

Oyster eaters: From consumer practices to the representation of risks

Elisabeth Guillou, Adeline Raymond, Nathalie Krien, Fabrice Buschini

► To cite this version:

Elisabeth Guillou, Adeline Raymond, Nathalie Krien, Fabrice Buschini. Oyster eaters: From consumer practices to the representation of risks. Appetite, 2019, 140, pp.105-113. 10.1016/j.appet.2019.04.012 . hal-02443363

HAL Id: hal-02443363 https://hal.science/hal-02443363

Submitted on 22 Oct 2021

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers. L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NonCommercial 4.0 International License

Version of Record: https://www.sciencedirect.com/science/article/pii/S0195666318307736 Manuscript_4f288bf9f8a9e48e1f14618e4d138f5a

Oyster eaters: From consumer practices to the representation of risks.

Elisabeth Guillou (corresponding author)¹, Adeline Raymond¹, Nathalie Krien¹, Fabrice Buschini²

Elisabeth.Guillou@univ-brest.fr (corresponding author) Université de Bretagne Occidentale – LP3C EA 1285 20 rue Duquesne – CS 93837 29238 Brest Cedex 3 – France Tel.: +33 2 98 01 63 61 Adeline.Raymond@univ-brest.fr nathaliekrien@gmail.com fabrice.buschini@sorbonne-nouvelle.fr

¹Université de Bretagne Occidentale / LP3C EA1285 – Laboratoire de Psychologie : Congition, Comportement, Communication

² Université Sorbonne Nouvelle – Paris 3 / IRMÉCCEN - Institut de Recherche Médias, Cultures, Communication et Numérique

Acknowledgement

This study was carried out with the financial support of the French National Research Agency's (Agence Nationale de la Recherche) 'ACCUTOX'' project 13-CESA-0019 (2013–2017).

Oyster eaters: From consumer practices to the representation of risks.

1 2

3 Introduction

This study was part of an interdisciplinary research project¹ aimed at characterising the determinism of the accumulation of paralytic shellfish toxins (PSTs) produced by dinoflagellates of the genus *Alexandrium* in *Crassostrea Gigas* oysters, commonly known as 'cupped oysters'. These PSTs come from micro-algal blooms and can have fundamentally significant socioeconomic, health and ecological impacts (Hoagland, Anderson, Kaoru, & White, 2002; Hoagland & Scatasta, 2006).

9 This particular project focused on the differences between the diploid and triploid oysters. In France, 10 the triploid oyster is commonly known as the "four seasons" oyster since it has been genetically 11 modified² to stem reproduction, the process responsible for milt. Some consumers do not appreciate 12 the milt, especially seasonal consumers, who consider the milky oyster to be of lesser quality 13 (Debucquet, Merdji, & Lambert, 2003). The oyster breeding season, which is when the milt appears, 14 is between May and August. The arrival on the market of this triploid variety therefore allows oyster 15 consumption during the tourist season. There is also a profitability objective for these all-year-round 16 oysters. However, according to the experts (most notably the biologists), the triploid oyster can pose 17 a more serious risk to health than their diploid counterparts due to greater contamination during 18 toxic algal blooms (Haberkorn et al., 2010). The psychosocial element of this interdisciplinary 19 research project sought to understand whether the risks perceived by consumers reflected those 20 perceived by scientists. We therefore focused on the practices and potential risks associated with 21 oyster consumption, examining, in particular, the social representation of oysters among French 22 consumers.

23 Study context: the biological point of view

24 Recent decades have seen the emergence and proliferation of toxic algal blooms, and these have had 25 major effects on marine ecosystems, the socio-economic activities that depend on them (such as 26 fishing and aquaculture, whose activity may be suspended through a ban on the marketing of 27 products) and human health. The species of microalgae considered to be toxic are those that 28 produce molecules that have negative effects on marine organisms, which can, in turn, have negative 29 effects on human organisms. In most cases, the effects of phycotoxin on human health occur 30 following consumption of contaminated marine organisms (Backer, Schurz Rogers, Fleming, 31 Kirkpatrick, & Benson, 2005; Van Dolah, 2000). For the past few decades, the commercial bivalves 32 sourced from French coastlines have been regularly contaminated by these compounds produced by 33 the microalgae, representing a health risk for the consumer. France is the leading European and 4th 34 largest worldwide producer of cupped oysters, with approximately 130,000 tonnes marketed each 35 year, and this production can be the target of paralytic phycotoxins. In high doses, these toxic 36 compounds, which are frequently found along a particular section of the French coastline (Lassus et 37 al., 2004, 2007), can be fatal for the consumer. There is an almost worldwide presence of PSTs, which

¹ ACCUTOX: 'From the characterisation of the determinants of the accumulation of paralytic shellfish toxins (PST) in the Crassostrea Gigas oyster to the associated health risks in a societal context' (2014-2017).

² The triploid oyster is not considered a GMO in France, so labelling is not compulsory.

are responsible for paralytic shellfish poisoning (PSPs), with approximately 2,000 cases reported each
 year and a mortality rate of between 4% and 10% (Sierra-Beltran et al., 1998).

40 Another major concern of scientists is bacterial contamination that can be fatal for high risk 41 consumers of raw oysters (e.g., people with liver disease, diabetes, weak Immunity). In France, little 42 attention is paid to these populations. This is probably due to the scarcity of reported cases of human 43 contamination by Vibrio Vulnificus (Geneste et al., 2000; Lam, Kaassis & Calès, 2004). The prevalence 44 of cases in the USA results in both a focused attention on the high risk population (e.g., Flattery & 45 Bashin, 2002; Interstate Shellfish Sanitation Conference, 2004) and a global concern (Word Health 46 Organization and Food and Agriculture Organization of the United Nations, 2005). With about 55 47 times fewer cases reported than in the USA, France is far less affected. However, it could be more 48 concerned in the coming years with ecological changes altering the salinity and the temperature of 49 waters (Farama, Lesne, Touron, & Wallet, 2008). In France, as in USA (e.g., De Paola et al., 2010), 50 health risk management has been based on the precautionary principle relying on monitoring 51 networks to survey bacterial (Rincé et al., 2018) and toxic phytoplankton contaminations³. This 52 precautionary principle is regularly challenged by those oyster farmers whose oyster beds have been 53 closed down, while consumers encourage its application from the point of view of risk management, 54 no matter how minimal it may be.

55 More specifically about oysters, a large part of the cupped oyster farming is composed of triploid 56 oysters (30% in 2008 and 50% in 2014⁴). In biological terms, these oysters present a reduced 57 gametogenesis, which means the so-called 'milky' appearance, which is linked to reproduction, can 58 be avoided. This characteristic is a commercial asset insofar as it allows the sale of oysters all year 59 round, particularly during the summer and tourist seasons (the usual oyster-reproduction period). 60 However, as it was already mentionned they could be more contaminated, especially during toxic 61 blooms. Not all consumers are in favour of the use of triploid oysters, but there is still a need to be 62 aware of them (Debucquet & Merdji, 2007).

As a consequence, these two issues (triploids and toxic episodes) combined can be a source of confusion and societal tensions. Understanding the social representation of oysters can therefore be a means of understanding the potential divergencies in regard to oyster production and consumption and the associated risks.

67 Enquiry from a psychosocial point of view: from practices to representations

It is not our intention in this article to develop the theory of social representations (Moscovici, 1976, 2001), which has been largely developed elsewhere (e.g. Bäckström, Pirttilä-Backman, & Tuorila, 2003; Deaux & Philogène, 2001; Debucquet, Cornet, Adam, & Cardinal, 2012; Jodelet, 1999). We note simply that this theory was elaborated to account for the sociocognitive processes that allow an individual to understand their environment, particularly through the appropriation of scientific concepts. Various functions are attributed to social representations (Abric, 2001; Doise, 1985, 1993;

³ https://wwz.ifremer.fr/lerpc/Activites-et-Missions/Surveillance/REPHY. This network was created by IFREMER (Institut Français de Recherche pour l'Exploitation de la Mer, or French Research Institute for Exploitation of the Sea) in 1984 and is composed of twelve coastal laboratories, which, between them, monitor phytoplankton and phycotoxins along the whole of the French coastline.

⁴ Data taken from 'Syndicat National des Employeurs de la Conchyliculture' (SNEC): http://www.snec-france.fr/

74 Jodelet, 1999; Moscovici, 1976). They are commonly associated with the functions of interpreting the 75 world, justifying positions adopted and managing social relationships (conduct and communication). 76 By constructing social representations, individuals build knowledge that enables them to interpret, 77 explain and understand the world around them. In so doing, they are able to situate themselves in 78 their environment, understand it, manage it, communicate with others and influence the content of 79 that communication (Breakwell, 2010). By formulating a social representation, individuals create a 80 common language or more precisely a common-sense knowledge that allows them to communicate 81 and to adapt practices and discourses to the diversity of situations. It is this scientific and lay 82 knowledge, as it relates to risks, that will be focused on here. More specifically, we want to identify 83 these different representations through a study of practices.

84 Between common-sense knowledge and scientific knowledge

Social representations are thus defined as a form of common-sense knowledge, in other words, as a
naive form of knowledge that is often opposed to scientific knowledge (Bangerter, 1995; DrozdaSenkowska & Streri, 2002; Gueorguieva, 2003; Jodelet, 1999; Moscovici & Hewstone, 1984).
Common sense includes everything that is not scientific and which refers to a 'meaningless' concept,
a 'mundane' reason, or an 'amateur scientist's' or 'curious observer's' knowledge. The forms
knowledge can take vary according not only to the individuals or groups involved but also, depending
on their objectives, to their logic, positions and practices.

- 92 The question of knowledge is directly related to science. Science is knowledge that is considered to 93 be 'exact', repeatable and verifiable, 'thorough', 'truthful' and 'real'. A number of authors (Belisle & 94 Schiele, 1984; Bourdieu, 1976; Gergen, 1996; Grize, Vergès, & Silem, 1987) have highlighted the 95 importance afforded to science as an institution that speaks the truth or which aims to establish the truth (Gergen, 1996; Belisle & Schiele, 1984). Scientific reasoning is essentially based on a 96 97 hypothetico-deductive logic, translating a causal link between the various phenomena observed. Any 98 discipline modelled on a similar logic can be considered a 'science'. Norms thus define what is 99 science and what is not, both for the researcher and in terms of common sense.
- 100 When constructing a social representation of an object, individuals are not seeking to advance 101 knowledge, as is the case for a scientist. Their aim is rather to reduce the distance between what 102 they know and what they observe. It is a process of familiarization with the strange (Moscovici, 103 2001). Social representations are a form of common-sense knowledge that have their own social 104 logic. However, their mode of reasoning cannot be considered 'non-formal' in comparison with the 105 so-called 'formal' mode of scientific reasoning (Grize et al., 1987). Grize et al. (1987) suggested that 106 scientific and lay knowledge have two distinct languages, each with their own logic. They maintained 107 that it is important 'not to make one the interpretative framework of the other (...). Social 108 representations are not erroneous, truncated knowledge. They are a form of knowledge whose 109 nature and functioning we need to understand' (Grize et al., 1987, p.24-25). According to these 110 authors, an understanding of social phenomena and representations does not just come from 111 comparing scientific knowledge with common-sense knowledge. It is also necessary to identify the 112 socioeconomic and historical sources, or 'places of determination', of these representations.

There is nevertheless an interdependence between these two forms of knowledge, since common knowledge is founded on inspiration from scientific knowledge and scientific knowledge is inspired by common sense (Moscovici & Hewstone, 1984). The assimilated knowledge has a functional aim, which is translated into discourses. Each group's discourse is aimed at someone, and it has an objective, which is to inform, convince, stimulate and influence. The representation of the object becomes a system of interpretation and is transformed into a language that facilitates communication on problems (Moscovici, 1976), such as risks (Breakwell, 2010).

120 In conclusion, common-sense knowledge is based on a method of reasoning that is linked to 121 psychosocial or cultural logics. It refers (sometimes pejoratively) back to 'false' beliefs, as compared 122 with scientific knowledge, which is considered the norm in matters of truth. However, scientific 123 thought and social thought refer to two different ways of thinking, to two forms of belief that differ 124 in terms of their purposes, objects and validation procedures. These two forms of thinking do not 125 have the same social usefulness. While science aims at the 'truth', representations prepare us for 126 action (Grize et al., 1987). In science, objects are reduced to their minimal properties so that 127 processes can be understood. Within the context of a social representations approach, objects 128 become multiform. In validation processes, science (in the sense of an exact science) seeks 129 coherence. Data must be verifiable and replicable, and they must reflect a certain reality. By contrast, 130 the study of social representations involves an examination of the diversity and proliferation of realities. Neither of these forms of knowledge is superior to the other. They are different because the 131 132 stakes and interests are different. This is what we will attempt to highlight here using the example of the social representation of a health risk. 133

134 The specificity of the social representation of risks

135 The domain of risk studies is particularly appropriate for highlighting these different thought 136 processes. Risks are commonly identified by technical or scientific experts, who determine risk 137 situations, risk levels and populations at risk. However, according to the experts, these populations, 138 who are classed as 'vulnerable', do not always behave in an appropriate way with regard to the risks 139 they face. Hence, when people have already been confronted with danger, unperceived risk is either 140 considered to be 'in denial' behaviour or put down to 'memory failure'. Many studies have thus been 141 conducted to study 'risk perception' with the aim of changing behaviour or adapting communication 142 to take better account of risk (Breakwell, 2010).

143 The theory of social representations relating to risks will serve to explain the sociocognitive 144 phenomena and processes at work from an alternative angle to that of erroneous individual 145 reasoning (Michel-Guillou & Meur-Ferec, 2016; Navarro-Carrascal & Michel-Guillou, 2014). There is 146 no longer any need to compare one form of risk knowledge (common-sense knowledge) with 147 another (scientific knowledge). Rather, the focus is on the object of knowledge from the 'expert' and 148 'lay' points of view. The objective is therefore to identify the social representation of a so-called 'at-149 risk' object. It is not the perception or non-perception of risk that is important here but the reasons 150 why some people will describe the object as 'at risk' while others either do not 'see' it or do not 151 objectify it as such (Joffe, 2003). Risk generally refers to 'danger' (Douglas, 1994). However, while an 152 object is considered to be a risk for some individuals or groups (negative connotation), this 153 positioning is not necessarily shared by other groups. A study of social representations leads to an 154 identification of the symbols and valency that given groups associate with given objects that may or 155 may not be perceived as a source of risk. These representations will depend on the practices, social 156 integrations and importance of the issue for people concerned (Doise, 1985). This was the subject of 157 our study, which was on the social representation of oysters among regular consumers.

158 Study

The aim of this study is to understand the thought process mobilised in interpreting risk. The logic behind scientific thinking is to gain an understanding of the processes at work in relation to a given risk, and the logic behind common sense reasoning is to identify and understand a risk in order to be able to act and communicate. Examining these different logics may allow us to identify any possible divergences in relation to the representation of oysters and the associated risks.

164 According to oyster-specialist biologists, triploid oysters are more sensitive to toxic algae than their 165 diploid counterparts. This makes them unfit for consumption, thus creating a health risk. So, what 166 are the overall risks associated with oyster consumption for the consumers? Do consumers perceive 167 the same health and safety risks as biologists? Based on the principle that social logic is different 168 from scientific logic, most notably on account of their respective aims and usefulness, we expected different representations. To tackle this problematic, we chose to focus our attention on consumer 169 170 practices. Using a consumption log, we were able to follow the actual practices of number of oyster 171 consumers over a period of eight months. Levy, Choinière, and Fein (2008) showed the importance to 172 consider practices in studying risk perceptions. Analysing a national food safety survey data, they 173 found that risk perception is not correlated with reported food safety practices. They pointed out the 174 importance of complacency and self-confidence, often related to education and experience, in the 175 lowering of practice-specific risk perceptions. They emphasized 'the critical role self-awareness plays 176 when reporting and actually engaging in food safety behavior. In most everyday situations when food 177 is prepared at home, the cook engages in routine, familiar practices that do not ordinarily provoke 178 concern about food safety hazards unless a hazard is called to mind, usually by something distinctive 179 in the immediate circumstances, for example, handling a food, such as raw hamburger, widely seen 180 as dangerous' (p. 759). Even if their study focuses on food in general, we think that simililar 181 processes are at stake in oyster consumption.

182 This study of practices was used to highlight the representation of the oyster and the 183 purchasing/fishing, preparation and consumption methods employed. Implicitly, it involved 184 identifying the potential risks associated with purchasing/fishing and consuming this seafood product 185 and, where applicable, the practices put in place to limit these risks.

186 Method

187 Participants

188 Twenty-nine households voluntary participate in the study (individuals or couples; n=29). These 189 households were selected for their regular consumption (that is beyond celebrations). They were 190 recruited either through oyster farmers (who put us in contact with some of their regular customers), 191 through associations offering fishing activities or through our own network. All the households were 192 located in France, mainly in the Brittany area (western France), where the study was conducted. Of 193 these, five practised intertidal fishing (n=5), that is recreational on foot shellfish fishing. At the end of 194 the survey, a €50 voucher was distributed to all households who had fully participated in the study 195 (one household dropped out of the survey). 196

- 197 Procedure
- 198 To study the social representation of oysters and understand the risks that consumers associate with
- 199 the production and/or consumption of these bivalves, we chose to conduct a longitudinal exploratory

study of consumption practices based on both self-fulfilled logbooks and research interviews. Thestudy covered an eight-month period, from July 2015 to February 2016.

In order to examine these practices, we created a consumption log containing a separate page for each entry, where respondents had to fill out information on up to a maximum of four stages, ranging from the initial intention to purchase/fish stage to the post-consumption stage, as follows (see Table 1).

206 **Table 1**. The consumption log

Page 1	Page 2
Intention to purchase/fish oysters	Purchasing of/fishing for oysters
(number)	
D () () () () () () () () () (• Date: / / 2015
• Date: / / 2015	Actual purchase/fishing location
 Intended purchase/fishing location 	✓ Beach
✓ Beach	 ✓ Fishmönger ✓ Ovster farm
 ✓ Fishmonger ✓ Ovstor form 	✓ Supermarket
✓ Supermarket	✓ Restaurant
✓ Restaurant	✓ Others:
✓ Others:	 Information used to purchase/fish the
 Information gathered before 	oysters
shopping/fishing trip	Has the motivation changed? Explain
 Motivation(s) 	• Have you consumed the oysters?
• Did you buy/fish oysters?	✓ Yes, go to page 3
✓ Yes, go to page 2	✓ No, explain:
✓ No, explain:	
Dago 2	Page 4
Page 5	Page 4
consumption of the bysters	Post-consumption
 Date: / / 2015 Consumption location (at home) Information concerning the preparation 	 Satisfaction from a taste point of view "Very happy" to "Very unhappy" 1-2-3-4-5-6-7
and consumption of the oysters	 Satisfaction from a quality point of view "Very happy" to "Very unhappy" 1-2-3-4-5-6-7
	 Overall satisfaction "Very happy" to "Very unhappy"
	1-2-3-4-5-6-7
	Can you explain your responses above
	Other satisfaction/dissatisfaction criteria

207

208 Stage 1: This first stage involved the measurement and description of the respondent's 209 intention (whether premeditated or not) to purchase/fish oysters (date, intended purchasing/fishing 210 location, information gathered before implementation of the purchasing/fishing behaviour, 211 motivation). At this stage, behaviour could be anticipated (e.g. a planned family meal) or 212 spontaneous (e.g. a sudden desire for oysters when passing a stall). At the end of this stage, the 213 respondent specified whether the purchasing/fishing act had actually taken place. If the act had not taken place, the entry for that page was complete, and a new page would be used to log the next 214 215 intention. If the act had taken place, the respondent would proceed to the next stage.

Stage 2: This second stage concerned the actual purchasing of/fishing for oysters. In this stage, the respondent described the time of purchase/intertidal fishing, the location, the type of information used to purchase/fish the oysters (type, quantity, size, environmental and social conditions, etc.) plus the motivation if this had changed from that cited in Stage 1. The respondent then specified whether or not the consumption had taken place. As before, if consumption had not taken place, the entry for that page was complete, and a new page would be used to log the next intention. If consumption had taken place, the respondent proceeded to the next stage.

Stage 3: This stage focused on the consumption of the oysters. The respondent recorded first the date of consumption and then the location (e.g. at home, at someone else's house, in a restaurant). They were then asked for information concerning the preparation and consumption of the oysters (opening them, accompaniment, preparation if applicable, people present, etc.). The respondents were asked to provide as much detail as possible, even using keywords.

Stage 4: This fourth and final stage concerned post-consumption. It was therefore completed by all those who had filled out Stage 3. It involved assessing consumer satisfaction/dissatisfaction (from a taste, qualitative and overall point of view) and explaining any behaviours that may have been related to the consumption, whether on the same day or a few days later.

232 The log was the main tool of the study in the sense that it allowed us to measure practices at the 233 time they occurred as well as their subsequent progression. It was distributed in sufficient copies to 234 the 29 households, during an initial face-to-face contact. In summary, the household member(s) filled 235 out at least one page in the consumption log for each intention (see Table 1). Regular interviews 236 were then conducted among these consumers based on the data in their consumption logbooks. The 237 interview guide followed the log's structure. The logs' contents themselves were not analysed: they 238 merely served as an aide-memoire, allowing the respondents to remember as many details as 239 possible during the interview about their actual practices.

240 The initial face-to-face contacts, which took place in July and August, involved a presentation of the 241 log consumption procedure. A first interview, which was based on summer consumption, took place 242 in September. Each household was then regularly contacted to arrange telephone or face-to-face 243 interviews, depending on their availability and their log fulfillment. The interviews' schedule followed 244 each stage from initial intention to purchase/fish to post-consumption. The final interviews, 245 conducted from the end of January into February, recorded the respondents' most recent practices 246 and summarised their perceptions of oysters, their thoughts on the associated benefits/risks, their 247 main location for purchasing/fishing oysters and their consumption. This was the only time the 248 question of 'risk' was explicitly mentioned. This theme was purposely not induced in the previous 249 interviews.

A total of 84 interviews, based on an average of six consumption logs per household (min. = 2, max =
11) were conducted over the eight-month period and transcribed in full. The number of interviews
per household varies between two and four.

253 Data analysis procedure

Analysis was based on the entirety of the transcribed discourse. This discourse was analysed using the textual analysis software Alceste (meaning analysis of the co-occurring lexemes within the simple utterances of a text), which mainly consists in studying the laws of vocabulary distribution within a corpus (Lebart & Salem, 1988; Kronberger & Wagner, 2000; Reinert, 1999). 258 The utterance was the basic unit of investigation. The semantics of the utterance are clearly different 259 from the semantics of the word in that they contain the mark of a psychological subject, of an 260 intentionality (Pottier, 1987). The aim of this method was not to calculate meaning but to topically 261 organise the discourse through the highlighting of 'lexical worlds'. In this discourse, a psychological 262 subject was expressing something to someone about the world. According to Reinert (1999), who 263 developed this method, Alceste maps the principal common places in a discourse. As such, it is a 264 useful tool for the textual analysis of a corpus. Since the corpus was compiled according to a certain 265 research topic, Alceste was able to extract the different divisions in the word distributions, opening it 266 up to an interpretative approach or content analysis (Reinert, 2002). The objective of the software is to obtain an initial statistical classification of the 'context units' in the corpus, which is studied 267 268 according to the distribution of words within these units in order to extract the most characteristic 269 words (the 'lexical worlds'). These context units are then statistically ranked according to a 270 descending hierarchical classification procedure. The aim of this classification is to distribute the 271 utterances into classes that are marked by the contrast of their vocabulary. This implies that the 272 speaker, at a given moment in their utterance, promotes access to some semantic worlds more than 273 others (if, by this, we understand sets of words whose associations prove sufficiently stable over time 274 to be able to structure a discourse or a set of discourses).

275 Results

The 84 interviews, defined as utterances, represent the 84 Initial Context Units (ICUs) of the corpus. These ICUs were segmented into Elementary Context Units (ECUs). The ECUs generally represented the equivalent of a sentence with punctuation taken into account by the software. The cooccurrences in these ECUs were then analysed. The total number of forms contained in the corpus was 315,808. The number of different forms was 10,915, and the number of hapax (single occurrence forms) was 4,906.



282

Figure 1. Presentation of the 5 classes representing 77% of the ECUs classified in the form of ahierarchical descending classification.

As shown in Figure 1, 77% of the textual units in the corpus were classified, representing a good level of relevance. These classified units were divided into 5 classes of significant utterances. Each class was numbered according to the order in which it appeared in the classification. Class 1 was the most specific since it was the first to be detached in the classification tree (see Figure 1). Its vocabulary 289 was the most homogeneous. It represented 18% of the classified textual units (i.e. 15% of the initial 290 corpus) and was characterised by words relating to intertidal fishing (fishing, foot, to collect, etc.) as 291 well as words formed with this root (e.g. to fish+) (see Table 2). Class 2 was the next to emerge, 292 representing 19% of the classified textual units (i.e. 16% of the initial corpus) and characterised by 293 words or roots referring to taste, appearance, quality, price, and so on (see Table 4). Class 3 294 represented 33% of classified textual units (i.e. 25% of the initial corpus). The significant words in this 295 class referred to purchase, celebration, weekend, family, and so on (see Table 3). Class 4 represented 296 17% of the classified textual units (i.e. 13% of the initial corpus) and was characterised by words such 297 as water, opening, fridge and time (see Table 5). Finally, Class 5 represented 13% of the classified 298 textual units (i.e. 8% of the initial corpus) and contained terms such as lemon, butter, bread, raw, 299 shallot and plain (see Table 6). From the point of view of the explanatory variables, none appeared to 300 be clearly associated with any specific class except the shellfish fishers, who were clearly associated 301 with the first class, 'fishing'. Consequently, in terms of consumption, our population appeared to be 302 homogeneous.

Based on this first result, we labelled the classes. Figure 1 shows a separation of the utterances into two broad categories. The first, representing the pre-acquisition and acquisition stage, included the first three classes, which we labelled as follows: fishing (Class 1), favourite oyster (Class 2) and purchase (Class 3). These classes referred to an utterance on the subject of the choice of oyster and its origin. The second category comprised Classes 4 (storage and preparation) and 5 (consumption), reflecting post-acquisition practices. A detailed analysis of each of these classes is presented below. For the purposes of analytical coherence, Class 3 is presented before Class 2.

Fishing	
Characteristic forms	Absent forms
pêche/fishing (252, 110, 77)*, pied/foot (174, 71, 75), ramasser/to collect (137, 80, 63), malade/ill (131, 90, 61), pêcher/to fish (120, 32, 91), maladie/disease (111, 35, 89), coquillage/shellfish (107, 47, 70), parc/farm (104, 44, 73), naissain/spat (93, 27, 96), interdit/prohibited (81, 22, 100), bigorneau/winkle (77, 30, 85), zone/zone (75, 23, 95), interdiction/ban (71, 21, 95), bienfait/benefit (69, 25, 84), élevage/farming (65, 20, 86), pollution/pollution (65, 25, 79), sanitaire/health (64, 15, 100), pêcheur/fisher (62, 17, 89), dinophysis/dinophysis (38, 9, 100)	manger/to eat (-42, 110, 12), plat/flat (-35, 15, 5), marché/market (-33, 5, 3), goût/taste (-30, 16, 6), creuse/cupped (-28, 7, 4)

310 **Table 2**. Examples of characteristic and absent forms in Class 1

311 Note: * For this and all subsequent tables, the number in parentheses represents: (1) the Chi-square value,

which indicates the strength of the link between the form and the class; (2) the real effective in the class; and (3)
the % of presence of the form in the class studied in relation to its total presence in the corpus. All the words

313 the % of presence of the form in the class studied in relation to its total presence in the corpus. All t 314 that emerged from the Alceste analysis are accompanied by their original French equivalents in italics.

Table 2 presents the terms from Class 1. These terms described the practice of intertidal fishing (fishing, foot, to collect, shellfish, winkle, etc.), which included other shellfish than just oysters: /// MAN: We'll see if there are any to collect around where we drop anchor. WOMAN: We collect

mussels, winkles, cockles, clams. Whatever's there.' (household 7, October). The origin of wild oysters 318 319 was sometimes associated with oyster farms (farm, spat): 'This is an area where there are oyster 320 farmers. Well I guess some spats do come out and now there are some ... in the next village there are 321 loads. On the rocks there are loads of them.' (household 16, November). Within this class, the fishers' 322 discourse was characterised by mentions of the health and environmental risks (ill, disease, 323 prohibited, ban, etc.). They talked about dynophisis and the bans, and they knew the health risks: 324 'There may be problems with bacteriological diseases. And the toxins, they've been talked about as 325 well, dinophysis, and all that. This is a safe place. AND SPEAKING OF SAFETY, WHAT ARE THE MAIN 326 PRECAUTIONS YOU TAKE WHEN COLLECTING OYSTERS? Well I make sure there's no temporary pollution in the area. In the summer I don't go fishing for that reason because there are loads of 327 328 people around and I don't want to be sloshing about with a lot of people around me. And also the 329 coasts are becoming more and more polluted, so we have to be careful. There are places where it 330 says it's prohibited to collect shellfish because they're rotten.' (household 18, January). Various health 331 control techniques were mentioned, including observation: 'I go to Penfoulic if I see the oyster farmers, they're not oyster farmers, they're shellfish farmers. If they're slogging away, it means the 332 333 fisheries are open. When there's pollution, it's IFREMER that controls it, so they prohibit, they prohibit 334 the professionals from fishing and also the movement of shellfish so that it does not spread. So if 335 they're not on their farms, it's because they're closed.' (household 18, October).

336 Triploid oysters were mentioned within this class: 'I'm no biologist but I've discussed it with the 337 professionals. When I go fishing I talk to them, I know them now, and it's interesting by the way, they 338 are interesting people. They know a lot. And IFREMER, because it was IFREMER who developed this 339 rubbish, wanted to do the same thing with mussels. And the professionals here vigorously opposed it.' 340 (household 18, October). However, while the fishers seemed to be rather opposed to this genetic 341 modification, the health risk was not their main reason. There was no link made between the health 342 risks mentioned above and genetically modified oysters. The fishers' rejection of these oysters was justified on more ideological grounds: 'You shouldn't interfere with living beings, full stop! It's not a 343 344 question of morals, it's a question of survival. It's not a rejection of science either; I was trained as a scientist. But this is sheer stupidity.' (household 18, October). This point of view extended even 345 346 beyond the fishers to the critics: 'We could have ... well, not necessarily dangerous things, but 347 chromosome manipulations that we don't... that we don't agree with.' (household 14, October).

- 348 We will now examine the class related to 'purchase' class (see Table 3).
- 349 **Table 3**. Examples of characteristic and absent forms in Class 3

Purchase	
Characteristic forms	Absent forms
<i>marché</i> /market (225, 188, 85), <i>acheter</i> /to purchase (163, 314, 62), <i>fête</i> /celebration (132, 96, 89), <i>dimanche</i> /Sunday (123, 115, 83), <i>samedi</i> /Saturday (101, 65, 94), <i>famille</i> /family (98, 82, 82), <i>mois</i> /month (95, 102, 77), <i>semaine</i> /week (94, 101, 77), <i>ami</i> /friend (87, 75, 81), <i>aller</i> /to go (84, 12, 48), <i>dernier</i> /last (74, 86, 73), <i>envie</i> /craving (71, 111, 67), <i>fois</i> /times (67, 313, 51), <i>week-end</i> /weekend (66, 57, 84),	eau/water (-120, 19, 6), goût/taste (-97, 15, 6), citron/lemon (-53, 2, 2), ouvre/open(s) (-45, 8, 6), pêche/fishing (-41, 6, 5)

matin/morning (59, 56, 78), *ostréiculteur*/oyster farmer (57, 124, 59), *année*/year (55, 101, 63), *repas*/meal (54, 92, 65), *Noël*/Christmas (51, 76, 69), *courses*/food shopping (48, 34, 89), *vacances*/holiday(s) (41, 40, 82)

350

'Purchasing' referred to the common spaces in which the oysters were purchased (see Table 3). In 351 352 their spatial dimension, these spaces referred to supply points (market, oyster farmer, etc.). In their 353 temporal dimension, they described the occasions (celebrations, weekends, family, holiday(s), etc.). 354 'MAN: Because it's Christmas, New Year. WOMAN: yes it's associated with parties too.' (household 355 10, January). No matter what the location, therefore, oysters were unanimously associated with the 356 idea of pleasure. 'It's always the same context. It's often the weekend, when we have some time. We 357 enjoy it and we wanted to have some oysters.' (household 14, October). They were seen as an 358 inevitable festive dish: 'It's true it's difficult to think of a Christmas or New Year's Eve. I don't think 359 we've ever had a Christmas Eve or New Year without oysters.' (household 10, January). Oysters 360 referred to the idea of sharing and even of heritage: 'We like oysters. Our parents as well. Our parents are the same. And we got it from there really, for a family dinner, it was the typical starter. 361 362 Since we all lived by the sea, it was... And well then we just continued, we still really enjoy making an 363 oyster meal.' (household 9, November).

364 To preserve these times, provenance was primordial and confidence in the oyster farmer was 365 explicit: 'We use an accredited vendor. We know him as well. So there's an emotional bond and also 366 trust. And he wasn't at the market the last two times because he had some... some health problems 367 and so here we are we've put it off.' (household 14, October). The purchasers sought not only quality 368 but also control: 'So I hear there's algae there. But that, there are the laboratories that say, that tell you, especially when it's in the Mediterranean or wherever, there's toxic algae getting into the 369 370 oysters. But that's normally regulated by the health agencies. But if someone's authorised, and they 371 sell me oysters, I trust them.' (household 11, November).

372 **Table 4**. Examples of characteristic and absent forms in Class 2

Favourite oyster	
Characteristic forms	Absent forms
<i>goût</i> /taste (267, 221, 59), <i>laiteuse</i> /milky (245, 93, 75), <i>qualité</i> /quality (203, 83, 78), <i>plat</i> /flat (198, 205, 53), <i>creuse</i> /cupped (190, 109, 60), <i>prix</i> /price (179, 75, 77), <i>Fine</i> (167, 46, 92), <i>Marennes</i> (161, 55, 89), <i>taille</i> /size (147, 61, 78), <i>Oléron</i> (134, 41, 90), <i>numéro</i> /size (133, 77, 66), <i>cher</i> /expensive (130, 81, 63), <i>charnu</i> /plump (130, 43, 90), <i>Claire</i> (124, 44, 81), <i>différent</i> /different (118, 68, 65), <i>satisfaction</i> /satisfaction (101, 31, 88), <i>bonne</i> /good (77, 103, 44), <i>meilleur</i> /better (74, 46, 60), <i>gros</i> /large (72, 83, 49), <i>noisette</i> /nutty (72, 21, 95), <i>provenance</i> /provenance (67, 19, 90)	eau/water (-35, 23, 7), ouvre/open(s) (-33, 0, 0), heure/time (-29, 1, 1), marché/market (-27, 9, 5), repas/meal (-25, 2, 2)

373

374 Hence, Class 2 (see Table 4) referred to the respondents' 'favourite oyster' from the point of view of 375 type (cupped or flat), flesh (milky, plump, etc.), provenance or designations of origin (Marennes, 376 Oléron, Fine de Claire, etc.) and size. 'Price plays a part too. The price and then the size. THE SIZE? I 377 mean, I like the large ones but there are a lot of people who just like the medium-sized ones. They 378 don't like them too big because they're more milky.' (household 25, January). These criteria can vary 379 widely, depending on the person, their preferences (flabby, milky, lean, etc.) and the oysters, but 380 ultimately the consumers all agree on one point, the noble oyster: 'There are vintages with oysters. 381 And so it's different tastes. It's more subtle. IS IT REALLY A MATTER OF PREFERENCE FROM ONE 382 PERSON TO THE NEXT? No I think, no no it's different tastes. There are some that are very clear, like 383 the Marennes d'Oléron and the Fines de Claire and all that and also the Cancales. And then there are 384 others where you can really taste the difference. They're not better they're not worse but I would tend 385 to, a bit like with wines, there are the Bordeaux, the Burgundies, and all that, it's the same with 386 oysters. They have their own vintages.' (household 23, January).

387 Table 5. Examples of characteristic and absent forms in Class 4

Storage and preparation	
Characteristic forms	Absent forms
<i>eau</i> /water (544, 307, 64), <i>ouvre</i> /open(s) (378, 116, 81), <i>ouvert</i> /opened (273, 121, 69), <i>ouvrir</i> /to open (269, 116, 69), <i>frigo</i> /fridge (225, 62, 93), <i>heure</i> /time (210, 114, 65), <i>laisser</i> /to leave (93, 81, 66), <i>vide</i> /empty (156, 38, 90), <i>refaire</i> /to refill (156, 42, 88), <i>mets</i> /dish (148, 61, 69), <i>garage</i> /garage (124, 30, 93), <i>vider</i> /to empty out (118, 31, 90), <i>jeter</i> /to throw away (108, 42, 72), <i>coquille</i> /shell (96, 57, 61), <i>vase</i> /mud (84, 32, 80), <i>odeur</i> /odour (76, 34, 69), <i>sèche</i> /dry (75, 21, 86), <i>table</i> /table (73, 38, 62), <i>garder</i> /to keep (68, 25, 72), <i>frais</i> /fresh (67, 96, 38)	acheter/to purchase (- 36, 27, 6), ostréiculteur /oyster farmer (-33, 3, 2), goût/taste (-27, 14, 5), aimer/to love (-22, 25, 8), marché/market (- 22, 8, 4)

388

389 The main risk for the consumer lay in how best to store their oysters, which must be consumed alive 390 (see Table 5). There were several storage practice options reported to avoid risk. Some consumers 391 stored the oysters in a cool, dry place (e.g. the garage). Some opened them shortly before 392 consumption. The most common solution was to allow the oysters to produce their second water 393 since the first was reputed to carry bacteria. These practices were specific to the well-informed 394 consumers and were based on the belief that, in so doing, the health risk would be avoided. 'We usually save them for Sundays. It's a bit of a celebration meal. Even if it's not really really expensive, 395 396 it's a bit of a celebration meal. It makes it a bit more special than the usual. SO EVEN WHEN IT'S 397 FROM THE FRIDAY FOR THE SUNDAY YOU STORE THEM ... yes, the same way. OK. WHEN DO YOU 398 OPEN THEM? We open them about half an hour before. I've heard that it's good to open them 30 399 minutes before to allow them to produce a second water.' (household 28, November). 'Well it's my 400 father-in-law who opens them. Usually they're on the table out on the terrace all morning to keep 401 them cool. My father-in-law opens them, he methodically removes the first water and then leaves

402 them out in the fresh air, like that, when it is just a few degrees outside.' (household 13, January). As 403 already mentioned, there was a belief among the consumers that this first water was harmful when 404 storing oysters. 'I've heard that you have to empty out the first water. It's advisable. They say the 405 second water's better. Less risk of bacteria too, I think.' (household 28, January). A collateral risk was 406 thought to be the potential knife injury when opening the mollusc. 'And there's always the small risk 407 of an accident anyway, when you open them with a knife like that and then the knife slips. It kind of 408 ruins your evening when someone sticks a knife in their hand, and you even hurt yourself sometimes 409 with the shells and everything.' (household 7, October). However, the risk here was linked to the 410 possibility that an oyster would be dead or considered 'bad' because of its storage rather than its 411 provenance or type. In summary, this class related to personal practice to protect against risk rather 412 to any characteristic of the oyster itself (e.g. preferring triploid over diploid oysters).

413 Table 6. Examples of characteristic and absent forms in Class 5

Consumption	
Characteristic forms	Absent forms
<i>citron</i> /lemon (659, 118, 84), <i>beurre</i> /butter (621, 83, 96), <i>pain</i> /bread (500, 88, 86), <i>cru</i> /raw (435, 88, 78), <i>échalotes</i> /shallots (408, 55, 98), <i>natures</i> /plain (358, 67, 82), <i>blanc</i> /white (262, 56, 65), <i>vin</i> /wine (250, 54, 67), <i>vinaigre</i> /vinegar (245, 34, 97), <i>cuite</i> /cooked (226, 45, 77), <i>four</i> /oven (168, 24, 92), <i>sauce</i> /sauce (167, 27, 88), <i>mâcher</i> /to chew (162, 36, 81), <i>fourchette</i> /fork (159, 32, 91), <i>gober</i> /to swallow whole (152, 34, 82), <i>couteau</i> /knife (145, 33, 68), <i>bouche</i> /mouth (128, 24, 72)	aller/to go (-34, 37, 5), acheter/to purchase (- 31, 11, 3)

414

415 Class 5, which we have labelled 'consumption' and presented in Table 6, was the smallest of the 416 corpus (13%). This represented the final act, and the whole discourse revolved around how to enjoy 417 an oyster within three broad practical aspects. The first concerned the food that accompanied the 418 savouring of oysters. 'I have them with a little bit of lemon. Sometimes we make a little shallot sauce. 419 With a little something to accompany it. That's it. Bread and butter. In Brittany we eat bread and 420 butter.' (household 21, December). The second related to how to ingest an oyster. There were 421 several schools of thought. Crunching: 'cut the muscle that attaches it to the shell, put the oyster back 422 in the middle. But I don't put vinegar or lemon or anything on it and I swallow it like this but I crunch 423 it.' (household 7, October). Swallowing whole: 'Like most people I think, I go in with a spoon and then I swallow them whole' (household 27, December). Chewing: 'You've got to chew them because, I 424 425 don't know, it's a small living being, so it passes through... AND SO IT CAN MAKE YOU UNWELL... I 426 don't know. I can't say because I don't really know. But maybe knowing you've swallowed a little... a 427 little thing does come into it. I don't know. It doesn't bother me.' (household 10, November). Finally, 428 the third related to how to consume oysters (raw or cooked). 'Well, you know that cooking them kills 429 the germs. Now, I've not experienced it myself but I know it's riskier when they're raw.' (household 430 28, November). Risk in this class appeared to be linked to the consumption of a foodstuff that was 431 raw. This risk could therefore be avoided through the implementation of practices linked to a variety 432 of beliefs, which included cooking the oysters, adding an acidic product (lemon, vinegar), and

- 433 ingesting the mollusc in a certain way (chewing rather than swallowing was suggested as a way of
- 434 killing the oyster while still being able to enjoy its taste). Finally, the consumers used their sense of
- 435 smell to detect a 'bad oyster', a practice already seen in Class 4, 'storage and preparation'.
- 436 In these final two classes, as with the previous ones, we note that certain practices, habits and beliefs
- 437 made the consumer feel safe from the risk of indigestion or bacterial infection, which was in any case
- 438 deemed not to be of any great consequence. '*The risk is food poisoning. Being out of sorts for two or*
- 439 *three days.*' (household 8, December).

440 Discussion

The aim of this study was to identify the social representation of oysters among French consumers in order to highlight the potential risks associated with their consumption. This involved, most notably, determining whether the elements linked to the contamination of these bivalves by toxic algae (scientific concern) was a health risk that consumers took into account.

445 The results showed that oyster consumption was associated with pleasure, so the qualities of an 446 oyster are not based primarily on sanitary qualities. They are consistent with former studies: Lin and 447 Milon (1993) showed that quality features, such as taste, freshness and price, but not safety 448 perception, are main determinants on shellfish products consumption. Houcke, Altintzoglou, Linssen, 449 and Luten (1998) found that taste, texture and odor are the main qualities valued by Dutsch oyster 450 consummers that are ready to pay more for oyster of specific flavor or cultivation area. This last point 451 is particularly important for regular consummers (Kecinski, Messer, Knapp, & Shirazi, 2017). The 452 interviewees adopted practices that were well established among regular consumers (our study 453 population). These practices were based on beliefs (related to conservation, purchasing, etc.) that 454 were widely shared, and they allowed savvy consumers to protect themselves against a potential 455 health risk. While the health risks highlighted by scientists and other experts were known, 456 particularly among intertidal fishers, they were rarely mentioned. There was a high level of trust 457 among consumers and fishers in the health inspection agencies (ANSES [Agence Nationale de 458 Sécurité Sanitaire de l'Alimentation, de l'Environnement et du Travail — French Agency for Food, 459 Environmental and Occupational Health and Safety], IFREMER). In terms of risk, trust was essential 460 because it connected with a sense of security. For Giddens (1990), this feeling is justified by the 461 confidence that an individual has in a person's or a system's reliability within a given context. 462 According to the author, this sense of security expresses a faith or a belief in the other insofar as the 463 principles on which it is based are very often abstract. This trust is therefore essential in order that 464 risk does not to become a concern or an anxiety (see also Luhmann, 1979, 1988; Simmel, 1978, 465 2009). In our study, trust was established through official documents (prohibitions), vicarious 466 experiences, generational transmission, and so on. It contributed to the construction of beliefs and 467 representations that allowed the individual to monitor and control their environment. Hence, for the 468 regular French consumer, it was clear the oyster was a source not of risk but of pleasure (Debucquet 469 et al., 2012). Only the presence of a 'bad' oyster (i.e. one that was unfit for consumption) could spoil 470 this pleasure. Nevertheless, the consumer did protect themselves by means of atavistic preparation 471 and consumption habits. It was therefore practices and beliefs linked to the experience of 472 consumption that protected against risk more than oyster type or provenance. Hence, even when 473 individuals were aware of the triploid, or 'four seasons', oysters, they remained convinced that their 474 actions were preserving them. There was a ritualization of behaviours towards a dish that was not 475 viewed like any other because it was not about eating for eating's sake but rather about enjoyment. 476 Here, the social logic and the scientific logic were different, and they were not comparable with one 477 another (Grize et al., 1987). The social logic was based on beliefs, and it governed practices linked to 478 oyster consumption, sources of pleasure and festive times. This differed from the scientific logic, 479 which induced practices aimed at identifying, among other things, the determinisms of toxin 480 accumulation in oysters and their impacts on health with no reference to any specific pleasure. These 481 two singular logics both generate a different representation of risks. One is social and refers to 482 domestic risks. The other is scientific and refers to health risks. Both logics are anchored in different 483 sociocultural contexts, which express different fundamental positionings (Doise, 1993; Grize et al., 484 1987).

485 In conclusion, this study, although it remains exploratory, has also highlighted the benefits of a 486 qualitative and longitudinal method for understanding the representations of risks. This method had 487 the advantage of not directly asking respondents about the potential risks associated with oyster 488 consumption. The negative connotation of the term 'risk' in the usual sense (Douglas, 1994) would 489 inevitably have generated a normative discourse, potentially foregrounding the importance of 490 environmental pollution. Various authors have attempted to show that the ecological norm, which is 491 aimed, in particular, at protecting the environment from human threats, has a positive social value 492 (Castro, 2014; Castro & Lima, 2001; Pol, 2007). It was therefore feasible to expect that the risk linked 493 to environmental pollution, which is known to consumers, and its associated health risks would have 494 been highlighted. Hence, the respondents in our study were asked not about the risks but about their 495 practices. The data were produced in different conditions to those of a semi-structured interview or 496 a questionnaire, thus allowing discourses to emerge according to the context in which they were 497 expressed, namely the consumption of oysters. It was thus this longitudinal methodology at the 498 heart of practices that allowed us to show that the risks perceived by consumers do not reflect those 499 perceived by scientists.

500

501 Acknowledgement

502 This study was carried out with the financial support of the French National Research Agency's 503 (Agence Nationale de la Recherche) ''ACCUTOX'' project 13-CESA-0019 (2013–2017).

504505 References

Abric, J-C. (2001). A structural approach to social representations. In K. Deaux, & G. Philogène (Eds.), *Representations of the social: Bridging theoretical traditions* (pp. 42-47). Malden: Blackwell
Publishing.

- 509 Bangerter, A. (1995). Rethinking the relation between science and common sense: a comment on the 510 current state of SR theory. *Papers on Social Representations*, *4*(1), 1-18.
- 511 Backer, L. C., Schurz Rogers, H., Fleming, L. E., Kirkpatrick, B., & Benson, J. (2005). Phycotoxins in
- 512 Marine Seafood. In W. Dabrowski (Ed.), Chemical and functional properties of food components:
- 513 *toxins in food* (pp. 155–190). Boca Raton (Florida): CRC Press.
- 514 Bäckström, A., Pirttilä-Backman, A. M., & Tuorila, H. (2003). Dimensions of novelty: a social 515 representation approach to new foods. *Appetite*, *40*(3), 299-307.

- 516 Belisle, C., & Schiele, B. (Eds.) (1984). *Les savoirs dans les pratiques quotidiennes. Recherches sur les* 517 *représentations*. Paris: Éditions du CNRS.
- 518 Bourdieu, P. (1976). Le champ scientifique. *Actes de la recherche en sciences sociales, 2*(2-3), 88-104.
- 519 Breakwell, G. M. (2010). Models of risk construction: some application to climate change. *WIREs* 520 *Climate Change*, *1*, 857-870.
- 521 Castro, P. (2014). The approach of social representations to sustainability: researching time, 522 institution, conflict and communication. Dans G. Sammut, E. Andreouli, G. Gaskell, & J. Valsiner 523 (Eds.), *Handbook of Social Representations* (pp. 295-308). Cambridge: Cambridge University Press.
- 524 Castro, P., & Lima, M. L. (2001). Old and new ideas about the environment and science. An 525 exploratory study. *Environment and Behavior*, *33*, 400-423.
- 526 Deaux, K., & Philogène, G. (Eds.) (2001). *Representations of the social: bridging theoretical traditions*.
 527 Malden: Blackwell Publishing.
- 528 Debucquet, G., Cornet, J., Adam, I., & Cardinal, M. (2012). Perception of oyster-based products by 529 French consumers. The effect of processing and role of social representations. *Appetite*, *59*(3), 844-
- 530 852. doi.org/10.1016/j.appet.2012.08.020.
- 531 Debucquet, G., & Merdji, M. (2007). Du nouveau dans les fruits de mer: les huitres triploïdes. In E.
 532 Ridel, E. Barre, & A. Zysberg (Eds.), *Les nourritures de la mer, de la criée à l'assiette* (pp. 299-303).
 533 Centre de Recherche d'Histoire Quantitative.
- 534 Debucquet, G., Merdji, M., & Lambert, J-L. (2003). *La perception des huîtres triploïdes par les* 535 *consommateurs et les acteurs de la filière ostréicole*. Report no. 01CV069. INSU-CNRS / AUDENCIA 536 (LESMA).
- DePaola, A., Jones, J. L., Woods, J., Burkhardt, W. 3^{rd.}, Calci, K. R., Krantz, J. A., Bowers, J. C., Kasturi,
 K., Byars, R. H., Jacobs, E., Williams-Hill, D., & Nabe, K. (2010). Bacterial and viral pathogens in live
 oysters: 2007 United States market survey. *Applied and Environmental Microbiology*, *76*(9), 2754–
 2768.
- 541 Doise, W. (1985). Les représentations sociales: Définition d'un concept. *Connexions, 45*, 243-253.
- 542 Doise, W. (1993). Debating social representations. In G. M. Breakwell, & D. V. Canter (Eds.), *Empirical* 543 *approaches to social representations* (pp. 157-170). Oxford: Clarendon Press.ER (n°01CV069).
- 544 Douglas, M. (1994). *Risk and blame: Essays in cultural theory*. London: Routledge.
- 545 Drozda-Senkowska, E., & Streri, A. (2002). La psychologie et le sens commun: croire le savant ou le 546 profane? *Éducation et Sociétés, 9*(1), 115-126.
- Farama, E., Lesne, J., Touron, A., & Wallet, F. (2008). Vibrions non cholériques dans les eaux littorales
 et les produits de la mer : caractérisation des expositions humaines. *Environnement, Risques & Santé*,
 7(3), 191–201. doi:10.1684/ers.2008.0149
- 550 Flattery, J., & Bashin, M. (2002). *A baseline survey of raw oyster consumers in four states*. Retrieved 551 from http://www.issc.org/Data/Sites/1/media/education/BaselineSurvey.pdf
 - 16

- Geneste, C., Dab, W., Cabanes, P. A., Vaillant, V., Quilici, M. L., & Fournier, J. M. (2000). Les vibrioses
 non cholériques en France : cas identifiés de 1995 à 1998 par le Centre National de Référence. *Bulletin Epidémiologique Hebdomadaire*, *9*, 38–40.
- 555 Gergen, K. J. (1996). Social psychology as social construction: the emerging vision. In C. McGarty, & S.
- A. Haslam (Eds.), *The message of social psychology: perspectives on mind in society* (pp. 113-128).
 Oxford: Blackwell.
- 558 Giddens, A. (1990). *The consequences of modernity*. Standford: Standford University Press.
- Grize, J-B., Vergès, P., & Silem, A. (1987). Salariés face aux nouvelles technologies: vers une approche
 sociologique des représentations sociales. Paris: Editions du CNRS.
- 561 Gueorguieva, V. (2003). Les deux faces du sens commun. *Canadian Review of Sociology &* 562 *Anthropology, 3*, 249-265.
- Haberkorn, H., Lambert, C., Le Goïc, N., Guéguen, M., Moal, J., Palacios, E., Lassus, P., & Soudant, P.
- 564 (2010). Effects of Alexandrium minutum exposure upon physiological and hematological variables of 565 diploid and triploid oysters, Crassostrea gigas. *Aquatic Toxicology*, *97*, 96-10.
- Hoagland, P., Anderson, D. M., Kaoru, Y., & White, A. W. (2002). The economic effects of harmful
 algal blooms in the United States: estimates, assessment issues, and information needs. *Estuaries*,
 25(4b), 677-695.
- Hoagland, P., & Scatasta, S. (2006). The Economic Effects of Harmful Algal Blooms. In E. Granéli, & J.
 Turner (Eds.), *Ecology of Harmful Algae* (pp. 391-402). Dordrecht: Springer-Verlag.
- 571 Houcke, J. van, Altintzoglou, T., Linssen, J., & Luten, J. (1998). Quality perception, purchase intention,
- and the impact of information on the evaluation of refined Pacific cupped oysters (Crassostrea gigas)
- 573 by Dutch consumers. *Journal of the Science of Food and Agriculture*, *98*(12), 4778–4785.
- 574 Interstate Shellfish Sanitation Conference (2004). *Raw oyster consumer follow-up survey: 2004.*
- 575Technicalreport.Retrievedfrom576http://www.issc.org/Data/Sites/1/media/publications/2004%20raw%20oyster%20consumer%20surv577ey.pdf
- 578 Jodelet, D. (1999). Représentations sociales: Un domaine en expansion. In D. Jodelet (Ed.), *Les* 579 *représentations sociales* (pp. 47-78). Paris: PUF.
- Joffe, H. (2003). Risk: from perception to social representation. *British Journal of Social Psychology*,
 42, 55-73.
- Kecinski, M., Messer, K. D., Knapp, L., & Shirazi, Y. (2017). Consumer preferences for oyster
 attributes: Field experiments on brand, locality, and growing method. *Agricultural and Resource Economics Review*, 46(2), 315–337.
- 585 Kronberger, N., & Wagner, W. (2000). Key words in context: statistical analysis of text features. In
- 586 M.W. Bauer, & G. Gaskell (Eds.), *Qualitative researching with text, image and sound: a practical* 587 *handbook* (pp. 299-317). London: Sage.
- Lam, Y. H., Kaassis, M., & Calès, P. (2004). Choc infectieux au retour du bord de mer chez un malade atteint de cirrhose. *Hépato-Gastro & Oncologie Digestive*, *11*(5), 385–387.

- Lassus, P., Amzil, Z., Baron, R., Sechet, V., Barille, L., Abadie, E., Bardouil, M., Sibat, M., Truquet, P.,
 Berard, J. B., & Gueguen, M. (2007). Modelling the accumulation of PSP toxins in Thau Lagoon oysters
 (Crassostrea gigas) from trials using mixed cultures of Alexandrium catenella and Thalassiosira
 weissflogii. *Aquatic Living Resources, 20*, 59-67.
- Lassus, P., Baron, R., Garen, P., Truquet, P., Masselin, P., Bardouil, M., Leguay, D., & Amzil, Z. (2004).
 Paralytic shellfish poison outbreaks in the Penze estuary: environmental factors affecting toxin
 uptake in the oyster, Crassostrea gigas. *Aquat. Living Resour.*, *17*, 207-214.
- 597 Lebart, L., & Salem, A. (1988). *Analyse statistique des données textuelles*. Paris: Dunod.
- Levy, A. S., Choinière, C. J., & Fein, S. B. (2008). Practice-specific risk perceptions and self-reported food safety practices. *Risk Analysis*, *28*(3), 749–761.
- Lin, C. -T. J., & Milon, J. W. (1993). Attribute and safety perceptions in a double-hurdle model of shellfish consumption. *American Journal of Agricultural Economics*, *75*, 724–729.
- 602 Luhmann, N. (1979). *Trust and power*. Chichester: Wiley.
- Luhmann, N. (1988). Familiarity, confidence, trust: problems and alternatives. In D. Gambetta (Ed.),
 Trust: Making and breaking cooperative relations (pp. 94–107). Oxford: Basil Blackwell.
- Michel-Guillou, E., & Meur-Ferec, C. (2016). Living in an "at risk" environment: the example of socalled "natural risks". Dans G. Fleury-Bahi, E. Pol, & O. Navarro (Eds.), *Handbook of environmental*
- 607 *psychology and QQL research* (pp. 487-502). Cham (Switzerland): Springer.
- 608 Moscovici, S. (1976). *La psychanalyse, son image, son public*. Paris: PUF.
- Moscovici, S. (2001). Why a theory of social representations? In K. Deaux, & G. Philogène (Eds.),
 Representations of the social: Bridging theoretical traditions (pp. 8-35). Malden: Blackwell Publishing.
- 611 Moscovici, S., & Hewstone, M. (1984). De la science au sens commun. Dans S. Moscovici (Ed.), 612 *Psychologie sociale* (pp. 537-566). Paris: PUF.
- Navarro-Carascal, O., & Michel-Guillou, E. (2014). Analyse des risques et menaces
 environnementales: un regard psycho-socio-environnemental. Dans D. Marchand, S. Depeau, & K.
 Weiss (Eds.), *L'individu au risque de l'environnement* (pp. 271-297). Paris: In Press.
- Pol, E. (2007). Blueprints for a history of environmental psychology (II): from architectural psychology
 to the challenge of sustainability. *Medio Ambiente y Comportamiento Humano*, 8(1y2), 1-28.
- 618 Pottier, B. (1987). *Théorie et analyse en linguistique*. Paris: Hachette.
- Reinert, M. (1999). Quelques interrogations à propos de l'"objet" d'une analyse de discours de type
 statistique et de la réponse "Alceste". *Langage & Société*, 57-79.
- Reinert, M. (2002). Alceste : Un logiciel d'aide pour l'analyse de discours. Manuel de référence, *Fichiers, Glossaire & Paramètres.* Editions CNRS.
- 623 Rincé, A., Balière, C., Hervio-Heath, D., Cozien, J., Lozach, S., Parnaudeau, S., Le Guyader, F. S., Le
- Hello, S., Giard, J-. C., Sauvageot, N., Benachour, A., Strubbia, S., & Gourmelon, M. (2018).
- 625 Occurrence of bacterial pathogens and human noroviruses in shellfish-harvesting areas and their
- 626 catchments in France. *Frontiers in Microbiology*, *9*: 2443.

- 527 Sierra-Beltran, A.P., Cruz, A., Nunez, E., Del Villar, L.M., Cerecero, J., & Ochoa, J.L. (1998). An 528 overview of the marine food poisoning in Mexico. *Toxicon, 36,* 1493-1502.
- Simmel, G. (1978). *The philosophy of money* (translated by Tom Bottomore and David Frisby). Londonand Boston: Routledge & Kegan Paul.
- 631 Simmel, G. (2009). Sociology: Inquiries into the construction of social forms (translated and edited by
- Anthony J. Blasi, Anton K. Jacobs, Mathew Kanjirathinkal ; with an introduction by Horst J. Helle).Leiden and Boston: Brill.
- Van Dolah, F.M. (2000). Marine algal toxins: origins, health effects and their increased occurrence.
 Environmental Health Perspectives, *108*(1), 133-141.
- 636 Word Health Organization and Food and Agriculture Organization of the United Nations (2005). Risk
- 637 assessment of Vibrio vulnificus in raw oysters Interpretative summary and technical report.
- 638 Microbiological Risk Assessment Series, 8, 1–135.

639



Table 1. The consumption log

Page 1 Intention to purchase/fish oysters (number) • Date: / / 2015 • Intended purchase/fishing location ✓ Beach ✓ Fishmonger ✓ Oyster farm ✓ Supermarket	Page 2 Purchasing of/fishing for oysters Date: / / 2015 Actual purchase/fishing location ✓ Beach ✓ Fishmonger ✓ Oyster farm ✓ Supermarket ✓ Restaurant
 ✓ Restaurant ✓ Others: Information gathered before shopping/fishing trip Motivation(s) Did you buy/fish oysters? ✓ Yes, go to page 2 ✓ No, explain: 	 ✓ Others: Information used to purchase/fish the oysters Has the motivation changed? Explain Have you consumed the oysters? ✓ Yes, go to page 3 ✓ No, explain:
Page 3 Consumption of the oysters	Page 4 Post-consumption
 Date: / / 2015 Consumption location (at home) Information concerning the preparation and consumption of the oysters 	 Satisfaction from a taste point of view "Very happy" to "Very unhappy" 1-2-3-4-5-6-7 Satisfaction from a quality point of view "Very happy" to "Very unhappy" 1-2-3-4-5-6-7 Overall satisfaction "Very happy" to "Very unhappy" 1-2-3-4-5-6-7 Overall satisfaction "Very happy" to "Very unhappy" 1-2-3-4-5-6-7 Can you explain your responses above Other satisfaction/dissatisfaction criteria

Table 2. Examples of characteristic and absent forms in Class 1

-

Fishing	
Characteristic forms	Absent forms
pêche/fishing (252, 110, 77)*, pied/foot (174, 71, 75), ramasser/to collect (137, 80, 63), malade/ill (131, 90, 61), pêcher/to fish (120, 32, 91), maladie/disease (111, 35, 89), coquillage/shellfish (107, 47, 70), parc/farm (104, 44, 73), naissain/spat (93, 27, 96), interdit/prohibited (81, 22, 100), bigorneau/winkle (77, 30, 85), zone/zone (75, 23, 95), interdiction/ban (71, 21, 95), bienfait/benefit (69, 25, 84), élevage/farming (65, 20, 86), pollution/pollution (65, 25, 79), sanitaire/health (64, 15, 100), pêcheur/fisher (62, 17, 89), dinophysis/dinophysis (38, 9, 100)	manger/to eat (-42, 110, 12), plat/flat (-35, 15, 5), marché/market (-33, 5, 3), goût/taste (-30, 16, 6), creuse/cupped (-28, 7, 4)

Note: * For this and all subsequent tables, the number in parentheses represents: (1) the Chi-square value, which indicates the strength of the link between the form and the class; (2) the real effective in the class; and (3) the % of presence of the form in the class studied in relation to its total presence in the corpus. All the words that emerged from the Alceste analysis are accompanied by their original French equivalents in italics.

Purchase		
Characteristic forms	Absent forms	
<i>marché</i> /market (225, 188, 85), <i>acheter</i> /to purchase (163, 314, 62), <i>fête</i> /celebration (132, 96, 89), <i>dimanche</i> /Sunday (123, 115, 83), <i>samedi</i> /Saturday (101, 65, 94), <i>famille</i> /family (98, 82, 82), <i>mois</i> /month (95, 102, 77), <i>semaine</i> /week (94, 101, 77), <i>ami</i> /friend (87, 75, 81), <i>aller</i> /to go (84, 12, 48), <i>dernier</i> /last (74, 86, 73), <i>envie</i> /craving (71, 111, 67), <i>fois</i> /times (67, 313, 51), <i>week-end</i> /weekend (66, 57, 84), <i>matin</i> /morning (59, 56, 78), <i>ostréiculteur</i> /oyster farmer (57, 124, 59), <i>année</i> /year (55, 101, 63), <i>repas</i> /meal (54, 92, 65), <i>Noël</i> /Christmas (51, 76, 69), <i>courses</i> /food shopping (48, 34, 89), <i>vacances</i> /holiday(s) (41, 40, 82)	eau/water (-120, 19, 6), goût/taste (-97, 15, 6), citron/lemon (-53, 2, 2), ouvre/open(s) (-45, 8, 6), pêche/fishing (-41, 6, 5)	

Table 3. Examples of characteristic and absent forms in Class 3

 Table 4. Examples of characteristic and absent forms in Class 2

Favourite oyster	
Characteristic forms	Absent forms
<i>goût</i> /taste (267, 221, 59), <i>laiteuse</i> /milky (245, 93, 75), <i>qualité</i> /quality (203, 83, 78), <i>plat</i> /flat (198, 205, 53), <i>creuse</i> /cupped (190, 109, 60), <i>prix</i> /price (179, 75, 77), <i>Fine</i> (167, 46, 92), <i>Marennes</i> (161, 55, 89), <i>taille</i> /size (147, 61, 78), <i>Oléron</i> (134, 41, 90), <i>numéro</i> /size (133, 77, 66), <i>cher</i> /expensive (130, 81, 63), <i>charnu</i> /plump (130, 43, 90), <i>Claire</i> (124, 44, 81), <i>différent</i> /different (118, 68, 65), <i>satisfaction</i> /satisfaction (101, 31, 88), <i>bonne</i> /good (77, 103, 44), <i>meilleur</i> /better (74, 46, 60), <i>gros</i> /large (72, 83, 49), <i>noisette</i> /nutty (72, 21, 95), <i>provenance</i> /provenance (67, 19, 90)	eau/water (-35, 23, 7), ouvre/open(s) (-33, 0, 0), heure/time (-29, 1, 1), marché/market (-27, 9, 5), repas/meal (-25, 2, 2)

Table 5. Examples of characteristic and absent forms in Class 4

Storage and preparation		
Characteristic forms	Absent forms	
<i>eau</i> /water (544, 307, 64), <i>ouvre</i> /open(s) (378, 116, 81), <i>ouvert</i> /opened (273, 121, 69), <i>ouvrir</i> /to open (269, 116, 69), <i>frigo</i> /fridge (225, 62, 93), <i>heure</i> /time (210, 114, 65), <i>laisser</i> /to leave (93, 81, 66), <i>vide</i> /empty (156, 38, 90), <i>refaire</i> /to refill (156, 42, 88), <i>mets</i> /dish (148, 61, 69), <i>garage</i> /garage (124, 30, 93), <i>vider</i> /to empty out (118, 31, 90), <i>jeter</i> /to throw away (108, 42, 72), <i>coquille</i> /shell (96, 57, 61), <i>vase</i> /mud (84, 32, 80), <i>odeur</i> /odour (76, 34, 69), <i>sèche</i> /dry (75, 21, 86), <i>table</i> /table (73, 38, 62), <i>garder</i> /to keep (68, 25, 72), <i>frais</i> /fresh (67, 96, 38)	acheter/to purchase (- 36, 27, 6), ostréiculteur /oyster farmer (-33, 3, 2), goût/taste (-27, 14, 5), aimer/to love (-22, 25, 8), marché/market (- 22, 8, 4)	

Table 6. Examples of characteristic and absent forms in Class 5

Consumption	
Characteristic forms	Absent forms
<i>citron</i> /lemon (659, 118, 84), <i>beurre</i> /butter (621, 83, 96), <i>pain</i> /bread (500, 88, 86), <i>cru</i> /raw (435, 88, 78), <i>échalotes</i> /shallots (408, 55, 98), <i>natures</i> /plain (358, 67, 82), <i>blanc</i> /white (262, 56, 65), <i>vin</i> /wine (250, 54, 67), <i>vinaigre</i> /vinegar (245, 34, 97), <i>cuite</i> /cooked (226, 45, 77), <i>four</i> /oven (168, 24, 92), <i>sauce</i> /sauce (167, 27, 88), <i>mâcher</i> /to chew (162, 36, 81), <i>fourchette</i> /fork (159, 32, 91), <i>gober</i> /to swallow whole (152, 34, 82), <i>couteau</i> /knife (145, 33, 68), <i>bouche</i> /mouth (128, 24, 72)	aller/to go (-34, 37, 5), acheter/to purchase (- 31, 11, 3)