Roskilde University

Size matter!

A choice architectural field experiment in reducing food waste

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École de Management Hôtellerie Restauration & Arts Culinaires
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MENU, JOURNAL OF FOOD & HOSPITALITY RESEARCH

FOOD & HOSPITALITY RESEARCH:

FROM PREPARATION TO CONSUMPTION

#4

MENU: JOURNAL OF FOOD & HOSPITALITY RESEARCH

Aims and Scope

Menu: Journal of Food and Hospitality Research aims to publishes articles about work in progress on food behaviors, in link with culinary arts, foodservice and hospitality. Its scientific ambition is both thematic and methodological. Firstly, it proposes to publish the work of PhD students, researchers interested in food, culinary arts and gastronomy, and who place people – as cooks or as consumers - at the Centre of their works. Secondly, from a methodological standpoint, the journal gives priority to ecological studies of these activities, promoting the development of *in situ* and *in vivo* approaches. While social sciences, behavioral sciences and humanities are at the heart of publications, the journal aims to maintain an interdisciplinary dialogue, especially with food engineering. As a scientific journal, it also aims to bring together the academic, public and private sectors, through the diffusion of applied research.

Menu publishes articles on the basis of PhD. Workshop and Symposium. Articles are subject to a double-blind review process involving internationally recognized, experienced researchers from the relevant scientific fields.

The journal contains four types of publications:

- **Research articles** present accomplished research works.
- **Varia** are research articles addressing a topic different from the theme of the issue.
- **Book reviews** are short articles presenting a critical view on recently published books.
- **Fieldnotes** are short research reports on exploratory studies or on the preliminary results of ongoing research works.

Editors of this issue

- Laure Saulais, PhD., Economics, Research Scientist, Institut Paul Bocuse Research Centre
- Agnès Giboreau, PhD., Food Science, Research Director, Institut Paul Bocuse Research Centre

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Editorial

Laure Saulais and Agnès Giboreau,

The Centre for Food and Hospitality Research, Institut Paul Bocuse

Once a year, the Centre for Food and Hospitality Research organizes a Summer school to create a unique opportunity for scientific exchanges for PhD students and researchers of both the Institut Paul Bocuse and other universities, without any distinction of discipline. The aims of this Summer School workshop are twofold. Firstly, the workshop provides a training opportunity on the process of scientific publishing. Workshops are organized with tutorials scientific article writing and peer-reviewing papers. . Moreover, participants experience the complete publishing process with the publication of the proceedings in Menu, the Journal of Food and Hospitality Research. During this process, junior researchers endorse successively the roles of author and reviewer. Secondly, the workshop is a research workshop, combining presentations and discussions of research works on the topic of Food and Hospitality Research. For two days, participants are able to present their research and exchange on methodology as well as concepts and results. The workshop also includes interventions from experienced researchers.

MENU, the on-line journal of the Research Centre, gathers the communications presented during the summer school as well as short communications of research works conducted with researchers of the Institut Paul Bocuse

The present issue of MENU gather works presented at the 2014 Summer School, which took place on July, 3rd – 4th , 2014. Keynote speakers were Sara Jaeger and Loïc Bienassiswho a presentation of their research exchanged on the basis of the presentations and discussed editing and publishing issues. Sara Jaeger is Science Leader, Sensory & Consumer Research, at the Plant and Food Research Institute, NZ. She is also an editor of *Food Quality and Preference*, a top-tier peer review journal.. Her conference was entitled *"Appropriate consumer research and appropriateness in consumer research. A tale of two halves".* Loïc Bienassis is Project Manager at IEHCA, Institut Européen d'Histoire et des Cultures de l'Alimentation (Fr), associate researcher at the University of Tours. He is an editor of *Food and History*. His talk was entitled *"An elusive object : how to apprehend traditional food ?"*

Five research articles from the 2014 Summer School are presented in this issue of Menu. The first research article (Julie Boussoco) aims to better understand how the culinary social representations are influenced by individual distance to cooking. The project studies how to build a typology of domestic cooks based on the distance to the "Cooking" object and on the score of food neophobia. The second article presented by Laurits Skov is an experiment conducted at a standing lunch. The aim of the work is to evaluate if a reduction in plate size would affect the amount of consumed food (and wasted one). Next research article (Pauline Fernandez) reports the results of a qualitative study dealing with an exploration of chefs' perception of plate dressing. The fourth article (Laura Guérin) describes the practices and interactions that take part in the daily organization of a shared meal in the context of a nursing home restaurant. It focuses on the management of physical and psychological dependencies of individuals. The last research paper (Céline Alcade) relates to the linguistic and interactional skills' transmission in the context of the table waiting vocational training.

The second part of this issue consists of three field notes. The aim of the first study (Kongsbak *et al.*) is to examine whether chemotherapy treatment affects taste and smell preferences for patients diagnosed with cancer. The second study (Schwartz *et al.*) describes the development of an experimental "mid afternoon snack" to measure neophobic behaviours, tested before and after a sensory education in school children. The last paper (Saulais *et al.*) measures how the ambiance of a restaurant affects the desire to eat and the meal pleasure of elderly residents of nursing homes.

This issue of Menu wishes to illustrate the multidisciplinary approach of the Center for Food and Hospitality Research, Institut Paul Bocuse, a multidisciplinary approach which is worked out during Summer schools as well as research projects.

Research Article:

Impact of cooking distance/proximity and food neophobia in French culinary social representations

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Abstract

The choice of a dish or a recipe is a dynamic process that among others includes cultural, social, contextual and individual factors (Corbeau & Poulain, 2002; Guibert, Minisini, & Beuré, 2010; Kaufmann, 2005). We know that practices are influenced by social representations. In this regard, social representations related to food and cooking might influence the choice of a dish to cook (Lahlou, 1998; Poulain, 2002). In this context, this project aims to better understand how these culinary social representations are influenced by cooking distance/proximity (level of knowledge, practices, involvement) (Abric, 2001; Dany & Abric, 2007; Dany, Apostolidis, & harabi, 2014) and food neophobia (Pliner & Hobden, 1992).

A sample of 420 non-professional French cooks was asked to complete a free ranking association task on "Cooking a dish". Then, they had to classify each word or expression based on their attitudinal orientation: from +2 (*the most positive*) to -2 (*the most negative*). Finally, their level of cooking distance/proximity (i.e., food and cooking knowledge, cooking practices, and involvement in cooking) and their level of food neophobia were evaluated through questionnaires.

Verbal data were analyzed on the level of occurrence and semantic levels by correspondence factorial analysis (CFA). Analysis of variance (ANOVA) and t-tests were used to compare the attitudinal orientation averages.

The results showed an influence of cooking distance/proximity and food neophobia. Culinary social representations of group with a very high cooking proximity were more positive and referred to less normative words (e.g., *pleasure, sharing*); whereas, group with a very low cooking proximity referred to normative (e.g., *eating, recipe, time, chore*) and less positive words. Furthermore, more neophilic group had a more positive social culinary representation than more neophobic group.

Keywords: social representation, cooking proximity, food neophobia, food, cooking.

1. Introduction

Historically, the use of fire and cooking practices aimed at improving the taste and food safety (Montanari, 2010). Human beings have to eat to live, and as they are omnivorous, they can eat a variety of foods. Indeed they cannot find all the necessary nutrients in one food, they have to eat many different types of food. Among these foods, some can be harmful or fatal to them. This raises the question of food choice. People waver between the attraction of novelty (neophilia) and the fear of novelty (neophobia) (Fischler, 1990; Pliner & Salvy, 2006; Rozin & Rozin, 1981).

According to current sociological studies on food and culinary practices (Poulain, 2002, 2012 ; Régnier, Lhuissier, & Gojard, 2006), globalization, female employment, full working days, the industrialization of the agro-food sector, the cut in the share of food in household budgets to the benefit of leisure activities all favored changes in cooking practices. Society becomes more individualistic and the subject is free to make its own choices. Culinary and food rules are less strict. We speak of “gastro-anomie” (Poulain, 2012). Also according to a report by INRA (Dallongeville et al., 2010), there is a reduction in the time spent preparing meals, time spent at the table, increased integration of processed food products in a simplification of meals and an increase in eating out of home. But according to a Guilbert, Minisini and Beuré (2010), only 3% of French people eat exclusively ready-made meals. Thus, domestic cooking practices still exist.

In fact, the choice of a dish, a recipe, is a dynamic process that integrates many considerations, such as cultural, social, contextual and individual factors (Corbeau & Poulain, 2002 ; Fischler, 1990 ; Gojard et al., 2010 ; Guibert et al., 2010 ; Kaufmann, 2005).

Social representations related to food and cooking might influence the choice of a dish to cook (Abric, 1994 ; Lahlou, 1998 ; Poulain, 2002). Abric (1994, p. 12) states "an object [as cooking] does not exist in itself, it exists for an individual or a group, and in relation to them. [...] A representation is always a representation of something for someone”.
Thus, there is no objective reality (Abric, 1994, p. 12), "all reality is represented, that is to say appropriated by the individual or the group, rebuilt in its cognitive system, integrated into its system of values depending on its history and of the social and ideological context that surrounds it. And it is this appropriated and restructured reality that forms the very reality for the individual or the group.” Moreover, the social representation has the peculiarity of being both the content and the process of a mental activity, (Abric, 1989, p. 188), "by which an individual or a group reconstructs the real they are facing and assigns it a specific meaning". Social representation acts as a socio-cognitive filter to understand the world around us. We used this approach and studied the culinary social representation underling culinary choices.

Moreover, the concept of distance to the object (DO; Dany & Abric, 2007; Dany et al., 2014) is useful in exploring the role of some psychosocial factors in the regulation of social representations: knowledge (real and perceived), involvement (importance, personal identification, perceived ability), and level of practices (or behaviors) associated with the social object under study, here, cooking a dish. We used the expression cooking distance/proximity when we talked about the distance to the social object: “cooking a dish”. A low cooking distance means a high proximity to cooking and vice versa.

2. Aims

In this context, this project aims at better understand how these culinary representations are influenced by cooking distance/proximity (i.e., level of knowledge, practices, involvement) (Abric, 2001; Dany & Abric, 2007; Dany et al., 2014) and food neophobia.

3. Methodology

3.1. Participants

A sample of 420 French internet users (non-professionnal cooks) was asked to answer an online questionnaire. The average age of our sample was 41.8 years (*SD* = 11.38, range 20–68). We tried to have a distribution close to reality (i.e., what can be seen in literature about culinary practices, Scholderer & Grunert, 2005). So, gender-wise, 21.9% of respondents are men (*N* = 70) and 78.1% are women (*N* = 350). Women are usually more responsible for cooking in the household (Daniels, Glorieux, Minnen, & van Tienoven, 2012). The sample was selected in order to meet the "diversity criterion", not aiming at being "representative" but rather "characteristic" of the

French population. Thus, the French territory was divided in regions, in the same way as with previous authors (Herpin, 1984; Poulain, 1998, 2002). According to Poulain (2002, p.175), "In the French society, yet very central, there are still profound regional differences in food representations".

3.2. Procedure

To study social representation, participants were asked to complete a free ranking valued association task. First, they had to give the 5 first words or expressions coming to their mind, in relation to "Cooking a dish". Then, they had to rank each word or expression based on its importance: from 1 (the most important) to 5 (the less important). Finally, they had to classify each word or expression based on its attitudinal orientation on the Likert scale: from -2 (the most negative) to +2 (the most positive).
Then, their level of cooking distance/proximity (i.e., food and cooking knowledge, cooking practices, and implication in cooking) was evaluated by a questionnaire created for this study (α =.83). With this cooking distance/proximity questionnaire, cutting on quartiles, we obtained 4 groups (0 to <4.17: very low proximity/very high distance (DO^{++}); 4.17 to <5.84: low proximity/high distance (DO^{+}); 5.84 to <7.11: high proximity/low distance (DO^{-}); 7.11 to 10: very high proximity/very low distance ($DO^{- -}$). Finally, their level of food neophobia (Reverdy, 2008) was evaluated by the the French adaptation of the food neophobia scale (AFNS; Reverdy, Chesnel, Schlich, Köster, & Lange, 2008). Cutting on mediane, we obtained 2 groups: more neophobic (>3.90) and more neophilic (≤ 3.90) people.

3.3. Data analysis

First, verbal data were analyzed on the levels of occurrence and semantic with the correspondence factorial analysis (CFA) (Doise, Clémence, & Lorenzi-Cioldi, 1992). Two criteria (Lo Monaco, 2008) were used to select words to include in the analysis: Importance (selection of the 3 most important words for each participant) and frequency (selection according binomial law[1] (Jeoffrion, 2009). The selected variables to be projected were: Cooking distance/proximity (4 modalities: DO^{++}, DO^{+}, DO^{-}, $DO^{- -}$) and food neophobia (2 modalities: more neophobic and the more neophilic).
Secondly, the average of the 5 attitudinal orientation's score, was calculated for each participant. Analysis of variance (ANOVA) were carried out depending on cooking distance/proximity (4 groups); and T-tests were conducted depending on the neophobia score (2 groups).

4. Results

4.1. Results about CFA

The CFA analysis revealed two factors which accounted for 75.7% of total inertia. The first factor (62.9% of inertia) received the contribution of 2 modalities of cooking distance/proximity: ($CF^{2}_{DO^{++}}$ =.54 + $CF_{DO^{- -}}$ =.21) = .75. (i.e., a contribution of 75% to the formation of the factor). Concerning the second factor (12.8% of inertia), we noted a contribution of neophobia ($CF_{\text{more neophilic}}$ = .24; $CF_{\text{more neophobic}}$ =.28) and cooking distance/proximity ($CF_{DO^{- -}}$ =.32). Thus, the total contribution of these two variables in the definition of this factor is equal to .84 (i.e., 84%).

As it can be seen on Figure 1, $DO^{- -}$ group is opposed to DO^{++} group (Factor 1). For the first group, cooking a dish was associated with feelings (i.e., *pleasure*) and other guests (i.e*., sharing*). Whereas for the second group, it was associated with necessity (i.e., *eating*), context (i.e., time, *recipe*), and feeling (i.e., *chore*). On factor 2, the more neophobic group and $DO^{- -}$ group who associated cooking a dish with feeling (i.e., *smell, pleasure*) are opposed to more neophilic group who associate it with context (i.e., *meal, time*), feeling (i.e., *good*), others guests (i.e., *friends*) and *health*.

4.2. Results concerning attitudinal orientation

There is an influence of food neophobia score, $F(1,418) = 18.52$, $p < .001$: more neophilics had a more positive social culinary representation (M = 6.16, SD = 1.73) than more neophobics (M = 5.42, SD = 1.75). And, there is an influence of cooking distance/proximity, $F(3,416) = 27.95$, $p < .001$. Groups with a very high cooking proximity had a

[1] Binomial law: minimum threshold frequency words (called "k") beyond which the probability of having been associated is significantly different from chance

[2] To decide whether a term defines one or more factors, we used the approach in terms of contributions by factor (CF; Deschamps, 2003, 2007; Lo Monaco, Piermattéo, Guimelli, & Abric, 2012)

more positive social culinary representation (*M* DO- - = 1.50, *SD* = .48) than groups with a low cooking proximity (*M* $_{DO}$+ = 1.08, *SD* = .63) and a very low cooking proximity (*M* $_{DO}$++ = .60, *SD* = .81; HSD Tukey. $p < .001$).

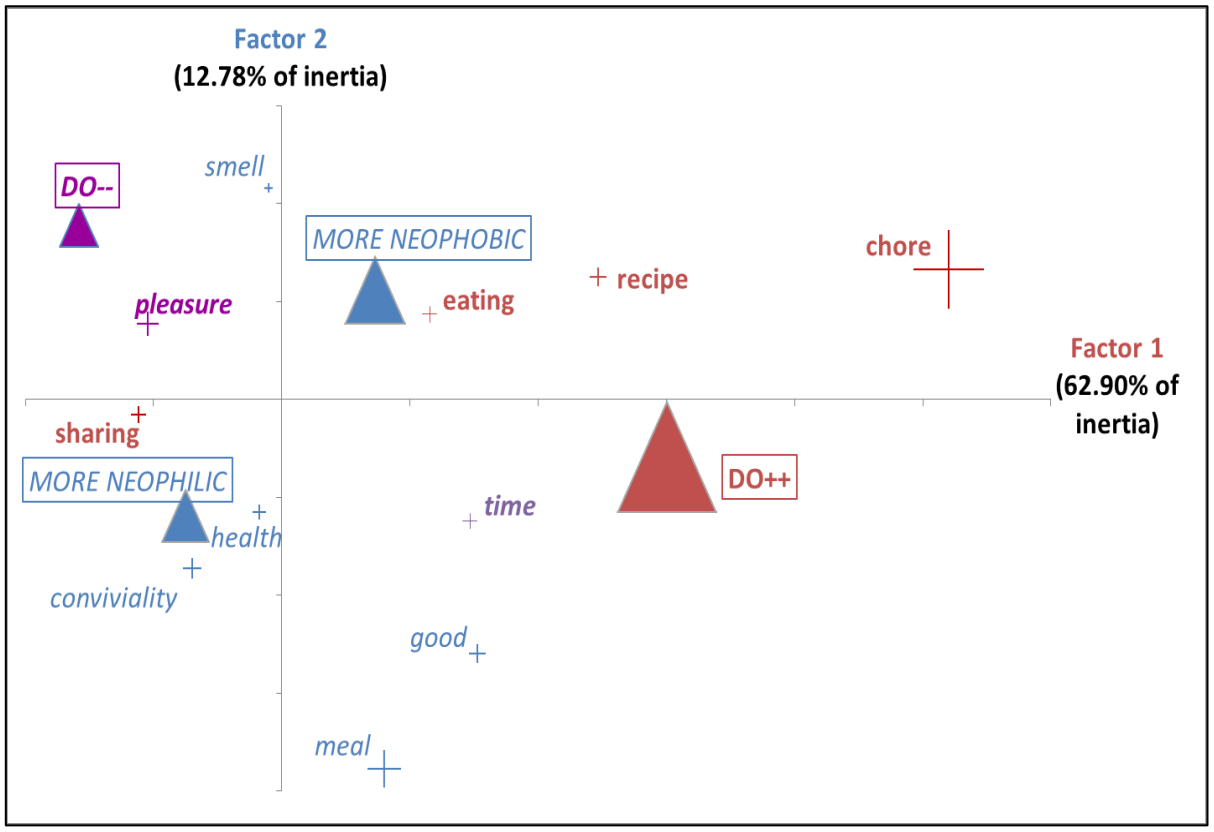

Figure 1. Graphic representation of modalities on the first two factors axis of CFA on similarities between words associated with "cooking a dish"

Note: The modalities in red bold type have the largest contributions on the first factor and those in blue italics on the second factor. Modalities in purple bold and italic type contribute to the first and the second factor. Part of the modalities that contribute little to the orientation of the two axes are not named. (cf. Deschamps, 2003). DO- - = Very High cooking proximity/very low cooking distance ; DO++ = very high cooking distance/very low cooking proximity.

5. Conclusions

We showed the influence of cooking distance/proximity and food neophobia on culinary social representations: on the type of words used and on attitudinal orientation. Very high cooking proximity group mentioned positive and less normative words whereas very low cooking proximity group referred to more negative and normative words Moreover, more neophobic groups referred to self-centered words, whereas, less neophobic groups referred to less self-centered words.

These results are in line with some previous research on distance to the object (Jeoffrion, 2009; Navarro Carrascal, 2009). Including that of Cazes-Valette (2006), who in his "festive cooking" study, found a positive/negative dimension marked by variable "practice of cooking." Thus in its results, participants who does not cook, talked significantly more about displeasure, boredom, fatigue, work, complexity ; While participants who cooked, quoted significantly more *fun, creativity, originality, research, presentation, organization, forecasting.*

Differences between high proximity and low proximity cooking groups, on social representations, may be less important than in other research (Abric, 2001; Dany & Abric, 2007; Guimelli, 2003; Lo Monaco & Guimelli, 2008; Rouquette, 1994; Salesses, 2005) since only one participant in our sample, had no cooking experience. All the others had already cooked something.

Regarding neophobia, our results provide new data from previous research on the link between food neophobia and eating behaviors, odors, or

sensation seeking (Dematte et al., 2013; Pliner & Hobden, 1992; Siegrist, Hartmann, & Keller, 2013).

A qualitative study will help us to better understand the influence of food neophobia and culinary proximity on social culinary representations.

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Research article:

Size matter! A choice architectural field experiment in reducing food waste

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Abstract

Objectives: We examined how a reduction in plate size would affect the amount of food waste from leftovers in a field experiment at a standing lunch for 220 CEOs.

Methods: A standing lunch for 220 CEOs in the Danish Opera House was arranged to feature two identical buffets with plates of two different sizes. One buffet featured standard sized plates that served as control (standard size as provided by the caterer, 27cm). A second buffet featured smaller sized plates (24cm) that served as the intervention. After the lunch concluded (30 minutes), all leftover food was collected in designated trash bags according to size of plates and weighed in bulk.

Results: Those eating from smaller plates (n=145) left significantly less food to waste (aver. 14,8g) than participants eating from standard plates (n=75) (aver. 20g) amounting to a reduction of 25,8%.

Conclusions: Our field experiment tests the hypothesis that a decrease in the size of food plates may lead to significant reductions in food waste from buffets. It supports and extends the set of circumstances in which a recent experiment found that reduced dinner plates in a hotel chain lead to reduced quantities of leftovers.

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1. Introduction

Human overconsumption of natural resources plays a crucial factor for global climate change and represents a troubling phenomenon from a perspective of social inequality in lieu of the millions of undernourished citizens in the developing world.

In the last decade public attention has increasingly turned to food waste as an example of such overconsumption. It has been estimated that, as of 2011, 1.3 billion tons of food, or about one third of the global food production, are lost or wasted annually. While loss and wastage occurs in all steps of the food supply chain it has been estimated that 100 kg per person/year is wasted specifically at the consumption stage in the developed countries (i.e. North America and Europe) [1]. The climate impact of 100 kg of wasted food from the European food service industry is estimated to cost 194 kg CO2 (the equivalent for households is 207 kg CO2 per 100 kg food waste due to differences in food waste composition and handling)[2]. In Danish industrial kitchens alone, relative to which this experiment was conducted, it has been estimated that a minimum of 21.000 tons of food end up as waste rather than consumed. This equals 40-75% of the food in this particular sector [3], and it represents a yearly loss of 419 million Danish kroner (Appox. €56.2 million) [4].

Recent research on the consumption stage highlights the size of the dinnerware, especially dinner plates, as playing an instrumental part in determining the total amount of food consumed [5, 6]. Such research is particularly relevant when it comes to out-of-home 'foodscapes' [7] such as restaurants, cafés, and cafeterias, where large plates are used as a competitive parameter by providing customers with more food in the same meal, or to provide an exquisite frame for the appearance of finer cuisine.

Several studies have found that an increase in plate size leads to increased portion sizes [8]. Larger servings provide more calories, and increased portion size systematically leads to greater consumption [9].

This suggests that reducing plate size in out-of-home 'foodscapes' is an economically viable as well as sustainable attractive strategy for caterers and restaurants that want to provide healthier eating options for their customers. But, although we have conclusive results on how contextual changes affect consumption, we still need more experimental data on contextual influences on the amount of food leftovers and ultimately the total amount of waste.

A recent A/B experiment from Norway using hotel guests at sit-down breakfast and lunch buffets, where not everyone is eating at the same time, showed that a reduction in plate size lead to decreased food waste from leftovers [10]. Our experiment aimed at examining whether reducing plate sizes would reduce food waste in a controlled field experiment at a standing buffet for CEOs in The Danish Opera. Our experiment thus extends the set of circumstances where reduced plates lead to reduced food waste and limits any biases and confounding interference during the period where the aforementioned A/B experiment ran.

2. Method

2.1. Theoretical framework

Choice architecture is a relative new theoretical concept that derives from the nudge approach to behavioural change as advocated by Thaler & Sunstein in 2008 in their influential book Nudge: Improving Decision Making about Health, Wealth, & Happiness [11]. Their synthesis of research from psychology and behavioural economics has caused widespread interest in choice architecture and its applicability in promoting various policy goals. Choice architecture is defined as a change in the choice environment that prompts behavioural change in a predictable way without restricting options and/or providing financial, social or other incentives for that specific behaviour change [12]. Our experiment adheres to these parameters since the only variable in the two buffets was the size of the available plates. Thus, the participants were free to take as much food as they wanted, and the available options and quantity of food in each buffet remained the same.

2.2. Participants

220 Danish CEO's, during a two-day Conference with a total of 550 CEO's, participated in the experiment. The experiment was one of 11 behavioural experiments conducted during the conference, but the only one specifically aimed at reducing food waste and the only experiment taking place at that specific food serving. The participants were not aware of the experiment, but were briefed on the results at the end of the day.

2.3. Materials

The standing lunch featured two identical buffets on opposite sides of the 1st floor of the Opera House. The only difference between them was that they had different sized self-serving plates. One buffet featured standard sized plates that served as controls (standard size as provided by the caterer, 27cm). The other buffet featured smaller sized plates (24cm) that served as the intervention.

2.4. Procedure

Participants arriving at the conference took either of two identical stairs from the symmetrical foyer of the Opera leading up to the 1st floor featuring the buffets. No attempt was made to interfere with participants' personal choice of stairs. Three members of the experimental team dressed as waiters and placed in the periphery as well as waiters from the usual staff oversaw that everything went as planned.

After lunch all food leftovers from the plates were collected in designated trash bags according to the size of the plates and weighed in bulk by research assistants from the experimental team. All plates were cleared by regular staff and overlooked by the research assistants, who were all instructed to make sure that the smaller and larger plates did not mix.

Participants were briefed and presented the raw results shortly after the implementation of the study. There was consent from the caterer and the event organiser to conduct the study. Two conference moderators briefed participants on stage about the nature and purpose of the study and that no personal data or identifying information had been collected. Also, the researcher responsible for the experiment was pointed out in person and people were encouraged to go and talk to this person or any of the conference organizers if they had questions or wanted further information about the experiment. As there was no personal data or identifying information collected from participants no ethical clearance or informed consent from the individual participants was needed according to the Danish Data Protection Agency, which relative to an IRB is the relevant institution in this country for this study.

3. Results & Discussion

We found that the average amount of food waste was substantially higher for the standard plate size (20g) than it was for the smaller plate size (14,8g), cutting overall food waste by 25,8% or 5.2 g. (see Figure 1).

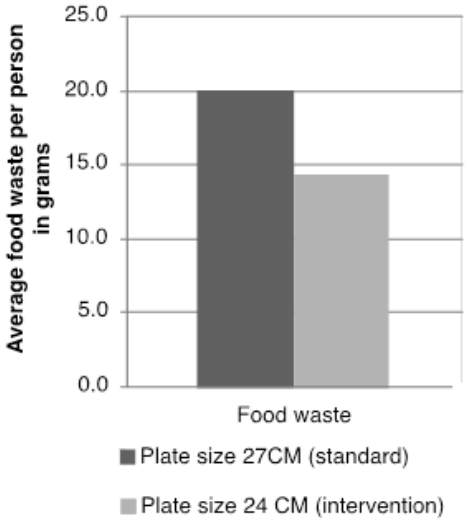

Figure 1 Average food waste per person at a single serving with a 27cm plate and a 24cm plate respectively

Wasted food represents a major obstacle in reducing global warming and securing ecological stability. Given that most food is wasted unnecessarily i.e. not due to industrial production processes, it is not surprising that policy makers and NGO's increasingly allocate resources to support initiatives that reduce food wastage in both industry- and service sectors as well as in private homes.

The increased focus on the issue necessitates more evidence-based discussions on how to engage with the issue cost effectively. In the report "Preparatory Study on Food Waste" issued by the European Commission, five different strategies are suggested and evaluated. The report suggests that consumer behaviour initiatives should be grounded in targeted awareness campaigns [13].

Our field experiment, along with similar research into choice architecture and its effects on behaviour [14], suggests that awareness campaigns may not be the most effective instrument for changing consumer behaviour, when it comes to reducing food waste at the consumption stage. Awareness campaigns may raise reflective public concern and motivate behaviour change to some

degree, but such initiatives could and should be supplemented by a stronger focus on choice architectural effects on behaviour.

Our experiment supports the view that when it comes to the point of consumption the issue may be addressed more cheaply and effectively by engaging with the industries that are responsible for the out-of-home 'foodscapes' i.e. restaurants, cafeterias etc.

Firstly, such an address should supply the industry with practical guidance and the necessary information for them to reduce customer food waste substantially through the use of better choice architecture.

Secondly, it could prove worthwhile to include choice architectural considerations into the private-public discussions on industry standards.

Lastly, it should motivate industry and service providers that strategically make use of choice architectural solutions by granting them the same public merit as we bestow on those who focus on reducing food waste through information and education.

Our experiment also deals with an important and mostly unanswered question in relation to the susceptibility of influence from choice architecture. In some domains, particularly finance and health, previous experiments has let to discrepant effects between different social groupings. In particular, we have seen that lower income groups were, in general, more susceptible to default settings than higher income groups [15].

The 25,8 pct. reduction in food waste from reducing the plate size from 27 cm to 24 cm extends the result from a recent experiment conducted with a hotel chain, which showed that a reduction in plate size lead to similar levels of reduction in food waste [16]. But, our experiment focussed exclusively on the behaviour of CEOs, whereas the participants in the earlier experiments have been students or hotel guests.

This indicates that adopting a choice architectural approach throughout various social arenas independent of income or social status may effectively reduce food waste from cafeterias and restaurants. Our experiment also extends the results from previous experiments by having the control as well as intervention carried out simultaneously, rather than at different periods in time.

Finally, our experiment lends credence to a recent paper on the ontology of different nudges [17], claiming that little difference should be found in the susceptibility to influences from subtle contextual factors, or type 1 non-transparent nudges, across various social groups.

4. Conclusion

Throughout Europe governments and institutions are currently attempting to develop economically sustainable strategies in the effort to improve their carbon footprints. With the EU's 2020 goals focused on transport and housing, food waste might seem insignificant in the greater picture. However, since interventions in the context of food waste are cheap and simple to implement, and save money for caterers while reducing their environmental impact, it should be considered. This study was conducted on a specific target group, in a closed environment with only one controlled real world serving as its empirical foundation. Further experiments using choice architecture to influence consumer behaviour towards a more environmental friendly behaviour in the food service business are highly encouraged.

Author Contributions

Conceived and designed the experiments: PGH AMJ. Performed the experiments: PGH AMJ. Analyzed the data: LRS. Wrote the paper: PGH AMJ LRS.

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Research article:

Plating in gastronomic restaurants: A qualitative exploration of chefs' perception.

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Abstract

The study investigates the extent to which the quality of dishes served in upscale restaurants can be perceived through the appearance of the different ingredients on the plate. More specifically, this study aims at identifying visual parameters of the plate that contribute to the perceived quality of haute cuisine from the perspective of experienced chefs.

Five chefs, with decades of experience in gastronomy, participated in individual semi-structured interviews during a 4-hour tasting meal in an upscale restaurant in Montreal. The free-format responses were analyzed using content analysis followed by linguistic discourse analysis on emerging themes.

The results highlight that although plating is an important factor contributing to the gastronomic experience, the quality of a dish cannot be reduced to its visual appearance. Chefs visually analyze dishes along three lines: the combination of flavors, the quality of the raw products and the culinary techniques used. Further lexical analysis will highlight the best practices for plating in the context of haute cuisine.

1. Introduction

1.1. Context

One factor affecting food liking is its physical appearance (Lyman, 1989). An extensive body of research has investigated the effect of visual cues on perceived quality and food liking (see Imram, 1999; Wadhera & Capaldi-Phillips, 2014 for review).

Among the parameters contributing to food appearance, color has been most thoroughly investigated (Piqueras-Fiszman, Alcaide, Roura, & Spence, 2012; Zellner, Lankford, Ambrose, & Locher, 2010). More recently, the relation between food presentation and consumers preferences has garnered increased research attention (Reisfelt, Gabrielsen, Aaslyng, Bjerre, & MØLler, 2009; Zellner, Loss, Zearfoss, & Remolina, 2014; Zellner et al., 2011). These findings can be applied to a restaurant setting to enhance the gastronomic experience. Indeed, customers' satisfaction in upscale restaurants is strongly influenced by the arrangement of food on the plate (Correia, Moital, Da Costa, & Peres, 2008; Namkung & Jang, 2007). More and more importance is also given to how restaurant dishes are visually presented.

1.2. Research motivation

There are two bases for the present study. The first one is that, while previous studies have demonstrated that visual cues affect food perception at both sensorial and hedonic levels, these effects have not been tested in a ecologically valid setting on a wide range of complex food, with the exception of two recent studies in the context of mid-scale restaurants (Piqueras-Fiszman, Giboreau, & Spence, 2013; Zellner et al., 2014). Our study first aims to test the ecological validity of previous findings in an attempt to bridge the gap between laboratory studies on food liking and actual food consumption in a restaurant setting. The second basis is the fact that the perception of gastronomic cuisine has received scant attention in the literature. If there is evidence that food plating contributes to the perceived quality of a meal in upscale restaurants, further research is needed to identify the relevant parameters and mechanisms influencing customers' judgment.

1.3. Objective

The present study focuses on the perception of food quality through the appearance of the different food components on the plate. More specifically, this study aims at identifying visual parameters of the plate that contribute to the perceived quality of haute cuisine. In addition, we focused on the perspective of chefs who have developed expertise over decades of experience in gastronomiy cuisine. These experts share their experiences, practices and knowledge through discourse. We therefore used a qualitative approach relying on semi-structured interviews and analyzed the free-format responses using content analysis followed by linguistic discourse analysis on emerging themes.

2. Methods

Five chefs (male, 42-62 years old) were interviewed individually during a tasting menu in a gastronomic restaurant in Montreal. All of them had extensive chef experience in gastronomic restaurants in Quebec and Europe. They now hold teaching positions in a culinary arts school in Montreal in different programs (Advanced Culinary Arts, Cucina Italiana, Professional Pastry Making). Following an interview guide, the chefs were asked to visually inspect and describe the different dishes as the meal progressed. Individual interviews lasted around four hours each. Each interview was recorded to allow a complete transcription.

The content analysis informs us on 1) the conventions for plating in gastronomic cuisine, 2) the type of information conveyed through plating, which include aesthetics, techniques and functions of the different food components. We only report consensual views raised by all the interviewees.

3. Results

3.1. Plating in gastronomic cuisine

All chefs mentioned that the visual presentation of a dish is important in gastronomic cuisine. We identified best practices for plating in gastronomic cuisine. Regarding the number of items on the plate, they recommended an odd number of items.

"When I was talking about positioning, I was talking about trying to work with odd numbers rather than even numbers. Because even numbers are limit movement." Cc_78

> *Quand je parlais aussi des dispositions, je parlais aussi d'essayer de travailler aussi avec des nombres impairs, plutôt que des nombres pairs. Parce que les nombres pairs, ils bloquent tout mouvement.*

In terms of shape and arrangements, a chef summarizes his considerations as follows:

"Me, what I teach about plating, is contrast, movement, depth, vanishing point and void. These are the 5 important points for presentations. When you have applied that, you are successfull." Cc_14

> *Moi, ce que j'enseigne avec les présentations, c'est le contraste, le mouvement, le relief, le point de fuite et le vide. C'est les 5 points importants pour les présentations. Quand tu as tout ça, tu as gagné.*

Specifically, in terms of color, chefs compose the plate by spreading the different colors over the surface of the plate.

"For example, if you have a chicken breast, snow peas, broccoli, carrots and a potato on your plate- you should try to not put the green stuff next to each other, instead you should try to separate them to produce a more visually attractive, beautiful dish." Cc_72

> *Surtout si tu as par exemple une poitrine de poulet dans ton assiette, avec mettons, du pois mange-tout, des brocolis, des carottes, puis une pomme de terre, ben faut essayer de pas mettre les trucs verts pas un à côté de l'autre, tu essaies de les séparer puis tu vas avoir une assiette... ton assiette va être plus belle.*

But these best practices are tacit knowledge identified and acquired by experience, there is no explicit frame of reference. Moreover, conventions have evolved over the past decades with the emergence of new culinary trends.

"It is a trend, yes, for four or five years, it became non structured. In the past, you would put everything in the middle in a heap. Today it is spread out" Cb_66

> *C'est une mode, ouais c'est ça, puis pendant quatre, cinq ans, les choses se sont décomposées, il y a eu le temps où on rajoutait tout au milieu, en tas. Aujourd'hui, on étale.*

In addition, some chefs push the limits of the established conventions to create their own style by differentiating themselves from the tradition.

"Because we want to try different things and we have seen a lot of things, like in songs or in art, and you always want something new. And yet this has not been done as of yet". Cc_72

> *Parce qu'on veut faire différent et on a fait le tour de pas mal de choses, que ce soit dans la chanson ou dans les arts, et puis on veut toujours se renouveler. Puis ça, ça n'a pas été fait.*

As an example of breaking established rules,

PF: It seemed to me that we put into the dishes, fish and meat facing the customer.
YP: Well, not necessarily today. Today, it is not a rule anymore. It is not a rule anymore. For sure, if, for example, I have a big piece of meat, if it is there and vegetable in front, that doesn't work. Cb_75

> *PF : Il me semblait aussi qu'on mettait dans les plats, le poisson et la viande face au client.*
> *YP : Ben pas forcement, aujourd'hui. C'est plus une règle ça aujourd'hui. C'est plus une règle. C'est sur que si par exemple, j'ai un gros morceau de viande tantôt, si elle est là-bas et le légume devant, ça marche pas.*

In addition to the aesthetics of plating, visual cues are used by the chef as quality control of the dish, before it is sent to be served. This expertise is also acquired by experience.

"And after that, the chef, he is looking at the plate which arrived in the kitchen passage and the chef is capable, he has enough experience to tell if the meat is done right. He can see it visually. There's also all the experience as a chef, his baggage. He can see visually if the meat is done right, if the vegetable is cooked properly, whether the sauce is on correctly or not." Cb_230

> *Et après ça le chef, il voit arriver au passe, il voit arriver l'assiette, et le chef il est capable, il a assez d'expérience pour dire ta viande est trop cuite ici, ça se voit visuellement. Il y a aussi toute l'expérience du chef, son bagage. Comme je te dis, il est capable de voir, juste un légume si il est assez cuit ou pas assez cuit, voir si la sauce elle a tourné ou pas, voir la viande si elle est trop cuite ou pas.*

But gastronomic food quality is not only defined through its appearance. Plating is important but not sufficient. A visually pleasing dish creates expectation and the dish itself, as experienced through taste, must be up to par.

"Plating is one thing, it is good. But the dish has to come up to expectations also. Sometimes, in some restaurants the platings are very very beautiful, like paintings, and look like works of art. But after that, in terms of flavors, it doesn't work. So it must be both visually beautiful, and at the same time, it should be good also". Cb_25

> *La présentation est une chose, c'est bien. Mais il faut que le plat assume. C'est à dire que des fois, il y a certains restaurants où il y a des présentations qui sont très très belles, comme des tableaux, on dirait des œuvres d'art. Sauf qu'après ça, gustativement, ça n'assume pas. Donc il faut que ce soit beau visuellement, mais en même temps que ça assume, c'est à dire que ce soit bon aussi.*

"I was a maniac about it, you know, plating, the visual. Not just that, ensuring taste as well. Most

importantly, first comes product quality and taste and then, very sophisticated plating". Ca_77

J'étais maniaque de ça, tu sais, de la présentation, le visuel. Pas juste ça, j'enlevais rien au goût. Le primordial, c'était la qualité des produits, le goût et après c'était présentation très sophistiquée.

3.2. How do chefs analyze plates visually?

Chefs analyse gastronomic dishes visually along three lines.

a. The combination of flavors

The chefs all started by identifying the different products arranged in the plate and then imagined the combination of flavors to predict the quality of the dish by looking at it.

"I think this is a great mixture. White truffle, leek, topinambour, they are mixtures ... I think, classics for truffles, you know, you're talking artichoke, leeks, truffle. topinambour seems like artichoke. So topinambour, truffle, it goes very well together. Leek and truffle it goes very well together, so we are in a classic blend of taste ... This is super nice, I like it ». Ca_179

Puis je pense que c'est un mélange génial. Truffe blanche, poireau, topinambour, ce sont des mélanges euh… je pense classique pour la truffe, tu sais, tu vas parler artichaut poireaux truffes. Le topinambour ça goute beaucoup l'artichaut, donc… topinambour truffe, ça va très bien ensemble. Le poireau et la truffe ça va très bien ensemble, donc on est dans un mélange très classique de gout… C'est super beau, j'aime.

Each item on the plate (e.g. dish, side dish and condiment) must serve a gustatory function. Chefs complained about the use of ornaments with no practical purpose other than decoration.

"If it doesn't add to the taste, don't do it. It's like those who put mint leaves in ice cubes, you know. If the taste of mint has no reason to be there, don't put mint leaf. The leaf here must be in line with the dish. It must bring something new. Otherwise, if it doesn't bring anything, don't put it. Everything has to have a reason to be there". Cb_94

Ça n'a pas de fonction gustative même, c'est pas… c'est… faut pas faire ça. C'est comme ceux qui mettent la feuille de menthe dans les glaçons, tu sais si le gout de la menthe n'a pas de raison d 'être, on met pas de feuille de menthe. La pousse qui est là, doit être en accord avec le plat. Elle doit apporter quelque chose de nouveau là. Mais sinon, si elle n'apporte rien, on la met pas. Chaque chose a sa raison d'être.

"Ducasses didn't want to put unnecessary herbs on a plate. For example, if you put roquette... Roquette has to bring taste to the dish. So it has purpose. But you know, there are many chefs who put herbs for decoration, when it doesn't have a reason to be in the dish, Ducasses kept telling us, grass, it serves to hide what it is underneath". Ca_75

Ducasses il voulait pas qu'on mette d'herbes inutiles sur un plat. Si mettons, par exemple, là tu mets de la roquette. La roquette, c'est pour amener un gout au plat. Donc c'est important. Mais tu sais, il y a beaucoup de chefs qui mettent des herbes en décoration. Quand ça a pas lieu d'être dans la préparation, Ducasses, il nous répétait, l'herbe ça sert à camoufler ce qu'il y a en dessous.

b. The appraisal of raw products

Visual cues are useful to assess the quality of the products used based on color and gloss of the different items in the plate

"You know, if you have dull things, it is not appetizing. Gloss means a beautiful nice glaze, a nice firing". That's it. Ca_156

Tu sais si tu as que des choses ternes et tout ça, c'est pas appétissant. Le brillant ça veut dire, c'est un beau glaçage, c'est un beau poêlage. Voilà.

The disposition of products in the plate provides information about product quality, by emphasing certain products.

"The meat, it must be very good because it is a highlight- look, this is not overloaded. Vegetables are laid in the back, and the potatoes and starches are served separately". Cb_238

La viande, elle doit être de très bonne qualité parce que elle est mise en avant, regarde, c'est pas surchargé. Les légumes sont mis en arrière, et puis on nous apporte des pommes de terre et des féculents à part.

High-quality products will be minimally processed.

"Norman Laprise, for him, the product must be denatured as little as possible. For example if he is presenting a carrot in the dish, where there is a carrot, a potato, and a piece of meat, the carrot will be as beautiful as possible (...). It will not be pureed, it will not be chopped, it will be the carrot on the plate as is, that's it. He will try to distort the product as little as possible. That is his way of working method ». Cb_50

Norman Laprise, lui, c'est dénaturé le produit le moins possible. C'est à dire, par exemple s'il présente une carotte dans l'assiette, là où il y a une carotte, une pomme de terre, un morceau de viande, la carotte elle va être la plus belle possible (…) puis, elle sera pas mise en purée, elle sera pas mise émincée, elle va carrément être la carotte dans l'assiette,

comme ça, bien cuite. Il va essayer de dénaturer le moins possible le produit. Sa manière de travailler c'est ça.

The way products are cooked also provides information about food quality.

"But in my opinion, when you have a product that is coated with another, then another, and then a sauce, you end up by not seeing the product... (here) I am sure that the fish that is served, it is the star. So it will be fried, simple, sea salt. There will be stuff all around. But I'm sure they will not cover the quality of this product, I am confident, anyway". Cc_27

Mais à mon avis, quand tu as un produit qui est enrobé d'un autre, puis enrobé d'un autre puis enrobé d'un autre, puis y'a une sauce et tu vois plus le produit.. (ici) je suis certain, que ces poissons là, qui sont servis, c'est la vedette. Donc il va être poêlé, simple, fleur de sel. C'est tout autour qui va avoir les trucs. Mais je suis certain qu'ils vont pas couvrir la qualité de ce produit là, j'ai confiance en tout cas.

c. The culinary techniques

The chefs assess the quality of a dish based on the culinary techniques used to realize it. According to them, the amount of work necessary is perceived only by the experts.

"What makes the dish that beautiful? It's simple, it was served in a shallow dish, the egg was topped with a sauce that was ivory, there were green dots all around. But they were 1 mm, 2 mm dots, all equal in size. And there must have been 200. That's it. And there was a small flower on top. This is all what was on the plate. So it is to push audacity. So the egg, I think it's a nice dish". Cc_36.

C'est quoi qui fait que le plat, il est beau? Ben c'était simple, là, c'était servi dans une assiette creuse, l'œuf était nappé d'une sauce qui était ivoire et puis y'avait des points verts tout autour, mais les points là, c'était des points qui étaient de 1 mm, 2 mm, tous égaux, puis il devait en avoir 200. That's it, puis il y avait une petite fleur sur le dessus. C'est tout ce qui avait dans l'assiette. Donc c'est de pousser l'audace. Donc l'œuf, moi je trouve que c'est un beau plat.

"Everyone has this blend of taste because it is a blend of classic taste. But he presented it differently. So tonight, he wanted to put it like that, but it's great, there is crustiness, it's beautiful, there's a lot of work put in, it takes time to make potatoes as spaghetti, there's work in the plate. Yes, I loved that, you know, visually it is beautiful. When you're an expert, you know the work involved in each step". Ca_201

Tout le monde a fait cet assemblage de gout parce que c'est un assemblage de gout classique. Mais il l'a présenté différent. Donc lui ce soir, il avait envie de le mettre comme ça, mais c'est superbe, hein, il y a du croustillant, c'est beau, y'a beaucoup de travail, c'est long à faire les spaghettis tournées, la forme de patate, y'a du travail dans l'assiette. Oui, moi j'ai adoré ça, tu sais visuellement, c'est beau. Quand tu es un peu connaisseur, tu sais le travail qui a dans chaque étape.

To summarize, chefs analyze dishes in terms of the combination of flavors, the quality of the products themselves and the culinary techniques used.
Each of these three elements contributes to the perceived quality of gastronomic cuisine.

4. Discussion

Previous research focused on the influence of appearance of dishes on the assessment of meals in restaurant. Results highlight the fact that aesthetic aspects of the dish are influencing individual assessment. The literature we studied took into consideration the perception of naive individuals most often in a laboratory context. Our study took place in a real context of restauration, during a tasting menu, interviewing chefs who have developed expertise over decades of experience in gastronomic cuisine. The results of the present exploratory study show that from the perspective of culinary and pastry chefs, gastronomic food quality is not only defined through its appearance. Best practices have been identified for plating in gastronomic cuisine, regarding the number of items on the plate, the arrangement of food and color… However, plating is important but not sufficient. A visually pleasing dish creates expectation and the dish itself, as experienced through taste, must be up to par. Concurrently, three visual elements contribute to the perceived quality of gastronomic cuisine: the combination of flavors, the quality of the products themselves and the culinary techniques used. In other words, the results of this study are in line with the previous, which identified the dish's aesthetic composition as a relevant parameter to create a guest experience in restaurant. However, from a chef view point, the composition of a dish has to be aesthetic and has to be functional.
To go further in the analysis of the perceived quality of a plate in gastronomic restaurants, it seems interesting to analyze the terms used by chefs to describe the plating. The first step of this ongoing work showed us a tendency of the chefs' usage of the term « beautiful » in different contexts of a sentence, such as plating description but also a culinary technique and cuisine in general. A lexical analysis will be further conducted

to better understand the use of specific adjectives to describe the plating of a beautiful plate in a gastronomic restaurant, depending on the context it is used in.

5. Conclusion

This ongoing work aims at exploring the chefs' perception of plating, by identifying visual parameters adapted to the gastronomic restauration. The semi structured interviews highlight that although plating is an important concept taking part of the gastronomic experience, it is not sufficient to define the quality of the dish. Chefs analyze plating along three lines they can assess visually: the combination of flavors, the quality of products themselves and the culinary techniques used. Further lexical analysis will be conducted to better understand the use of specific adjectives to describe a "beautiful" dish in a gastronomic restaurant.

Future research will look into the perceived quality of plate in a non-chefs perspective of the specific context of gastronomy. It will allow us to study if the parameters identified by the chef are also perceived by the eaters or if they have different expectations regarding the plating in gastronomic restaurants.

Together, the findings will highlight salient parameters along with the meaning they convey in the context of gastronomic restaurants.

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Research article:

Eating together, dying together. Playing commensality in French nursing homes.

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Abstract:

Based on an ethnographic investigation in EHPAD[1] , the article describes the practices and interactions that take part in the daily organization of a shared meal in the context of an accommodation focused on the management of physical and psychological dependencies of individuals in the final stage of life.

Keywords: Commensality, meal, EHPAD, dependency care, end of life

[1] Établissement d'hébergement pour personnes âgées dépendantes (EHPAD) : accomodation facilities for dependent elderly.

1. A traditional meal?

Social science studies on daily life in EHPAD underline the pivotal role of meals, either defined as "one of the last occasions for residents to take part in a social context" (Mallon, 2004, p. 137) or as the "neuralgic place" of every institution (Doutreligne, 2006 : 53). If the meal is so important, it is because it concentrates the main missions of the institution, which are care and accommodation: that means the maintenance and fixing of the patients' bodies on the one hand (Macia, 2008 ; Doutreligne, 2008 ; Rimbert, 2011), and the possibility to recreate a last "home" on the other hand (Mallon, 2004). It is at the heart of three major activities that are housing, nursing care and medical care" (Darmont & Martin, 2007).
At first glance, the meals served are fairly traditional : set times, set place where meals are taken, there is a collective dimension to the food intake, and the observance of various calendar events at the table[1] (Herpin, 1988). Residents share breakfast, lunch, afternoon tea and dinner on a daily basis, at the same time and in the same institution. They are part of the 52% of the French population who are having lunch every day at around 12.30 (De St Pol, 2005). At the same time every day, personal care assistants and auxiliary nurses help them eat depending on their level of physical and psychological dependency. As most of the residents are suffering from several pathologies[2], they require daily professional assistance. The question of food is incorporated within the framework of a both short and final accommodation[3]: life expectancy when entering the institution averages 3.8 years (Observatoire national de la fin de vie 2013). That being said, eating together is a daily rule in nursing homes except in three main situations: the presentation of a medical certificate that allows eating in the bedroom, hospitalization or the final exit from the institution. In this context, explaining the social aspect of food through reasons related to family, friends or work (De Saint Pol, 2005 : 70 ; Larmet, 2002 : 191) does not suffice to depict a situation where individuals are gathered and fed on a daily basis rather than gather and eat together by themselves. Eating is part of the management of residents' dependency. There are on average 61 professionals working full time, for 100 residents in 2007, 55% of which were identified as being highly dependent (DRESS[4] , 2014). This percentage keeps increasing since the early 2000s (DRESS, 2014). When it comes to eating, some residents can experience difficulties in moving around, finding a seat in the dining room, or in cutting and ingesting food. At the table, mutism is confronted with physical paralysis, oblivion, constant wandering, and various kinds of tremors and pains depending on situations. Zimmer frames, canes and wheelchairs appear to be almost as numerous as the residents taking part in the meal. Thus, simple tasks such as putting food in one's mouth characterize the shared meal, meaning a meal where every resident is given the ability to eat and drink.

2. Methodology

The ethnographic investigation was conducted between September 2012 and June 2014 in two institutions, both belonging to the same EHPAD associative group. The first institution, located in the south-east of France, hosts 107 residents. The second one, located in Paris, hosts 92 residents. Data were collected through participant observation and the writing of a field diary during and outside meals. Observing, listening and experiencing life in these institutions was made possible through various activities such as meals (breakfast, lunch, afternoon tea and dinner), participating in daily activities (music, movies, lottery) and attending staff meetings. The data were complemented with residents' medical files and several informal interviews. All ethnographic cases mentioned were made anonymous. The references to the field diary are noted with [JT] and the date of observation.

[1] In his sociological investigation of the evolution of eating habits, Nicolas Herpin hypothesizes on the more and more individualistic French eating habits, based on five different criteria making the difference between a "traditional meal" and an "unstructured meal". Defined moments (breakfast, lunch, dinner), defined place, collective activity are the main elements defining the traditional meal.

[2] Treatment of more than three pathologies on average (Vetel, 1999: p.434).

[3] « Nursing homes have become a frequent place of death of the nursing home residents » (Morin L., Rotelli-Bihet L. & the DeHPAD study group, 2014).

[4] DREES : Direction de la Recherche, des Etudes, et de l'Evaluation et des Statistiques. The Directorate for Research, Studies, Evaluation and Statistics conducted an investigation through questionnaires on the options regarding residential facilities for dependent elderly in 2011, see Dress, n°877, February 2014

3. Commensality with all their might

During an informal interview, Radja (50-year-old mother of two, married, daughter of a taxi driver and a stay-at-home mother of Moroccan background) describes the evolution of the meals she has witnessed during her career in the institution, first as a care assistant (for seventeen years) and now as a hotel tasks manager (for nine years).

"We used to be able to do lots of things with the residents like chatting for instance. Now it is almost impossible as there are more and more pathologies like Alzheimer or dementia. We were almost fighting between nurses to know who was going to sit next to a resident to spoon-feed him because it was only a couple of them at that time. Let's say there were much more "normal" people who were eating "normally" to put it this way. Have you seen how many residents we have to feed and watch at the same time now ? Between those who cannot sit still for more than ten seconds, those who have troubles drinking, those who cannot move their arms, it's sad to say but it's almost a production line kind of work" [JT 20/05/14].

The employees of the institution consider that giving up on certain ways of behaving at the table is contributing to the loss of eating normality, understood as the situation in which individuals actively participate in gathering in a same place, and following rules like "table manners" (Fischler, 2011; Corbeau, 2008). The accommodation of highly dependent residents requires a new rationalization of the meal service, more focused on manual tasks and verbal tasks. It is a professional adjustment on a case-by-case basis depending on the level of dependency, assessed by a doctor and based on a nationally recognized[1] evaluation scale (Benaim, C. & al., 2005). Six stages of dependency are defined by criteria linked to the ability to move about in space, to communicate, to eat, to get dressed and to use the toilet. This helps determine if the resident needs occasional, partial or full-time assistance. "Doing things by themselves" is the decisive factor to determine their autonomy. It follows that a resident will be considered all the more dependent since he needs assistance to eat, that is to say to bring food to his mouth, chew and swallow, among other things. I have noticed that the care assistants and nurses express this institutional classification in their own words, often using the metaphor of absence to talk about residents, making the difference between those who "are almost gone", those who "are not quite there" and those who are "still here" (the fewest of them). So many expressions that tie in with the common representations of the Alzheimer syndrome, associated with "the dehumanization and debasement of the self" since the 1960s (Kapferer, 1979). The transgression of certain social norms –such as autonomy, continence, productivity- represents a crack on the very human status of individuals who are affected by it and have to be taken care of. (Herskovits, 1995)

4. Eating together apart

At around 11.30, right after the morning wash, personal care assistants and auxiliary nurses go from room to room to make sure that the residents are heading towards the dining room where their nominative seat is reserved. On every floor, they wait for the lift. They are between 50 and 90 to move at the same time and for the same reason: eating together. Climbing floors up and down is supervised by professionals and requires to squeeze together in the lifts to make room for wheelchairs and Zimmer frames. A seating plan, generally displayed on the wall, explains every resident's assigned seat and diet. The dishes are the same for everybody. The texture is the only aspect that is modified, that means mixed, when a resident is medically declared as having trouble swallowing. Thus, if the residents eat together, it is in differentiated dining spaces.

During the ethnography, I noticed how the difference between residents who are more or less "here" is made visible during shared meals. Levels of dependency find themselves both gathered together and isolated from others. In the EHPAD situated in the south-east of France, these differentiations are inscribed in the dining space and named. Indeed, there are four different dining rooms, each with a different name, located between the kitchen and the front desk. Residents identified by employees as being the most autonomous are gathered in the Atrium room:

[1] The national GIR scale (Groupes Iso-Ressources) allows to assess the degree of physical and psychological dependency of an elderly person according to 17 variables linked to behavior, communication, orientation in space and time, nutrition, elimination, transfers, the ability to wash, get dressed and move about (inside the building of the institution). It affects individuals living at home or in institutions, and serves as a basis to determine the amount of the PAA (Personal Autonomy Allowance) received, see Benaim, C. & al. « Evaluation de l'autonomie de la personne âgée », Annales de réadaptation et de médecine physique 48, 2005, pp. 336-340.

assistance at the table is available, but rather occasional when it comes to help cutting food, pouring water or getting up from the table. In Ancient Rome, the atrium refers to the central room of the house; the most open to the outside. In the EHPAD observed, this is the dining room that is the closest to the main entrance, probably because it is the most presentable one of the institution.

The most dependent residents are gathered in the Acacia room. Wheelchairs, bibs, employees spoon-feeding and cleaning the faces of the residents can be seen all around. Care assistants and nurses mime certain gestures or touch the person they are taking care of to bring them back to eating if they fall asleep or stay still. Eating is supervised and encouraged when a resident does not finish his plate because he forgets, is physically unable to, or refuses to.

Residents identified as "semi-dependent" are gathered in the Lime room: they receive more assistance than in the Atrium room but still less systematically than in the Acacia room. The employees repeat certain gestures such as pouring, cutting or stirring food for the residents. They do not automatically help the residents put food in their mouths but only when they are physically unable to do it by themselves.

The Chanterelles room is part of a closed unit with a large rectangular table, couches, a television and toilets. It is reserved for residents diagnosed with Alzheimer or dementia who spend their day here, from 11 am to 7 pm. A care assistant is in charge of table service, which implies defining the situation of the meal: regularly reminding residents of the date and the menu for instance.

Depending on the dining rooms, table service does not imply the same amount of work from employees. Eating differentiations go from eating alone to being fed by others, from a service on plate (for autonomous residents) to a service demanding more physical investment from employees (for dependent residents). In this latter case, helping to eat consists in putting food and drinks in the residents' mouths.

A shared meal implies practices that set up the social frame where food intake is ensured according to the resident's physical state. In this context, "feeding" consists in a social regulation of rhythms and levels of ingestion and implies a supervision of the sitting plan, of the different textures of the food and of the feeding methods. Different eating practices define different social situations[1] within the institution depending on, for example, if the resident eats "normal" or "mixed", if he is given a plate, if his food has to be cut for him and put into his mouth, if he wears a bib or not. At the table, while verbal interactions are mostly a one-way exchange (from employees to residents), the physical dimension of the service becomes more and more decisive.

Even if residents eat together, they do so in different ways and with different objects, which would lead to think that body movements, seats, positions, frames of mind at the table express the different relations between social status, space, and political power (Haroche, 1998: 377). "The physical space delimited of the table is a social space. The arrangement of participants around it both reflects and determines relationships between them. It also places them in a hierarchical structure." (Fischler, 2011: 535) Commensality contributes to the creation of distinctions: we eat together, but differently according to the levels of dependency.

5. Conclusion

This communication focused on commensality in EHPADs from the perspective of the management of old age dependencies. The aim was to show how the daily management of physical and psychological degradations during the meal results in a game of inclusion and exclusion of the residents in different eating spaces according to different "body techniques" (Mauss, 1934). In this context, the shared meal becomes part of a socially differentiated work on body boundaries, depending on whether the residents are able to take on the management of the substances that go in and out of their body. The supervision of the food intake is one of the different tasks related to the maintenance of the bodies that also includes cleaning, dressing and bowel and bladder control. These tasks are performed to various degrees by care assistants and auxiliary nurses and create distinctions between residents considered to be more or less "alive", and whose subjectivity is thought to be more or less close to humans or to animals depending on their behavior at the table and the objects used to eat. The fork, for example, whose importance in the civilizing process (Elias,

[1] As Sébastien Doutreligne rightly pointed out: "A number of actions related to residents' ordinary lives (feeding them, bathing them, helping them walk) can be subject to specific care programs including, for some, specialized gestures" in Doutreligne, 2006, "Regard ethnologique sur les maisons de retraite, Horizons stratégiques, n°1, p.103"

1969) was demonstrated by Norbert Elias, places every resident depending on whether the use of this object is maintained or if it has been replaced by a spoon, and whether the resident uses this spoon himself or needs an employee of the institution to feed him. An EHPAD is an "in-between space" (Pouchelle, 2013), where accommodation is both temporary and definitive.

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Research article:

Teaching and learning linguistic and interactional skills in table waiting vocational training - How to deal with competence building?

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Abstract

This research paper relates to the linguistic and interactional skills' transmission in the context of the table waiting vocational training. Adopting a qualitative and inductive approach borrowed from ethnography and based on participant and non-participant observations (video recording, note taking, interviews), we analyzed how operates the transmission process of the aforementioned competencies. We briefly present our findings in this article, which highlight that a complex collective dynamic takes place to achieve competencies transfer, questioning the individualizing approach of vocational skills training and assessment.

Keywords: learning and training, ethnography of communication, discourse analysis and interactional sociolinguistics, multimodality, training engineering

1. Introduction

The impetus for this study, anchored in the cross-disciplinary interests of linguistics and educational sciences and related to research in vocational didactics and interactional linguistics, emerged from different backgrounds. Firstly, in the services sector, not only catering professionals currently face drastic changes in their interactions with customers, but, according to A.N.P.C.R. (Association Nationale des Professeurs de Cuisine et Restaurant des C.F.A.), since the arrival of TV programs such as Top chef or Masterchef, most young people (75%) interested in the hospitality and catering sector orient themselves towards cooking careers rather than hospitality careers (only 25%). In contrast, 20 years earlier both career options attracted the same number of students. Secondly, in the research area, a previous study (C. Hugol-Gential, 2012) has showed that interactions between customers and the waiting staff in restaurants are crucial to the customers' appreciation of the food served. Thirdly, in the training field, despite previous comments, there is still no effective program in the curricula of the table waiting vocational training especially dedicated to language and interactions that could especially prepare waiter or maître d'hôtel apprentices to master the communication skills essential to the smooth running of the activity.

In this paper, we present a part of our PhD project that deals with the linguistic and interactional skills' transmission in the context of the table waiting training. We focus on these skills which have been identified as paramount to the professionalization of waiters, owing to their impact on the successful functioning of the restaurant service and customers' satisfaction. With this perspective, this study aims at describing and analyzing the transmission process of the aforementioned linguistic and interactional skills during the table waiting training: does it correspond to an individual, bilateral, or multilateral dynamic? Our Analysis shows that what we usually perceive as a bilateral relationship of knowledge exchange between the students and the trainer is in fact a complex dynamic process of training assumed by all participants of the work activity during the training sessions.

2. Research methodology

With regard to our research scientific framework, our methodology depends on a qualitative and inductive approach of the interactional dynamic that takes place during table waiting training activities at the Paul Bocuse Institute into a multimodal perspective (verbal and nonverbal language). Our scientific experimental research process consisted of participant and non-participant observation phases of the theoretical and practical training related to the table waiting activity in its linguistic and interactional dimensions. This experiment enabled us to collect, by video recording and note taking and interviews, empirical data revealing work or training practices conducted and collected in the context of the first year of the Bachelor's degree in International Hotel and Restaurant Management of the Paul Bocuse Institute, in collaboration with those involved (trainers and apprentices).

The sample we worked on concerns the training of two groups of students from the first year of the Bachelor's degree in International Hotel and Restaurant Management at the gastronomic restaurant-school *Saisons* of the Paul Bocuse Institute. We integrated the first group during three weeks to be trained with them as an apprentice, in order to experience the training process from within, and during three other weeks we recorded some sessions of the second group, in order to collect data of the training progress and evolution over time we could analyze in retrospect with the field notes taken during both periods.

The data study took place after transcription of selected extracts of the data set, and consists in analyzing the use made of language and multimodal communication resources in their double praxeological and interactional dimensions, and in identifying all the specific interactions that take place during the service training sessions in Saisons dedicated to the transmission and building of the linguistic and interactional skills needed in the table waiting activity. For this analysis, we use the tools of vocational didactics and linguistics which entails considering training as a collective construction of transmission.

3. Results and discussion

L. Filliettaz (2008) underlines (referring to Schwartz 2000: 499) that when analyzing performance at work, we observe that the overall efficiency of a work team doesn't correspond in any case to the addition of individual competencies assessed separately. This observation points at a problematic individualizing approach of work, in a global system that tends to evaluate work activity as the result of an individual process (which is reflected through employment, job classification, promotion, …), whereas the reality of practice confirms that work is performed through a complex collective dynamic.

Considering linguistic and interactional skills definition, which is the operational aim of our research, it raises the issue of the perspective to adopt, individual or collective, for analyzing work activity.

On this point, what becomes clear from our analysis of work-based training practices is that the training process is never mainly assumed by the trainer alone for a student in particular, neither even by the trainer alone for the whole group of students, but all participants of the work activity contribute in their own way during the training sessions, to build table waiting skills through various and complex interactions.

The training interactions we can notice consist of interactions between:

1. The students and the maître d'hôtel-trainer,

2. The students themselves,

3. The students and the kitchen staff,

4. The students and the customers,

5. The maître-d'hôtel assistant and the whole staff.

And these interactions take place in various spaces with different modalities:

1. The back-office of the restaurant (the strategic crossroad of all the spaces) and the dining area (in the absence of customers) are the field of the maître d'hôtel-trainer,

2. The kitchen is the field of the kitchen staff, particularly the chef and sous-chef

3. The dining area (in the presence of customers) is the shared space of customers and the maître d'hôtel, with the preeminence of customers

4. The assistant maître d'hôtel holds the role of a general assistant for both the kitchen and the waiting staff, constantly shifting location throughout the restaurant area.

Therefore, we drew from our analysis that it's mainly through this interactional training process, that students achieve the level of expertise expected in relation to the linguistic and interactional skills required in the table waiting activity. Consequently, this leads us to think that skills building should be considered from a collective point of view, according to "the knowledge co-construction" dynamic described in various scientific fields by Vygotski (1985), Filliettaz (2008, 2012), Kunégel (2011) and Mondada (2006), which opens up major porspects for training engineering perspectives.

4. Conclusion and perspectives

Supporting the idea that the common individualizing perception of work doesn't correspond to the reality of practice, and that, on the contrary, interactions are the basis of skills building in the table waiting activity, this study opens up new perspectives to improve training practices and methods of teaching language and interactional skills in the table waiting vocational training. As a consequence, with these improvements, this study is foreseen to guarantee the excellence of the training at the Paul Bocuse Institute at the leading edge of research, and furthermore, is supposed to bring the final possibility to provide a general model for teaching linguistic and interactional skills to the vocational training field. This model could help the profession to properly prepare the apprentices to face customers and in the long term to contribute popularizing again this career amongst young people.

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Field Notes:

The impact of chemotherapy on taste preference

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Abstract

Chemotherapy induces various physiological, psychological and social disturbances in cancer patients. Patients under treatment were interviewed before and during treatment regarding their food preference. They were asked questions related to taste in order to identify specifities of food charges due to chemotherapy. This allowed to precise more specifically the disturbances induced by the treatment. After 3 cycles of chemotherapy, the patients seemed to have a loss of sensibility of the receptors for the salty taste, since they generally added salt to their dishes. On the contrary, the sour taste seemed to be over-pronouced or disturbed. The study needs now to be reproduced with more patients

Key Words: Chemotherapy – bronchial cancer – sensory distrubances – taste – pleasure of food

1. Introduction

Chemotherapy induces various physiological, psychological and social disturbances in cancer patients [1]. Sensory impairments have also been suggested as potential impacting mechanism, including the olfactory system [2]. A study of olfactory function performed in 15 bronchial cancer patients receiving cisplatin and 15 control subjects, suggested that cisplatin therapy in bronchial cancer patients impairs the pleasure of perceived food odours, which may account for disturbances in food intake and quality of life in this population [3].

The aim of this study is to examine whether chemotherapy treatment affects taste and smell preferences for patients diagnosed with cancer. The statistics are based on the following hypothesis:

H0 = There is no difference in the taste preference before and after the third cycle of treatment with chemotherapy. The habit of using specific food ingredients to the dish in order to make it taste good remains the same before and after treatment.

2. Method

The study was carried out in 2013 in 2 hospitals in Toulouse and 2 hospitals in Lyon. Cancer patients at these four hospitals were asked to answer a questionnaire at four different cycles of treatment (C1, C2, C3 and C4). Some patients were included during the clinical study and answered only the last questionnaire(s). The patients were asked question related to taste and to smell.

For the questions regarding taste, eight different food components presenting a typical taste or trigeminal sensations (pungent) were selected:

- sugar,
- salt,
- pepper (trigeminal),
- mustard (trigeminal/acid),
- ketchup (sweet/salty),
- vinegar (acid/trigeminal),
- soya sauce (umami),
- lemon (acid).

Patients were asked whether they had a habit of adding the food items to the dish in order to make the dish taste good.

2.1. Description of sample

The sample size contains in total 182 patients. Out of these; 27 patients responded to all four questionnaires, 45 to three, 51 to 2 and 59 only responded to a single questionnaire.

The aim of this study was to see if chemotherapy had any influence on participants' taste and smell preference. For this reason we were only interested in the patients who answered the questionnaire before first treatment (baseline, C1). If the chemotherapy had any influence on taste, it should be possible to detect this effect after third cycle of chemotherapy (C3) why this was chosen as the comparison point.

87 patients responded to the first questionnaire, and were compared with independent answers from 87 patients responding to C3. As taste is shown to be very individual the independent sample (n=87) was compared with a depended sample were only patients who responded to C1 and C3 were included (n=48

Analysis

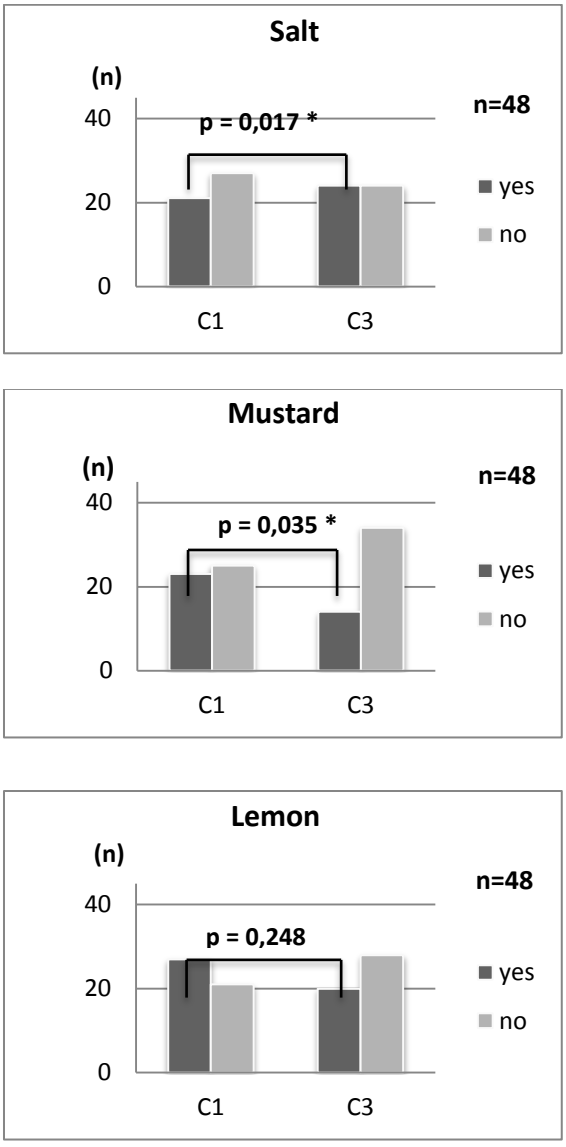
Statistical analyses were performed using SPSS (Version 21.0 SPSS Inc., Chicago, IL, USA and R statistics). All p-values reported were two-tailed and statistical significance was indicated at $p < 0.05$. Histograms were made to obtain an overview of the data (Appendix 1-2 and 4-5). As data was nominal McNemar's test was used to test whether the taste preferences changed between C1 and C3.

3. Results

The results showed a significant difference for the following food components: salt (p = .017), mustard (p = 0.035) and lemon (p =. 005) between C1 and C3 (***figure 1***). Regarding the habit of adding mustard a significant decrease was found for both the dependent sample (n = 48) and the independent sample (n = 82). Salt was found to be significant increasing for n = 48. Lemon was found to be significant decreasing (p = .005) for (n=87) but this significance was not obtain in the depended sample (p = .248). No significant results were found among the other food

components. Nevertheless, it seems the patients' taste preferences are more likely to change for the food components containing acid (mustard, vinegar and lime) even though this is not always significant (See appendix).

a) dependent sample (n=48)



b) independent sample (n = 82)

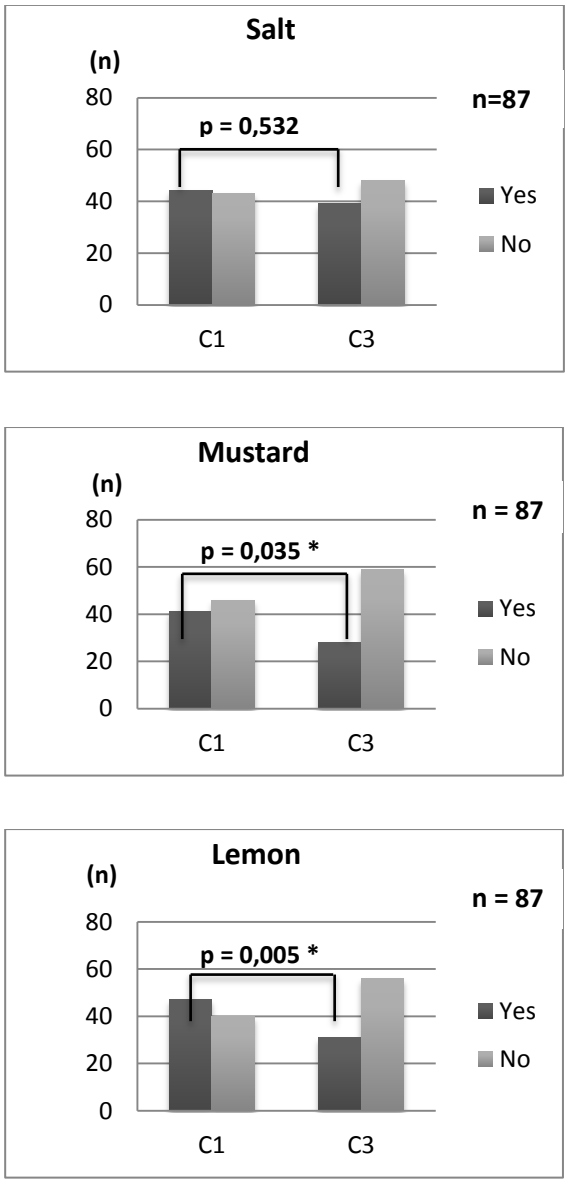


*Figure 1 – Differences in habit of adding the food components between C1 and C3 a) n=48 and b) n=87*significant difference between C1 and C3*

4. Discussion

After 3 cycles of chemotherapy, the patients seem to have a loss of sensibility of the receptors for the salty taste, since they generally add salt to their dishes. On the contrary, the sour taste seems to be over-pronouced; indeed patients generally decrease the use of moustard, lemon and vinegar in their dishes. Practical tests might allow the precision of taste distrubances, in term of quantifiфcation and qualification.

5. Conclusion

This study allowed to precise more specifically the gustative and olfactive disturbances that are induced by the chemotherapy with cisplatin. But it was performed only in a very small number of patients, so it needs to be reproduced with more patients. Understanding how chemotherapy treatment affects odour pleasantness is a central question for cancer patients, because odour hedonics plays a determining role in the recognition and enjoyment of foods.

Acknowledgment

The authors wish to thank the scientific committee involved in this research - Moustafa Bensafi, Martine Laville, Julien Mazières, Jean-Pierre Poulain, Pierre-Jean Souquet - as well as the medical teams who participated to the fieldworks - CHU Lyon-Sud, Hospices civils de Lyon, Service de pneumologie, Groupe hospitalier Lyon Sud and Clinique des voies respiratoires, Hôpital Larrey, CHU Toulouse, Service de pneumologie, Toulouse.

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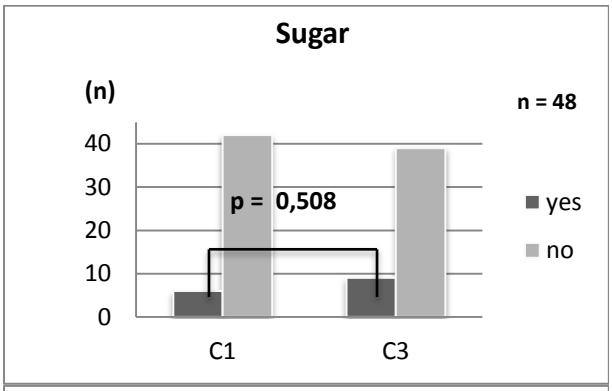
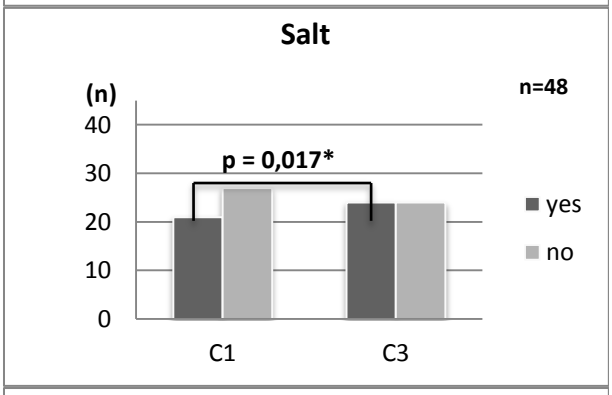
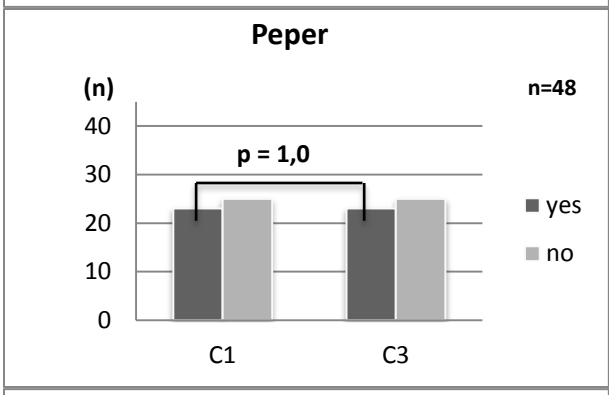
Appendix 1: Histograms taste n = 48

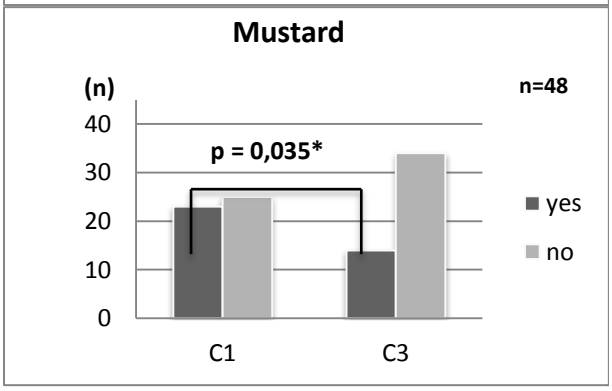
(dependent sample)

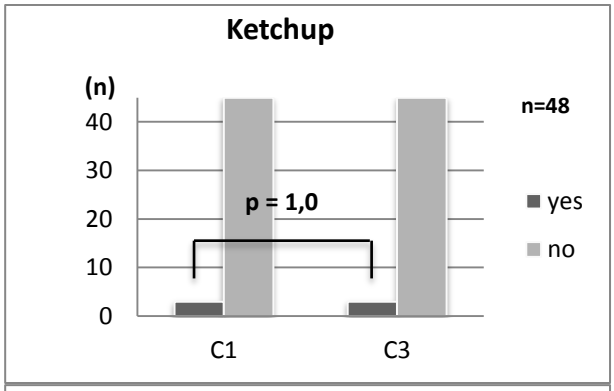
Question 16: Habit of adding food components to the dish before diagnosis (C1) and after 3 cycle of chemo (C3

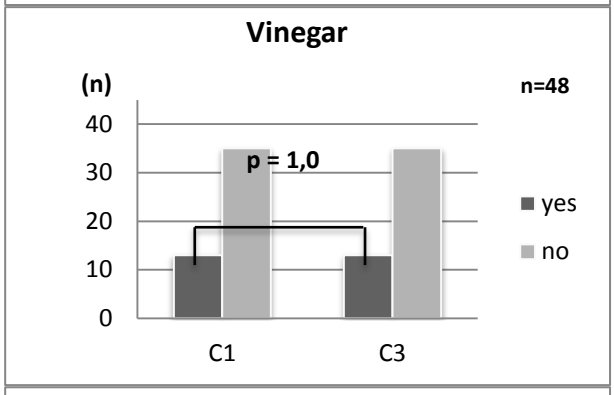


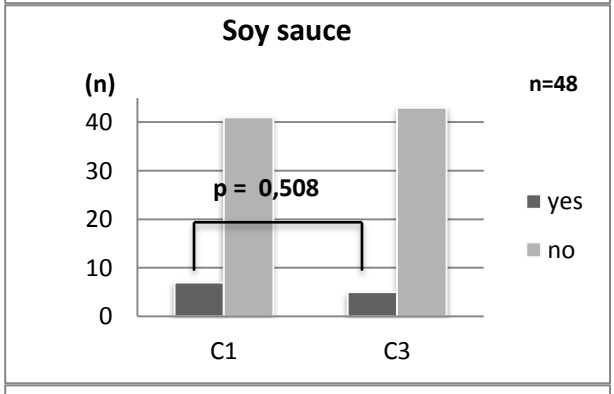


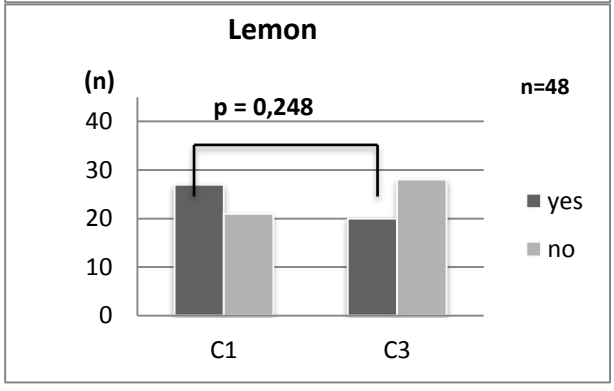








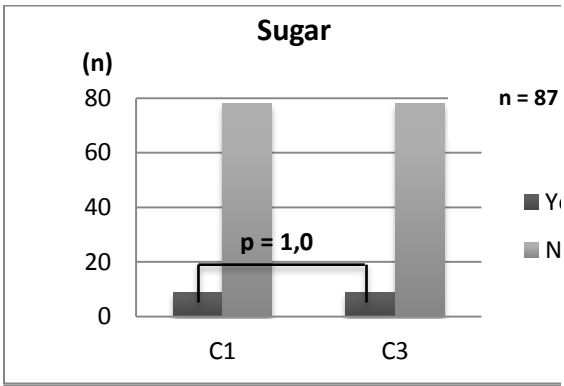


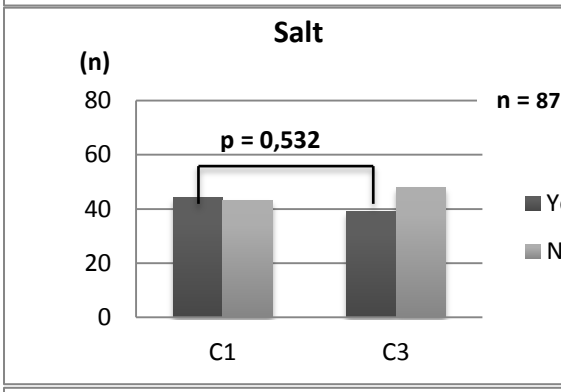


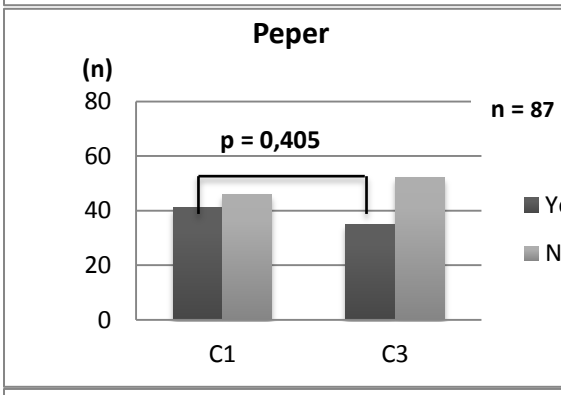
Appendix 2: Histograms taste n = 87

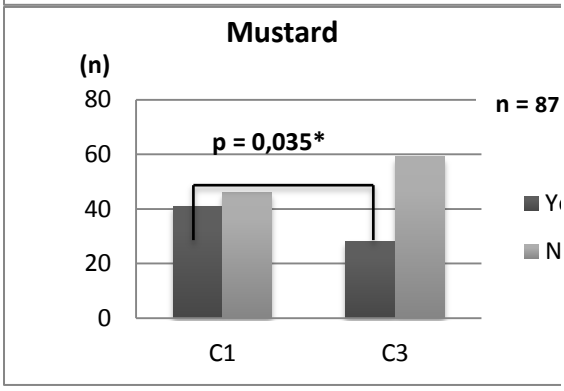
(independent sample)

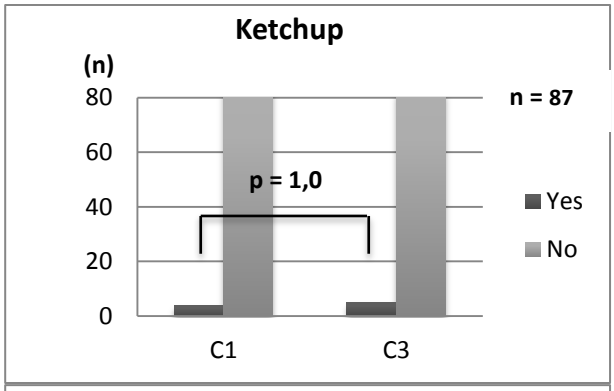
Question 16: Habit of adding food components to the dish before diagnosis (C1) and after 3 cycle of chemo (C3)

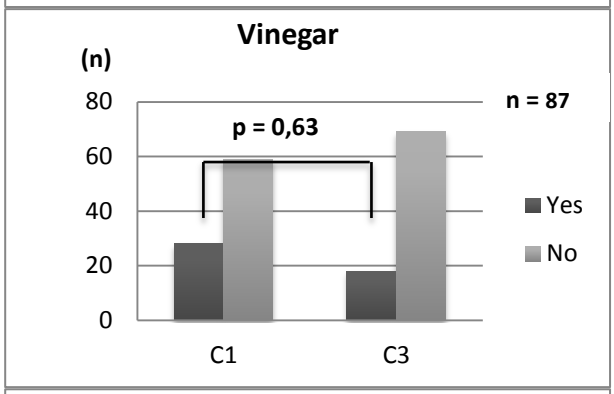


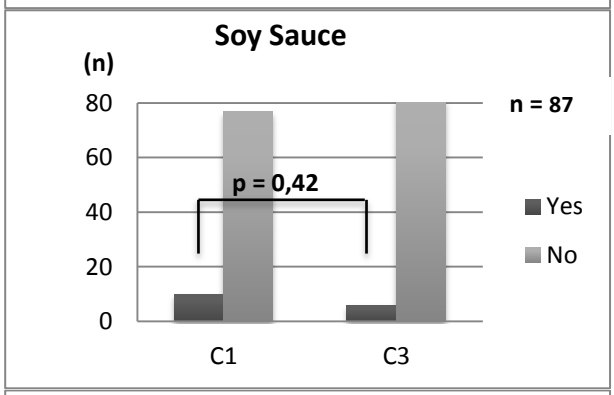


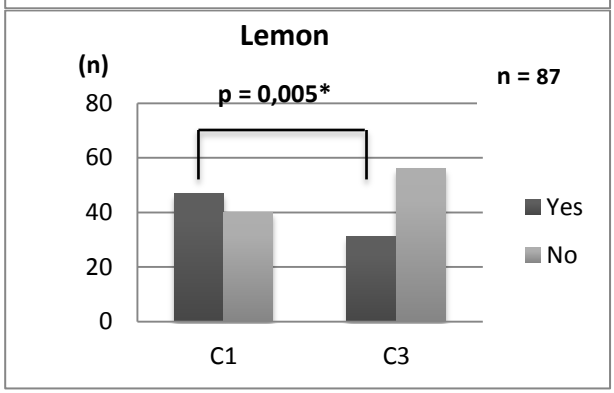












Field Note

How to measure food neophobia in school agedchildren under a natural setting: tracks for ecological evaluations.

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Key words: behavioral methodology / out of laboratory setting / children / food neophobia / food choices

Abstract

The aim of this paper is to present an ecologically-valid methodology to assess the efficiency of sensory education sessions on food behaviors and preferences in school aged children. We measured the impact of these sessions during an "experimental mid afternoon snack" at the research center of the Institut Paul Bocuse. Three variables were investigated: neophilia (willingness to try *a priori* unknown foods), order of choices, and quantities consumed. Data was obtained from pictures and reports. Interestingly, we observed a significant increase of the neophilia score but also that more *a priori* known foods were eaten within the intervention group.

1. Introduction

Food neophobia and picky/fussy eating behavior are presented as the two main factors responsible for food rejections in children and may concern the rejection of healthy items like fruits and vegetables (Dovey, Staples, Gibson and Halford, 2008). Some authors have developed different tools underlying an interesting distinction between "neophobia state" (also named behavioral neophobia) and "neopohobia trait" (Pliner, 1994). The former would correspond to the actual overt food behavior of the child facing food and may be influenced by situational factors (Pliner, 1994). The latter would be a mere behavioral disposition. According to Pliner (1994) neophobia trait is a personality trait corresponding to "a continuum along which people can be located in terms of their stable propensity to approach or avoid novel foods" – this propensity is usually evaluated by a questionnaire (Pliner and Hobden, 1992). Measuring either dimensions of neophobia is of interest for researchers who aim to understand or to alleviate some barriers in eating behavior to encourage a healthier eating behavior in children, pre-adolescents and adolescents.

A great majority of these tools available in the literature to assess neophobia in school-aged children are constituted of validated sound questionnaires, filled out either by parents (Food Neophobia Scale for Children; Pliner, 1994) or by children themselves (Food Situations Questionnaire; Loewen & Pliner, 2000; Questionnaire pour l'Enfant de Néophilie Alimentaire namely QENA; Rubio et al., 2008). These questionnaires were designed to measure neophobia state or neophobia trait; and have been for some of them translated and validated in different countries. Some food tasks have been also used and developed. For example, the WTNF (Willingness to Try New Foods) behavioral test has been developed among 8-10 years old French children under a laboratory setting (Reverdy et al., 2008).

To our knowledge, observing children in a naturalistic setting facing unknown foods is the least commonly used methodology; being the most ecologically option though. Indeed, one can argue that when children are facing uncommon foods under a laboratory setting they might feel a bit uncomfortable, which might increase their unwillingness to try new foods, or, on the contrary, they might feel comfortable with experimenters and/or may want to please the experimenters by trying new foods. Indeed, children may have developed a trusty relationship with sensory educators who are also conduct the evaluation of the curriculum. It is reasonable to think that such a relationship with a high degree of familiarity and trust affects positively children food behaviour[1] . Within the frame of the evaluation of a sensory curriculum the methodological consequence is that it becomes difficult for the educators to disentangle the benefits of this relationship from the benefits of the curriculum itself. Moreover, a food task is not as involving as a real food intake and may also blur the results of the sensory education curriculum.

For these reasons,we aimed to develop a new methodology to evaluate behavioral neophobia in children without directly questioning them, in a natural setting to encourage their involvement and with a methodology that could be easily adapted and implemented in a school setting across different countries. To do so, we develop an "experimental mid afternoon snack"[2] .

Previous studies have shown that sensory education activities can reduce food neophobia transitorily – evaluated by parents or with a food task – (Mustonen et al., 2010; Reverdy et al., 2008). We then implemented our methodology before and after delivering a sensory education curriculum based on the one developed by Jacques Puisais in 1974 and promoted by the SAPERE network.

2. Method

2.1 Participants

85 French children (39 boys, 46 girls; M age = 7,9 years, ± 0,33 years old) took part in the study (the intervention group took part in a sensory curriculum of 7 lessons, sapere-asso.fr): intervention group n=53 (2 classes, school 1), control group n=32 (1 class, school 2). Allergic children were not excluded from the sensory curriculum but did not taste the same foods as non-allergic children. Written parental assent and consent was obtained for each participant.

[1] The scientific literature on the influence of social facilitation and modelling on food behaviors and preferences speak in favor of this idea (Dovey et al., 2008, for a review).

[2] The very idea of the "experimental mid afternoon snack" is based on previous studies conducted within the Senso 5 project. In order to evaluate the impact of the Senso 5 curriculum on children eating behavior, a buffet containing a wide range of more or less familiar foods was designed for breakfast (Clerc-Bérod, Hugo, Luisier, 2012). The hypothesis tested was that children who followed the sensory classes would be more willing to taste a wider range of foods (Openness to diversity food). Briefly, children were invited to participate in a breakfast and could help themselves on a buffet containing 65 different foods served in individual cups freely.

2.3 Procedure

Food behaviors and choices were measured before and after the sensory education curriculums at the living lab of the Institut Paul Bocuse Research Center (Giboreau & Fleury, 2009). Children were told a cover story explaining their venue at the Institut Paul Bocuse. No explicit link were made between their venue to visit the Institut Paul Bocuse and their participation in the sensory curriculum displayed at school. They were indeed invited to visit the castle and then to watch documentaries, specially designed for this age range, on vanilla production (T0) and bees (T1). For this occasion, children were also invited to have a "mid-afternoon snack"; the "chef Rémy" having prepared some foods for them to taste and eat. In reality, these documentaries served the purpose of refraining children from talking to each other during the mid afternoon snack not to influence each other too much in their reaction when facing foods on their trays. Preliminary trials with about 10 children showed that it was not natural and too time consuming to ask children to help themselves in turn at a buffet. A tray with several food options by children was then the option used (see Figure 1). Children were instructed to eat what they wanted, in the order they wanted and in the quantity they wanted. The snacks were videotaped and pictures of food trays were taken before and after the meal. Due to possible peer influence, children were seated at the same place at T0 & T1. The "mid afternoon snack" lasted around 1h. Trays were identified with little pictures.

Figure 1: General disposition in the living lab of the Institut Paul Bocuse Research Centre (a) and trays presented to children at T0 (b) and T1 (c)

2.2 Stimuli and Apparatus

At T0 and T1, children were offered a priori familiar (madeleine, apple juice...) and a priori unfamiliar foods belonging to 4 food categories: biscuit (N=4), dairy (N=2), fruit (N=4), and beverage (N=2) (see Table 1 and Figure 2). All foods (N=12 at T0 and N=12 at T1) were served, in individual serving size, on trays. In each food category, half the foods were a priori familiar while the other half was a priori unfamiliar so that on a tray 6 foods were a priori familiar and 6 foods a priori unfamiliar. All foods were either available on the market or easy to cook. Many unknown foods were from foreign countries or were cooked by the pastry chefs so that to be uncommon for children and not available on the French market (e.g. a violet flavored panacotta). The order of presentation of the food items on the tray was controlled: in each food category the order from child to another one was balanced; two pupils seated side to side at foods organized differently on their trays. Quantities were chosen so as children could taste or eat in greater quantity each food

Table 1: Summary of foods used at T0 and T1.

	T0 (n=12 foods)		T1 (n=12 foods)	
	A priori Known versions (n=6)	**A priori unKnown versions (n=6)**	**A priori Known versions (n=6)**	**A priori unKnown versions (n=6)**
Biscuit (N 4)	Madeleine (1pce)	Green (lemon) madeleine (1pce)	Cake (1pce)	Passion marble /log cake (1pce)
	Financier hazelnut (1pce)	Orange financier orange with candied cherry (1 pce)	Chocolate biscuit (pepito) (1pce)	Red bean Mochi (1/2 pce)
Dairy ~90g (N 2)	Plain yogurt + sugar	Blue orange blossom flavored yogurt + sugar	Vanilla panacotta	Violette panacotta
Fruit (N 4)	Apple (1 pce)	Passion fruit (1/2 pce)	Banana (1pce)	Kaki (1 pce)
	Pear (1 pce)	Kumquat (2 pces)	Clementine (1pce)	Pomegranate (1/2 pce)
Beverage 100mL (N 2)	Apple juice	Aloe vera juice	Orange juice	Beverage with basil seeds

2.3. Data recording and off-line analysis

One questionnaire consisting in a picture of the tray was filled out during the snack. Children were instructed to circle each food they have tasted and indicate in which order they had tasted the food to inform the chef Rémy who had prepared the snack in the following way: « Today, the chef has prepared you a snack that we will have during the viewing of the documentary. The chef would like to know what you have eaten and in which order you have tasted foods. Circle the foods you have tasted and indicate the rank of tasting. Thank you. Bon appétit. ». Pictures of trays were taken before and after the meal.

Three pieces of information were collected by the end of the "mid afternoon snack" : 1/the foods tasted (via pictures of the trays and the questionnaire filled out by children – data showed that children accurately filled out the questionnaire), 2/the order of tasting (via the questionnaire filled out by children: the first food tasted was scored 1 while the last food tasted was scored 12) and 3/the quantity consumed for biscuit and the fruit categories (via pictures before and after the snack: a 4-point scale was used ranging from 0=no food eaten to 3=food fully eaten).

Partly based on previous methodologies we computed 3 scores: 1/ a NEOPHILIA score (NS), 2/ a CHOICE score (CS) and 3/ a QUANTITY score (QS). The NS was obtained in dividing the number of a priori unknown tasted foods by the number of total a priori unknown foods (N=6). The higher the NS, the more neophilic the child is. In the same vein, the CS was computed as follows: (Sum order known foods/number of tested foods) - (Sum order unknown foods/number of tested foods). Thus, If the CHOICES index is <0, it means that known foods were tasted first. On the contrary, If the CHOICES index is >0 known foods were tasted last. Finally, the QS was computed as follows: (mean intake known foods) - (mean intake unknown foods). Thus If QUANTITIES <0, it means that more unknown foods were eaten. On the contrary, If QUANTITIES >0, it means that more known foods were eaten.

2.4. Statistical Analyses

For statistical analyses, allergic children or children who have missed either education sessions or evaluation sessions were deleted to end with a total group of 66 children (26 children in the control group and 40 children in the intervention group). Data were analyzed using XL stats. Means or proportions were used for descriptive analysis.

3. *Results*

3.1. Proportions of children who tasted each food

Overall, at T0 and T1, familiar foods were tasted by more children than unfamiliar foods (see Figure 2).

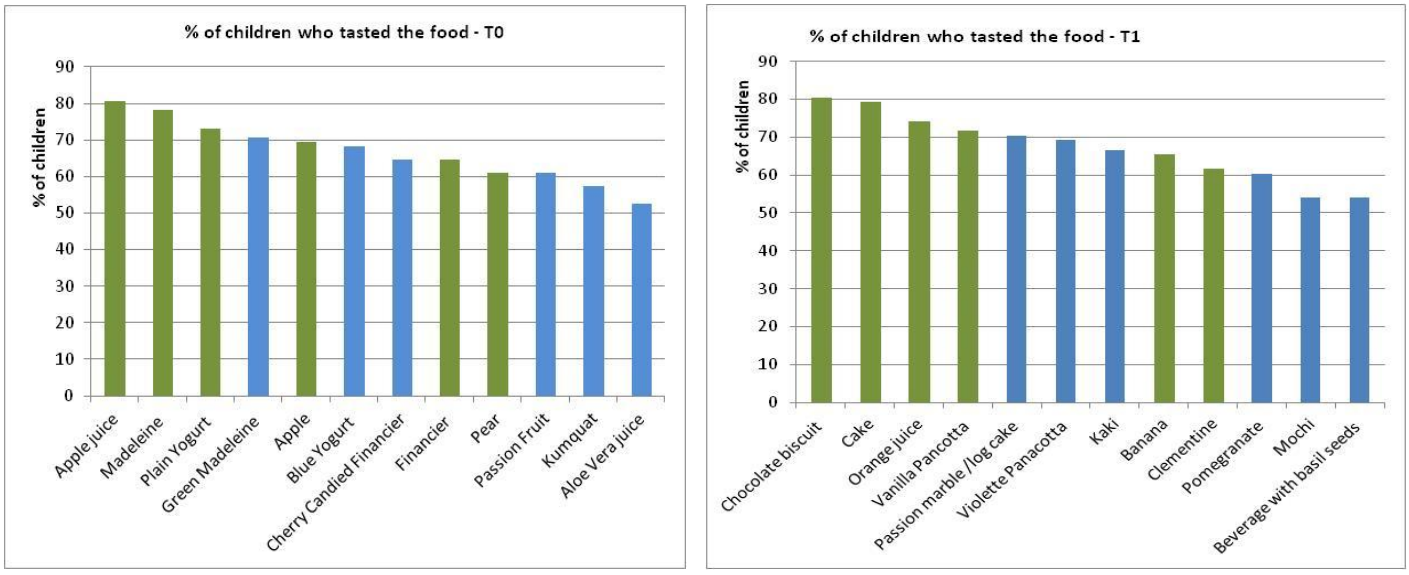

Figure 2: Proportions of children who tasted each food at T0 (left) and at T1 (right). A priori familiar foods are in green while unfamiliar foods are in blue.

3.2. NEOPHILIA score – NS

In the control group, NS marginally decreased from 0.76±0.24 to 0.63±0.28 (P=0.061) from T0 to T1. In the intervention group, NS significantly increased from 0.18±0.15 to 0.83±0.25 (P<0.0001) from T0 to T1. NS was significantly different between the control and the intervention group at T0 (0.76±0.24 vs 0.18±0.15 respectively; P<0.0001). However, average evolutions between T1 and T0 between the two groups were significantly different +0.65±0.25 in the intervention group vs -0.13±0.30 in the control group (P<0.0001). Interestingly, the results speak in favor of our prediction regarding neophilia. Indeed, the sensory education curriculum influenced positively the willingness to try unknown food in the intervention group.

3.3. CHOICE score - CS

Prior to the intervention, no differences for this score were significant (control: 0.03±1.53 vs int: 0.26±1.38 ; P=0.189). No significant results were obtained regarding CS. In the control group, no significant difference was significant between T0 and T1 (0.03±1.53 vs 0.22±1.30 respectively; P=0.741). Only a marginal decrease of CS was apparent between T0 and T1 in the intervention group (0.26±1.38 vs -0.30±1.40 respectively; P=0.054) ; this result being inverse to our hypothesis. This result would suggest that, during the snack, children tasted latter unknown foods.

3.4. QUANTITY score – QS

Prior to the intervention, no differences for this score were significant (control: 0.55±0.86 vs int: 0.34±0.80; P= 0.424). In the control group, QS marginally increased from 0.55±0.86 to 0.92±0.73 (P=0.094) from T0 to T1. In the intervention group, QS significantly increased from 0.34±0.80 to 1.17±0.48 (P<0.0001) from T0 to T1. As a reminder, if QS>0, it means that more known foods were eaten.

4. Conclusion and discussion

The fact that our methodology under a natural setting revealed that sensory education seems to decrease behavioral neophobia is very encouraging. Our results regarding the QS could be a bit puzzling. Indeed,more a priori known foods were eaten after the sensory education curriculum within the intervention group. These results go against our initial thought according to which children would eat more unknown food after the intervention.

To conclude, the experimental 'mid afternoon snack' is a very promising methodology to assess behavioral neophobia under a naturalistic setting. This methodology could be easily adapted for other cultures. We acknowledge that the categorization of food into familiar and unfamiliar foods in a French sample of children of the same age is required, and would be necessary to select appropriate food options for others cultural settings. We should also control the degree of attractiveness of foods (familiar or not) that can vary between T0 and T1. Within future implementations, adapting the present protocol for lunch would enables the inclusion of other food categories like vegetable or meat that might triggers different reactions. The reflection on the data to extract from this kind of experiment, especially regarding food intake should be deepened. Indeed, intake and order of choices might be somehow dependent due to physiological constraints: you eat less of the latest food you eat.

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Field Note:

Designing restaurant ambiences for retirement homes: a user-based approach

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Abstract

This article presents the results of two studies investigating the ambience in the restaurant of retirement homes from the point-of-view of residents. In the first study, we developed a questionnaire to characterize the preferences for different ambience components of 52 residents in three French retirement homes. A second study assessed, through questionnaire and behavioural observation, the impact of three experimental ambiences on the meal pleasure, desire to eat and food intake of 56 residents. Although not the primary determinant of meal pleasure and desire to eat, the physical ambience and its components played a role for residents, and affected food intake, though marginally so. In particular, ambience components in the close environment (notably tableware) had a greater influence. This exploratory research suggests that user-based approaches can have added-value in the design of adapted foodservice and hospitality solutions for the elderly.

Keywords: Retirement homes, Ambience, Desire to eat, Meal pleasure, Restaurant; Elderly

Introduction

Undernutrition or malnutrition, defined as insufficient intake of energy to compensate for expenditure, constitutes a significant risk in the elderly that can propel individuals into a downward health spiral (Abbasi & Rudman, 1994; J. Morley & Van Staveren, 2008). According to the French National Authority for Health, malnutrition concerns between 100 000 and 200 000 geriatric institutions residents in France. Worldwide, this represents between 6 and 38% of nursing and retirement home residents (Haute Autorité de Santé, 2007). For elderly care professionals, reducing malnutrition has, therefore, become a major stake.

Malnutrition in the elderly is multifactorial. While medical troubles, such as anorexia, dysphagia, chewing troubles, xerostomia and sensory deficits, play a major role, it is increasingly recognized that social, psychological and contextual factors are also important (J. E. Morley, 1997). Mealtime is a key moment in the day of a retirement home resident. Over the recent years, the French retirement home industry has invested many efforts into the improvement of the quality of the food offered to residents. In the private sector especially, major stakeholders have started developing offers specific to the elderly, especially those with medical troubles. Nevertheless, professionals observe that many residents, when given the choice to do so, prefer not to go to the restaurant but to eat in their own room, leading to potential isolation. Conversely, in residences where an effort is made to increase the comfort of the restaurant room, more residents seem to come for lunch. It has been found that eating at a table, in the presence of other people, significantly increases food intake in hospital patients at risk of undernourishment (Edwards & Hartwell, 2004). Therefore, improving the attractiveness of retirement home restaurants to make residents want to come for their meal may constitute an interesting avenue for elderly care professionals to pursue.

Multiple hypotheses may explain the residents' lack of motivation to eat at the restaurant. While mealtimes are structuring elements in the day, the meal may also be a source of anxiety for residents (Pajot-Philouze, 2001). Furthermore, other elements than the food offer may come into consideration to determine the quality of the meal, such as the social environment, the relationship with the staff, the setting of the meal, or, more generally, the quality of the eating environment. Works conducted on the general population have demonstrated the existence of a link between the eating context and food acceptance, liking and meal pleasure (Edwards, Meiselman, Edwards, & Lesher, 2003; King, Meiselman, Hottenstein, Work, & Cronk, 2007; Petit & Sieffermann, 2007; Piqueras-Fiszman, Giboreau, & Spence, 2013), and between context and food intake or food choice (Stroebele & De Castro, 2004).

However, no study has, to our knowledge, investigated the perception of the eating ambience and the impact of the eating context on meal pleasure and desire to eat among retirement home residents. The purpose of this work is to provide a better understanding of how the ambience of the

affects the desire to eat and the meal pleasure of residents. Ambience is defined as the context of environmental stimuli in which eating takes place, and comprises various components, such as sound, temperature, smell, color, time, or furniture (Stroebele & De Castro, 2004).

In this research, the focus is placed on four ambience parameters: luminous ambience, room decoration, sound ambience and tableware. We present the results of two successive studies conducted in 2011 in three retirement homes in the Rhône-Alpes area (Southeast of France). The first study aimed to evaluate the perception of the ambience of residence restaurants by residents, the second to measure the impact of three different ambience scenarios on desire to eat and meal pleasure.

Study 1: Perception of ambience and preferences for ambience components:

The goal of this first study was to evaluate the residents' perception of their residence's restaurant rooms, their desire to change and expectations towards the ambience of the restaurant.

Materials and Methods

Setting and subjects

The study was conducted in three private retirement homes located in the Rhone Alpes area, in France, and belonging to the same company. As most of the parameters of the study implied

statements about perceptions and preferences, the study was conducted only with those residents in the retirement home who had a level of autonomy compatible with the completion of the study. We used the French GIR (Groupes Iso-Ressources) scale of autonomy and selected only the residents who were classified as GIR 4, 5, or 6, which corresponds to residents who are autonomous or in need of limited or occasional assistance for some everyday tasks (GIR 4, 5 and 6).

Protocol

In order to evaluate the perception and the importance of ambience parameters of the meal for retirement home residents, a questionnaire was designed specifically for this study. Exploratory interviews were first conducted with a small subsample of residents and service staff members, who were asked to describe their perception of the four ambience components, their expectations, the elements they rejected and their motives for coming to the restaurant. Technical measures (sound and light intensity) were also made in the restaurant rooms in order to compare the objective characteristics of the three sites.

Based on these interviews, a 6-part questionnaire was developed. The questionnaire focused on the ambience at lunch, and was structured around two main outcome variables: pleasure of the meal and desire to eat. The desire to change the current ambience was also assessed. The first part of the questionnaire comprised general characterization questions about the resident (age, gender, GIR, date of arrival at the residence, placement in the restaurant room). The second part aimed to collect the general perception and assessment of the restaurant ambience, and to assess the perceived link between the desire to eat and the restaurant ambience. To avoid erroneous measures, it was explicitly stated in the questionnaire that "restaurant ambience" was meant in this study as the physical environment, to the exclusion of, for instance, the relationship with staff or other residents. The next four parts were dedicated to the specific assessment of each of the four ambience components (lighting ambience, sound ambience, room decoration, tableware). For each component, three types of questions were asked: the importance of the component in the eating pleasure (How important is lighting ambience to eat well?), the evaluation of the component in the current restaurant room and the related desire to eat (How would you rate the current lighting ambience in this restaurant?), and the expectations and desire to change (If you had to change one thing about the lighting ambience in this restaurant, what would it be?).

Experimental procedure

The medical staff of the residence delivered the questionnaire one-on-one right after lunch. One respondent answered per table and per day in order to avoid the influence of other table partners on the replies. The administration of the questionnaire was conducted in the span of a week, in January 2010. The weekly menu served during this period was identical in the three sites.

Data analysis

We performed a descriptive statistical analysis of the replies to the questionnaire, as well as a comparative analysis of groups of residents according to individual characteristics. The basic analysis was conducted with the MS Excel software, while statistical tests used the R statistical environment (R Development Core Team, 2011). For this study, results are presented for the complete sample (pooling the results of the three retirement homes). Statistical tests of comparison were performed to compare the results in the three sites. They revealed no differences for the variables related to overall perception of the link between restaurant ambience and desire to eat or eating pleasure. There were differences between the three sites in the assessment of satisfaction with current ambiences, but these site-specific results are not presented in this article.

Results

Participants' characteristics

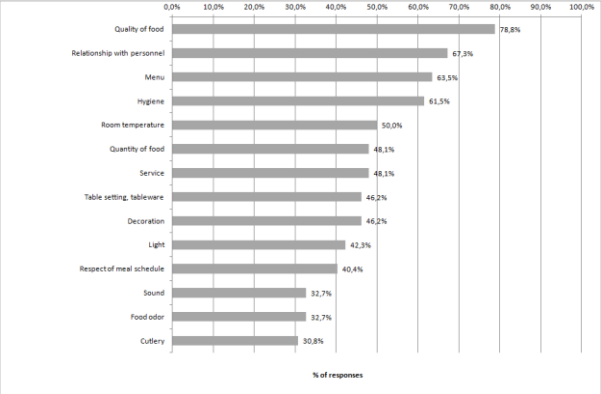
Fifty-two respondents, from the three different residences, responded to the questionnaire. The sample is composed of 65% of women, and the mean age of respondents is 89±2.5 years old. 28 participants have been staying in the residence for less than a year, 14 for 1 to 5 years, and 10 for over 5 years.

Role of ambience in meal pleasure

Figure 1 presents the results of the role of ambience components in meal pleasure, compared with other parameters. Respondents could select as many options as relevant to them. The quality of food and the relationship with the staff were the two most frequently selected items (respectively, 78.8 % and 67.3% of respondents). The content of the menu and the hygiene of the restaurant were also deemed as important by over 60 % of

participants. Three of the four ambience components (tableware, lighting, and decoration) were mentioned by over 40% of participants. Sound was considered important by less than a third of participants.

Figure 1: *Most important parameters of meal pleasure according to respondents*



Residents also evaluated each specific ambience component separately for the importance of its contribution to meal pleasure. These results are presented in Table 1. The contribution of ambience components was perceived as "somewhat important" by a majority of respondents. Sound, decoration accessories and colour of walls are the parameters whose contributions were most frequently judged as not really important or not important at all (respectively, 36%, 37% and 46% of the sample). Lighting and sound were also the most frequently perceived as very important contributors to meal pleasure.

Table 1: *Contribution of ambience components to meal pleasure (N=52)*

	Very important	Somewhat important	Not really important	Not important at all
Lighting ambience	21%	54%	19%	6%
Sound ambience	22%	42%	32%	4%
Decoration *Placement of tables*	12%	61%	20%	8%
Furniture	17%	52%	19%	11%
Accessories (eg. paintings, flowers...)	12%	51%	27%	10%
Color of tablecloth	11%	54%	27%	8%
Color of walls	10%	44%	27%	19%
Tableware	18%	57%	19%	6%

Link between ambience and desire to eat

The perceived intensity of the link between the general ambience of the restaurant and the residents' desire to eat was generally low. A majority of participants (28 out of 52) stated that they have a normal desire to eat in the current restaurant ambience, while 17 out of 52 saw no connection between their desire to eat and the ambience of the restaurant. When asked whether the restaurant ambience makes them want to go to the restaurant, 17% of respondents stated that they want to go to the restaurant even before the start of the meal, and 34% stated that they enjoy staying in the room after the meal.

Conversely, one third of the respondents said that they wished to leave the room as soon as possible, sometimes even before the end of the meal.

Desire to change

When faced with the possibility to change the restaurant ambience, two groups of residents emerged: those who are adverse to any change (53% of respondents), and those who are willing to change, but only occasionally (once or twice a year, 31%). Only 16% of respondents (8 residents) wished for the ambience to change more than twice a year. Overall, the desire to change concerned the general ambience rather than specific ambience components.

Preferences for specific declinations of ambience components, elicited through hypothetical scenarios, revealed no precise expectations regarding the ambience components.

A Pearson chi-square test of the null hypothesis that there is no difference of desire to change according to the duration of the stay in the residence (grouped in three categories) reveals that participants who had stayed for less than a year were significantly less willing to change than those who had been there for over a year. However, after four years of being in the retirement home, the desire to change decreased again.

Discussion

This first study describes the residents' perception of the restaurant ambience and of the link between this ambience and meal pleasure and desire to eat. We found that, though residents did not see a satisfying ambience as a pivotal element of the meal, they nonetheless perceived it as an important contributor to meal pleasure. This result is in line with previous works, conducted in the general population, which demonstrated the existence of a link between food expectations and the physical environment (AV Cardello, Bell, & Kramer, 1996; Armand V Cardello, 1995). Conversely, residents did not perceive that the ambience had an impact on their desire to eat, suggesting that satisfaction with the ambience plays primarily on wellbeing.

Interestingly, there seemed to be a hierarchy in the perceived contribution of ambience components to the pleasure of the meal. Components in the direct environment of residents (such as cutlery, tablecloth colour, furniture, tableware), were more frequently perceived as more important than more distant elements (such as colour of walls, or accessories).

Almost half of respondents expressed a desire of change regarding the ambience. This concerned especially those residents who had been staying for an intermediate time. We may hypothesize that residents who had been there for a short period of time were "not bored yet" of the restaurant ambience, while those who had been staying for a longer period were now so used to this ambience that they did not wish to change anymore. This desire to change did not concern specific ambience components, but ambience as a whole. Moreover, most of the answers obtained in the questionnaire did not seem to express strong opinions about the ambience. In other words, when asked about the current restaurant ambience, residents tended to answer that they were satisfied, and even those who wished to change did not express specific needs, and did not reject some elements of the current ambience. In the small sample of residents interviewed for the construction of the questionnaire , several interviewees stated that they felt like they were not at home, but in a common room, and that they were unable to ask for or to suggest changes. This could explain the responses obtained. This hypothesis, however, cannot be verified with our questionnaire data.

Study 2: Impact of different ambience scenarios on desire to eat, meal pleasure, and food intake

The first study elicited statements about the perceived importance of ambiences, and satisfaction with hypothetical changes. These statements, however, may differ from real behaviours and the perception of actual changes, which may lead to inaccurate measure of the impact of ambience components on desire to eat or meal pleasure. Study 2, therefore, follows an experimental approach in order to validate the results concerning perceptions and preferences obtained. More specifically, it aims to compare the effect on desire to eat and meal pleasure of three contrasting ambiences in the restaurant of the residence, and to assess the relative weight of direct and indirect environment on the residents' desire to eat, meal pleasure and food intake.

Methods

Setting and subjects

The study was conducted in the same three retirement homes as study 1 and the same criteria were used for participants' selection (only GIR 4, 5 and 6 residents were included in the study). However, the sample of study 2 does not correspond completely to that of study 1, as several months separated the two studies. Some residents had left the nursing home or died during this time interval, while new residents had arrived.

Protocol

Three contrasting ambience scenarios were designed, based on the results of study 1. These scenarios are described in Table 3. The scenario "Just like home" focused on the personalization of the most direct environment of the resident, especially tableware, and on the idea of giving the resident more involvement in the restaurant, to feel at home instead of at an outside restaurant (decoration with familiar objects, choice of her/his plate colour and the tableware when the family comes to visit, personalized menus and napkin rings…).

The "Cosy" scenario was designed to focus on a larger environment (the table), and transformed each table into a specific zone (with conversations among residents, a specific lighting ambience, and colours evoking comfort and cosiness. The "Flowers" scenario focused on a larger environment by creating zones of several tables (using the colour themes of the tables).

***Table 2**: Parameters of the three scenarios*

Parameters		**Just like home**	**Cosy**	**Flowers**
Lighting ambience		No change	Individual electric candle jars	No change
Sound ambience		No changes	Cards with "daily facts" put on tables to encourage discussions between residents	Classical music
Decoration	*Accessories*	Personal objects from residents (brought by families)	Large vase with coloured flowers at the restaurant entrance	Large vase with white flowers at the restaurant entrance
		Paintings on the theme "home kitchen"	Paintings of colourful flowers	Paintings of white flowers
	Colour of tablecloth	White	3 zones of colours (blue, red and yellow)	Chocolate
Tableware	*General*	Coloured table napkins Possibility for the resident to choose the colour of the plate each day	Flowered placemats Table napkins and drinking glasses of the colour of the table zone	Brown/Golden placemats White table napkins
	Table accessories	Personalized daily menus Customized napkin rings made by the residents	Flowers at the centre of the table Name of the flower theme of the table zone	White orchids on the table

A questionnaire was developed on the basis of the results of study 1 to evaluate the ambiences. The questionnaire was composed of four sections, regarding, respectively, the general perception of the ambience, the sound ambience, the decoration and the tableware. Individual characterization questions were also asked. The luminous ambience was not evaluated, as little modification was brought to the lighting parameters of the rooms. The ambience and
ambience components were first evaluated in general (how much do you like this ambience /ambience component?) then respondents evaluated the effect of each ambience/ambience component on their desire to eat and their meal pleasure.

To create a reference point for analysis, the 'reference ambience' (=before any change was implemented) was first evaluated by the residents. Then, each of the three scenarios was implemented successively in each site and evaluated using the same questionnaire.

Procedure

The study (including the evaluation of the reference ambience) was conducted over the span of four months. Each scenario was implemented for one month in each site. To control for menu effects, a different scenario was implemented in each of the three sites over a given period of time. The administration of the questionnaire followed the same procedure as in study 1, and took place

during the last week of implementation of each scenario. In parallel, during this evaluation week, dieticians and foodservice staff recorded each day the food consumption of each resident, by visual estimation using standard food intake assessment forms (Parent, Niezgoda, Keller, Chambers, & Daly, 2012; Shatenstein, Claveau, & Ferland, 2002; Simmons & Reuben, 2000).

There was a two-week transition between two scenarios, to allow for scenario preparation in each residence. Although the study was designed as a repeated-measure experiment, an important number of subjects did not complete the four phases of the questionnaire, as some residents left the retirement home or died, while some joined during the study.

Statistical analysis

We employed the same approach and software as in study 1, however, the analysis in study 2 focused on the comparison between the three scenarios, with the reference scenario as a basis for comparison. The questionnaire measured two types of variables: quantitative variables were elicited using Likert scales of intensity, while categorical variables were obtained when there were multiple-choice questions. In order to take into account the repeated measures design of the study, the effect of each ambience on the quantitative variables was assessed by estimating mixed models, with individuals as random factors and the scenario as fixed effect. For categorical variables, we used random-effects logit models (Greene, 2003) to estimate the effect of the ambience on the probability to choose one option over the others.

Results

Participants

In total, 156 questionnaires were collected in the four months of test. However, not all participants completed all four questionnaires. Table 3 presents the number and characteristics of participants in each scenario, as well as the results of the tests of the null hypothesis that the groups' characteristics were different in each scenario.
36 respondents evaluated the "reference ambience", 38 respondents evaluated the "Just like home" scenario, 43 the "Cosy" scenario and 39 the

"Flowers" scenario. The results of the statistical tests show that there are no significant differences in terms of gender, GIR status, length of stay in residence and age between the four evaluation periods.

Table 3: *Participants characteristics in Study 2*

Variable	**Description**	**Ambience**				
		Reference (N=36)	Just like home (N=38)	Cosy (N=43)	Flowers (N=39)	**p-value of Pearson Chi-square test**
Gender	*H (%)*	22.2	18.4	23.3	25.6	0.8965
	F (%)	77.8	81.6	76.7	74.4	
GIR status	*GIR 4 (%)*	77.8	87.9	74.4	86.8	0.5751
	GIR 5 (%)	13.8	9.1	23.3	13.2	
	GIR 6 (%)	0.0	3.0	2.3	0.0	
Length of stay in the residence	*Less than a year (%)*	41.7	26.3	46.5	41.0	0.8988
	Between 1 and 2 years (%)	19.4	10.5	30.2	17.9	
	Between 2 and 3 years (%)	2.8	2.6	4.7	10.3	
	Between 3 and 4 years (%)	5.6	2.6	4.7	0.0	*(Missing data excluded for statistical comparison of samples. There was a problem with the JLH scenario responses on one site for this question)*
	Between 4 and 5 years (%)	0.0	0.0	2.3	5.1	
	Over 5 years (%)	11.1	5.3	11.6	7.7	
						Analysis of variance
Age	*Mean*	88.16	88.91	88.83	89.25	F-value=0.3676;
	(std. dev)	(4.38)	(4.28)	(5.00)	(4.15)	Pr(>F)=0.7765

General appreciation of ambience

Respondents were asked to rate their appreciation of the ambience on a Likert scale ranging from 1 (I do not like it at all) to 5 (9 like it a lot). The results reveal no significant differences between the overall appreciation of the three scenarios (p value = 0.7809). Similarly, other categorical questions

about the effect of the ambiences on the overall emotional state of the respondents, or on the emotional state upon discovering the ambience, reveal no significant differences.

Participants were asked to qualify the ambience using a list of adjectives. They could select as many as the proposed adjectives as they wished. There are no significant differences between the perception of the "Just Like Home" and the "Flowers" ambience. The Cosy ambience is significantly less likely to be perceived as joyous (p=0.0243), coloured (p<0.001), heart-warming (p=0.0505), friendly (0.0130), welcoming (p=0.0101) and modern (p=0.0089). The "Just like home" ambience was less likely to be perceived as friendly (p=0.0057) and more likely to be perceived as sad and morose (p=0.0272). The "Flowers" ambience was less likely to be perceived as friendly (p=0.0044) and heart-warming (p=0.0827).

Impact of ambiences on desire to eat

The desire to eat in the restaurant room and the meal pleasure were evaluated for each scenario on a Likert scale ranging from 1 (not at all) to 5 (a lot). The average scores obtained in each scenario are presented in Table 4.

The scenario has a non-significant impact on the desire to eat in the restaurant (p-value = 0.2715). However, a trend seems to be emerging: the "just like home" and reference ambiances seem to generate a higher number of negative responses compared to the other two ambiances, which are subject to more positive or average responses. The desire to eat is, for the majority of residents (between 60 and 70% depending on the ambiance), medium, low or null. The average score of the overall effect of ambience on desire to eat is higher for the Cosy ambience. However, the differences between the scenarios are not significant (p=0.6785).

Table 4: *Effect of ambience on desire to eat and meal pleasure. Means of appreciation measured on Likert scales ranging from 1=not at all, to 5=a lot. Standard deviations are between brackets*

	Ambience				**p-value of mixed model**
	Reference	Just like home	Cosy	Flowers	
Effect on desire to eat					
General ambience	3.17 (0.88)	3.03 (0.82)	3.30 (0.65)	3.18 (0.80)	0.2715
Sound	2.58 (0.94)	2.30 (0.81)	2.40 (0.90)	2.44 (1.03)	0.336
Decoration	2.80 (1.16)	2.43 (0.90)	2.51 (1.0)	2.53 (0.93)	0.2157
Tableware	3.00 (1.04)	2.68 (1.02)	3.08 (0.84)	2.97 (0.87)	0.3545
Effect on meal pleasure					
General ambience	3.08 (0.87)	2.97 (0.82)	3.25 (0.84)	3.21 (0.90)	0.8497

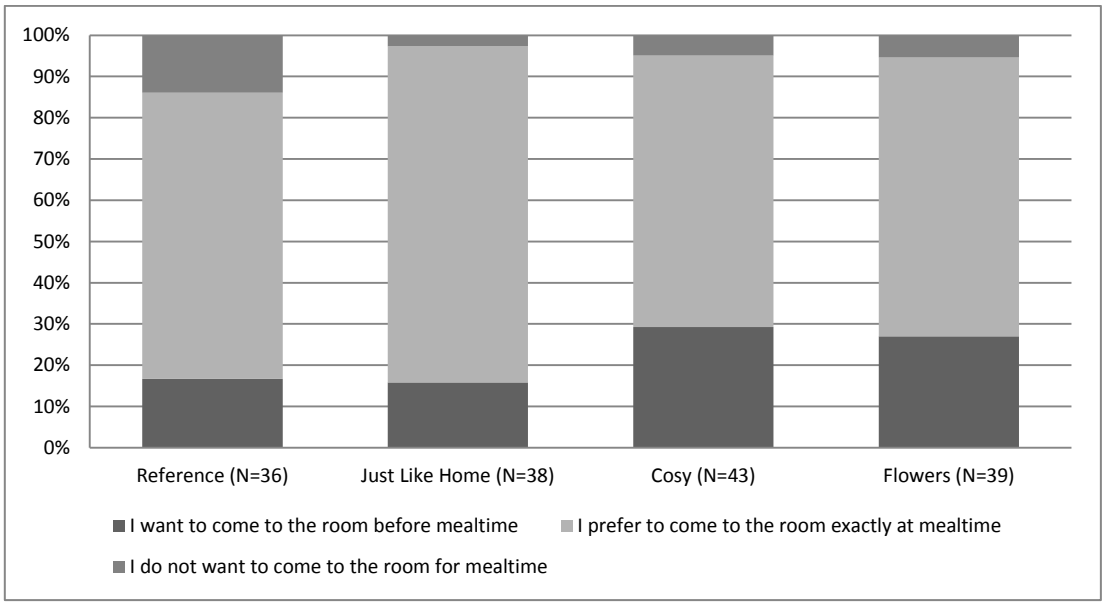


Figure 1: *Effect of ambiance on desire to come to the restaurant room*

As presented in Figure 1, the ambience scenario has a significant impact on the desire to come to the restaurant. According to a random-effects logistic model, the probability of not wanting to go to restaurant is highest for the reference ambience (z-value = 2815; Pr (> | z |) <0001), followed by Flowers (z-value = 3,124, Pr (> | z |) <0.001), and Just like home (z-value = 3,047, Pr (> | z |) <0.001). The Cosy has the highest probability of wanting to come (before or at mealtime) (z-value = 3671; Pr (> | z |) <0.001). 15 to 30% of residents come to the room even before mealtime, especially in the Cosy ambience, confirming the central role of the restaurant and mealtimes in the life of the residence. The pleasure to stay in the room after the meal was also measured, but revealed no effect of the ambience. However, nearly 50% of the residents stated that they liked to stay at the table after finishing the meal; this trend appeared to be stronger for Cosy and Flowers.

Concerning the ambience components, neither sound, nor decoration, nor tableware, seem to have a specific impact on desire to eat, as seen in Table 4. A more detailed analysis reveals that the noise associated with the service of food was perceived by residents to be correct in general (between 55% and 70% depending on the ambience, n.s.). The sounds from the kitchen were also seen as correct or non-existent. The sounds due to furniture (chairs especially) were perceived as overall correct, with no effect of the ambience scenario. External noise (outside the dining room) was mostly not perceived by residents (between 60 and 80% stated that there was no noise from outside). Music, which was only tested in the Flowers scenario, was disliked by 40% of respondents, while 30% were indifferent.

Impact of ambiences on meal pleasure

The overall pleasure to eat in the restaurant room was evaluated on a similar Likert scale, ranging from 1 (not at all) to 5 (a lot). The average score for all scenarios is 3.11 (a little above average), and we find no significant effect of the scenario on this variable (p= 0.8497), although there seems to be a trend towards a higher meal pleasure in the Cosy and Flowers scenarios.

Impact of ambiences on food intake

Food intake was recorded for each resident during the five days of evaluation. The food intake assessment sheet allowed to measure, using a visual representation of plate quarters, whether the plate was left completely untouched (score=0), 25% (score=1), 50% (2), 75% (3) or 100% consumed (4). The mean intake scores for starters, main dish and dessert over the five days of evaluation are presented in Table 5. Although overall, the "ambiance" factor did not significantly affect the food intake, a contrast analysis shows some differences between the scenarios for the intake of dessert, which was higher in the new scenarios than in the reference scenario (p=0.0498, 0.0363 and 0.0215, respectively, for Just Like Home, Flowers and Cosy).

Table 5: *Mean intake of starters, main dish and dessert over the evaluation week (0 - the resident did not consume the dish; 1 – consumed ¼ of the plate; 2 - consumed half of the dish; 3 - consumed ¾ of the dish; 4- consumed the whole plate)*

Mean intake	Reference	Just Like Home	Cosy	Flowers	p-value mixed model
Starters	3,27 (0.68)	3,39 (0.66)	3,40 (0.82)	3,25 (0.68)	0.1415
Main Dish	3,17 (0.77)	3,05 (0.83)	3,03 (0.84)	3,11 (0.85)	0.2286
Dessert	3.41 (0.77)	3.66 (0.77)	3.74 (0.56)	3.58 (1.01)	0.451

Discussion

The second phase of the test aimed to further explore, with on-site experimentation, the stated perceptions of ambience components elicited in the first phase. The results reveal no significant effect, overall, of the ambiences on meal pleasure, desire to eat, and food intake, although trends and ambience-specific effects may be observed. Several hypotheses may be drawn to explain this lack of differences. Firstly, the results may stem from experimental settings. The scenarios, which played essentially on the residents' direct environment, may not have been contrasting enough for the residents. For instance, it would have been interesting to test other scenarios where more major changes, such as the furniture or the room arrangement (colour of walls, ceilings; type of floors...) were made. The interventions may also have been implemented for a too short period of time. Another important point concerns the implementation of the study in the field. Although the three residences were part of the same company, there were some differences in the base furniture and in the room configuration which may have caused some differences in the impact of the scenarios. The sample sizes in each residence were

too small to allow for a statistical evaluation of the effect of the site on the evaluation, but this experimental constraint may play a role in the statistical significance of the results.

While study 1 used hypothetical scenarios of ambience changes and declarative methods to assess the ambience, study 2 was designed to assess the differences in perception when the ambience actually changes, and measured stated desire to eat and stated meal pleasure, but also actual eating behaviours through the measure of food intake. Observations may have revealed some differences in behaviour due to the change in ambience, even though the impact of these changes were not perceived by residents. However, we found no effect of ambience on neither stated perceptions nor observed behaviours in our study. In the specific context of retirement homes, most works studying the impact of the meal environment have focused on health status or wellbeing. Mathey et al. (2001) found a positive effect of an improved ambience (defined as improved physical environment, organization of nursing staff assistance, and improved food service) on food intake, weight, and health status of residents of a Dutch nursing home (Mathey, Vanneste, de Graaf, de Groot, & van Staveren, 2001). Likewise, Nijs, De Graaf et al. (2006) found a positive effect of social interactions ("family-style meals") on quality of life among nursing home residents without dementia (Nijs et al., 2006).

Concerning the behavioural variables measured in our study, although staff visual assessment methods are subjected to biases and are not as precise a measure of food intake as plate weighing, such methods have been validated in other studies (Shatenstein et al., 2002; Simmons & Reuben, 2000). Nonetheless, our recording of food intake only lasted for 5 days, which may be insufficient to observe some contrasts with such a method. For instance, an effect on dessert consumption seemed to emerge with some ambiences, even though the data available does not allow a clear conclusion on the robustness of such an effect. The observed differences only concern one category of dish (dessert), which suggests that a very specific element of the ambience played a role on food intake. It is likely that the type of plate, which varied across scenarios and dishes, is this element. This would be in line with recent works conducted in the general population, showing a relationship between plate shape or size and food consumption (Wansink, 2004).

Regarding stated variables, the use of a questionnaire for the evaluation of desire to eat and meal pleasure may be questioned. It may, indeed, have been difficult for residents to assess their desire to eat and meal pleasure, as those were not usual tasks for them. Questionnaires and visual scales are the most frequently used tools to assess motivation to eat (Bellisle, 2009). While these tools have been tested and validated in the general population, they may not be adapted to the assessment of these variables among a population of elderly people. Similarly, eating pleasure is most frequently assessed using Likert scales or visual analog scales, but alternative methods may be more adapted to retirement home residents. The evaluation of emotions using visual pictograms adapted to elderly people has been successfully tested in nursing homes (Pijls, Groen, Oldeman, & Thijssen, 2010). Developing such tools to specifically assess food-related emotions may be a promising perspective. Further research should be directed to the development of indicators and measuring tools more adapted to the studied population, not only to allow a more precise measure, but also to make it possible to measure the effects of ambience on all the residents, as our study was limited to those residents who were able to complete a questionnaire.

Conclusion

The impact of the context on food perception and food intake are increasingly acknowledged in research about the general population. These two studies provided knowledge on the little explored topic of the preferences for the physical context of restaurant rooms by retirement home residents, and on the impact of this ambience on meal perception and eating behaviours. The originality of this work lies in the use of an on-site experimental approach, which allowed us to compare the expectations towards hypothetical scenarios to the perception and impact of actually implemented ambiences. Although the results obtained did not reveal major contrasts, this research generates insights for the retirement homes industry, as it provides data about this specific population, whose preferences and behaviours remain largely unknown. Even though the quality of food remains the primary element for a pleasant meal, the ambience components also have an important place, and our results should encourage further research and innovation on this topic. We find that, in particular, context components closer to the resident and to the dish seem to have the greatest impact, both on perceptions and on eating behaviours. Further experiments should therefore be conducted on tableware and plate presentation in order to assess their specific impact. For the more indirect context components, such as decoration or sound, it appears that future efforts in the retirement home

industry should be directed towards changes of ambience as a whole rather than punctual changes to one aspect of the room, but also towards making residents feel more like they can be actors of their eating environment.

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