makes sense to do'. It is a set of emotions, moods, motivations, beliefs that manifest when an action is performed.
- General understanding – reflexive understandings on the whole project in which people are involved. This provides sense and identity to the participants implicated in the set of actions towards the accomplishment of a project.

In summary, practices are open-ended, temporally unfolding networks of human actions linked by practical understandings, rules, teleo-affective structures and general understandings[5].

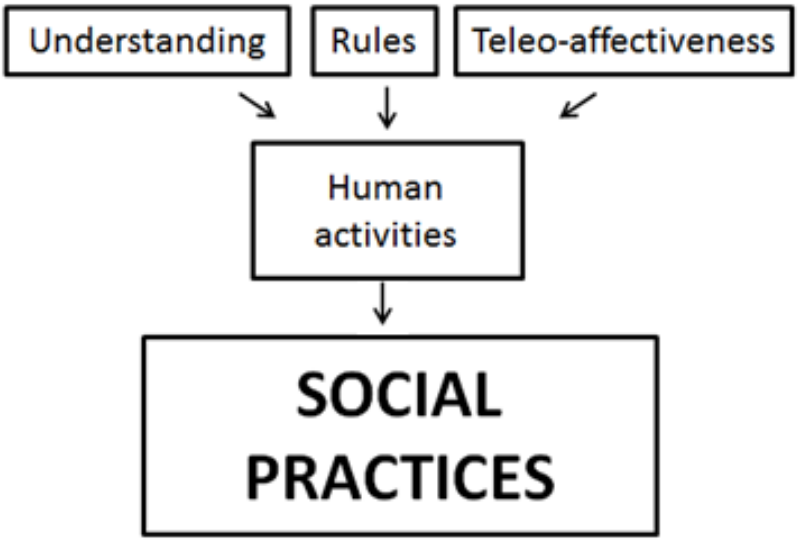

Fig. 10 - Social practice theory, adapted (Schatzki, 1996).

NOTES

1. - More information about the methods and tools utilized throughout the laboratory experiments is shown later in the 'Lab Intervention' section from the chapter 'Experimental'. There, detailed information of the questionnaires, the software, technological equipment and statistics is explained in more depth.

2. - The 'Analysis Ellipsis' can be better explained as:
   - Inner dimension – the purpose of the design is expressed by the techniques and functions behind it; the materials and considerations – construction –that compose the product
   - Context – the conditions and situations where the product stands. It considers its target group and its idiosyncratic values – cultural and sociological frames; the ethics. It also considers ideologies behind it and the time, style and influences throughout design history
   - Outer dimension – it is in this dimension that 'form' plays its major role. Shapes and forms are important, including the actual facts of the design like volume, weight and measurements. The materials, textures, colours, decorations and other aesthetic aspects offer an experience and communicate the product's identity.

3. - Semiotics could be referred to as the study of how meaning [sense] is constructed (Akrich, 1992).

4. - 'Semiotic Analysis of Objects' is divided in three elements:
   - Intra-objectual relations – the parts of the object that are internal to it and that compose it.
     - Plastic configuration: related to shapes, colours, properties of materials (consistency, texture), etc
     - Bodies: articulated in a core and an envelope; each plastic part outlines a body in interaction with other bodies outlined by other plastic parts
     - Figures: parts that are recognizable and usually nameable
   - Inter-objectual relations – accounts for their affordances, the set of their imaginable uses. The relations that are inscribed into the object, that is to say, the deployment of other, external, relations.
   - Inter-objective relations – accounts for practices. It is the stage where objects manifest themselves as such, taking part in a series of interrelated actions.

5. - A good example of Social practices is described here: On following the 'rules' of a recipe, the actions of boiling water, cooking pasta al dente, and chopping some tomatoes are different tasks that may overlap. However, different happenings can occur during the process of cooking, issues that perhaps where not taken into account from the author of the recipe, i.e., exact temperatures, salting, types of tools/containers to use. And it is in this stage where 'teleo-affective' structures come into play, where the person in charge of cooking has to proceed depending on whatever makes sense to her. Between the author of the recipe and the person cooking the meal, there exists 'practical understanding' of the terms and tasks for each step described on the recipe. That at the end it reflects on a 'general understanding' among the participants-diners towards the meal that they interpret as, for instance, 'pasta al pomodoro'.

EXPERIMENTAL

LAB INTERVENTION

Throughout this chapter the laboratory intervention is displayed in a systematic order. First, an introduction explains again and justifies the reasons behind the actual intervention. Then, the methods are clarified with the purpose of further replications and reproductions. Subsequently, the results displayed in tables and figures open the conclusion of the final section which is the discussion in the 'Implementation' chapter.

The study attempted to provide more evidence on platescapes and their effects on eating behaviour. As described in detail before, the aim is to explore new ways of commensality that could still guarantee a good meal experience and ultimately good health and nutrition.

Since the object in question had been created, with all its functionalities dependent to its form and contexts, it was then relevant to first test it in a controlled environment such as in a laboratory.

Therefore, this chapter further develops this thesis project and enriches more the discussion on the importance of design in food environments, at all micro levels – the mealscapes.

Usually, individuals tend to act and behave differently when they know they are in observation. However, it is assumed that this laboratory observation can answer many questions and even raise others that have not been reflected yet. The findings revealed in this chapter are of great value for future research and possible implementations in different disciplines focused on a holistic approach, such as those of the Integrated Food Studies.

Experimental methodology

The empirical data collection was carried out through a repeated measure performed through a cross-over experimental design in order to determine the effects of the 'embrace-me bowl'. The experiments were performed only to university students from Aalborg University in Copenhagen, Denmark. The setting for the experimental interventions took place at the 'Food Scape Lab', a laboratory located at the same university campus.

The purpose of this study was to examine the effects of the 'embrace-me bowl' on eating behaviour and social interaction. The only independent variable was the 'bowl' presented already in this paper, whereas the controlled condition was a plastic bowl that was considered as the neutral condition[1]. The two dependent variables were food intake and social interaction. Moreover, food intake was measured in vegetable consumption (grams) and energy intake (Kcal). Whereas the second dependent variable, social interaction, had to be rated by the participants based on their meal experiences (Glaeser, 1999).

Lastly, since 263 grams – including potatoes – is the average amount of vegetables consumed per day in Denmark among adults, it was intended to increase the vegetable intake (Pedersen, 2010). Therefore, an increase of 20% in vegetable intake was set as a goal.

Participants

Thirty participants took part in the laboratory study. They voluntarily registered for events on campus advertised as "Soup Sessions" where they were encouraged to attend the two experimental events at different days during lunch time with free soup offered in compensation. Information about the specific aim was never provided prior or during the two sessions. According to the ethical principles of the Declaration of Helsinki (WMA, 1964), each of the registered participants signed a declaration of consent regarding this research study[2].

Experimental manipulations

The treatment consisted of the 'embrace-me bowl' mentioned across the entire investigation. The bowl – made in ceramics and coated with a white glaze – was used to explore if its unique form and function, from a design perspective, would influence food intake and social interaction. The non-treatment consisted of a plastic bowl offered at the food canteen of the same university the students attend. This plastic bowl was considered "normal" as the participants were familiar to the object[1].

Meal and meal preparations

The food offered was the same for treatment and non-treatment measures. It consisted of a home-made vegetable soup 'à-la-vichyssoise' style with bread croutons[3]. The soup was cooked from scratch two days before the first experiment. It was then frozen and simply prepared and reheated prior to each experiment in order to assure general hygienic cooking practices such as appropriate temperature, etc.

Fig. 11 – Volunteers at the Soup Sessions serving vegetable soup from the iBuffet in the Food Scapes Lab at AAU CPH.

Measurement apparatus

For each of the experiments two main technologies served to measure food intake. Firstly, the 'intelligent Buffet', enabled the study to record behaviour in regards of food servings. In addition, the 'Food and Waste Monitor' helped the study to record the food left-over of each participant – plate waste. The two technologies applied together accurately informed what and how much each participant ate (Syscore, 2014).

Moreover, the researcher took the role as a "fourth" observer when running the intervention, a sort of ethnography on site (Angrosino, 2007). However, it was always in consideration that some studies affirm that biases are more frequent due to the fact that the participants observed tend to change their behaviour (Drury, 2001; Schwartz, 1955).

Procedure

Prior to the start of testing, the students who signed up were randomly allocated in different days, with 12-16 participants per session – Fig. 13 for diagram flow of the study. If the students agreed with the schedule they were later registered and given information about the "Soup Sessions". Then, at the laboratory each of the volunteers were provided with a 'RFID' wrist-band[4]. As a requirement each of them had to sign a 'waiver-of-informed-consent' prior to their participation. Attached to the form there was also included a pre-questionnaire.

Later, the participants approached two tables in groups of six to eight. After all of the participants of a table finished answering the pre-questionnaire, the researcher handed to each of them a bowl with the same design – the one in turn according to the experimental allocation. The instructions were given to the participants at the start of the experiment, as follows: "Please serve yourself at the buffet and hope you have a good time at the table, bon appétit". The participants were also encouraged to have second servings if they wanted to. Once the participants had finished their lunch, they were instructed to place the water-proof 'RFID' wrist-band inside each of their bowls which were also left at the tables – this with the aim to keep track of who consumed whatever amount of food . Right after, each of the participants completed a last but brief questionnaire.

Finally, when all of the participants left the Food Scapes Lab, the researcher registered – with the 'RFID's' – and measured the amount in grams of the leftovers, including soup and bread, with the use of the 'Food and Waste Monitor' equipment.

Questionnaires

During the laboratory experiments questionnaires were filled out by each of the participants. First, a questionnaire was provided after the participants registered. This was used to collect information about the participants and their food habits in order to be fully aware of any confounding factors (see table 1). Also, before each session, brief pre-questionnaires with a 'Visual Analogue Scale' (VAS score) questions – using an affective magnitude scale, from 1-10 – were used to rate each of the participants' appetite status before eating the soup (Reips, 2008).

Finally, post-questionnaires were answered after each session to rate the satiation and level of social interaction with the use of VAS score.

In order to rate social interaction, four variables were considered ranging from 1-10: dynamic with others at the table, naturalness of the conversation with others at the table, degree of involvement with others at the table and affinity of the conversations with others at the table (see table 2). These variables were based from previous studies that have intended to measure social interaction (Glaeser, 1999; Michaels, 2013).

Data Analysis

Total intake of soup, total intake of calories, vegetable consumption and social interaction variables on each study day were compared by fitting mixed models in SAS Proc Mixed (SAS version 9.3, SAS Institute, Inc). All results are stated as "mean" as estimated under that model. Since such models assume normality, preliminary tests for normality of each variable were executed (SAS Proc Univariate). These analyses suggested that all variables were not normally distributed and were transformed with the log function, with exception of the social interaction variable. The models used considered missing outcome data. This data analysis is able to include all participants. For all variables, differences between 'embrace-me bowl and plastic bowl were considered statistically significant if the two-tailed probability value was <0.05.

In addition, during the analysis a score variable was created by merging the original four variables on social interaction. This variable ranged from 4 to 40, with the intention to simplify the measurement of social interaction.

Results

The volunteers' age ranged between 20 to 30 years (M= 23,4 years, SD=2.6), where 25 were male. All of the participants were Aalborg University Copenhagen students from both undergraduate and graduate programs.

According to the results of the SAS Proc Univariate, the 'embrace-me bowl' did not exert a significant effect on participants' consumption of soup ($p = 0.9106$), vegetables ($p = 0.9829$), and caloric intake ($p = 0.9829$). These findings suggest that the recipient did not have an effect on total consumption, vegetable intake or total energy intake. For all the attributes, the 'embrace-me bowl' scored slightly higher than the plastic bowl but not representing a significant difference (see Table 3).

On the other hand, contrary to the expectations, the effect of the form and function of the 'embrace-me bowl' had no effect in terms of participants' ratings of social interaction (the score created from the four different variables has a Cronbach's Alpha of 0.833, which means that it has a good internal consistency), while the plastic bowl had a significant effect instead ($p = 0.0451$).

Fig. 12 – Although the results suggest that the 'embrace-me bowl' did not influence food intake, it may possibly have a positive effect on connecting closer the consumers and their meals when compared to an ordinary bowl.

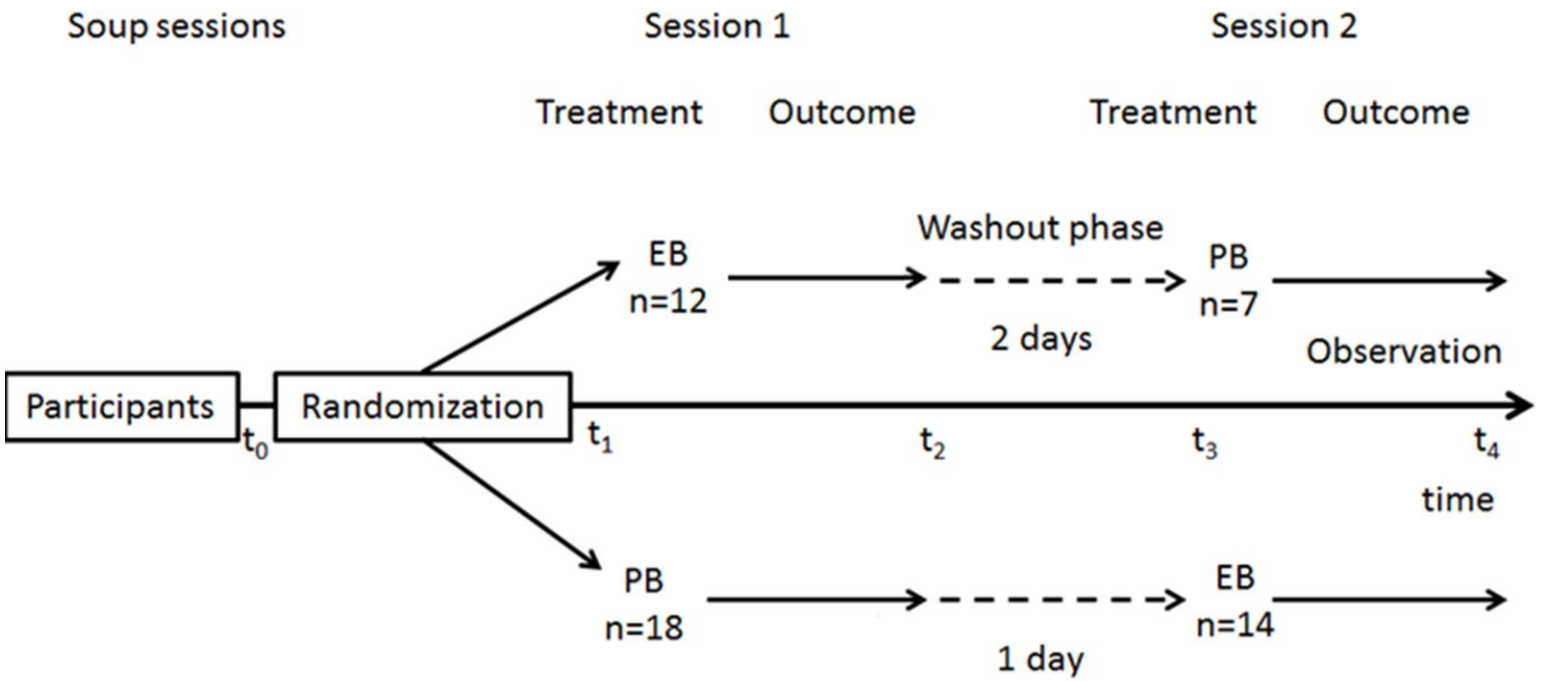

Fig. 13 - Flow diagram of the crossover study.

Table 1. Participants characteristics

Determinants of Nutrition	Overall n=30	'embrace-me bowl'* n=12	Plastic bowl (control)* n=18
Age (years)	23,46	23,7	23,3
Gender (%)			
Male	83,3	83,3	83,3
Female	16,7	16,7	16,7
BMI (kg/m^2)			
Normal	76,7	75,0	77,8
Overweight	23,3	25,0	22,2
Marital status			
Single	56,7	66,7	50,0
Long relationship (not living together)	16,7	8,3	22,2
Married	3,3	8,3	0,0
Cohabiting with partner	23,3	16,7	27,8
Living situation			
Live alone	40	58,3	27,8
Live with spouse (and kids if the case)	3,3	8,3	0,0
Live with partner	23,3	16,7	27,8
Live with one or more roommates	33,3	16,7	44,4
Smoke			
Yes	16,7	8,3	22,2
No	83,3	91,7	77,8
Highest completed education			
High school	63,3	50,0	72,2
Undergraduate level	30,0	50,0	16,7
Graduate level	6,7	0,0	11,1
Frequency of eating breakfast			
Never/rarely	10,0	8,3	11,1
1-2 times a week	6,7	8,3	5,6
3-4 times a week	10,0	16,7	5,6
5-6 times a week	13,3	16,7	11,1
Everyday	60,0	50,0	66,7
Frequency of eating morning snack			
Never/rarely	30,0	16,7	38,9
1-2 times a week	23,3	16,7	27,8
3-4 times a week	13,3	25,0	5,6
5-6 times a week	13,3	16,7	11,1
Everyday	20,0	25,0	16,7
Frequency of eating homemade soup			
Never	3,3	0,0	7,1
Very rarely	46,7	71,4	64,3
Once a week	13,3	14,3	21,4
Very often	6,7	14,3	7,1
How soup is cooked			
Canned soup	10,0	8,3	11,1
From scratch	70,0	75,0	66,7
Mix of both	16,7	16,7	16,7
Other	3,3	0,0	5,6
Frequency a meal is shared with others			
1-2 times a week	10,0	16,7	5,6
3-4 times a week	33,3	41,7	27,8
5-6 times a week	20,0	0,0	33,3
Everyday	36,7	41,7	33,3
Eating when experiencing emotions			
Yes	30,0	33,3	27,8
No	70,0	66,7	72,2
School is usual location of meals			
Yes	26,7	50,0	11,1
No	73,3	50,0	88,9

*Started with that treatment

Table 2. Social interaction

Dependent variables	'Embrace-me bowl'* n=12		Plastic bowl (control)* n=18	
	Mean	SD	Mean	SD
Participants attended with a friend (%)				
Yes	83,3		85,7	
No	16,7		14,3	
Participants knew others at the table (%)				
Yes	83,3		100	
No	16,7		0,0	
How hungry before eating soup**	6,7	1,4	7,2	1,1
How hungry after eating soup**	2,6	1,9	3,4	1,4
How dynamic was social interaction**	7,8	1,8	6,7	1,4
How natural was conversation with others**	8,0	1,4	7,9	1,4
Degree of involvement with others**	7,3	1,7	6,4	1,9
Affinity of conversation**	7,6	1,4	6,9	1,6

*Started with that treatment
** scale from 1-10(being 1 "not at all" and 10 "extremely"); mean (SD)

Fig. 14 – Sometimes the 'embrace-me bowl' can be overwhelming to the users.

Table 3 - Variation in vegetable consumption, amount of soup, total caloric intake and interaction according to the bowls tested (N=30).

Dependent variables	Follow-up		Time x intervention
	First phase	Second phase	p
Soup (g)	**'Embrace-me Bowl'**	**Plastic Bowl**	0,9106
Group 1	532,3	508,3	
	Plastic Bowl	**'Embrace-me Bowl'**	
Group 2	477,4	538,9	
Vegetable (g)	**'Embrace-me Bowl'**	**Plastic Bowl**	0,9829
Group 1	294,4	280,6	
	Plastic Bowl	**'Embrace-me Bowl'**	
Group 2	268,6	305,8	
Total intake (Kcal)	**'Embrace-me Bowl'**	**Plastic Bowl**	0,9829
Group 1	431,1	410,9	
	Plastic Bowl	**'Embrace-me Bowl'**	
Group 2	393,3	447,8	
Social interaction (mean)	**'Embrace-me Bowl'**	**Plastic Bowl**	0,0451
Group 1	30,8	31,7	
	Plastic Bowl	**'Embrace-me Bowl'**	
Group 2	27,9	26,4	

Limitations

Since the laboratory experiments had some limitations, it is possible that some issues influenced eating behaviour and social interaction. For instance, during the first treatment some participants made positive comments about the vegetable soup. The day after these participants came back for the second treatment, they realised it was the same soup served before, and by consequence they ended up consuming a significant amount of soup compared to their first treatment. These ‘learning effects’ could have been avoided, it is believed, with a longer period of time for ‘wash-out’. However, according to the analysis, these variations were not significant in the final results. In addition, a larger sample could have benefited this investigation with more power.

NOTES

1. -

Fig. 15 – The ‘embrace-me bowl’ measures 265 g in weight and can contain 350-400 ml; while the plastic bowl weighs 6 g and can carry up to 300 ml.

2. See the ‘declaration of consent’ in the ‘Appendices’.
3. - For every kilogram of ‘vichyssoise’ soup there were:

Ingredients	**% grams**	**% kcal**
Salted butter	4,137443	36,00876
Heavy cream (fluid) 28%	4,120562	17,25608
Whole milk 3.25% (no vit. Added)	17,06116	12,63268
Black pepper	0,620616	1,890837
Table salt	1,241233	0
Garlic	2,482466	4,489796
Leeks (bulb & leaf-portion)*	33,09954	12,45491
Onions*	12,41233	6,629228
Potatoes (peeled)*	8,274885	8,638085
Tap drinking water	16,54977	0

*Cooked, boiled, drained, without salt

4. Each rubber wristband is a RFID – radio frequency identification – wireless technology which contains one electronic chipset. These are semiconductors usually applied in a wide range of technologies; identification, wireless infrastructure, lighting, industrial, mobile phones, consumer and computing applications. The information it contains can be traced; it can be read, recorded, or rewritten (Weis, 2007).

IMPLEMENTATION

In this chapter, theories from different disciplines have been revised with the unique aim to better evaluate an object and so describe the way the relations are interwoven and how it participates in practices. The theories and explanations provided earlier were to be implanted to the results gained from the laboratory intervention – experiments, questionnaires, observations.

The overall framework aimed to integrate knowledge permitting mutual support from diverse research areas involving different qualitative and quantitative research methods which reinforced the analysis of this investigation. The diversity of perspectives considered the various relations that, in this case, the ‘embrace-me bowl’ can go through. But in order to actually account for the object and not just for the practices in which it participates, it is still vital to describe on what basis a certain object can take part in certain practices, as described in the design section including the semiotic analysis.

Furthermore, it has been explained that considering the Dual Process Theory and the results of the laboratory experiments, an edifying discussion can elaborate more on the possible implementations of the object in real life through the social theories in innovation and networks.

Discussion

The aim of this section is to provide a better comprehension of why the author chose the theories selected. Since there were various theories considered, it can be sensed the lack of target of this investigation. Still, this section offers the opportunity to refocus in order to gain the right sense and orientation. By explaining how the theories were put in practice and how the structures can be flexible, a more agile and practical understanding process can be executed.

Health and Nutrition

The laboratory experiments investigated whether or not the function of the 'embrace-me bowl' would exert a significant influence on the perceived eating behaviour of each participant, measured as quantity of food consumed, and the overall social interaction – commensality, measured through a reliable score developed for this study.

The results demonstrated that the participants' soup consumption was not affected by the 'embrace-me bowl' in which it was served. The form of the bowl exerted its natural function with a null significance on soup, vegetable and caloric intake. Furthermore, contrary to what a study has informed on the influence of the weight of plates in total consumption, the 'embrace-me bowl' did not show an effect when presented against the lighter, plastic bowl (Piqueras-Fiszman B., 2011). Since the 'embrace-me bowl' is heavier in weight and bigger in size, this contrast was supposed to enhance eating behaviour resulting in more food intake, which means that this investigation does not allow confirming in the published reports (Wansik, 2006; 2007). Thus, this study suggests that the size of plates may not impact perceived illusions as stated elsewhere (Rolls, 2007).

However, more experiments and research studies should be performed in larger samples or with a longer wash-out period, in order to better assess and clarify the effect of how sizes, weights and possibly form-function of objects impact eating behaviour.

According to the initial expectations, the plate-ware used for the experiments was supposed to influence the individual's behaviour following 'System 2', one of the two paths according to the 'Dual Process' theory (Evans, 1996). The attitudes shaped by the

‘embrace-me bowl’ were to follow this system through deliberated processes with the individuals being fully conscious about their behaviour. Surprisingly, the object seemed to follow a different path, ‘System 1’, where it could be inferred that unconsciously the object significantly influenced the social interaction among the participants during the experiments.

The advantage of the ‘Dual Process’ theory is that it can be used to see how successful the designer was when measuring the relation user-object in terms of attitudes and behaviour. Certainly in this case, it can be said that the designer “failed” on trying to deliberately manipulate the behaviour intended through the design of the ‘embrace-me bowl’. As a result, the participants of the experiments actually performed the opposite from what was originally intended in terms of social interaction. This result could also be attributable to the fact that the form of the designed object behaves only towards the consumer and not leaving enough space to interact with other commensals. If this is the case, then the design of reasoning processes can be readjusted in ‘System 2’ for deliberate actions.

Furthermore, it can also be assumed that there might have been some unidentified external cues affecting eating behaviour – e.g. distractions, the people present, the place, etc. More precisely, the external cues that are naturally generated at meal scenarios could have also been manipulated and controlled if they were identified correctly, resulting in an advantage to influence people’s behaviour (Smith, 2009).

Hitherto, the results of the laboratory experiment through a ‘cross-over’ experimental design have contradicted the hypothesis of this investigation. It was found that the function of the ‘embrace-me bowl’ appeared to affect the interaction of the participants. Although, as mentioned earlier, not in the expected mode. However, the results might suggest that the object can be useful for other purposes different from commensality. For instance, the ‘embrace-me bowl’ may have the potential to benefit health and nutrition in specific personas like children, elderly people, etc. Since the results suggest that the object is immune to certain distractions such as those from social interaction, then it could be

beneficial to put the object in use where people have difficulties eating, e.g. hospitals, schools, nursing homes, etc.

Social Innovation and Networks

Based on the importance of design, which emerged as the background theme in the present study, it has been most thoroughly explored in regard to the 'Analysis Ellipsis' and Semiotic Analysis of Objects'. On the design scenario, it is remarkable to note that bridging design and semiotics – meaning – with 'Actor Network' and 'Social Practice' theories has facilitated the comprehension once the users practiced and performed with the object.

Design and social theories combined presented an outline of how to conceptualize an experience and the material. The theories also explained how meaningful experiences distil into patterns, and how those patterns can be used to inscribe meaning into materials to create new experiences. The results suggest that the meaning the 'embrace-me bowl' gained while in practice is capable to produce a certain tendency in eating behaviour.

During the experiments it was observed that the rhythms of consumption slowed down due to, perhaps, the shape of the 'embrace-me bowl'. The fact that the bowl is unstable showed that some users were rapidly annoyed. Probably, two perspectives can be seen, an object that handicaps the users and/or the user that embraces and takes care of the bowl and the food. These contrasts definitely have different meaning and subsequently the eating practices and behaviour can vary depending on the user experience. Still, it is not clear what exact meaning can be constructed at this point from a social point of view. Therefore, in order to find the potential meaning it is necessary to carry out observational studies on the 'embrace-me bowl' in every day practices, in normal settings such as the dining room of a family, or a restaurant in the city, etc.

Finally, it can be said that it is relevant to identify how practices can be designed based in the relationship between designer, users, and objects or materials. This has to involve serious considerations, moral and ethical, on how to assess the desired influence on an object to be expressed with a user and the design object in practice.

However, there is a need for these issues to be independently investigated with a deeper approach on social sciences, whether it is with an actor-network or social practice

philosophy but always keeping in mind that design must promote and only be intended to perform practices for good, in this case eating for a healthier and more meaningful experience.

Fig. 16 - The ‘embrace-me bowl’ may not be as social and interactive as initially believed, but it may have the potential to increase the connection between the consumers and their meals by reducing the distance mouth-food in a comfortable manner.

Applications

The next paragraphs describe how the gaps between the perspectives have been filled. This was done with a creative and innovative way of thinking. Subsequently, after showing the experimental results, it is also pertinent to merge them with the theories described in the 'Research Framework' chapter.

The possible meaning of the 'embrace-me bowl'

Even though the results of the experiment were not as expected, the 'embrace-me bowl' can still impact behavioural consumption articulated in eating practices. As explained in the last section, if it is now known that the bowl does not affect consumption but suggests that it can connect more with the user, then the social networks interwoven through the bowl should focus to a different meaning apart from commensality.

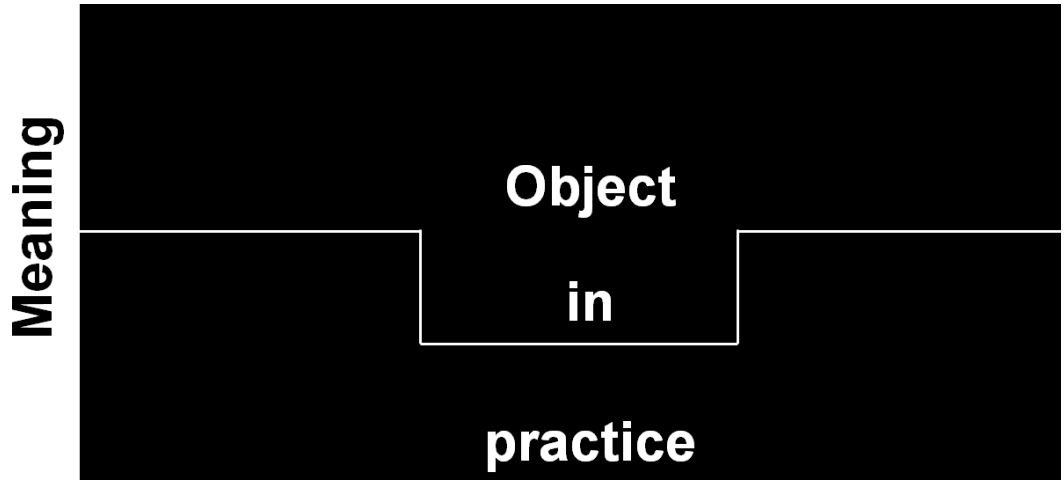

Fig. 17 – Objects in practice provide meaning that makes sense to the user (Mattozzi, 2009).

The nature and identity of the bowl is fully reliant to the practices that provide meaning to it. Because meaning is not inherent in an object, it is given by the object in practice and its users. That is, the design objects exist. However, meaning doesn't emanate from them but is placed on them. For instance, if the bowl is placed in a scenario where there is a lack of connection between consumers and their meals – e.g. infants, elders, etc. – then it would be much more positive to promote the object as an artefact that fully connects with its user, immune enough to the distractions than encompass the mealscape. Possibly, is not that

the ‘embrace-me bowl’ is anti-social, but maybe it is just an object capable of provoking full intimacy with the user. This context would give total sense and the meaning of the object perhaps could find a common and practical understanding among its actors involved.

Designing food related practices

Most practices wouldn’t exist without the materiality of the sorts they deal with. But also, materials wouldn’t exist without the practices that give meaning (Schatzki, 1996). Material aspects are often the means of accomplishing a practice; just as cooking and eating practices require tools and things to achieve its purpose (Nicolini, 2013).

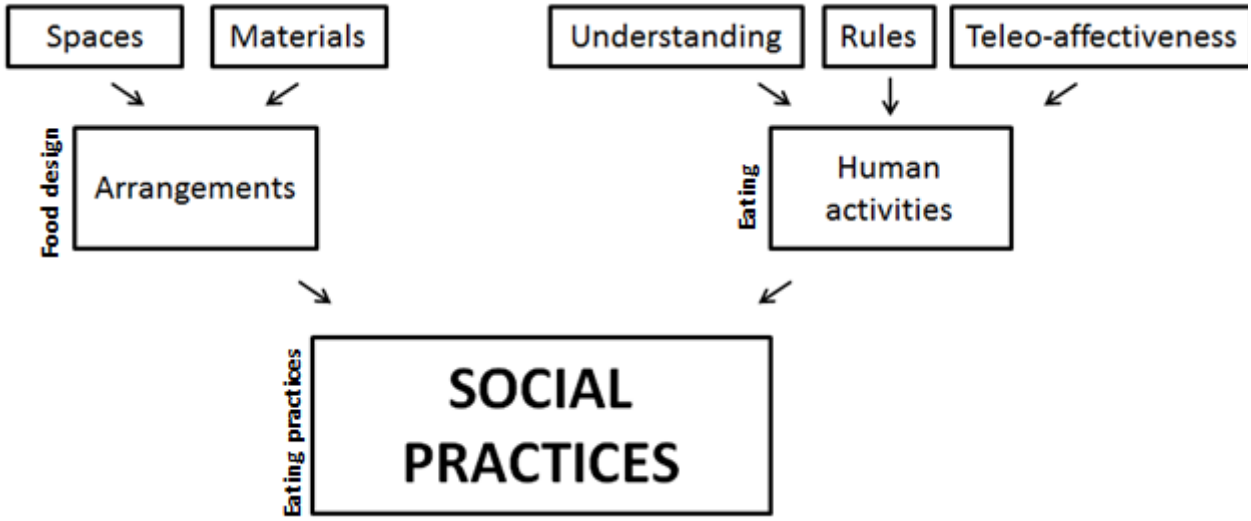

Fig. 18 - On how social practices are articulated. Model inspired from Schatzki (1996).

It is then personally considered that it is possible to arrange spaces and materials on purpose in order to influence in social practices such as commensality or any other eating practice. As Fischler has suggested, it is also important to identify the current human activities like eating, and based on that start the design processes in order to create the solutions needed for a better commensality and by consequence better health and nutrition. It is particularly assumed, that this issues should be addressed in conjunction and not in an independent manner. Addressing nutrition problems should be accompanied with a social perspective for better understanding of how social practices end affecting nutrition. Nevertheless, it is encouraged to carry tests in real scenarios before encouraging any sort of real application.

Implementation process of the 'embrace-me bowl'

Finally, the 'Integrated Food Studies' approach intends to propose a way of implementing the 'embrace-me bowl' with the use of a model that incorporates the three perspectives of the study.

The model – see fig. 19 – is composed of 13 steps for the object to be applied in real life. Each of them show the nature of the discipline they are conformed, 'FD' for food design, 'PHN' for public health nutrition and 'FINe' for food innovation and networks.

These steps are explained in systematic order:

1. Design Process of the Object – a problem is identified and a solution is proposed by design thinking process. Once the prototypes or objects are materialised, then they are ready to be tested. The objects can always be redesigned after several tests.
2. Lab Test – after the object is created, it is pertinent to carry structured experiments in order to find any potential use. This step uses quantitative methods.
3. Analysis of Results – enables the designers and researcher involved to decide whether the design object should continue the implementation process for more further tests or should be redesigned, going back to step 1.
4. Living Lab – if the results from the experimental tests show any potential, then it is suggested to carry more tests but in real life scenarios. Involving potential users (Pallot, 2009). This step uses qualitative methods, such as observational studies.
5. Analysis of Results - enables the designers, and researcher to decide whether the object is ready for the next step or the object needs to be redesigned in cooperation with the user, going back to step 1.
6. SCOT Analysis - 'Social Construction of Technology' identifies the relevant actors discussing, redefining and redesigning until common understanding is achieved. This can always go back to step 1 to start the process all over again.
7. Closure – once the SCOT analysis is performed and all the actors involved arrive to a common final decision the object is finally designed and made available for application.
8. Implementation – the design can be then implemented in different settings and contexts, it all depends on the initial intentions of the actors involved in the object.
9. Human Activities – in this step, social practice theory starts to appear in the scene through the 'rules', 'understanding' and 'teleo-affectiveness' comprised in activities. The activities in combination with the object start to be expressed in a series of social actions.
10. Dual Process – the actions articulated by activities in conjunction with the object can be again measured and observed if they belong to automatic or deliberated actions.

11. Social Practice – the object in practice provides sense to the social circles through the activities performed. It also provides meaning to the object.
12. Outcome – the results of the object in practice are exposed and can be used for evaluative and assessment purposes.
13. Feedback – the integrated approach can provide critical reviews for improvement.

Before concluding, it is also important to clarify that the process of this report and investigation has reached the third step according to the 'IFS Implementation model' – fig. 19. Yet, the vision is to follow the final steps in its systematic order for a successful and final implementation. The process is still half its way. Only with patience, dedication and with the right actors involved, not only the embrace-me bowl' can be improved and applied, but also any other objects designed with the aim to promote better eating practices that assure health and nutrition among the populations.

This concept has been modelled around the functional effects of the 'embrace-me bowl' in food consumption, in fact, it is a proposition to expand on how people's actions can be influenced for better practices and subsequently better nutrition and health. Each step of the model can belong to one or more IFS approaches in combination.

Although this model proposed is debatable, it definitely carries the essence of each discipline. This eclectic scheme is innovative in the sense that promotes collaboration between actors from different backgrounds. In short, it can be inferred that for this specific study, Design and Gastronomy offered solutions to a couple of problems; Meal Science and Public Health Nutrition measured and quantified the effects of the solutions proposed; while Food Policy and Innovation Networks is still pending to put this proposal – the object – in full practice.

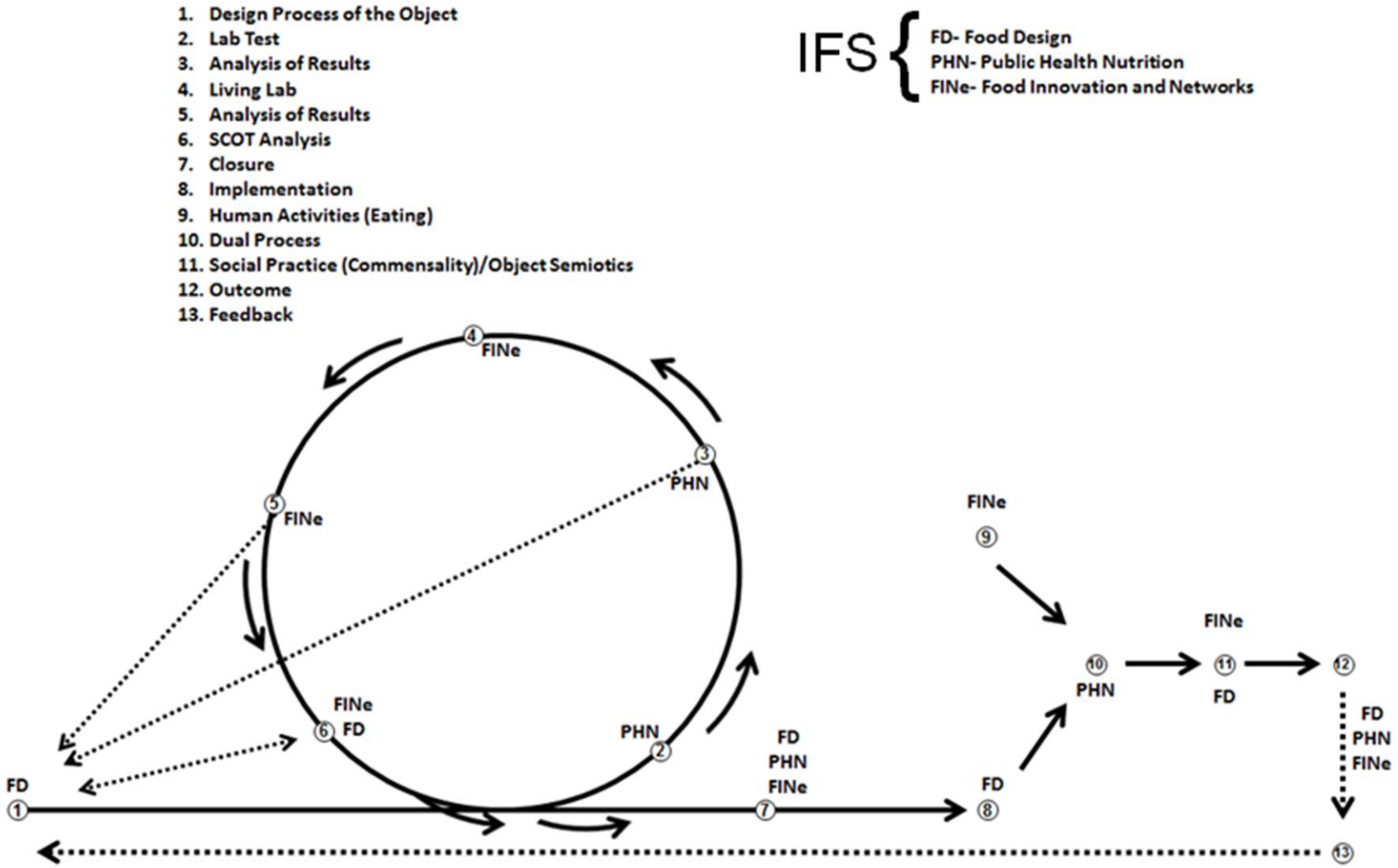

Fig. 19 - Holistic model for the implementation of the ‘embrace-me bowl’ through the Integrated Food Studies approach.

OUTRO

CONCLUSION

The aim of the present study was to investigate whether the functions of a designed food container, specifically a bowl being held in the participants' hands, would influence food intake and the social interaction with other participants.

Based on experiments conducted at the 'Food Scapes Lab' in Aalborg University Copenhagen it was developed a laboratory study that enriched the research of this project thesis. An object meant to promote health and nutrition through commensality was tested with university students. Incorporating food design and innovative social theories, the project and the object design proposed, has demonstrated that health and nutrition – characterised also by very technical analytical methods – can be combined for the development of creativity in eating behaviour. This holistic approach has definitely filled a gap in the food system in context with design, nutrition and eating practices.

The experimental process was positively designed, throughout the ideation and development phases, in order to find a correlation between the problems in commensality-nutrition and an object used to eat. However, the results of this investigation acclaim that the eating object in question preaches against the essential foundations of commensality; not only by lowering the social interaction at the table, but also by not showing any statistically significant difference in terms of food consumption. To support this, an important aspect ensuring this is the multidisciplinary work used with tools from design, natural and social sciences.

Thereby, it is highly suggested to consider the results for further investigations but also for further observations in real case scenarios where the object can be put fully in practice. Because the functions of an object can transmit different meanings, they can derive in determined practices prescribed by both the user and the object.

The strategy on implementing sociological tools and observations, it is believed, could actually answer many questions of the real potential of the 'embrace-me bowl' by making a difference in problems related to health and nutrition.

FUTURE PERSPECTIVE

The designed object, proposed to meet problems on commensality, has shown a concrete result. Nevertheless, the object should be implemented and tested in social and everyday situations. If then it keeps showing similar results to those from the laboratory experiments, then it could be inferred as a critical and antisocial object.

Therefore, in that case scenario, it would be likely that the object can have possibilities to reach certain types of users. For instance, it was mentioned already about the distractions present at mealtime; and it is generally known the difficulties in encouraging children to eat their meals, especially vegetables. The distances between an infant's mouth and the plate is usually less than thirty centimetres, however hundreds of distractions can block the connection mouth-food. Thereby, the 'embrace-me bowl' could have a chance of reaching out to a potentially very big market, parents who struggle with their kids during meals.

Right now, the author behind 'Critical Plate-ware' is exploring its different functionalities with the purpose to improve interaction or shorten the relation meal-consumer. These explorations are intended to be performed with different kinds of users; kids, young adults, elderly people, etc. Moreover, an additional advantage of the plate-ware is that it is able to interact with other objects such as glasses, cutlery and the several eating utensils used for meal consumption. These creative processes could promote a more versatile commensality, which would mean that depending on the context and situations food design can provide more possibilities for eating, interacting, connecting closer the consumers toward their meals, and maybe also when an individual is unable to share a meal having no other option but to eat alone.

Nevertheless, in the end, the questions are still the same. Will we still eat together tomorrow? Is our individualistic approach going to refuse any form of commensality or will it be capable of crafting new forms and processes? Will it be flexible but ritualized enough to offer sense to the communal table experience? Fortunately, food design has great future and possibilities for the further development of not only platescapes, but also in the other spheres of the mealscapes. Nutritional and social problems related to food

consumption can always be addressed with creativity and invention, but better if it is with multidisciplinary practices.

REFLECTIONS

From the very beginning of this investigation a series of problems appeared, especially at the moment to take a final decision and put forth this project. A resolution between studying and focusing only on food design or following another path had to be made.

An affinity for design and gastronomy has been evident since the beginning of the Master's education; exploring design and its creative possibilities has always provided with enough energy to fuel the imagination required in this discipline. Even though it has always offered satisfaction and seemed to be the safest track to explore, it was decided to merge a number of routes available in the map. In reality, the previous project on food design functioned as the main platform to depart onto regions that are not necessarily located in comfort zones.

At the end, it was difficult to reject the challenge and opportunity of pursuing a project in academic areas which have been not fully dominated. The choice resulted with a sequence of struggles during the research process, to the point that those differences between the varied contexts tempted to redirect the focus of the project in just one and "safe" direction. Yet, focusing the problem 100% on one perspective appeared to be repetitive and tedious. Instead, against all the personal strengths, it was determined that the research problem had to be targeted from mixed angles. At the same time it means that one can easily lose accuracy when targeting an issue.

Ending up confused as many different doors were opened up in the search of more theories and knowledge has been a lifetime lesson. It was difficult to find the focus as information was planned to be embedded in the process. The early lack of boundaries could have probably affected the research in one way or another but it is believed that the necessary adjustments and calibrations were performed in the right and most crucial moments of the entire academic journey.

In retrospect, it could have probably been more beneficial to share this academic problem with another student; although the working process tends to be slower and more conflictual, the explorations can cover even those distant nooks capable to constantly inspire the development of a solution. Nevertheless, this project has been very personal and finding someone with the same enthusiasm was an unnecessary matter.

After all, the vision of keeping various angles on target has been a learning process. Many decisions compromised valuable data collected along the way. At the end, much of the information gathered had to be put down. These resolutions facilitated a smoother progression in the further academic process. It has been very edifying to work under these conditions where it was proved once again that limitations are not always of a negative nature.

Putting public health nutrition resources in practice has broadened the scope of knowledge on how to assess food and nutrition related problems. It has also fostered hidden skills that until then were not in use. On the other hand, the food networks and innovations approach has augmented logical understanding of how complex food systems are along with the deportments their social links behave. This approach seemed to neglect the rules reforming some concepts and leaving those in constant motion. It was a challenge to find a sense and a rhythm from a world full of different philosophies and valid ideas. Yet, evaluating possible solutions from that perspective has produced and assembled processes never imagined, undoubtedly nurturing creativity and comprehension of how networks are exerted no matter how small or big the context is.

The risk has been taken and the outcomes have turned up to be in favour!

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