Methodological and ethical issues in food research
Aims and Scope

*Menu: Journal of Food and Hospitality Research* aims to publish 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.

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Editorial

Laure Saulais

The Centre for Food and Hospitality Research, Institut Paul Bocuse

With its yearly PhD Workshop, the Centre for Food and Hospitality Research intends to create a unique opportunity for scientific exchanges for PhD students of both the Institut Paul Bocuse and other universities, without any distinction of discipline. This issue of Menu gathers contributions from young researchers who participated in the third issue, which focused on the topic of Methodological and Ethical Issues in Food Research. The aims of this workshop are twofold. Firstly, the workshop provides a training opportunity on the process of scientific publishing. In addition to tutorials on scientific article writing and reviewing during the workshop, participants also experience the complete publishing process with the publication of the proceedings in Menu: The Journal of Food and Hospitality Research. During this process, junior researcher endorse successively both the roles of author and reviewer. Secondly, it is a methodological workshop, which combined presentations and discussions on the issues of ethics in food research, with interventions from experienced researchers, as well as presentations and discussion of PhD works and scientific exchanges.

Food behaviors and nutrition researchers are frequently facing sensitive data, either when studying vulnerable or sensitive populations (eg. children, elderly, disabled...), or when targeting confidential or personal topics (such as religion, health, or social status) or when using observational or physiological data. The way such data is handled is at the heart of the ethics of research. Some scientific disciplines use a standardized framework and methodologies to address these issues (eg. through randomized controlled trials, double-blind trials). Others have established guidelines about the position of the researcher facing these questions. These ethical issues are a part of conducting research and building projects, which may be reviewed by an ethics committee prior to their launching.

Based on concrete illustrations from the works presented by workshop candidates, the following questions were addressed during the workshop: which attitude should be adopted in delicate situations? How should the research project be presented to the studied subjects? What level of involvement should researchers have in the observed phenomenon? What are the precautions to take when communicating the results of such research? The research articles in this issue report some of the reflections and illustrations which contributed to address these questions.

Various complementary topics are also presented in this issue, in the form of two fieldnotes and one book review.
Fieldnote: Research on parity in starred hotels and restaurants

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Abstract

This research paper relates to managerial parity in the hotel industry. The restaurant, reception and housekeeping sectors are gendered and women’s presence is obviously scattered. Paired with theoretical concepts, we attempt to clarify the impact of the past and present on women’s social representations as managers. Emerging empirical methodology triangulation and analysis have provided us with plural and complementary results in order to answer our research questions. Indeed, this mixed methodology leads us to better understand manager social representations with the purpose of confronting them in face of managers’ activities, depending on the sector in which they work.

Keywords: hotel, parity, manager, social representations, activity analysis
1. Introduction

At the beginning of the 70's and after many works in social psychology and organizational behavior which have been leaded on leadership and gender, Schein (1973, quoted by Casini & Sanchez-Mazas, 2005) initiated the “think manager, think male” phenomenon in order to realize the “very strong as well as very steady association between the stereotype of the male role” (p. 101). As many men as women feel that the characteristics associated to a great leadership are more likely to be held by men than by women. By admitting that, firms as well as both male and female professionals support this phenomenon and even inspire themselves from this phenomenon while recruiting. It is not paradoxical that women are a minority in management positions.

According to Beauvois (2003), 46.5% of positions in the hotel and restaurant industry are held by people under 30 and one woman in two works in this industry. Besides, women occupy low-skilled positions and almost half of them work part-time.

Thus, it is by acting within an international hotel group that the research is able to point out the parity between men and women within organizations and more particularly within starred hotels and restaurants. This group wonders about the lack of women in decision-making positions despite the improvements of the legislative framework and its institutional dynamic based on desegregation, equality and parity. Those are the reasons why the links between the social representations of managers – female vs. male-, the type of management used according to the gender of managers, and –inevitably, according to the sector of activity in which the managers belong will be wondered.

2. Research methodology

Area of study

The area of study is an international hotel group which has been in the industry for decades. It is one of the leaders in the world and it exists in ninety countries with almost five thousands hotel spread over the five continents. The group also offers a wide range of hotels such as cheap or luxury hotels. Besides, according to the 2011 annual report of the group, women would be more represented than men whatever their type of contracts. Indeed, there would be 56.2% of women against 43.6% of men. Nevertheless, regarding both male and female framing professionals, 47% of them would be women. In fact, the male population occupies more management positions whereas women are restricted to subordinate positions. Likewise, women are poorly present within the management of luxury hotels and only two women out of ten are a member of the Board of Directors. Yet, the group made of parity one of its four priorities regarding its diversity policy.

The methodological triangulation

In order to place the research in a coherent dynamic, a triangulation of research material has been made, that is to say that the use of data set techniques was crossed. This triangulation gathers essentially qualitative methods which collect and treat data in various ways. It also permits not only to be dependent on interpretations but also to think in comparison with the various methods used.

First, direct non-participant observations have been introduced in order to appreciate and to be “the witness of the social reality” (Moscovici and Buschini, 2003, p.152). The situations observed and recorded in a log book permitted to define the highlights of the professional activities such as their position in this environment, the organization between services – catering, reception, and floors – as well as the communications between male and female professional hoteliers. This method enabled to have a large panorama relative to the daily activities of male and female professionals.

Secondly, semi-structured interviews have been made with the hotel staff – directors, managers and employees of starred luxury hotels- in order to more particularly apprehend their activities and to understand their representations towards male and female managers according to their socio-professional group and their gender. Thus, semi-structured interview – it means that the interview is not entirely opened, but is also not entirely closed – has been used and was armed with an interview grid which first enabled the interviewee to approach the themes of the research and which also enabled the interviewee to have some leeway regarding what to say and the themes to approach.

Thirdly, observance via video recordings was made. It allowed to introduce a descriptive and analytic study of working conditions. According to Lacoste, (1996, p.7) the video recordings of a work activity had two use: “to show the situation (or the activity) thanks to the image [...] with more details and continuity [...]” as well as
“to express the meaning from the image: the meaning of the activity, the meaning of the situation, the meaning of the work and in order to succeed, to stimulate the word by the image.” Thus, it was possible to understand the highlights of their activity; moreover the relations between male and female professionals were carefully studied in order to compare those relations with the social representations made during the semi-structured interviews previously conducted. The differences vs. analogies between the common knowledge of social representations, which indicates a type of social thoughts, and the relations concerning work activities between male and female professionals in the hotel industry were studied.

The analysis method

The exploitation of semi-structured interviews was realized with a textual analysis with the help of the Alceste software which enabled to highlight and to analyze the essential information held in the interviewee’s verbatim. Nevertheless, this analysis did not permit to have a more precise view of social representations regarding a particular issue: “In your opinion, what are the qualities required to become a manager?” This is the reason why a Vergès prototypical analysis (1992) was added in order to put into words the managerial characteristics of representations.

Besides, the audiovisual corpus is devoted to collecting work activities sequence within two “settings” (Goffman, 1973) – the kitchen and the reception. Those surroundings “[...] made by actors set the relations: the themes, the speech rules, the behavior standards, the tone and the goals change when we go from one place to another” (Lacoste, p. 32, 2001). Professional environments vary and local interactions organized by participants actually are set up and can be set up. It is from the audiovisual sequences used that it was possible to highlight the introduction of the categorization methods (Mondada, 2000) between male and female professionals according to the activities in which they participate, their behavior and their way of speaking. These categorizations enabled to determine them, their positions, their actions and it also enabled to perceive the adaptation of their coworkers regarding their behaviors.

3. Results

According to the analysis made from semi-structured interviews, the representations of the managerial qualities vary according to the status and the gender of both male and female professionals. For male directors and managers, the ideas regarding the manager would be to “listen, gather and discuss”. This term is more linked with the characteristics expected by organizations. On the contrary, “supervise, control and lead” would be the manager characteristics perceived by the employees. The first are graduated, trained and have experience, they could assimilate the characteristics required to be a great manager whereas employees in lack of experiences and professional training would only venture their own representation of managerial characteristics.

Besides, according to the prototypical analysis, the characteristics expected to be a manager would be moving because they more and more correspond to female qualities such as “being tuned in”, “being human” and “being affective” (Bem, 1974). Moreover, the representations and roles stay linked to the gender and it exists in organizations sectors in which genders are divided.

Actually, inside the kitchens, it is expected that a professional has an evident physical strength, that he or she adapts quickly in the context in which he or she integrates himself or herself, but also with the other male and female professionals he or she is working with. Consequently, it will be asked to women that they hide and even deny their femininity in order to be a part of it. It is true that the numeral superiority of men engenders a patriarchal culture which supplants women and even falsifies their characteristics.

On the opposite, in front of the reception customers, the female gender is highly represented, the physical appearance is a huge part of the position and it is easier to create relations with customers. It would not be surprising that women are exclusive in this sector, yet men apply and occupy positions within these female professional sectors. Nevertheless, employees highlight the homosexuality of the majority of male professionals working at receptions. This comment might reveal that the men working in these female sectors would also “chase away” some aspects of their manliness. Considering the male “domination” in the working environments, the reception of employees in these positions might be highlighted as an evidence of the gender role division.

1 Software for the analysis of textual data
2 The prototypical analysis was introduced by Vergès in 1992 in order to cross the frequency and the average rank of social representations from an inductive word.
3 Categorization in the perspective of the Conversation analysis (Sacks, 1972 and quoted by Bonu and al., 1994) is a method which consists in making descriptions of members in a production context.
world and the attraction for female characteristics, would not these professionals precisely meet the needs of organizations?

Moreover, one has to admit that as the research deals more specifically with parity, it will be confronted with the sexual division of work.

This is why the main professional brakes of women would be due to their shape of being a woman and a mother. The rhythm imposed by their family life would consequently be incompatible with high positions. A woman should assume the fact of being a woman. Thus, high positions belong to men and positions with less responsibility belong to women, that is to say subordinate positions so that they can exercise their motherly and domestic role.

According to extracts of activities which come from the observations made from video recordings, interactions and adaptations vary according to the sector of activities – the kitchen vs. the reception. Moreover, sequences recorded within the kitchen highlight the stratification of professional hierarchies. Hierarchical relations are strongly present and perceived by the orders given, the change of speech but also by the prosodic use – intonations, etc. - of interlocutors. This structure enables each member to identify and adjust their position according to the presence of the speakers. In the same way, a stratification of the generated roles is notable since professionals participate in categorizing women in a dominant/dominated relationship. On the other hand, the reception is a more coherent environment because on an external point of view, in an endogenous perspective lead by data, there are not enough means to distinguish the different status of the participants. Moreover they do not make any categorization or difference based on gender. In addition to that, no matter whom the interlocutor was – men, women, customers, - linearity in the verbal resources used can be underlined.

These observations via video recordings highlight the importance of the environment – the kitchen or the reception- in the categorization process. Indeed, both male and female professionals observed had the same status, that is to say employees or managers. However, hierarchies are more or less visible according to the environment and this is why the relations between managers and subordinates can not necessarily be thematized. In the same way, the physical position of these environments, the trainings of these male and female professionals, and the gender of the speakers etc. have an impact on the categorization of these same members.

4. Discussion and conclusion

Main results

According to the main results, the qualities expected for a management position would more and more correspond to female characteristics. However, there are more men and they would be perceived as being more legitimate in positions of responsibilities.

Moreover, the hotel industry – reception, kitchen, and floors- tends to divide these trends. The cookery which is male dominant has a patriarchal vision of management where the Chef – as it is said in kitchens – holds the authority and dominates the work environment. The cookery professionals adjust their positions – experts or non-experts- in accordance with the interactions – the comings and goings of the “Chef”, etc. – and organize in an intelligible way their actions – their hierarchical “takeovers”, their withdrawal, etc. - by adjusting to their coworkers. The kitchen is a stratified sector where hierarchies between professionals are manifest. In the same way, every professional is categorized as an expert or a non-expert according to the presence or not of professionals.

On the contrary, the sector of reception is highly feminized. The management might be defined by exchanging and sharing between the manager and the subordinates regarding the means to introduce in order to achieve their common goals. Contrary to the cookery sector where hierarchies are marked, the sector of reception is more coherent.

These two types of management used in kitchen and reception are respectively directed towards male characteristics – in kitchens – and female characteristics – in receptions. Thus, it is not surprising that male managers and employees have a position within the kitchen and that female managers and employees are concentrated at the reception. The professional spheres distinguished as male vs. female categorize and maintain these trends in the positions described by the society.

Limits of the research

Among the main limits that can be evoked, some are methodological. First, the research wanted to compare not only two but three hotel spheres – the kitchen, the reception and the room service - considering the attribute of their gender. However it was not possible. The research focused on the kitchen and on the reception without dealing with the room service where a majority of women work. It would have brought an improvement to the area of study considering the theme of the research.
Moreover, the number of interviews was restricted to 21 interviews. Continuing a research with a more important and more heterogeneous sample can be considered according to the sectors of activities of the hotel, the range of hotels, and the seniority of the professionals. In the same way the limited characteristic of video recordings has to be taken into account in the limits of the research. On a larger scale, the final results would have been more exhaustive. Moreover, it is important to underline that video recordings go with the real involvement of the researcher but also of the persons working on the field. Thus, recording, watching, analyzing and dealing with video data remain a meticulous work in which what is seen cannot fully be rewritten, due to incomprehension, non-visibility, inaudible, etc. Despite all of that, the use of various methods enabled to support the analysis and to draw a conclusion.

Moreover, the intervention and the methods used ask for the use of qualitative methods in a work environment. From then on it was possible to underline the importance of the triangulation of materials which permitted not only to be dependent on interpretations but also to reason regarding the various means and methods used. The importance is even more imparted to numbers with quantitative methods. This is why it is not easy to directly return to the analysis results.

Perspectives of research

Further to this research, it must be necessary to get every actor of an organization involved –directors, managers but also employees. In this way, it is through briefing sessions, trainings, and groups of exchanges about this trend that both male and female professionals will feel involved in these issues regarding what parity can bring to a firm.

Besides, it has been noticed that cookery was the sector of activity in which women where absent and even discriminated against. It is necessary to introduce trainings in hotelier schools since as soon as they start working; there is a considerable lack of women. In the same way, male and female professionals underlined, during the interviews, the misogynous character of teachers during the cooking course. It would be interesting to compare hotelier schools in which the Chefs sometimes would be men, and sometimes would be women.

Thus, through immersions on fields or observations through video recordings it would be possible to attend courses made by Chefs. First it would enable to apprehend the division by gender in the hotel industry and secondly it would enable to see how courses are made. Moreover, by for instance relying on “Trainings for a gender equality” (Vinet, 2012), ideas, tools and perspectives could be suggested in order to make the students as well as the teachers aware of the progress of the feminine careers in male positions. Besides, this awareness also should be present within the careers of the hotel industry so that these trainings are made at school as well as during the career.

The perspectives of research will continue within the hotel industry as issues have been raised – during the immersion while working on the field – and remain unfinished.

Besides, these issues regarding parity in director positions but also regarding the division by gender of some sectors of activity tends to become widespread for every firm which is reluctant and worried about the integration and the recognition of women – and of men in some female positions – in the working environment.

Indeed, careers guidance should not be “disabled” by social representations concerning women and men.

5. Bibliography


Fieldnote: What cooking brings to the pleasure of eating at home and in a restaurant

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Key words: Culinary art, “home made”, behavior, liking, perception
1. Introduction

In food, “home-made” products are developing really fast, mostly thanks to appliances and food preparations which help cooking (study of the CREDOC, Centre for Research and Documentation on Living Conditions, 2008). The interest in what is “home-made” is not limited to food. Indeed, a GIFAM/TNS study (2010) showed that 83% of people who make “home-made” cooking also apply it to other areas such as DIY (61%), decoration (48%) and beauty (28%). The same study justifies this trend, at the level of food, by various factors such as health – eating healthy and controlling what we eat (34%), pleasure (22%) and friendliness (21%). In science writing, there are very few studies which deal with home-made cooking. Daniels, Glorieux, Minnen and Tienoven (2012) showed that the meaning and the perception of a home-made meal depend on different factors such as previous experiences, social and professional situations or even on what is expected by consumers. Moreover, the fact of being involved in the preparation of a meal and to share it, enable consumers to assert themselves and to become more confident (Dessajean, 2006; Moisio, Arnould & Price, 2004). All of this gives them satisfaction and will consequently increase their expectations towards a meal they made themselves, particularly regarding the quality and the taste expected (Cardello, 1995).

Agribusinesses are willing to innovate and to distinguish themselves from one another in order to meet consumers’ needs. Some catering brands offer projects that enable the consumers to create their meal themselves. In France, this trend is more recent and is developing (Moisio and al., 2004). For instance, Danone yogurt bars have been existing for more than 30 years in the US whereas they only started to set up the project in France in order to test it in front of consumers (Lentschner, 2011). Other projects linked to the home-made trend can be found such as self-service buffets – where for example consumers are invited to compose their own salad, or some fast food brands where consumers choose the ingredients of their sandwich. For catering brands, these projects are a way to widen their supply and to win customers.

The study consists in placing the consumer in a situation where he can be the actor of his own meal by making it, in a catering situation. In the first part, the consumers choice behavior between a dessert already made and a “DIY” dessert will be studied. The second part consists in a comparison between the consumers’ appreciation and perception of making their own dessert in a catering situation.

2. Methods and equipment

2.1 Catering concept

This study was made in a new catering concept, in a cafeteria type, called “Pause Déjeuner”. It was introduced in the frame of the Experimental Restaurant of the Research Centre of the Institut Paul Bocuse. This project enables the Research Centre to carry out studies on consumers’ food behavior in a real situation of consumption. The approach proposed is said “in vivo” which means that it is an experimental situation in the frame of a real meal. Experimentations took place during 8 lunches in May 2012. Menus were the same: a salad bar, hot and cold meals, a selection of desserts and drinks (wine, coffee, and tea.)

2.2 Method

The study focused on desserts. Indeed, consumers were asked to choose between a fromage frais already made by the experimenter and a fromage frais that the consumers could create themselves. Various flavours of fromage frais were offered – plain, sweet or with a fruit coulis. 73 consumers participated to the study and among them 63% were women. During the study, different measures – behavioural and declarative – were made.

2.2.1 Behavioural measures

These measures do not directly involve consumers. Indeed, they were made by video observations thanks to a video camera situated above the buffet of desserts. The choice behaviors of consumers between the two kinds of fromage frais were observed as well as their behavior-based personalization of fromage frais.

2.2.2 Declarative measures

The consumers’ liking of the fromage frais they consumed was studied via a questionnaire. Consumers could grade their appreciation on a 9 points-scale going from “I don’t like it at all” to “I like it very much”. Then, on a more general basis, consumers were asked about making their dessert themselves in a catering situation. To do so, consumers were asked to give their degree of agreement to the four following affirmations – the scale of agreement was on 4 points, going from “I totally disagree” to “I totally agree”:
- “I enjoy personalizing my own dessert”
- “personalizing my own dessert enables me to control what I eat (quantity, flavour)
- “personalizing my own dessert takes time”
- “I am not used to personalize my own dessert in a restaurant

3. Results

3.1 Behavioral measures: choice and personalization of the fromage frais

Results show that 63% of consumers chose the fromage frais. A difference between men and women can be noticed since women were the one who mostly chose to personalize their dessert, and this in a significant way ($\chi^2 = 7.29; p = 0.007$). It can also be observed that consumers who created their own dessert increased the quantity taken in comparison with the one who ate the fromage frais already made. These measures where collected by weighting the bowls of fromage frais and coulis before and after every lunch. According to Table 1, it can be noticed that on average, consumers took three times more of fruit coulis and 40g more of fromage frais basic.

<table>
<thead>
<tr>
<th></th>
<th>Fromage frais already made</th>
<th>DIY fromage frais</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fromage frais base</td>
<td>100g</td>
<td>140g</td>
</tr>
<tr>
<td>Fruit coulis</td>
<td>12g</td>
<td>40g</td>
</tr>
</tbody>
</table>

Table 1: Average quantity of fromage frais and fruit coulis consumed by consumers according to the type of fromage frais chosen.

Video observations showed that while making their dessert, consumers had two different types of behavior. The first one which was observed in 50% of the case consisted in organizing the dessert by superimposing layers of fromage frais and of coulis. Thus, consumers used various coulis. The second behavior observed consisted in mixing one or several coulis with the base.

3.2 Declarative measures: appreciation and perception of DIY

Regarding the liking of the fromage frais, results show that consumers enjoyed the 2 types of fromage frais. The one already made – by the experimenter, was enjoyed with an average grade of $5.8/9$ ($N=29$) and the DIY fromage frais was enjoyed with an average grade of $6/9$ ($N=44$).

Results also show that for the majority of consumers, personalizing their dessert was appreciated. Indeed, 92% of consumers agreed to say that it enables them to control what they eat and that it is nice. Moreover, 78% of them thought that it is unusual in a catering situation and that it does not take time (72%).

4. Discussion

This study aimed to a better understanding of the consumers’ reaction and feelings when they are offered to participate in the elaboration of their meal in a catering situation. In the first point approached, it was possible to show that the majority of consumers chose the DIY dessert and that it existed two types of behavior-based personalization: “assembling” the dessert (1) and mixing the ingredients (2). However, the judgment of behaviors through video is proper to the experimenter. It would be then interesting to measure – by questionnaire or interviews, the reasons and motivations that can lead certain consumers to take time to personalize their dessert, such as the increase in the desire of eating a dessert, visual pleasure etc. Moreover it could also be studied if it exists a potential link between the choice, the consumers’ behaviour at the restaurant and their culinary habit at home. The hypothesis would be that consumers who spend time cooking at home or who enjoy cooking at home are the one who get more involved in personalizing their dessert in a catering situation.

The second point of this study deals with the liking and perception towards the DIY practice. It was highlighted that this trend is appreciated by consumers in a catering situation when it is offered – in self-service for instance. Indeed, the majority of them preferred to chose the DIY dessert, with a slightly superior liking for the dessert already made. For consumers, DIY is a practice associated with the notion of pleasure and it enables to control what we eat. Nevertheless, the study was based on personalizing desserts, which corresponds more to culinary assembling. It can be supposed that the DIY liking and perception would be different if consumers were asked to entirely realize a meal from raw products. It is also important to take into account the fact that the results are valid for a specific catering situation: simple menus in self-service. Thus, it can be thought that the results would differ according to the catering situation. In order to have some complementary data, it would be interesting to introduce experimental economic measures. For instance, the consumers’ consent to pay, that is to say the maximum price that they are willing to pay
for a product would enables to compare the value that they grant to a product that they made themselves and the value of a product already made. Finally, this study was made in a real situation of consumption, so the possibility that there could be exchanges between the subjects has to be taken into account as it could affect their choice and behaviour.

The study presented here enables to highlight a certain interest of consumers in the DIY practice in a self-service catering situation. It is necessary to realize new studies to obtain complementary results regarding the consumers’ representation towards the DIY practice.

References


Research article: Quality perception by different eating-out industry players: do producers wear magnifying glasses?

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Abstract

Résumé:

Keywords:
1. Introduction

When shopping for groceries, products are differentiated on the shelves by all the information coming from the packaging; like the quality of the packaging itself, the brand, the production process, the list of ingredients or different types of labels. Consumers can infer the quality of the product and the value they associate to it thanks to this information display. In restaurants, managers choose the products from a large range too, but then they offer only a subset or sometimes even one of the products of a category to their customers. As a result, some product might be sold more as a commodity than they are on the retail market, as they become just “some bread”, “some apple juice” or “some house wine”. For product categories with such traditional and though complex production process like wines, natural ciders, local cheeses or extra virgin olive oils, producers may have an accurate idea of what is a high quality product in their field and intend to convey this idea to final consumers. In such field, a high-end quality product is often by definition a product processed according to a reference production model of excellence (Meiselman, Johnson, Reeve, & Crouch, 2000), and presenting the corresponding sensory attributes in tasting sessions. These sensory characteristics related to production process might be more noticeable for experts than for consumers (Parr, Mouret, Blackmore, Pelquest-Hunt, & Urdapilleta, 2011) and quality judgments by experts and consumers might not be correlated (Delgado & Guinard, 2011), as perception of quality seem to depend on the level of expertise (Sáenz-Navajas, Ballester, Pêcher, Peyron, & Valentin, 2013).

High quality products however, due to more expensive or time consuming process steps, also often have a higher cost. Therefore agrifood producers struggling to differentiate their offer in restaurants may wonder: “Are my high-end products perceived as of higher quality by consumers?” and if so “How to promote these products, today sold in restaurant as a commodity?”

1.1 Signaling quality

On the one hand, theory of economics suggests that a major issue on the selling side could be the fact that for such products sold as commodity, there is an information asymmetry at the expense of the demand - restaurant clients. Indeed at the moment of ordering, the supply side - the restaurant manager – has more information than the clients on the product characteristics: its origin, process, quality, taste, or the way it is prepared or served. In such situation, ordering can represents a risk for consumers as they are not able to estimate actual quality of the product. This uncertainty around quality leads to an average willingness-to-pay of consumers for all products. As it is difficult for restaurant managers to sell high-end products with a price premium, the market might fall into a low-quality-low-price equilibrium (Akerlof, 1970). Therefore to better promote high-end quality product, producers could collaborate with restaurant managers to provide final consumers with quality signals like information about the production process, from which consumers could infer the actual quality of the product.

On the other hand, in the food product development area of research, such a question could be approached from a consumer-led point-of-view (Hal MacFie, 2007). In order to develop a differentiated offer, suppliers first need to know what consumers perceive as a high-quality product. Indeed on the conception side, the information asymmetry is about the consumer home-grown preferences and values, at the expense of supply. Therefore, in a latter objective of signalling quality and differentiating the offer, a first step would be to assess whether for products of a category, a higher level of quality as judged by agrifood producers indeed correspond to a higher value both for consumers and for restaurant managers. Indeed restaurant managers are the first buyers and prescript the products for their consumers. Value does not have a monetary connotation here but refers to the utility judgment depending on individual’s own objectives and expectations about the product’s function (AFNOR, 1994).

1.2 Coordination on quality

In theory of economics, vertical differentiation occurs when consumers unanimously agree on which product they prefer (Giannakas, Lusk, Roosen, & Shogren, 2011). From a whole industry system point-of-view, products are vertically differentiated if all stakeholders agree on which product has the more value, depending on their assumed objectives: quality for producers, customer satisfaction for restaurant managers and preference for consumers. If all agree on a utility ranking of products, this means that if products were at the same price, they would all choose to have the same variant on the market. This coordination on what quality is across the market seems to be a prerequisite for producers of traditional products wanting to signal the quality of
their offer and differentiate it in restaurants. In other words, in order for producers to promote their high quality wines for example, a first step is to check that restaurant managers and consumers indeed perceive these products as having a greater value when tasting them. Although vertical differentiation is a widely acknowledged theory of economics and although a large amount of research and development studies use ranking methods to evaluate consumer preferences for food products (Hein, Jaeger, Tom Carr, & Delahunty, 2008), to our knowledge no study is available yet that experimentally tests the theory of product differentiation using such consumer testing tools.

1.3. Objective of the study

The objective of this study was to evaluate whether, for a given product category, the process-based vertical differentiation of products made by experts translate into the same vertical differentiation when tasting the products blind for the producers, the restaurant managers and the consumers. Specific objectives were to evaluate whether there is a vertical differentiation at each step of the industry, and if this vertical differentiation of products is the same across all groups of stakeholders.

2. Material and method

2.1 Products

For confidentiality issue, the product category actually tested cannot be mentioned. Products could be wines sold by the glass in a restaurant for example. Four products were chosen to represent different levels of quality, based on two characteristics: input ingredients and presence of defaults. For input ingredients, it is widely acknowledged by experts that the variety H (high) gives finer products than variety L (low). Variety L is cheaper and most often used in blends. For wines sold by the glass in restaurant, this could be the grape variety. The second characteristic is the presence of defaults in the intermediate product. For our example this could be a bottle of corked wine. Characteristics of products are summarized in Table 1. All products were tasted blind, labelled with three-digit codes. Presentation order was designed to balance the effect of rank order presentation and in the consumer group it was also designed to balance first-order carry-over effects (Hal MacFie, Bratchell, Greenhoff, & Vallis, 1989). They were prepared according to hospitality standards for these products in terms of serving temperatures, quantity and containers. Participants were sitting individually and had water to cleanse their palate between products.

<table>
<thead>
<tr>
<th>Final product</th>
<th>Input ingredient</th>
<th>Intermediate product</th>
<th>Default</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>H</td>
<td>No</td>
<td>22€/unit</td>
<td></td>
</tr>
<tr>
<td>HL</td>
<td>H&amp;L</td>
<td>No</td>
<td>16€/unit</td>
<td></td>
</tr>
<tr>
<td>H*</td>
<td>H</td>
<td>YES</td>
<td>10€/unit</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>L</td>
<td>No</td>
<td>3€/unit</td>
<td></td>
</tr>
</tbody>
</table>

Table 1 - Products characteristics

2.2 Participants and settings

Products were evaluated in three groups, representing market players: consumers, eating-out industry professionals and producers.

Consumers

Consumer testing took place in Ecully, in the neighbourhood of Lyon (France). Participants were recruited through flyers left in local food stores, shops, offices and markets. They were screened to consume products on a regular basis, to eat out in restaurants at least once a month and to sometimes order the tested products on this occasion. Testing sessions took place during three days, in the morning and lasted about one hour each. Each participant was remunerated by choosing a gift worth 20 Euros.

Restaurant managers

To represent restaurant managers, a test with eating-out industry professionals was held during an annual meeting of graduates from the Institut Paul Bocuse, a Culinary arts and Hospitality management school in France. Data used here are from 16 graduates, screened to all have a significant professional experience in French restaurants.

Producers

Producers were represented by 9 professionals from the corresponding agrifood sector, all acting at different steps of the production business: ingredient sourcing, quality control, tasting, marketing, sales, etc.
2.3 Data collection

2.3.1 Principle

In order to elicit products ranking, the methodology used here was to collect the position of each products on a value scale, through a simultaneous presentation of the four products. This distance collection combined two advantages. From a testing point of view it enables participants to give comparative scores, which are easier to generate for participants than absolute scores (Ares, Varela, Rado, & Giménez, 2011) . On the analysis side, obtained data were relative scores, without forcing the number of ranks to be given by each consumer. Variable measured on the scales were different according to presumed objectives of each group: quality for producers, customer satisfaction for restaurant managers and liking for consumers. For these variables, participants had to give: either their estimation of average ranking in a reference group or their individual opinion. When estimating ranking in a reference group, participants were induced to guess average results of this group through a contest in which they could win a gift. This type of task was designed to be incentive-compatible in order to involve participants in the guessing task and so that they do not just report their own evaluation. This was done in order to see if in each group, above individual judgment, there is an implicitly admitted hierarchy of what is perceived as a high-end product. Participants were also asked to point out any product they judge as not acceptable to be served in a restaurant in their own opinion, or that they thought would be judged so by a majority of the reference group.

2.3.2 Procedure

Four products were simultaneously presented to all subjects in the order they had to taste them. They first had to lay the products on the 58 centimetres unstructured line scale printed on paper. Then they had to report corresponding 3-digit codes of each product at the place it was situated. Anchor points labels were different according to the variables measured in each group. Ban signs stickers were also provided to mark unacceptable products. Variables measured, anchor points of scales and tasks performed in each group are summarized in the Table 2.
Table 2 - Tasks performed in each group

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Presumed objective</th>
<th>Anchor points of the scale</th>
<th>Estimation of average result in a group of peer</th>
<th>Individual scores</th>
<th>Additional tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Producers</strong></td>
<td>Quality</td>
<td>“Very low quality product” to “Very high quality product”</td>
<td>YES</td>
<td>YES</td>
<td>Estimation of average consumer liking, comments on products</td>
</tr>
<tr>
<td><strong>Restaurant managers</strong></td>
<td>Customer satisfaction</td>
<td>“Unsatisfied customers” to “Very satisfied customers”</td>
<td>YES</td>
<td></td>
<td>If different than the estimation</td>
</tr>
<tr>
<td><strong>Consumers</strong></td>
<td>Liking</td>
<td>“I don’t like it at all” to “I like it very much”</td>
<td>YES</td>
<td>If different than the estimation</td>
<td>Comments on products</td>
</tr>
</tbody>
</table>

As an example, instructions given in the three groups are shown in the appendix.

2.4 Data analysis

Friedman test and post-hoc multiple comparisons in all three groups

Vertical differentiation occurs if all subjects of a group agree on the ranking of products. The testing of this theory in food products is challenging for several reasons. First, food perception and evaluation depend on the presentation order. For example, persistent bitterness or acidity of a previously tasted product might mask the taste of the next one. In addition, sensorial fatigue also makes last tasted products more difficult to evaluate.

To counterbalance these effects and in order not to penalize one product, a presentation design balanced for orders and carry-over effects was used and data were analyzed at the group level. A Friedman test was conducted on the product scores in each group, testing product effect. Product effect was considered as significant when p-value was below 0.05, meaning that at least one of the products was found significantly different from the others. In order to evaluate which couples of products present significant difference in the way they were evaluated, post-hoc comparisons were then computed. Products assigned with the same letters (a, b, c) are not significantly different from each other.

A product was considered as vertically differentiated in a group if it was significantly different from the others. If two or more products are not significantly different from each other, then either subjects of the group found them equivalent, or they did not agree between them. In any case these products are not vertically differentiated in the sense of the theory, as there is no agreement on one of them having a higher utility or value.

Overall, presence of a vertical differentiation of products within each group was evaluated by looking at: significant differences between products level on the scale, and number of times a product was judged unacceptable, or predicted to be judged so by a majority of peers.
Principal Components Analysis and Ascending Hierarchical Clustering on products liking scores by the Consumers group

In order to detect clusters and assess if there are groups of consumers similarly judging products within a group and differently between them, a principal components analysis (PCA) followed by an ascending hierarchical clustering (AHC) was performed on products liking scores. In PCA, dissimilarity between subjects is emphasized by a distance separating them on the graphical representation of results. On the contrary, the closer two subjects appear, the more they presented similarities in the way they evaluated the products. The aim of the PCA is to compare the repartition of consumers for two products, without considering the fact that from one product to another, average scores are more or less high. Hierarchical clustering of PCA data enables to evaluate to which extent subjects differ in the way they evaluate the products and if there are homogeneous clusters. In AHC optimal number of clusters is calculated in order to minimize variability within each cluster and to increase variability between them.

3 Results and interpretation

3.1 Demand: Consumers

3.1.1 Product effect on liking scores

Results of Friedman test showed a significant product effect on the position on the scale going from "I don’t like it all" to "I like it very much". Results of post-hoc multiple pairwise comparisons are presented on Figure 1, together with the average mean of each product on the scale, confidence intervals, and the number of times a product was judged unacceptable to serve in a restaurant at the individual level. Product H was significantly better liked overall than products L and H*, and judged unacceptable to serve for only 2% of subjects. On the other hand, product L was significantly less liked than the three others and judged unacceptable by 67% of subjects. In between, both products H* and HL were judged unacceptable by 19% of the subjects. H* was significantly better liked overall than L, and less than H. Product HL however, was not significantly different from H* and H.

Figure 1 - Consumers ranking on a Liking Scale

These data show that differences are perceived between products, and that these differences result in different assignment of value by consumers. Indeed, positions on the liking scale and unacceptability rates can be summarized in three levels of acceptance represented in different shades of grey in the table. Therefore, at the group level there is an overall vertical differentiation of products. This differentiation follows the curve of products prices and therefore the hierarchy of quality aimed to be tested by the two characteristics: ingredients and presence of defaults. However, some cues of disparities in the way products were evaluated can be pointed here: for example the position of product HL was not significantly different from the position of product H overall, but it was judged as unacceptable by 16% more subjects. Therefore, after this analysis of the mainstream tendency of liking of each product, the next step is to evaluate whether there is homogeneity of these preferences or whether there are clusters of consumers.
3.1.2 Homogeneity of preferences: clusters of consumers

The first dimension of variability among subjects opposes those who gave higher score to product H* to those who gave a higher score to products HL or L. The second dimension of variability between subjects comes from the liking scores of product H. It opposes those who gave a high score to this product to those who gave a low score.

Partitioning of participants according to AHC principles gives the two main clusters represented on the PCA map of Figure 2. This graphical representation of clusters clearly shows that the first dimension of variability opposes the two clusters. The first cluster includes 8 subjects who liked the products differently than the rest of the group but similarly between them. Cluster 1 subjects liked product HL and L more than the average: they were 7 (87%) to rank HL first or second. Figure 3. They also liked product H* less than the average: all of them ranked this product third or fourth. Conversely subjects from cluster 2 liked product H* more than the average and product HL and L less than the average. However, they are much closer to the average ranking previously seen and superior in numbers (41 out of 49 subjects). Therefore cluster 1 could be called “Ingredient L liker’s and default rejecters” whereas cluster 2 would be the “Mainstream” cluster of consumers. Liking of product H does not intervene in this partition in the two clusters: the average mean of liking score for this product is not significantly different in the two clusters. In other words, participants agreed more on the liking levels of product H than on the liking levels of the three other products.
3.1.3 Expected results for the group

Expected results for the group given by consumers are not detailed as they are very close to those individually given. Apart from a few inversions in ranking order of products, they are in general correlated with individual responses. Friedman test and post-hoc multiple pairwise comparisons give the same significant differences between products than at the individual level.

3.2 Producers

3.2.1 Expected quality evaluation in a group of peer experts

Results of the Friedman test performed on expected quality evaluation of products by a group of peers showed significant product effect. Post-hoc multiple pairwise comparisons revealed that only H was significantly different from L and H* overall.

The first interesting element is that products quality evaluations by experts follow the exact same ranking pattern as the one given by consumers in terms of liking (Figure 4), but there are fewer significant differences between products overall. Despite the fact that products were evaluated by producers, products are less clearly vertically differentiated than with consumers. Indeed only two levels of differentiation can be seen: products H and HL on the high end, never estimated to be judged unacceptable, and products L and H* on the low end, respectively 3 and 4 times estimated to be judged as unacceptable by a majority of experts.

Comments show that about half of the subjects of this group perceived a defect in H*, and ingredients L was often mentioned when present in a product. This recognition of ingredients and identification of defect might in fact have led to less agreement between evaluation of producers, depending on the fact that they took this information in consideration or not when evaluating the quality of each product. Indeed producers show less magnitude in their vertical differentiation than the group of consumers. Behind detection of low quality characteristics like presence of defaults or unbalanced composition, producers do not agree much between them on a hierarchical structure of sensory quality.
3.2.2 Consumer’s preferences estimations

When looking at the consumer’s preferences estimations by the producers (Figure 5), again the agreement is on the estimation of a vertical differentiation by consumers between H and HL on the high end, and H* and L on the low end, with the exact same ranking pattern as seen among consumers. Results of the Friedman test showed significant product effect but only H was significantly different from L and H* overall. This might come from the fact that they underestimate rejection of product L, and overestimate rejection of product H*. Indeed only 2 out of 9 of them thought a majority of consumers would find L unacceptable, when in fact 67% found it unacceptable. On the contrary there were 5 out of 9 producers thinking that H* would be judged as unacceptable by a majority of consumers, when in fact only 18% of participants in the consumers group found H* unacceptable. As for quality evaluation, it seems that producers do not agree on the hierarchy of products when low quality characteristics are present. Overall, producers are aligned and with consumers in terms of value they assign to each product when ranking them. However, they tend to distort importance of some characteristics, showing less coordination in terms of magnitude that they assign in the differences between products.
4 Discussion and perspectives

The objective of this study was to evaluate whether the process-based vertical differentiation of products made by experts translate into the same vertical differentiation when tasting the products blind for the producers, the restaurant managers and the consumers. In each group, whatever the presumed objective, products were ranked in the same way by all participants overall, showing an alignment on values assigned to each product. The valuation of products followed the price of the intermediate level, which is an indication of process-based quality in terms of composition and grade of the products. This alignment shows that there is a vertical differentiation at each step of the industry, and that it is the same across all groups of stakeholders.

However, magnitudes of differences observed between products were different across groups. For example there was a low agreement around quality evaluation in the group of producers, resulting in only two levels of product differentiation. Producers do not to agree on a hierarchy of characteristics on the low quality side. When estimating consumers preferences afterward, producers also seem to wear distorting glasses as they give too much weight to the defect of product H*. This might be because producers are used to select high quality products by looking for defects. They recognize defects in the final product and directly associate it with the corresponding event in the process. They are trained to identify “expert’s characteristics”: features of the product that they detect because of their process knowledge and that they can link with a previously known scenario of production like ingredient variety, parameters of process or storage conditions. For example, Wine experts tend to regroup wines according to grape varieties, whereas consumers group them according to basic tastes like sweetness (Hughson & Boakes, 2002). This recognition of specific attributes changes their perception of the products and probably impacts their valuation of defaults.

Restaurant managers also tend to have distorting glasses that reduce the magnitude of differences between products. They are guessing correctly when estimating that product L is on the low end of consumer liking scale and that the three others are better liked. But their prediction that all three products lead to the same level of satisfaction is not exact. One interpretation might be that when evaluating customer satisfaction they are estimating for which of these products they would get customers complaints in a restaurant, and for which they would not.

Results show that consumers are the ones who better differentiate the products vertically when tasting them blind. The reason why producers in fact struggle to differentiate their product in restaurants might be that restaurant managers in fact do not select the product they sell on the basis of taste quality and related expected customer satisfaction. To choose which products to sell in their restaurants, they might take other characteristics into account that are of a greatest importance for them in the differentiation of products: like brand, packages, delivery of products and so on.

The main conclusion of this experiment is that these different magnitudes in the way market players are evaluating the products represent risks. For consumers there is a deception risk. The risk is to be offered “under quality” in restaurants, as managers from the eating-out industry may choose H (22), HL (16) and L* (10) indifferently (Figure 6). With actual prices the chances are high they would choose H*, the cheapest product of the three. Some managers could care less about customer satisfaction anyway and choose L (3), even though they know the consumers will not appreciate it.

The risks for Agrifood producers is to supply “Over quality”, as they may produce H (22) instead of H*(10) and not be able to sell it to restaurants.

<table>
<thead>
<tr>
<th></th>
<th>L (3)</th>
<th>H* (10)</th>
<th>HL (16)</th>
<th>H (22)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Producers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restaurant managers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Figure 6 - Coordination on quality on the market*

To the agrifood producers willing to differentiate their offer in restaurants, we can confirm that their high-end products are perceived as of higher quality by consumers when tasted blind, but not by restaurant managers. Therefore the major issue for them will be to pass more information about the product on to the consumers, in order to reduce uncertainty around quality. This could increase the value consumers attach to the product and thus encourage restaurant managers to select these high-end products. In other words, a way to promote their products might be to work in collaboration with restaurant managers in order to provide final consumers with quality signals like information about the production process, origin, or taste, from which consumers could infer the
actual quality of the product. In parallel, so as to increase the value of their product for restaurant managers, they might work on the improvement of other characteristics of their product that are important for professionals like brand, packages, delivery of products and so on. Indeed, to lead the offer in these two directions may widen the differences perceived between products across the market and line up the differentiation made by all stakeholders.

Acknowledgements
Assistance provided by interns, students and permanent staff of the Culinary Arts and Hospitality Management School and by the Agrifood producers industry in conducting these experiments was greatly appreciated.

5 References


APPENDIX

Restaurant managers instructions

Group scale: “A study was performed among restaurant managers serving between 30 and 70 covers per day, for an average bill of €15 to €30. These managers tasted the same products as the ones in front of you. You are asked to taste the products one by one and to guess their average ranking in terms of customer’s satisfaction. In order to do so, place the products on the scale going from “Unsatisfied customers” to “Very satisfied customers”. The more distance between the products, the less they had similar performances in terms of customer satisfaction according to this group of peer professionals. When your ranking is finished, write down the 3-digit-code of each product at its place along the scale. If you think that one product or more was judged as unacceptable to be served by this group, signal it by stamping a ban sign sticker nearby.”

Individual scale: “If your evaluation of products is different, give your own products ranking and product acceptability on a second scale.”

Producers instructions

Group scale: “The four products in front of you also have been evaluated by a group of peer experts. Estimate their evaluation of products in terms of quality on a scale from “Very low quality” to “Very high quality”. In order to do so, place the products on the scale. The more distance between the products, the more their quality level is different. When your ranking is finished, write down the 3-digit-code of each product at its place along the scale. If you think of products that were judged as unacceptable to be served in restaurant by this group, signal it by stamping a ban sign sticker nearby. Write down two or three words to describe each product.”

Individual scale: “If you think judgment in your own group would be different, report this other products ranking and product acceptability on a second scale.”

Estimation of consumer’s preferences: “These four products will also be tested during a consumer test. Consumers will be screened to frequently consume product of this category. They will place products along a scale going from “I don’t like it at all” to “I like it very much”. Estimate what will be the average level on this scale for each product, when computing all consumers’ answers. Follow the same procedure as before to indicate each estimated product level on the scale and whether you think that one product or more will be judged as unacceptable to be served in a restaurant by a majority of consumers.”

Consumers instructions

Individual scale: “Imagine all these products are offered in a restaurant at the same price. You are asked to give your preference of these products on a scale from “I don’t like it at all” to “I like it very much”. Taste the products in front of you from left to right and place them on the scale in such a way that the less you like a product, the closer it is to the “I don’t like it at all” anchor, and the more you like a product, the closer it is to the “I like it very much” anchor. When your ranking is finished, write down the 3-digit-code of each product along the scale. If you judge one product or more as unacceptable to be served in a restaurant, signal it by stamping a ban sign sticker nearby. Write down two or three words to describe each product.”

Group scale: “Now try to guess what will be the average result obtained by computing all participant answers to previous question, except yours. Follow the same procedure as before to indicate each estimated product position on the scale and whether you think that one product or more was judged as unacceptable to be served in a restaurant by a majority of consumers”.
Abstract

Résumé: Sensory science needs human volunteers to carry out experiments. Such research requires that both the subjects and researchers be aware of the ethical and legal issues involved. Thus, biomedical research, defined as research conducted on humans to develop biological knowledge, is submitted to both strict international ethical standards and national legislation/laws to protect the persons involved in the research. Despite adherence to such standards, laws, and legislation, sensory scientists can feel helpless when faced with these issues. There are two main reasons for this: (1) sensory science may, from time to time, transcend the traditional parameters of biomedical research; and (2) the legal requirements for clinical trials may at times be disproportionate for sensory research protocols and thus extremely difficult if not impossible to apply. Although there is no clear legal framework for conducting sensory research per se, some general guidelines should be adopted to fit the nature, objectives and specificity of the research so as to protect the rights and safety of the subject participants. The overriding concern, of course, is the well-being of the subjects. In embarking on biomedical research, therefore, sensory scientists do not have to be bogged down by applying systematically some rather arbitrary biomedical legislation, but they should take into consideration the broad legal and public policy dimensions of the ethical issues involved in such research. This, then, is the challenge for those engaged in sensory and eating behaviour research.

Keywords: sensory study, eating behaviour, ethics, clinical trial, biomedical research.
1. Introduction

All researchers have a duty and responsibility to be cognizant of the ethical issues relating to the studies they conduct. This statement is particularly true when research concerns human participants in medical and biomedical experiments. International instruments or codes such as The Declaration of Helsinki (1964) which has undergone seven revisions and legislation in different countries provide a general ethical and legal framework which sets out how clinical trials involving humans need to be conducted in terms of respect of human integrity and dignity. Developed by the World Medical Association, The Declaration of Helsinki, for example, provides a set of universally accepted ethical principles—that is to say, as a general guide—for human experimentation. Food research, and especially sensory science, also requires human volunteers to carry out studies which are not necessarily considered to be within the parameters or field of biomedical research. Thus, researchers in that particular field can feel helpless when confronted with certain ethical and legal issues, a situation we have experienced, in the Centre des Sciences du Goût et de l’Alimentation (CSGA), an academic research centre based in Dijon, France, over the past seven years. In this article, we will examine international codes and regulations in France for biomedical research in an attempt to demonstrate that sensory and eating behaviour research continues to pose a challenge to laws and legislation governing such research. Hence, some practical guidelines can be considered necessary when carrying out sensory and eating behaviour research.

2. Medical and Biomedical Research

2.1. Brief history

Ethical principles for medical and biomedical research have been developed at the national and international levels over the last sixty years. In reaction to human experimentation in Germany during World War II, the Nuremberg Code (1947) defined the informed consent of the patient as a prerequisite to any research involving human beings. In 1964, the World Medical Association (WMA) published the Declaration of Helsinki, Ethical Principles for Medical Research Involving Human Subjects which is regularly revised (last revision October 2013) and remains the central reference text for clinical trials all over the world: “Preamble: [...] Consistent with the mandate of the WMA, the Declaration is addressed primarily to physicians. The WMA encourages others who are engaged in medical research involving human subjects to adopt these principles. Medical research is subject to ethical standards that promote and ensure respect for all human subjects and protect their health and rights. While the primary purpose of medical research is to generate new knowledge, this goal can never take precedence over the rights and interests of individual research subjects” (WMA Declaration of Helsinki, Preamble and articles 7 and 8, October 2013). On the basis of these principles, the French law “Huriet-Sé rusclat” (1988) developed a legal framework for biomedical research in France and, in 2001, the European Union’s Clinical Trials Directive (2001/20/EC) was published in order to harmonize the different rules for clinical trials as applied in the EU member states. In 2004, French law integrated the EU Directive in the Code de la Santé publique which is currently the regulatory framework for biomedical research in France. It is also noteworthy that the European Medicines Agency has published in 2002 a Guideline for Good Clinical Practice.

2.2. Definition of Biomedical Research

French law defines biomedical research as “trials or experiments organized and carried out on human subjects in order to develop biological and medical knowledge” (Art. L1121-1, Livre premier, Code de la Santé publique du 9 août 2004). Two points need to be emphasized here: first, that experiments are on humans, and not with humans; and second, the object is to enhance biological (or medical) knowledge. This second point will be taken up in section 3. It is first necessary to look closely at the notion of “intervention”, suggested by the preposition “on” (“on humans”), which is central in French law as well as in the UE Directive. The notion of intervention is, however, mainly defined by its opposite: “Non-interventional study: a study where the medicinal product(s) [studied] is (are) prescribed in the usual manner in accordance with the terms of the marketing authorization. The assignment of the patient to a particular therapeutic strategy is not decided in advance by a trial protocol but falls within current practice and the prescription of the medicine is clearly separated from the decision to include the patient in the study. No additional diagnostic or monitoring procedures shall be applied to the patients and epidemiological methods shall be used for the analysis of collected data (EU Clinical Trials Directive 2001/20/EC, Article 1, Definitions, c). French law stipulates that “[the] present law does not apply to researches where all the acts or products are used in the usual manner, without additional or unusual procedure of diagnostic or of monitoring” (Art. L1121-1, Livre

Footnotes:
1 For more details, see Meunier 2009: 279
2 WMA: World Medical Association
premier, Code de la Santé Publique du 9 août 2004). In other words, present law does not concern non-interventional studies, also called observational studies. It is to be noted that both the European and the French code use medical language (“patients”, “therapeutic strategy”, “diagnostic”, “usual care”), hence the questioning of the notion of intervention when the research is conducted with healthy volunteers outside the framework of hospital and care. The difficulty evaluating the limit between interventional and non-interventional studies will be illustrated with examples in section 3.

2.3. French legal requirements

Article L.1121-2 of French law restates ethical principles set out in the Declaration of Helsinki: “Biomedical research cannot be carried out on human beings:
if it is not based on the state of scientific knowledge and on a sufficient preclinical experiment;
if the anticipated risk incurred by the persons is out of proportion to the estimated profit for these persons or the interest of the research;
if it does not aim to extend scientific knowledge of human beings and the possible means to improve its condition;
if the biomedical research has not been designed in such a way that [...] predictable inconveniences linked to the disease or to the research are reduced.[...]
The interest of the persons participating in biomedical research always takes precedence over the interest of science and of society. The biomedical research can only start if all these conditions are satisfied. Their respect must constantly be maintained.”

This article of law can be summed up in three words: a clinical trial should be undertaken if and only if it is justified, achievable and useful (Meunier, 2009: 280). These three terms can be applied to any kind of scientific research: a bibliographic work must demonstrate that the research question has not yet been solved and needs further investigations; it must be concretely and ethically possible to undertake the research with the conviction that results will enhance scientific knowledge; in the case of clinical trials, “useful” also means that results may be used in clinical practice within a reasonable delay.

For a better understanding of the notion of achievability, the main requirements of French law need to be: a biomedical research project must (1) be supervised by a physician with appropriate experience in the research field (Article L. 1121-3), (2) be carried out in a laboratory which has been given a license for biomedical research (Article L. 1121-13), (3) obtain specific insurance for the research (Article L. 1121-10), (4) be approved both by a “Comité de Protection des Personnes” (CPP)iii and by a government organization, the Agence Nationale de Sécurité du Médicament (ANSM) (Article L. 1121-4), and (5) to receive informed (and written) consent from the volunteer before inclusion in the clinical trial (Article 1122-1 and followings).

The constraints put on these requirements make them difficult to follow outside the context of a hospital: for instance, the obtaining of the license for the laboratory implies buying medical equipment in case of emergency (equipment that nobody in a research laboratory may be allowed to use) and writing up numerous procedures and the whole process can take several months or years. Moreover, research laboratory teams do not always include physicians who can supervise the research carried out with human volunteers. Editing and collecting all the files for submission to the CPP and the ANSM also constitutes a huge task. It implies also considerable delays (at least two months) before the authorization to begin the research is obtained. These requirements are clearly necessary and justified to protect volunteers involved in biomedical research. Are they, however, necessary and justified for volunteers involved in sensory and eating behaviour research? The following section focuses on this question.

3. Sensory and eating behaviour research and biomedical research

3.1. Role of volunteers in different types of research

At the Centre des Sciences du Goût et de l’Alimentation (CSGA) in Dijon, research teams in different disciplines carry out studies with human volunteers. They investigate the relationship between food and humans and aim to understand the perception of food by humans and the drivers behind their eating behaviour. Such research combines different approaches involving both physico-chemical and sensory sciences, psychology and biology. Depending on the aim of the studies, the roles of the volunteers can vary widely: we can distinguish roughly five types of research (Table 1).

iii The “Comité de protection des personnes” (CPP) (which could be translated as Committee for the Defense of the Volunteers) are independent committees, with an agreement from the Health Department; they gather a diversity of expertise relating to biomedical, ethical, social, psychological and juridical matters. CPP also include representatives of hospital users (Art. L.1123-1 et 2), Livre premier, Code de la Santé Publique du 9 août 2004).
Table 1: 5 categories of research involving human volunteers in an academic research centre

<table>
<thead>
<tr>
<th>Focus of the research</th>
<th>Human volunteer is</th>
<th>Aim of the research: to enhance knowledge on...</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Physico-chemical characteristics of the product</td>
<td>A masticatory device</td>
<td>The relationship between the matrix composition and the flavour release in the mouth cavity</td>
</tr>
<tr>
<td>2. Sensory characteristics of the product</td>
<td>A sensory measuring device</td>
<td>The organoleptic characteristics of a product according to its process</td>
</tr>
<tr>
<td>3. Preference of the consumers for a product</td>
<td>A sensory measuring device and object of the study</td>
<td>The preferences of consumers and what can explain those preferences</td>
</tr>
<tr>
<td>4. Eating behaviour</td>
<td>The object of the study</td>
<td>The impact of the context (internal, external, experience...) on the choices of consumers</td>
</tr>
<tr>
<td>5. Physiological parameters</td>
<td>The object of the study</td>
<td>The impact of individual physiological parameters on the perception of food</td>
</tr>
</tbody>
</table>

This table highlights the different ways and levels of volunteers’ involvement according to the aim of the research; volunteers are either mere “tools” or the “object” of the research. It seems logical that the legal constraints should differ according to the role of volunteers and to the nature of the research. But, in France, still in 2014, the research is either “biomedical” (and the law has to be respected in all its requirements), or “observational” and there is no regulatory framework, except regarding aspects of the collection of nominative data or biological collections. There is no mean between these two possibilities1. Thus, the key point is to know if such types of researches, or some of them, correspond to the biomedical research regulatory framework and thus have to follow all its requirements. Facing this issue means looking closely at the research aims to see if its aim is to “enhance biological knowledge” and if it is “interventional”.

1 A third category, which is called “intermediate cares” is specified by the law but it is scarcely used by the CPP and it can be applied only to volunteers already involved in a healthcare process (such as in Retirement homes)

3.2. Aim of the research and notion of intervention in sensory and eating behaviour research

In Table 1, the five categories of research are arranged in increasing order of proximity with the definition of biomedical research. Thus, type 5 research (Table 1) focuses on the impact of individual physiological parameters on the perception of food: for example, different parameters such as saliva composition or chewing activity are measured and may be combined with sensory measures of perception. Trials are performed on human subjects, who may be healthy or patients, and enhance biological knowledge of human perceptions. Volunteers’ involvement in the trial is indeed linked to a research protocol which modifies their “usual care”: they come to the laboratory for the sole purpose of having their masticatory activity measured while eating a product (as) required by the trial. It can thus be considered as interventional and this type of research fits the biomedical research definition.

If biological is taken in a broad sense including psychology and cognition, research which focuses...
on the impact of experience or of the context (moment of consumption) on eating behaviour (Type 4, Table 1) develops biological knowledge concerning humans. The concept of intervention is more difficult to appreciate and may vary according to the research protocol (behavioural questionnaires, cognitive tasks, choices in real situations...). Deciding whether a protocol adds “an unusual procedure” or is observational comes within the competency of the CPP. On the other side, types 1 and 2 (Table 1) seem quite different as they focus mainly on the product or its components. They are carried out with human volunteers, who play the role of devices, but not on humans and such research do not aim at developing any biological knowledge of humans. Therefore, we could conclude that these 2 types of studies do not belong to biomedical research. Type 3 (Table 1), which investigates the preferences of the subjects, combines a double approach, which can focus on both product and volunteer. Depending on the aim of the study, it may be very close to type 4 or to type 2; in fact, each separate study needs to be examined specifically. As we can see, although this categorisation of food and taste research could seem quite effective, it does not solve all the questions. Firstly, the boundaries between the 5 categories are not completely hermetic: in fact, research on food and taste often combines different approaches, from food perception to eating behaviour for instance (type 2 to 4), or combining types 1 and 5. Moreover, experience shows that sensory studies which correspond to categories 2 and 3 (Table1) can sometimes be considered as biomedical research. As already emphasized, regarding its legal definition, biomedical research should concern only studies that aim at enhancing biological knowledge on humans, not on products. Thus, the aim of the research should be the main point to be taken into account. However, the category of participants, the methods, and the type of products must also be examined. The following examples illustrate this statement.

3.3.  Three examples of sensory and eating behaviour studies

First example: a study was carried out in a private company with 60 infants aged between 12 and 24 months in order to obtain the optimal texture for new recipes of baby food. The focus was on the product and the aim was clearly not to enhance biological knowledge but to elaborate a new product for the baby food market. However, as the participants were vulnerable (infants) and as there was a risk of choking (slight but real), the promoter of the research applied all the requirements of the biomedical regulatory framework and obtained an approval from a CPP; the study was thus conducted in a reassuring context for the scientists as well as for the parents.

Second example: a classic consumer test was carried out with 250 healthy adults to study the acceptability of new meat products. Here too, the focus of the study was on the product and the volunteers were only sensory devices to describe the products and give their appreciation. However, this sensory test took place in the wider context of research aiming at limiting colon carcinogenesis with new strategies in production and processing of meats: the final objective of the research therefore belonged to the biomedical research field; moreover, the products were prototypes (the process of production and transformation of the meat was new); therefore the consumer test was considered as biomedical and had to obtain approval from the CPP and the ANSM.

The third example illustrates the difficulty that not only scientists but also governmental organizations encounter when deciding if sensory studies should apply the regulatory requirements for biomedical research: a study aiming at “understanding the concept of wine quality perception by the consumers” was qualified as a mere “consumer test” of wine quality by the ANSM and consequently outside the biomedical research field as it did not enhance biological knowledge. On the contrary, the CPP considered that it was interventional as the research was carried out with human volunteers who had to come to the sensory laboratory simply to comply with a research protocol. Moreover, the answer from the CPP was that the research could not be approved as the balance between risks and benefits was negative: according to the CPP, there were benefits neither for the volunteers nor for society and the risk for the volunteers was not zero because of the ingestion of alcohol, in spite of all the precautions taken. In appeal, another CPP agreed with the ANSM position and answered that it was not competent to give an approval as this research did not belong to the biomedical regulatory framework. To sum up, the first CPP gave priority to the notion of intervention and protection of persons whereas for the ANSM and the second CPP the aim of the study took priority, a position which seems to be in strict accordance with the law.

4.  On the borderline of biomedical research legislation

4.1. Interpretations of the law

The heterogeneity of the answers given by official committees to sensory or eating behaviour
researches is due to the absence of a clear definition of the notion of intervention as already noted in section 2.2, and to the gap in the current legislation for scientific research with minor constraints and risks involving volunteers but not necessarily with a biomedical purpose. According to Meunier (2009:286), the definition of an intervention in French law is: “[when] it is linked to a research protocol, not to a treatment, and when it modifies the usual care of the volunteer (patient or healthy volunteer), whether the modification is major or minor (for instance: randomization, questionnaires, non-invasive examination).” It is important to stress here that “interventional” is not a synonym of “invasive” because these two words are often confused: the word “intervention” belongs to the vocabulary of clinical trials and laws whereas the word “invasive” belongs to the vocabulary of medicine and care and refers to a break into skin or mucous membrane. Thus a study can be interventional without any invasive examination. For instance, the simple fact of asking volunteers to come to the laboratory is discussed among the CPP: some of them consider that this fact in itself constitutes an intervention modifying the usual care, as the volunteers come on purpose for the research and only for that, and some do not. It is also noteworthy that CPP members are unfamiliar with these types of research which they examine among protocols dealing with new therapeutic strategies for serious diseases. However, these kinds of protocols interest them because they are relatively simple for non-specialists to understand, especially the non-physician members of the CPP who represent patients and citizens. Thus, paradoxically, CPP members are both more sensitive and more critical as they identify themselves as potential volunteers (or parents of volunteers for studies with children) and they sometimes tend to be very strict when evaluating the benefit/risk balance.

As noted by Meunier (2009: 278), French law does not respond to all situations and all questions. Confronted with the gap in the current law and with its complexity, what can and must be done by sensory scientists in the field of sensory and eating behaviour research?

4.2. The benefit/risk balance

According to the three examples above, the notion of intervention is linked to the notion of risk, which depends on the type of volunteers, on the method, or on the products. As emphasized in all the texts already quoted, to weigh the foreseeable risks and drawbacks against the anticipated benefits for the individual volunteer and for society must be a priority for the scientist. Whatever the legal framework, the balance between risks and benefits must be sought. Each study is unique and it is impossible to answer the question generically. Some general statements can, however, be put forward. As the benefits for volunteers or society in sensory and eating behaviour research may seem quite limited compared to the impact of tests on new therapies that the CPP are accustomed to examining, the risks have to be very close to zero. And, vice versa, since risks can never be totally eliminated, there must be at least some global benefits for society. The research has to be “useful”. This is a key point in an ethical approach: volunteers cannot be involved in a research protocol without serious justification and expectations about the results. What kind of benefits, for the volunteers and for society, can be obtained by sensory studies and what are the foreseeable risks for the volunteers? This is the question researchers have to answer each time they plan to involve volunteers in a new test.

4.2.1 Benefits

There are scarcely any direct benefits for the volunteer in sensory studies, except the pleasure of tasting a product and the increase in self-esteem through contributing to scientific research. Secondly, benefits for society depend on the aim of the research; for instance, the aim of some research can be fundamental (increased knowledge of human perception to bitterness) or methodological (development of new methods for sensory analysis). Benefits for society are indirect and sometimes difficult to present. Other research can aim to understand consumers’ behaviour and provide recommendations which are useful for health policy; in such a case, the benefits are easier to promote; for instance, studying the acceptability by consumers of biscuits with a reduced sugar, salt or fat content can lead to recommendations to manufacturers, and thus to an improvement in the nutritional quality of food which can have a positive impact on public health.

4.2.2 Risks

On the other side of the balance, what are the risks for the volunteers? In fact, in sensory studies, the risks seem very low compared to clinical trials on drugs; nevertheless, they cannot be ignored and they need to be reduced as much as possible with preventive actions. The main risks in food tasting are choking, allergy and food intoxication. Food must be adapted to volunteers such as infants or the elderly; volunteers with allergies, pregnant
women and breastfeeding mothers must be eliminated from recruitment as far as possible and very strict hygiene practices must be applied. Research on alcoholic beverages induces a specific category of risk such as a car accident after testing. This risk can be reduced by controlling the quantity of alcohol given during the session, carrying out breath tests before and after the session (and keeping the volunteer in the laboratory till the alcohol level in the blood is equal to 0) and by developing home-testing.

4.2.3 The informed consent

Once the balance between the expected benefits and the foreseeable risks has been assessed as positive, precise and clear information about the research, its methods, objectives and possible benefits, risks and drawbacks must be delivered to the human volunteers and their informed consent must be obtained before involving them in the research. This major ethical principle has to be respected, whether the research is biomedical or not and it constitutes the basis of good clinical practice.

5 A pragmatic approach

Taking into account good clinical practices, the sensory scientist will want to know if he should apply the regulatory requirements for biomedical research. First of all, it is essential to remember that the decision should not be in his hands but in the hands of the law and of governmental organizations. Nevertheless, to seek an official advice from the CPP or the ANSM normally implies that answers have already been found to all the requirements of the law, which can be very constraining and time consuming if the research is not considered in the end to belong to the biomedical regulatory framework. What’s more, the researcher may not be able to conduct the research in his laboratory and respect the constraints of the research itself (time limit for instance) if he has to apply all the legal requirements for biomedical research. And he needs to know early on the process if the research is achievable. Thus, before seeking official advice, the researcher needs to carry out his own examination of his research protocol, step by step, with different criteria which may help him to present the research in relation to the law. Figure 1 arranges the criteria to examine in decreasing order of priority.

For each criterion, the researcher imagines an indicator “BMR” (for Biomedical Research) which flashes like an alarm if the answer to the question inclines towards concepts such as “person” or “risks” on the right. All the criteria have to be examined individually and together as they interact; one “flash” does not necessarily mean that the research is “biomedical” but should lead to a request for approval from a CPP, or at least to an attempt to obtain external advice on the obligation (or not) to submit the research protocol to the regulatory framework for biomedical research. It is noteworthy that some CPP are ready to give preliminary advice on the qualification of the research (interventional or not) on the basis of an abstract.

If the research seems to be outside the biomedical field (no “BRM” flash), what can and must the researcher do? First, if he can easily fulfil all the requirements of the law, the promoter may nevertheless choose to submit the protocol to the CPP and the ANSM and thus get official advice on the qualification of the research. If ever the research is finally considered as biomedical and if it receives a refusal (which is exceptional), this may lead the scientist to reconsider his protocol ethically speaking, to improve it and to submit it to another CPP in appeal. If the research receives an approval, the researcher is then provided a clear and reassuring legal framework in particular for insurance and volunteer’s indemnities; thus, there is no clear legislation in France regarding the indemnities of volunteers involved in tests outside the biomedical framework and this gap sometimes leads to proceedings brought by the governmental tax agency against private companies or public organizations which give indemnities to their panellists. Furthermore, submitting the protocol to a CPP can be useful in order to publish the results of the research: in fact, more and more journals in the field of nutrition or psychology require a statement indicating that the research has received an approval from an ethics..
committee and that volunteers have given written consent. Thus, publishers exempt themselves from
responsibility, leaving it to the ethics committee. Some researchers who have been refused publication for that
reason have afterwards regretted to have not submitted their protocols to a CPP.
However, non-interventional research can also be submitted to an internal Ethics committee, preferably
accredited as an Institutional Review Board by the Office for Human Research Protections (OHRP). Hospitals,
learned societies or academic research institutes such as the “Institut National de la Santé et de la Recherche Médicale” (INSERM) thus have their own Ethics Committee which delivers ethical approvals. This is useful not only for publication but for the research itself, for the research team and for communication towards the volunteers. Some CPP in France also agree to deliver an ethical approval for non-interventional research.
Unfortunately however, although the number of Ethics Committees is growing, not all research institutions,
both private and public, have access to an Institutional Review Board and cannot get an approval from an
Ethics Committee outside of the whole biomedical regulatory framework.
One last point needs to be mentioned: as nominative data are often collected for research with human
volunteers, the researcher also has to guarantee the confidentiality of the data and respect the legislation
on that matter: in France, the authorization of the Comité Consultatif pour le Traitement de l’Information en
matière de Recherche dans le domaine de la Santé (CCTIRS), and a declaration to the Commission Nationale
Informatique et Libertés (CNIL).

To sum up:

- In French law, the “Code de la Santé Publique” gives a legal framework to biomedical research
  involving human volunteers and has thus to be applied whenever the research fits this definition

- Sensory studies may be considered as biomedical research or not, depending on the final objective of
  the research and on the notion of intervention; this notion has no clear definition and is difficult to
  evaluate; it is linked to the notion of risk, which depends on the type of volunteers (infants/healthy
  adults for instance), on the method, and on the type of products tested

- The “Code de la Santé Publique” provides a constraining but reassuring framework and can be very
  useful when carrying out sensory studies (insurance policy, indemnities for volunteers). Moreover,
  receiving an approval from a CPP is useful to publish in international journals

- Nevertheless, applying biomedical legislation when it is not required can be very time consuming,
  impose heavy constraints and may even be crippling for the research

- If the research does not belong to this regulatory framework, the researcher has the ethical duty to
  apply good clinical practice that can be easily extended to all research involving human volunteers, all
  things being equal

- A priority is to obtain informed consent from the volunteers, the second to guarantee the
  confidentiality and the respect of private life.

6 Conclusion

Sensory and eating behaviour science is quite unknown to the legislator and to most of the CPP. Situated
somewhere between clinical trials and marketing research, it should require regulation which is adapted to the
slight risks and inconvenience encountered by the volunteers involved in the research. Such a law could also
provide a clear framework for private companies which carry out consumer tests on a wide scale with little
reference to the Code de la Santé publique which is not adapted to their studies and economic constraints. In
France, a new law for “research involving human beings” (also known as the Loi Jardé) including non-
interventional studies was promulgated in March 2012. This law specifies different levels of risks and adapts
the level of requirements to them; it also aims at harmonizing the functioning of the CPP. This law answers
many of the questions raised in this article. The decrees specifying its enforcement have been delayed because
of a new European Rule on clinical trials which is about to be adopted by the European parliament as a

1Loi n° 2012-300 du 5 mars 2012 relative aux recherches impliquant la personne humaine (JO n°0056 du 6 mars
2012)
Regulation directly applicable throughout the European Union. This new European Regulation will concern only clinical trials on medicinal products; thus it will not harmonize the rules for sensory and eating behaviour research which are different throughout the European Union and complicate the carrying out of European research programmes. Furthermore, the adoption of the European regulation will make the new French law null and void and will deprive French sensory and eating behaviour scientists of the regulatory frame they had been expecting for several years. Meanwhile, they have to deal with ethical principles and laws which have not been written specifically for their field of research and with their own ethical convictions. It seems that for the world of sensory and eating behaviour research the question “Do I have to submit my research protocol to a CPP?” is here to stay for some time yet.

7 Acknowledgments:

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Research Summary: Are recipes from women’s magazine in accordance with women cooking practices? - An exploratory study.

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Modern society has transformed our diet. Media influences our food habits and health practices. The popular press, soap operas and magazines are especially important because they are ubiquitous in our daily lives. They represent something familiar and easy to adopt (models). In Quebec, women’s magazines are the most popular publications. Women, who in most households are still in charge of cooking, may consult the magazines for recipes and articles. Recipes do not actually show eating habits, but they undoubtedly participate in the dissemination of our practices.

This subject raises two important questions. Firstly, are the recipes in women’s magazines in line with the dominant standard? Secondly, what relationship do the readers maintain with the recipes, and what meaning do they give to their practices?

According to Claude Fischler, the eater seeks arbitration to help choose his diet, but rational arguments alone are not sufficient to make him accept a type of food specifically. Therefore, the social norm (which is normal, consistent, which surrounds the good and evil) is not alone in determining the behavior of the eater. The behavior and personal knowledge of the eater also influence his understanding. In this project, I want to understand the evolution of social norms in the recipes of a women’s magazine to capture their influence in the daily practices of regular readers: the story of the preparation of their meals. Our presentation was based on this last point.

With this aim in mind, I will study Chatelaine magazine’s recipes in order to understand the implementation of the dominant standard (via the title, words used, authors, ingredients...). Furthermore, I will describe trends in food consumption and illustrate the evolution of culinary discourses. The first point has previously been the subject of communications and publications (Laperrière, 2011, 2013). In my presentation for this institute, I have focused on the latter part.

In the second phase of my research project, twenty experienced readers of Chatelaine will be interviewed to understand how they read their magazines. The story of their daily food preparation routines can provide some insights on what influence their actions and whether or not recipes are involved in the management of their diets. It was the subject of this workshop presentation.

More specifically, I am interested in the various influences which shape eating habits and meal preparation, and this, in order to highlight whether or not recipes or any other media discourses influence everyday practices. In light of my preliminary research, I postulate that—recipes and their performative nature may affect the culinary practices of Quebeckers; even if they do so very indirectly. Like Michel de Certeau, I think that cooking is dependent on cultural issues but that it is not fixed. I believe practices are consistent with personal meaning — that is, the meaning given to these practices by the actors.

Current research on the subject, mainly statistical approaches or surveys, tend to be too homogenous and in a sense fail to grasp the various influences in culinary habits. I believe the action expresses the meaning the actor gives to his actions. To sum up then, I’m interested in researching the way norms present in the medias are transmitted and I would like to understand how a person cooks, her influences and her inspiration. Interviewing experienced readers of Chatelaine will help me—understand their representations and the meaning they give to their actions.

I will use semi-structured and comprehensive interviews. An open environment is intended to reveal possible sources of change in the interviewee’s habits. Despite the tone of the conversation used which seems relaxed, the investigator (me) needs to be actively engaged since his interpretation is at the Centre of the process. After the analysis, I believe that our discussion will reveal what is done by the cooks and that I will enable to study not only their position vis-a-vis the norm, but also the meaning they give to their practices.

In short, I would like to understand the connection that women established with their magazines, the act of cooking and the recipes. In other words, I am trying to demonstrate what is the relationship between norms conveyed by the mass media and their impact on daily practices. In Quebec, food and food habits are recent objects of analysis in the social sciences. Overall, this thesis in progress will help us to better understand how social norms shape behaviors through the meaning that eaters tend to give to their daily practices.

I would like to thank my supervisor Prof. Jacques Beauchemin and the Faculty of Social Sciences at the UQAM for their financial support for achieving this communication. I would also want to thank my co-supervisor Prof. Julia Csergo for her many advice.
References:


Abstract

Résumé: The natural cider is a beverage produced worldwide. Several research works contributed to the general knowledge in relation to the local and the international productions of cider. Some of them report that ciders composition differs for each region, normally depending on the apple variety used and the elaboration process (Alonso-Salces et al, 2005; del Campo et al, 2005). It is demonstrated that microbiological diversity exists between ciders from different geographical areas like Asturias (Spain), France, Ireland or the Basque Country (Irastorza & Dueñas, 2010).

As it has extensively been done for the wine (Henick-Kling et al, 1998), an integrated characterization of a food product has to combine sensory analysis together with the microbiological, chemical and physical evaluation of it (Tuorila & Monteleone, 2009). Few studies have investigated the microbiological population of Basque cider during the fermentation process (Dueñas et al, 1994; del Campo et al, 2008), but no research exists considering its sensory description, even if it has already been done for ciders from other areas like the Asturian or the French ones (Le Quéré et al, 2006). As a result, there are no scientific data that combine Basque natural ciders organoleptic profile with its compositional analyses or instrumental analyses. Having such results for the Basque cider would open the way to reach a controlled quality and ease to achieve a differentiation from other products (like for instance a PDO label) by using physical, chemical, microbiological and organoleptic descriptors together. Furthermore, it would create advantages for the local tourism or for the culinary heritage by for instance, proposing pairing of ciders with dishes.
Introduction

Cider, hard cider or apple wine is a popular alcoholic beverage produced worldwide, similar to wine or beer in elaboration that results normally from apple juice. Cider industry is relevant in countries like France (overall, Normandy and Brittany), Spain, Germany, Finland, Sweden or Denmark in Europe and also in the USA, Canada, Australia, New Zealand, Chile, Mexico or South Africa (Sharples, 2012). In Spain, the law that regulates ciders and other beverages derived from apples are stated in general terms in The Spanish Alimentary Code (BOE, 1979). The majority of the research regarding to cider nationally, is developed in the Regional Food and Agriculture Research and Development Service (Servicio Regional de Investigación y Desarrollo Agroalimentario, SERIDA) in Asturias located in the north Atlantic coast. This region produces the largest amount of cider at national level with a total average of 80 million litres per year, highest after U.K., Ireland and France for cider (Picinelli et al., 2000; Rodríguez Maderera, Lobo and Alonso, 2010). The Asturian cider is known as well due to the Protected Designation of Origin (PDO) it holds since 2005 (Council Regulation (EEC) No. 2081/92, 2005).

Basque Country, which is a neighbour region to Asturias bordering France, the natural cider has been produced for centuries (Uria Irastorza, 1978). Clear evidence of it is a restored cider-house I (a current museum) from the XVI century proof of the cultural and historical heritage of the area in Ezkio-Itsaso, a rural village. Furthermore, the first written documents related with apple and ciders date from the XI century (Uria Irastorza, 1978), which already show the importance of the fruit and beverage for the local inhabitants. More recently, we find Basque poetry referring to cider (Artola, 1860). The relevance of the cider in the Basque Country is at the same time demonstrated by the place names from different localities derived from the name apple or cider in Basque language and by the link to the Basque culture with bertsolaritza II and Basque gastronomy (Aguirre Sorondo A., 1999). Currently, it is usual to find traditional menus in the cider houses where apart from cider, typical Basque plates can be tasted. In 2013 there are 24 local markets with cider tasting festivals organized over the Basque Country in different villages, mainly in the province of Gipuzkoa (Ferias Agrícolas, Ganaderas y Perceras de Euskadi, 2013). In those markets cultural activities like traditional dances, bertsolaritza, or traditional plates are offered.

In contrast with other beverages like wine or beer or cider in other regions, cider has maintained the traditional elaboration process in the Basque Country. This implies that during the elaboration process only endogenous yeasts, sugars or carbon dioxide are utilized for the fermentation (Dueñas et al., 1994). This gives the name of “natural cider” to the product. The indicated process where no indigenous elements are added is also known as spontaneous fermentation. This characteristic gives authenticity, but also complexity in means of the microbiological, chemical and physical control of the product, in other words, it gives randomness to the product quality (Mangas et al., 1996). Besides, the high amount of apple varieties in the Basque Country and the different mixture of them for cider production add diversity to the natural ciders of the same region. Moreover, oenological procedures (sulphur dioxide treatment, clarification or correction of the acidity) are not practiced in Basque cider-making (Garai-Ibane et al., 2008). Although several researches have been carried out regarding to cider, the differences among raw apples, the equipment, technology and fermentation control and so on. Those parameters make the final product variable which includes the modification of the organoleptic properties of the beverage.

In addition, as it has already been developed for wine (Henick-Kling et al., 1998), the study of compositional properties should be combined with sensory analysis in order to obtain an integrated characterization of a product (Tuorila and Monteleone, 2009). The differences in composition of the beverage during the elaboration process are afterwards translated in sensory differences of the product. Those sensory analyses and the combination of the compositional and sensory properties have not been accomplished yet for Basque natural cider.

This paper reviews the current knowledge of the Basque natural cider and specifically the chemical, physical, microbiological and sensory properties. It also explores the ways of adding value of it and compares it with beverages like wine for which more scientific data are found in order to identify and propose future research.

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I Cider house is translated as tolare in Basque language or caserio lagar in Spanish. It is a kind of winery but for cider production.
II Bertsolaritza is a traditional art and activity of improvising verses in Basque language.
2. Characterization and composition of cider

We can say that Basque natural cider is elaborated in a traditional way in difference to for instance the UK (Lea and Drilleau, 2003) where a commercial cider is produced. The traditional elaboration way is more complex as the process is difficult to control. Many research papers tackled the method in order to learn from it during the last decades. In this section the review of research regarding to cider microbiology, physic-chemistry and sensory analysis is addressed.

1.1 Microbiological profile of ciders

The microbiological flora found during any fermentation process is variable during time. That is why the microorganisms participating in cider production process are one of the most studied actors in cider research, as the assurance of alcoholic beverages quality depends partly on the identification and characterization of bacteria and yeast strains (Valles et al., 2005).

The yeast and bacteria present in alcoholic and malolactic fermentation comes mainly from the fruit surface (Chand-Goyal and Spotts, 1996). The population in the surface or peel fruit is influenced by the ripening stage, the soil conditions, fruit variety and growing practices of the cultivars (Laplace et al., 2001; Renouf et al., 2005). However, mostly when the beverage is elaborated with traditional methods, the microbial community can be originated from the cellar, the traditional wooden vats or pre-fermentative technology which can affect to the final product flavour (Laplace et al., 1998; Santamaría et al., 2005; Swaffield, Scolt and Jarvis, 2007).

In contrast, as cleaning the equipment is less complicated when stainless steel vats are used, it is considered that the flavour of the product is more predictable and controllable when modern technology is utilized (Swaffield, Scolt and Jarvis, 2007). Besides, as in other alcoholic beverages like wine or beer, dried active yeast or starter cultures can be added in order to activate the fermentation, which controls the fermentation process but at the same time reduces the strains diversity (Valles et al., 2007). This is not common in the Basque Country where yeast and lactic acid bacteria (LAB) occur naturally from the apple must (Dueñas et al., 1994).

The alcoholic and malolactic fermentations are the responsible processes for the transformation to cider from apple must. In Basque ciders the malolactic conversion occurs after alcoholic fermentation finishes or instead, both fermentations happen at the same time (Dueñas et al., 1994). However, some results show that when the malolactic fermentation finishes before the alcoholic does, the organoleptic quality of the final cider is not altered (del Campo et al., 2008). The main microorganisms that conduct this transformation are yeasts and LAB.

Three yeast categories complete the alcoholic fermentation of cider: yeast with fermentative metabolism, yeast with low fermentative activity and yeast with oxidative metabolism (Dueñas et al., 1994). The yeast population varies from one region to another due to various reasons (apple variety, soil type, elaboration method used). This is revealed in several research works demonstrating the yeast diversity by identifying, isolating and enumerating the yeasts and their distribution from ciders originated from Asturias, France, Ireland or Basque Country (Laplace et al., 2001; Coton et al., 2006; Valles et al., 2007a; Irastorza and Dueñas, 2010). In the latter one, Kloeckera apiculata and Sacharomyces cerevisiae are the yeast species with a major activity that carry the alcoholic fermentation. From the Sacharomyces strain the uvarum specie is the most present in Basque ciders (Dueñas et al., 1994). Furthermore, Candida pulcherrima has also been found in initial Basque apple musts (Dueñas et al., 1994).

The LAB responsible for the malolactic conversion in cider are Oenococcus oeni, considered one of the best candidates to fulfil the wine malolactic conversion, together with Lactobacillus and Leuconostoc oenos for ciders (Dueñas et al., 1994; Laplace et al., 1998; Sánchez et al., 2010; Sánchez et al., 2012). The evolution of lactic acid bacteria population in Basque apple natural ciders has been reported by Dueñas et al. (1994) and del Campo et al. (2008). The lactic bacteria are known as influential actors that modify the organoleptic characteristics on the final flavour of the beverage and contributors of the microbial stability (Scott and O’Reilly, 1996: Laplace et al., 1998). In this context, LAB strains producing bitterness in Basque natural ciders have been identified (Garai-Ibabe et al., 2008).

Scientific results are found related to the microbial community of ciders mainly in the case of French or Asturian ciders. Basque ciders do not stay behind, the identification of yeast and bacteria flora as well as their population, have been studied along with the linkage between the microbiology and the traditional elaboration method.
1.2 Physic-Chemical profile of ciders

The physic-chemical profile of ciders has been widely analysed several times. (Picinnelli et al., 2000; Piyasena et al., 2002; del Campo et al., 2005: 2008; Valles et al., 2005: 2007a; Rodriguez Madrera et al., 2010). The evolution of the content and identification of acidity, phenolic compounds, alcohols, malic acid, acetic acid, volatile acidity and physical parameters like pH or relative density have been studied to find the differences between apple juices or ciders composition and the influence of the microorganisms in them. Considering the absence of oenological procedures (like for instance clarification or sulphur dioxide treatment) in Basque natural ciders, the variability of these parameters is higher than in ciders applying these methods.

In particular, polyphenols are one of the most studied phytochemical compounds that have gained importance in food research due to their antioxidant capacity, which opens the way to functional foods or beverages. Polyphenols are the most abundant antioxidants in human’s diet. Those are recognized by nutrition together with other scientifically societies as important health promoting or disease preventing agents (Scalbert et al., 2002; Dimitrios, 2006). Alberto et al. (2006) found that there is a direct relationship between phenolic content and antibacterial effect and states that epidemiological studies associate phenolic consumption with lower mortality. The origin of the antioxidant capacity in cider comes from apple peels, apple variety, ripening degree, season, region or fertilization type are some of the factors that affect to the polyphenolic profile of cider (Boyer and Hai Liu, 2004; Alberto et al., 2006).

What it is known is that when apples are processed to make juice, the phenol content decreases and an average of 35% of the initial phenols remain (Bonsi and Padilla-Zakour, 2005). The major percentage stays in the apple pomace, a waste usually utilized for livestock feed in the Basque country that could be investigated as value added ingredient to contribute as functional food (Boyer and Hai Liu, 2004; Diñeiro García, Valles, and Picinelli Lobo, 2009). This has already been done for apple cider vinegar (Shahidi et al., 2008).

Anyhow, the polyphenolic profile also serves to characterize the ciders and to add information about its sensory properties like colour, aroma or flavour (Alonso-Salces et al., 2004a). Thus, the polyphenol content, profiles have been defined for apple cortex, juice or cider in many countries like for instance France, Brazil, US, Asturias and even the Basque Country (Sanoner et al., 1999; Guyot et al., 2003; Bonsi and Padilla-Zakour, 2005; del Campo et al., 2005; Nogueira et al., 2008; Picinelli et al., 2009).

In Asturias a lot has been studied regarding to the physico-chemical and polyphenolic profile of natural ciders. The analytical characteristics of natural ciders in spontaneous fermentations are well defined and the chemical composition is described (Picinelli et al., 2000:2009; Madrera et al., 2006; Valles et al., 2007a). This allows the differentiation of apple origin as well as the phenolic and antioxidant composition of Asturian cider using different methods. In addition, the difference between the chemical composition of Asturian cider when yeasts are inoculated or commercial yeast starters are added has been compared to the ciders without yeast inoculation (Mangas et al., 1996; Valles et al., 2005). The characterization of Asturian cider apple cultivars are also investigated resulting from phenolic profiles (Mangas et al., 1999).

The general chemical analyses for Basque natural cider have previously been studied (Dueñas et al., 1994). Besides, the principal component analysis of cider apple juice (organic acids, sugars content, phenolic compounds) have been defined for some Basque apple varieties and compared with the analyses from other regions like the UK (del Campo et al., 2005). For the first time, the biogenic amines production, metabolized by LAB has been identified (Garai et al., 2006). Those can present toxicity for some individuals. In addition, the characterization for several Basque cider apple cultivars have been determined together with the distribution in technological groups (sweet, bittersweet, semi-acid, semi-acid-bitter, acid and acid-bitter), linking them with the polyphenol contents. This allows classifying the varieties technologically and to identify the interesting properties like susceptibility to oxidation or the sensory properties of the final product for each variety (Alonso-Salces et al., 2004a: 2004b). Besides, taking into account the use of apples from other European regions for Basque natural cider elaboration, it has been possible to differentiate ciders according to the geographical origin of the apples used and predict the origin of apples via the polyphenolic profile of ciders (Alonso-Salces et al., 2006). This proves the influence apples have for the properties of natural ciders and provides an authentication control of apple origin in cider industry.

The relevance of the physico-chemical profile of ciders is affirmed and widely defined during the last three decades in science. The composition of final ciders is completely related to many
characteristics including the sensory properties of the ciders. The case of Basque natural ciders is no exception and research has allowed us to classify autochthonous apple varieties and to relate them with their final properties.

1.3 Sensory profile of ciders

As mentioned previously, for the integrated characterization of a food product the sensory analysis has to be determined apart from the microbiological, chemical and physical evaluation (Henick-Kling et al., 1998; Francis and Newton, 2005; Tuorila and Monteleone, 2009).

Sensory food science, in comparison to instrumental science, is a relatively new discipline that adds sensorial information perceived by humans to food science. The method of analysis of this discipline is sensory evaluation that "makes use of senses to evoke, measure, analyse and interpret product response" (Lawless and Heymann, 1999). This science helps understanding the drivers of consumer preferences or developing food industry (Tuorila and Monteleone, 2009). Sensory evaluation uses different methods depending on the objective sought. The main ones are the descriptive, the affective and the discriminative. Each of them adds information related to the products analysed. The descriptive tests compare two or more samples of a food product where the trained panellists identify and indicate a difference between them. The affective method serves to measure and compare the level of acceptance and preference of food products among untrained tasters. Finally, in the discriminative tests the panellist compare two or more food product samples and indicates if they perceive or not a difference. Likewise, those tests are used to train the panellist.

The descriptive methods provide detailed and objective sensory properties of a product, what is useful to define sensory quality. The method requires training of panellists and determining their reproducibility, evaluation of samples and measuring panel performance. It is time consuming and requires effort as judges need to show time availability and continuity commitment. The judges or experts need specific training to give consistency and reproducibility to the method (Lawless and Heymann, 2010). They are the responsible ones who decide the descriptors and who generate attributes to evaluate the sensory properties of the specific product. This method, has extensively been used for instance in wine research studies being recognized by describing wines in an objective manner (Preys et al., 2006; Varela and Gámbaro, 2006; Chira et al., 2011). It mainly assesses and controls the quality for specific wines depending on the origin of the fruit, the variety, the region and other factors that differentiate them. The result is an average sensory profile, where the expert panellists describe the presence of the specific attributes by quantifying each of them. In the case of cider, acidity, bitterness, lactic, floral or fruity attributes are used in expert taste panels among others (Figure 1).

![Figure 1: A sample of Asturian cider aromatic sensory profile (Antón Díaz, Suárez Valles and Picinelli Lobo, 2011b).](image-url)

Lately, a PhD thesis has developed for the first time a sensory descriptive analysis method to control the sensory quality of Rioja Alavesa young red wine (Basque Country) that holds a PDO label (Etaio et al., 2010). This method has been later accredited guaranteeing and improving an official quality control. After that, the method for the sensory quality control of txakoli white wine from Bizkaia (Basque Country) is being improved (Etaio et al., 2012). The method development helps to determine the particular characteristics associated to each particular product and avoids the use of generic methods. A similar method of generating attributes and selecting them for the sensory analysis of a particular product would help to explore and learn about the sensory properties of Basque natural ciders.

In Asturias, the aroma profile of their PDO ciders have been defined using descriptive sensory analyses together with olphatometry (Antón Díaz, Suárez Valles, Picinelli Lobo, 2011a: 2011b). This technique combines the results of descriptive sensory analysis together with a human nose attached to chromatography equipment. The equipment measures the volatile compounds that can be detected using chromatography to compare it with the expert’s results in order to know the aroma that are perceptible and the ones that are
not. The aroma is one of the most important descriptors in a beverage and it describes part of its sensory quality. We cannot forget that despite the fact that in the panel tastings the senses are considered separately (flavour, aroma, visual etc.), the sensory experience, for example the act of eating or drinking, integrates all the senses in one. The reason is that the sensory regions in the brain are physically connected. For instance, the aroma is very important when it comes to the flavour of a food, but it is shown that the visual appearance and the sound can alter to the flavour at the same time (Rosenblum, 2013).

The Basque natural cider is a traditional product and one of the current objectives of local cider makers is to obtain a quality distinction, probably the PDO as the product would fulfil the requirements for this label (Garai-Ibabe, 2010). However, apart from using local apple varieties produced in the place, the sensory quality profile needs to be determined. Even though sensory analyses generic methods and local methods for similar products have been developed and tested, the literature referring to sensory evaluation of Basque natural cider is inexistent.

It is true that the polyphenol composition is related to the sensory properties of a product and that the polyphenolic characterization of Basque natural cider is already studied (Alonso-Salces et al., 2004a). Nevertheless, no specific research has been accomplished regarding to sensory characterization of Basque natural cider or to the combination and linkage between sensory and the compositional characterization of this cider. In contrast, studies combining chemical or polyphenolic compounds and sensory analyses for wine and other food products like virgin olive oil are easily found in literature (Cliff and Dever, 1990; Lesschaeye and Noble, 2005; Petca et al., 2006; Preys et al., 2006; Chira et al., 2011; Dabbou et al., 2011).

The Basque natural cider, a candidate beverage to hold a distinctive label like a PDO, has a wide and general regulation and control for physic-chemical properties based on the national law (BOE, 1979). In scientific literature, we find many studies that address the microbiological, physical and chemical properties of ciders including the Basque. For Basque specific wines (Rioja Alavesa young red wine and txakoli from Bizkaia), sensory methods have already been developed to define their particular sensory quality. Those methods could be utilized for Basque natural cider. Sensory quality has not been approached for this traditional apple drink even though in other regions like French or Asturias, they have worked in this line already with local traditional ciders.

3. Valorization of traditional food products and food pairing

Natural cider like the Basque one is a traditional beverage with local characteristics. The case of the traditional local wine industry in the Canary Islands demonstrates that local gastronomy can benefit from traditional beverages of the region (Alonso and Liu, 2011). The traditional Basque natural cider production industry could be a repetition of this example reinforcing Basque gastronomy. For that, cider and local cuisine have to be clearly associated, which is the case in the Basque country like for instance in cider houses. At the same time, a local product like wine or natural cider can be advantageous for local gastronomy, local businesses, tourism or culture. Normally, these products can acquire advantages using quality, product differentiation and branding policy as marketing strategies (Fandos and Flavián, 2006). Some examples of it are La Rioja (Spain) or Bordeaux (France) with their wines that hold PDO labels and are much known in the region as part of the major activities for local tourism. The mentioned PDO label matches in the culinary heritage and culinary tourism environment. Plus, it is showed that information transmitted by PDO via images, such as the image of a traditional product or the image of the region improves consumer’s feelings and affects positively toward PDO products increasing significantly loyalty (Fandos and Flavián, 2006). Therefore, in the case of developing a traditional and local product, the local gastronomy, the label possibilities, the consumer’s acceptance and behaviour have to be studied as well. All those factors together will help in the advancement and improvement of the local traditional gastronomy.

One of the mentioned factors is the association of the traditional beverage with local cuisine, which leads to pairings. Little research regarding to food and beverage pairing is found in scientific articles. The main analyses are exploratory and they determine ideal pairings among wines from different regions and cheese using descriptive analyses (King and Cliff, 2004; Bastian, Collins and Johnson, 2010). Even though flavour interactions coming from different products are still unclear some authors report the association between “chemical flavour compounds” in food pairing. The results state that North American and Western European cuisines tend to cook recipes that share flavour compounds in their ingredients. In
contrast, East Asian and Southern Europeans avoid recipes where ingredients share flavour compounds (Ahn et al., 2011). The chemical flavour compounds could be studied for food pairing in different countries, including the beverage in the recipe. With some of these pairing analyses, the promotion of tourism through the valorisation of the territory, local gastronomy, culture and traditions could be expected (Donadini, Fumi and Lambri, 2012).

Apples and cider, due to their long history of cultivation, have an intense linkage to specific regions and have value as part of the culinary heritage (Sharples, 2012). The case of the wine could be extrapolated to local ciders. Still, the Basque natural cider’s potential remains held back. Once the descriptive sensory analyses for traditional cider are carried out and the sensory quality for the label is settled, the valorisation of it could be sought. This can be accomplished by using local food pairing and exploring ways to impulse it with tourism as part of the culture and heritage. However, it is not the major interest of the scientific research at the moment as there are no research studying food pairing and tourism for Basque cider industry.

4. Conclusion and future research

Nowadays, research is becoming more multidisciplinary and different sciences depend from each other to evolve. In the case of traditional and local beverage products wine is the most advanced product. Results accomplished by researchers for wine can be extrapolated to other beverages providing that the methods are adjusted and own properties of each beverage are maintained. This is the case of cider, for which several investigation works contributed to the general knowledge in relation to the local and the international productions.

The Basque Country is one of the regions where natural cider has been produced for centuries (Uria Irastorza, 1978). However, the law that regulates the elaboration process of ciders is general and based on wine regulations (BOE, 1970). For the microbiological and physico-chemical profiles and characterization of Basque natural cider various referent researches exist (Dueñas et al., 1994; del Campo et al., 2008). Nevertheless, the traditional elaboration process adds complexity as the final product is not microbiologically stabilized.

Even though for wine and the ciders from other regions, specific tasting panels have been developed, it is not the case for Basque natural ciders. Besides, the links between the compositional characterization and sensorial properties have not been reported yet. This has been elaborated for olive oil, wine or Asturian and French cider already (Francis and Newton, 2005; Le Quéré et al., 2006; Dabbou et al., 2011) and would help to reach a controlled quality system, by using physical, chemical, microbiological and organoleptic descriptors jointly to define a specific quality evaluation for Basque natural ciders. The expert panel together with the other analyses would be of great utility to differentiate the product and to define a particular regulation or to obtain labels such as PDOs.

Many investigation lines that would help adding value to this traditional apple beverage are unrevealed. In the scientific literature, there is no investigation for instance on the perception of cider makers, on local consumers or tourists, on the pairing possibilities with the large variety of Basque gastronomy, on the labelling opportunities and implications or on the marketing and consideration of cider as a tourism attraction. Moreover, for the cider sector it would be interesting to achieve results concerning to obtain added value of their products like for instance with food pairing. Although activities involving cider are common in the Basque Country, still scientific research is missing regarding to the Basque natural cider consumption within the scope of sensory perception.

To conclude, the authors highlight the interest of combining instrumental and sensory analyses for Basque natural cider characterization. Thus, in order to achieve progress many studies are necessary, which includes: (I) further research in expert tastings panels for Basque natural ciders and other local products for cider characterization, (II) study different labelling possibilities for Basque natural cider (III) analyses on how adding value to local beverages affect to the promotion of local gastronomy, (IV) to explore the possibilities of food pairing with Basque cider to contribute to rural tourism and strengthen the culinary heritage.

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6. References


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Research article: Setting-up a method based on digital photography to measure food intake in real meal situations – application to a geriatric institution

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Abstract

*Résumé:* Measuring food intake is an important issue in geriatric institution but requires to be integrated in a real sitting environment. Using standard methods like weighed food method is not well adapted especially when food items intakes (vegetables, meat, sauce...) have to be differentiated in order to investigate qualitative food choices. The aim of this exploratory study is to investigate for different types of food the reliability of a tool based on digital photography to measure food intake in geriatric institution; in allowing differentiating food items intakes. 3 independent non-trained raters evaluated food items and total intakes on the basis of 867 plate images taken before and after meal in the context of a geriatric intuition (4 different dishes). To test the reliability of the method based on photography, agreements between and within assessors were assessed using intra-class correlations. The results showed the raters provided repeatable ratings and agreed between them. In the light of these results we can assume that raters do not need specific training if clear reference images are available to self-calibrate the visual estimation. Further statistical studies have to be implemented to test the accuracy of the method based on photography compared to weighed food method and thus, to validate this tool in the context of a geriatric institution.

*Keywords:* food images, food intake, food items, geriatric institution
1. Introduction

Food studies cover a wide range of questions among those the understanding of the relative role of health and pleasure in food consumption. Thus, research works need accurate means to measure liking and to record consumed quantities. Visual analog scales are the most used approach to record liking and are not questioned here. Regarding the follow-up of consumed quantities in real meal situations, the golden standard is to weigh food served before meal and food wasted after meal. It provides precise and objective measures. Nevertheless, this method is time-consuming, resource intensive and not much adapted to a large number of subjects (Wansink, 2009). In addition, when diverse foods are served in a same plate – as often in France - it is difficult, if not impossible to weigh the different food items (starchy food/vegetables, meat/fish and sauce) separately.

Another simpler method used consists in visually evaluating food intake of a subject, thanks to the observation of a rater during mealtime. This method permits to differentiate food items intakes and also shows a good reliability (Shatenstein, Claveau, & Ferland, 2002). However, it is less precise than weighed food method because, among others, a bias may exist due to the observer personal beliefs. For instance, in geriatric institutions, when the care staff is in charge of visual estimates, they may overestimate the consumption in order to be in line with health expectations (Simmons & Reuben, 2000). To avoid this bias, this method requires a large number of external experimenters at the same time (double recording) which means expensive costs.

This is why the digital photography method is a more and more used method in real settings. It consists in photographing the plate - or the tray - before and after the meal and then in evaluating the amount of food consumed (or left in plate) on the basis of the images. This method is interested because it does not require a large number of experimenters at the same time and it allows a visual estimation of left quantities after the field work, in a quiet environment without any rush due to the course of the meal. This method also permits to distinguish food items intakes and to separately estimate eaten quantities of meat, vegetable and sauce. Digital photography method shows a good reliability in restaurant (Hinton et al., 2013), cafeteria (Swanson, 2008) and for free-living population (Martin et al., 2009). Nevertheless few studies are available to validate this method in geriatric institution.

The aim of this paper is thus to propose a method based on digital photography to measure food intake in geriatric institution. More it aims at differentiating food items intakes (side dish, meat/fish and sauce) in plate.

This work is part of a wider study that will not be described here. This wider study investigates individual food consumption of elderly in relation to sensory quality of four dishes: beef bourguignon with carrot, spicy lamb with rice, rabbit olive with prune sauce and Farfalle pasta, and poultry with sweet and sour sauce and cauliflower. The tests were performed on 16 lunchtimes over a 10-week period in four nursing homes. Each nursing home involved in the study tested one dish per lunchtime and tested all the four dishes four times.

2. Participants and ethical issues

The participants were recruited in 4 nursing homes in the area of Saint-Etienne, France. The medical staff of the nursing homes first identified potential participants suitable for this study according to criterions of inclusion and exclusion. Criterions of inclusion were to be aged over 70 years-old, have lived in one of the 4 nursing homes for more than 1 month and be able to eat alone. Criterions of exclusion were to be critically ill or injured, be allergic or intolerant to any of the foods provided in the study and be on diabetic, high calorie, salt-restricted and/or texture-modified diets. People with and without cognitive impairments could be included in this study.

Potential participants and their legal guardians were then asked if potential participants agreed to participate in this study. Family agreement was also asked for people with high cognitive impairments and who cannot understand the purpose of the study. A potential participant was included in this study only if an informed consent was obtained signed by both the participant or his family and his legal guardian if he was nominated.

Between 15 and 25 participants were finally recruited by nursing home. A total of 66 participants were involved in this study (17 males and 49 females) with ages ranging from 72 to 98 years (average age=87.4±5.2 years).

To be in accordance with nutritional needs of the participants, the tests were planned according to the rotation of the dishes in the nursing homes i.e. the menu; constructed by dieticians. This menu was shared by the 4 nursing homes involved in this study as they took part of the same commercial
organization (ORPEA). So, the 4 nursing homes tested the same day the same dish.

The study protocol was approved by a French national ethical committee (CCTRIS – approval n°13-150).

3. Samples preparation and service

3.1. Food production

Dishes were realized in the kitchen of each nursing home according to standardized recipes. The 4 nursing homes followed the same procedures. The cooking staff was in charge of the realization of the dishes during this study and had followed special training. One experimenter was assigned per nursing home to support the cooking staff to insure the recipes were cooked as planned.

a. Standardization of plates served to the participants

Plates were prepared between 30 to 5 minutes before meal by the experimenter. To keep an adequate temperature, prepared plates were filmed and placed in a steam room at 75°C before being served to the participants. The quantity of dish items (meat, sauce and side dish) served for each participant was standardized by weighing each item. Quantities were chosen according to nutritional recommendations: 150g of vegetables or starchy food and 90g of meat. 40g of sauce was added per participant for rabbit olive with prune sauce and poultry with sour and sweet sauce. However as spicy lamb and beef bourguignon were dishes cooked with sauce, 50g of sauce was served per participant. One of the plates was photographed before meal to obtain a reference image of a full plate.

b. Mealtime procedure

The organization of the meal did not change from its usual process in the nursing homes. After the first course, each participant received a standardized plate. After the participant had finished the second course, the plate was disserved and was stored in the kitchen for being photographed. As usual, dairy products, dessert and coffee were then served to the participants.

c. Data collection

Plates for each participant after meal were photographed using a digital camera with the lens around 0.6m above the plate and with a camera angle of approximately 45°. A label was added near to the plate with the participant anonymous code (received with his/her plate) in order to identify the image.

4. Data analyses

4.1. Analytical material: set of reference images for each food item

To help the raters in their visual estimates, reference images were done for each food items (carrot, rice, pasta, cauliflower, beef, lamb, rabbit olive, poultry, bourguignon sauce, curry sauce, prune sauce and sweet and sour sauce) for different levels of food wasted (figure 1). These images simulate different levels of food items intakes. For side dish and meat, each food items were photographed left in plate in unit of 10% (10, 20, 30, 40, 50, 60, 70, 80, 90 and 100%). As it was more difficult to evaluate the percent of sauce left, reference images for sauce were done in unit of 10, 25, 50, 75 and 100% left in plate.
d. Estimates of food items intakes by rater

The images taken during the study were analyzed by three raters on a computer screen. The raters estimated independently the percent of each food items (meat, sauce and side dish) left for each image (figure 2) in unit of 10% left in plate for side dishes and meats and unit of 10, 25, 50, 75, and 100% left in plate for sauces. The raters assessed visual estimates with the help of the reference images (see Figure 1). They also had a reference image of a full plate before meal (Figure 2). Raters reported their estimates on a repertory grid. For each rater, food items intakes (meat, sauce and side dish) of each participant were then calculated from the quantity served to the participants (150g for side dish, 90g for meat and 40 or 50g for sauce depending of the dish). Total food intake assessed by the method based on photography was finally calculated for each participant by adding the quantity consumed for each dish item.

A total of 867 images were analyzed by the 3 raters. 50 images randomly chosen were also analyzed a second time by the 3 raters to study their repeatability. The second estimates were done with a delay of three weeks or more after the first ones.

In order to evaluate raters’ performance, agreements within and between them were investigated.

5. Agreement within and between raters for visual estimates

5.1. Agreement within rater

Figure 1 - Example of reference images for rice, left in unit of 10 (0.1), 20, 30, 40, 50, 60, 70, 80, 90 and 100% in plate.
Agreement within rater for visual estimates based on digital photography was evaluated for each food item and each rater using Intra-Class Correlations (ICC) between the first and the second estimates of the 50 randomly chosen images. The ICC coefficient ranges from 0 to 1 and indicate an extremely low (0) to an extremely high (1) correlation. This analysis showed high correlations between the first and the second estimates of the same images for each rater and each food item with an ICC ranged from 0.880 to 0.985 (p<0.001) (Table 1). The first and second raters’ estimates of the amount of each item consumed demonstrated a high level of agreement resulting from digital photography method. Based on these results, we considered that raters were repeatable for visual estimates based on digital photography whatever the food item (side dish, meat or sauce).

<table>
<thead>
<tr>
<th>ICC</th>
<th>Side dish</th>
<th>Meat</th>
<th>Sauce</th>
</tr>
</thead>
<tbody>
<tr>
<td>rater 1</td>
<td>0.964</td>
<td>0.985</td>
<td>0.959</td>
</tr>
<tr>
<td>rater 2</td>
<td>0.965</td>
<td>0.983</td>
<td>0.880</td>
</tr>
<tr>
<td>rater 3</td>
<td>0.952</td>
<td>0.970</td>
<td>0.900</td>
</tr>
</tbody>
</table>

Table 1 – Intra-Class Correlation coefficients (ICC) of food items and total food intakes estimates within rater (p<0.001)

5.2 Agreement between raters

Agreement among the three raters for visual estimates based on digital photography was evaluated for each food item using intra-class correlations. The results showed strong intra-class correlations between the 3 raters for visual estimates of side dish (ICC=0.965; p<0.001), meat (ICC=0.959; p<0.001) and sauce (ICC=0.829; p<0.001).

The comparison of the 3 raters’ estimates of the amount of each item consumed demonstrated an extremely high level of inter-rater agreement resulting from digital photography method. Based on this result, aggregate estimates for each food item and total food intakes could be calculated on mean responses across raters.

6. Conclusions

Even without a specific training to analyze digital photography, they provided repeatable ratings (high intra-rater agreement) and agreed between them (high inter-rater agreement). These results show the reference images were a useful tool to reach good level of intra and inter-rater agreement. In the light of these results we can assume that raters do not need specific training if clear reference images are available to self-calibrate the visual estimation.

7. Perspectives

To test the accuracy of the digital photography method further statistical studies have to be implemented on these data. Particularly, the precision of the digital photography method will be investigated in comparing the results obtained with the digital photography method and the actual weight of food consumed; measured by weighed food before and meal for each participant and each meal. To test whether the precision of the digital photography is dependent of the type of food provided, results obtained for the different food items of each dish will be compared. Indeed, different kinds of food items were offered in this study (different side dish, meat, and sauce) varying in color and size and so constituted a good material to investigate this question.

The comparison of food intakes measured with this photography based method and with the weighed method is on-going. If the results show a good accuracy of the digital photography method, we could conclude this method is well adapted to record food intake in geriatric institution. Indeed, it requires less experimenter at the same time than the weighed food method. This method permits also to distinguish food items intakes which are particularly complex to separate and weight independently in plate in real-setting environments. Thus, food consumption patterns and nutritional intake could be more precisely investigated.
8. References


Research Summary: Ethic and ethnography in EHPAD¹. The case of an investigation on meals

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¹ Etablissements d’Hébergement pour Personnes Agées Dépendantes : residential care homes for the elderly
A number of recent social and economic transformations such as the narrowing of the social gap between interviewees and interviewers, the opening to online advertising, the progressive spread of the Anglo-Saxon model of the legal and ethical supervision of the field study, make researchers in social sciences question the ethics of the ethnological situation itself (D. Bizeul, 2007), of publications (Weber F., 2008) and the need of a critical and constructive criticism towards a supposedly universal and prescientific ethic (Simpson, 2011). The presentation follows this reflection by focusing on the “epistemological divergence” (Desclaux, 2007, p.79) that makes the difference between medical sciences and social sciences, and by exposing the benefits of an ethnographic approach in EHPAD, through participant observations and informal interviews.

While the legal and ethical supervision of research was largely inspired by the post-World War II biomedical model of the body (especially with the Nuremberg trials), this legacy, deeply rooted in body ethics (what can or cannot be done to the body) does not seem to cover the empirical and theoretical issues faced in ethnography. Individuals being studied become less of “human subjects” and more of interlocutors, informers, collaborators, even friends: “Bodies come with persons attached” (Simpson B., 2011, p.385). From the standpoint of the legal supervision of researches, the idea of protecting the subjects is inherently and exclusively linked to the interviewees and not to the interviewers. However, it is not rare to see that the researcher himself is “hindered” during ethnography. The deontological implications of the research shouldn’t be reduced to the physiological dimension of the body, but are tinged with socially symbolic and practical issues that are socially situated and often hard to anticipate or control, and that yet give information on the object studied.

Uncomfortable situations or conflicts on the field modify the hypotheses, construct the investigation. In the framework of my research, it is about taking into account the management of the end-of-life and death in the issue of common meals. When facing residents who hardly communicate, taking physical and psychological dependences becomes crucial to determine the social logic that set the frame for the common meal. If residents eat together, they do it differently, and with different objects, raising the idea that body movements, seats, positions, frames of mind at the table convey various connections between social status, space, and political power (Haroche, 1998: p.377). Commensality in EHPAD is part of the drawing of distinctions: we eat together, but differently according to dependences. These distinctions act as end-of-life social indicators. The behavior at the table places every resident on a different level on a symbolic and material scale going from “end of life” to “almost dead”.

The whole presentation is based on a set of data collected between September 2012 and June 2013 in two institutions, both belonging to the same associative group EHPAD. Observing, listening and experiencing life 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.

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Keywords: qualitative research, video of interactions, social analysis.
The three authors of *Video in qualitative research*, work at the King’s College of London: Christian Heath is Professor of Work and Organisation, Jon Hindmarsh is Reader in Work Practice and Technology, and Paul Luff is Professor in Organisations and Technology. The starting point of this present publication lies in the fact that throughout their own research, the authors could measure the lack of texts which may constitute a comprehensive and practical guide for students and academics, when using video for their studies. And this was all the more urgent since scientists took time to use video as a research tool across social sciences, whereas it constitutes an amazing opportunity for providing unprecedented, distinctive and unique ways of collecting, reviewing, sharing, and presenting data research, besides being very affordable and accessible.

Given these observations, with this clearly written and formatted book, the authors developed the questions and problems the use of video raises, from both ethical and practical point of view. Thus, the book is divided into seven chapters that detail the process of undertaking a video-based study, from tracing an historical panorama of the use of video in social sciences to take into consideration the final implications, applications and options for development of the video-based study methods. Consequently, through the book, the readers have the opportunity to address the video project planning (with the issue of accessing the field contemplated, and ethical problems involved); the audio-visual data collection; the data analysis (on which the authors place particular emphasis). The reader also can get an overview of the way video can be used and combined with more conventional materials (such as field notes/ interviews responses), contributing to approach differently the issues of method and theory. The book also allows the readers to consider how video enables various new ways of presenting insights, observations and findings in the field of social sciences research, in comparison with traditional materials and methods.

On a pragmatic level, each chapter includes informational boxes that serve as benchmarks for video recording projects. The authors notably precise key points and steps, technical, practical and ethical aspects to take into consideration, various guidelines and checklists, standard model texts for presenting the study and get the consent of people, organisations, or institutions that are planned to be filmed, as well as exercises and recommended reading to train the readers to set up a video-based study project and help them expanding some aspects addressed in the book. In addition, the book is illustrated by examples drawn from the authors’ own research projects (undertaken over the past few decades, and related to organisational environments and activities in the UK and abroad, and to the fields of trade, art, health and medical cares, telecommunications, architecture, etc.), in order to immerse the readers in the context and contingencies of real research scenarios.

Regarding the authors’ methodology: within the framework of qualitative studies the authors adopt the perspective of ethnomethodology and conversation analysis, but specifying that their recommendations are applicable to a wide range of methodologies across social sciences, as well as they also form the basis for more applied studies and interventions, including communication skills training, and the designing of new technologies and methods of evaluation.

To refer more specifically to the precise content of the book, in the preface and in the first chapter, the authors mention the considerable benefits scientists can get from using video as a research tool for their studies across social sciences (whatever the stage they are in). They carry on developing this important point throughout the book.

The first chapter is also dedicated to an historical overview of the use of photography and video in social sciences research, precising some differences of use among disciplines or fields of research. In doing so, the authors point out a paradox: the use of video in social sciences has been slow in spite of its undeniable benefits for that kind of research. Indeed, if photography has been recognized as a useful tool for social sciences research since 1830, it is only at the end of the 19th century that social anthropology began to use both video and photography to study cultural practices, and moreover knowing that it finally turned to use these media to illustrate cultural practices more than for the possibilities they provide for detailed scrutiny and analysis in scientific research. This trend prejudiced the perception of video as a research tool. Nonetheless, some fields of social sciences did seize the opportunity of using video and greatly benefited from it. It is the case of studies focused on workplaces, classrooms, non-institutional organisations, or based on communication and interactions, notably targeted at communication skills training and consumer behaviour. And finally, at the end of the first chapter, the authors give an overview of the challenges the use of video in social research arises at each stage of the process (data collection, analysis of the audio-visual recordings, communication of findings).
Throughout the second chapter, the authors address the issues of access and ethics that emerge when dealing with video recording in the field of research. Concerning the access to the field of research for video recording, the authors specify that it should not be a problem if the researchers pay attention to the proper approach to adopt in order to get in contact with the key stakeholders of the field observed (participants but also leaders of the organisations or institutions involved). They notably have to gain information on the ethical guidelines of the professional bodies and associations related to their research, as well as on the characteristics of the setting they planned to record. Then, they have to think of the range of possible reasons the organisation involved could turn down requests for access, along with how to obtain its consent, from the data collection to the presentation and publication of the research. For this purpose, researchers have to pay attention to clearly inform participants about the interest and significance of their study, the valuable input of video in it, and involve them in their research project. The authors also precise that once researchers got the permission and consent of the team involved (participants, leaders and key stakeholders), it’s essential for them to also take care of maintaining its ethical approval and seek to stimulate its willingness for cooperation. In the book, all this process is accompanied by various guidelines detailing how to proceed, examples of standard letters, several extracts from codes of ethics, and an exemplary project timetable, recommending to alternate data collection with analysis. Furthermore, in order to help readers with concrete examples, the authors refer to three cases they have encountered in their own research, that turned to be particularly complicated research scenarios: a study of an organisation focused on the London Underground (complicated by the huge bureaucracy of the organisation); a study of a school (constrained by the security rules involved when filming children); and a study of interactions in public environments focused on the visitors of a museum (with the difficulty of getting people consent in a public setting). The authors finally end the chapter addressing the ethical aspects of undertaking video-based studies. In this regard, they put a particular emphasis on how to access, anonymize, store, present and disseminate video data, which must be decided at the beginning of the research (in negotiations with participants while presenting them the research and seeking their consent for observation and video recording). In order to help the readers in this phase, the authors added useful internet links to ethical guidelines and procedures of various organisations.

The authors dedicate the third chapter to practical aspects concerning the recording process and the audio-visual data collection. They draw attention to the fact that all forms of data are selective, and that the optional choices related to their collection will have crucial impacts on the data themselves, and on the analysis the researcher will be able to undertake. Consequently, the authors recommend a careful examination of the setting where the data collection takes place along with an important fieldwork (including interviews with key informants), in order that the researcher is perfectly aware of the possibilities and practical constraints to which he/she is subject, and finally is able to make the adequate choices. Secondly, beyond this, the authors point out the need for the researcher to think deeply of how to consider the actions he is recording (different matters of focus), according to the analytic orientation he adopted and the nature of the data he wants to collect. Given these observations, the authors review the benefits and drawbacks involved when choosing different camera positions and recording methods and recommend to proceed first to a test in order to be able to revise the method adopted to record images and sound, and find the best way to do it. They also provide advice about which action to focus on, how to find, avoid and frame the action, along with a technical guidance (notably for obtaining high-quality audio) and an equipment checklist. In addition, the authors discuss as well the important issue of how to handle the relationship with participants with the aim of avoiding disruption of normal activity when recording.

Then, chapters four and five deeply examine the analytic phase of video-based studies. Chapter four takes into account the preliminary steps of data reviewing, selecting, and transcribing, before entering specifically the first stage of analysis. The authors underline that video recording presents the unprecedented opportunity to be reviewed indefinitely with each time different ways to focus on it, according to the researcher’s various possible interests and analytic commitments. In this context, to address the video data, the authors advise proceeding, first, to a preliminary review, for the purpose of creating a catalogue of the recorded video sequences that constitute the corpus. In this way, the researcher will have the possibility to be fully aware of the different situations, key events and activities, it covers. Secondly, the authors recommend a substantive review, more focused on relevant data extracts for the purposes of the assessment initially planned by the researcher. At least, the third step concerns the analytic search of the data corpus, that takes place when, the study progressing, it becomes
necessary to refine the analysis, and definitely choose some key fragments that will constitute the principal data for research. The authors highlight that a wise selection of these fragments is capital, for it will enable the researcher to study the phenomena he wants to focus on, through different and pertinent points of view. In order to succeed in these first steps, the authors provide a reflection on where to begin the reviewing process. Then, they put a special emphasis on the role of transcription for data analysis, detailing how to begin. Indeed, as many activities that arise in any kind of environment are mainly accomplished (or at least in part) through talking, a meticulous transcription is a key step for data analysis, enabling the researcher to approach his corpus through detailed scrutiny. With this objective, the authors propose to refer to the methodology of conversation analysis, which they develop in a general overview, aimed at introducing the readers to its use for transcribing verbal and non-verbal interaction. For this purpose, they demonstrate that the operating rules of action are based on sequentiality, acknowledging that all social interactions are organised in sequences that successively constitute responses to previous actions, which they illustrate using the example of a medical consultation. Thus, a careful attention to the sequential organisation of actions will inform the researcher about their potential relations, their production and intelligibility. The authors finally close the chapter with broadening their perspectives by addressing some key analytic considerations about video data analysis from any methodological approach.

Through chapter five, the authors more specifically develop the methodological aspects of video data analysis related to the situational and contextual characteristics of the activities examined. They precise that context has long been a key issue in social sciences, and draw attention to the importance, for the analysis, of taking into consideration elements usually considered as being part of a broader context of action, for they impact both participants and the organisation of action. Besides, some aspects of the physical environment often shape or even determine the activities that arise within its framework. To refer to these situations, the authors talk about ‘perspicuous settings’, insisting on their deep interest in studying social interaction. To illustrate this point, the authors refer to the analysis of a video fragment recorded in a museum, where art objects obviously play a key role on the action observed. Therefore, the authors propose to take a closer look at objects and artefacts (as computer systems for example) that are part of the physical environment, and shape or even determine the actions and activities carried out. For this reason, the authors mention them as “interactive tools and technologies”, and give the example drawn from a video-based study related to the control room of the Docklands Light Railway in London. Besides, they call on the researcher to think about how to transcribe and analyse their use. Furthermore, the authors suggest extending the study to more flexible and variable forms of participation that arise in encounters, examining how they influence interaction. To this end, they recommend using Goffman’s participation framework, which postulates that “when a word is spoken all those who happen to be in perceptual range of the event will have some sort of participation status relative to it”. In other terms participants will adopt various positions that can be referred to the “normative specifications of appropriate conduct” in order to be defined for interaction analysis (Goffman, 1981 : 3). To make it more concrete, the authors present a fragment of a video-based study dealing with pre-operating anaesthesia. Finally, in this perspective of advocating for an in-depth study of the context, referring once more to a concrete example of research, the authors discuss how video-based studies can complement other kinds of studies concerned with talk and discourse in institutional and organizational environments. To conclude the chapter, the authors raise the issue of the limits the researcher has to respect when studying the context. For example, according to them, it would be misleading to define interaction as constantly determined by contextual variables. To avoid this pitfall during the analysis process, the authors suggest to focus “on the ways in which participants themselves render relevant features of the context in the accomplishment of action” (p.107). In this perspective, when studying the impact of the environment upon action and utterance, the researcher can strengthen his analysis by taking into account information drawn from his fieldwork. Indeed, if participants do refer to the context in their talk or actions, then the researcher can consider it to be relevant.

Chapter Six deals with the stage of presentation and publication of the findings. It focuses on how to include video data, according to the mean of disseminating research results selected, the time allocated, the circumstances, and the analytic point(s) of view adopted. For this reason, the authors provide advice for both live presentations and disseminations of video data in written texts, addressing very precisely the key steps to be taken into account for each exercise. Thus, in the case of live presentations, they review from the planning and structuring of the presentation, through selecting the video fragments to be used, to the tools to involve for this work and the problems
usually encountered. As regards the dissemination of video data in written texts, they attend to the description of video fragments, the images and transcript integration (with a special concern for ethical issues, through getting the participants’ consent and guaranteeing their anonymity). Concerning the choice of video fragments for presentation or publication, the authors also insist on the importance for the researcher to select them according to their relevance to reveal and argue key aspects of the actions and practices studied (too many video fragments would prejudice the presentation of the study), as well as to pay attention to introduce the video fragments properly, and modulate their complexity (from the setting to the details of action). Finally, the authors address the technical aspects related to the presentation and publication of images to ensure their quality (now yet a little bit outdated on certain specific points, for example since the flash media storage and SD cards replaced DV tapes).

The last chapter, chapter seven, touch on implications, applications and new developments of video-based studies. With this objective, the authors outline the effective contributions of the use of video data for research: notably for the social, cognitive and computing sciences, by impacting the examination of consumer behaviour, communication skills training, technology design, etc. To illustrate this point the authors review the examples of three workplace studies they conducted. The first one is related to the use of surveillance technologies on London Underground; the second one deals with interactions between doctors and patients; and finally the third case is based on interactions between visitors in museums and galleries. The authors then close the book with a discussion on the value and growing importance of the use of video for studying social interaction through online social networks, and the challenges it arises in terms of methodology.

In conclusion, Video in Qualitative Research constitutes, in the field of qualitative video-based studies, an effective guidance for researchers to master video as a research tool with unprecedented opportunities. Through detailing ethical, methodological and practical considerations, this very pedagogical book leads the researcher in the video recording process, from the planning of the study to its presentation and publication, via data collection and analysis, always taking care to illustrate and argue the points of view presented with examples drawn from the authors’ own research.

References


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