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

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

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).

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

Study context: the biological point of view

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

38 are responsible for paralytic shellfish poisoning (PSPs), with approximately 2,000 cases reported each
39 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 (World 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, Tournon, & 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 mentioned 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).

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

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

68 It is not our intention in this article to develop the theory of social representations (Moscovici, 1976,
69 2001), which has been largely developed elsewhere (e.g. Bäckström, Pirttilä-Backman, & Tuorila,
70 2003; Deaux & Philogène, 2001; Debucquet, Cornet, Adam, & Cardinal, 2012; Jodelet, 1999). We note
71 simply that this theory was elaborated to account for the sociocognitive processes that allow an
72 individual to understand their environment, particularly through the appropriation of scientific
73 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.snecc-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*

85 Social representations are thus defined as a form of common-sense knowledge, in other words, as a
86 naive form of knowledge that is often opposed to scientific knowledge (Bangerter, 1995; Drozda-
87 Senkowska & Streri, 2002; Gueorguieva, 2003; Jodelet, 1999; Moscovici & Hewstone, 1984).
88 Common sense includes everything that is not scientific and which refers to a 'meaningless' concept,
89 a 'mundane' reason, or an 'amateur scientist's' or 'curious observer's' knowledge. The forms
90 knowledge can take vary according not only to the individuals or groups involved but also, depending
91 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
96 truth (Gergen, 1996; Belisle & Schiele, 1984). Scientific reasoning is essentially based on a
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.

113 There is nevertheless an interdependence between these two forms of knowledge, since common
114 knowledge is founded on inspiration from scientific knowledge and scientific knowledge is inspired
115 by common sense (Moscovici & Hewstone, 1984). The assimilated knowledge has a functional aim,

116 which is translated into discourses. Each group's discourse is aimed at someone, and it has an
117 objective, which is to inform, convince, stimulate and influence. The representation of the object
118 becomes a system of interpretation and is transformed into a language that facilitates
119 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
131 realities. Neither of these forms of knowledge is superior to the other. They are different because the
132 stakes and interests are different. This is what we will attempt to highlight here using the example of
133 the social representation of a health risk.

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**

159 The aim of this study is to understand the thought process mobilised in interpreting risk. The logic
160 behind scientific thinking is to gain an understanding of the processes at work in relation to a given
161 risk, and the logic behind common sense reasoning is to identify and understand a risk in order to be
162 able to act and communicate. Examining these different logics may allow us to identify any possible
163 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
169 different representations. To tackle this problematic, we chose to focus our attention on consumer
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 similar
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 voluntarily 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

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

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

206 **Table 1.** The consumption log

<p style="text-align: center;">Page 1 Intention to purchase/fish oysters (number__)</p> <ul style="list-style-type: none"> • Date: -- / -- / 2015 • Intended purchase/fishing location <ul style="list-style-type: none"> ✓ Beach ✓ Fishmonger ✓ Oyster farm ✓ Supermarket ✓ Restaurant ✓ Others:_____ • Information gathered before shopping/fishing trip • Motivation(s) • Did you buy/fish oysters? <ul style="list-style-type: none"> ✓ Yes, go to page 2 ✓ No, explain:_____ 	<p style="text-align: center;">Page 2 Purchasing of/fishing for oysters</p> <ul style="list-style-type: none"> • Date: -- / -- / 2015 • Actual purchase/fishing location <ul style="list-style-type: none"> ✓ Beach ✓ Fishmonger ✓ Oyster farm ✓ Supermarket ✓ Restaurant ✓ Others:_____ • Information used to purchase/fish the oysters • Has the motivation changed? Explain • Have you consumed the oysters? <ul style="list-style-type: none"> ✓ Yes, go to page 3 ✓ No, explain:_____
<p style="text-align: center;">Page 3 Consumption of the oysters</p> <ul style="list-style-type: none"> • Date: -- / -- / 2015 • Consumption location (at home...) • Information concerning the preparation and consumption of the oysters 	<p style="text-align: center;">Page 4 Post-consumption</p> <ul style="list-style-type: none"> • 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 • 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
 214 taken place, the entry for that page was complete, and a new page would be used to log the next
 215 intention. If the act had taken place, the respondent would proceed to the next stage.

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

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

228 Stage 4: This fourth and final stage concerned post-consumption. It was therefore completed
229 by all those who had filled out Stage 3. It involved assessing consumer satisfaction/dissatisfaction
230 (from a taste, qualitative and overall point of view) and explaining any behaviours that may have
231 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.

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

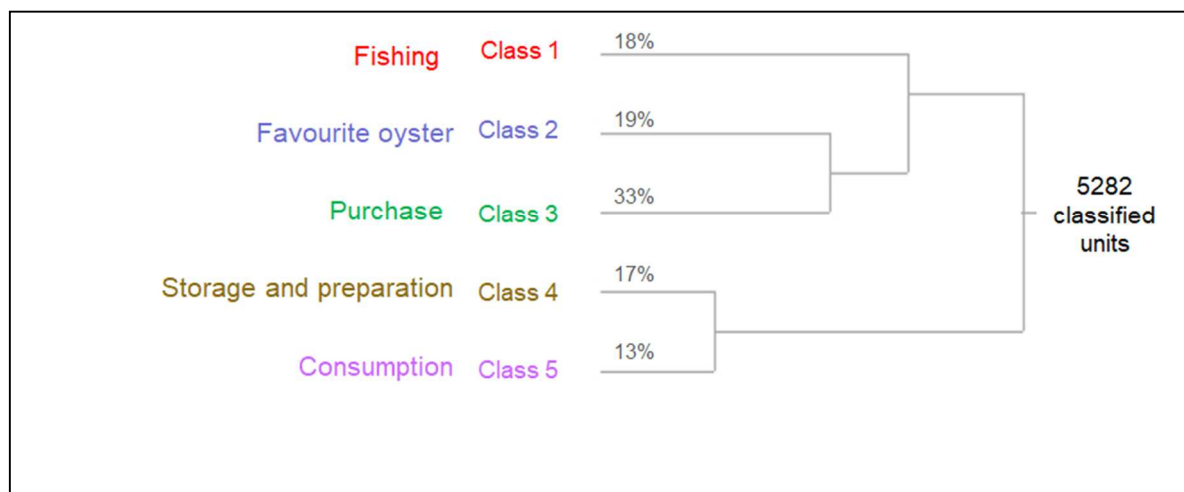
253 *Data analysis procedure*

254 Analysis was based on the entirety of the transcribed discourse. This discourse was analysed using
255 the textual analysis software Alceste (meaning analysis of the co-occurring lexemes within the simple
256 utterances of a text), which mainly consists in studying the laws of vocabulary distribution within a
257 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
 267 to obtain an initial statistical classification of the 'context units' in the corpus, which is studied
 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**

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



282
 283 **Figure 1.** Presentation of the 5 classes representing 77% of the ECUs classified in the form of a
 284 hierarchical descending classification.

285 As shown in Figure 1, 77% of the textual units in the corpus were classified, representing a good level
 286 of relevance. These classified units were divided into 5 classes of significant utterances. Each class
 287 was numbered according to the order in which it appeared in the classification. Class 1 was the most
 288 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.

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

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

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

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

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

318 *mussels, winkles, cockles, clams. Whatever's there.'* (household 7, October). The origin of wild oysters
 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 dynophysis 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*
 327 *pollution in the area. In the summer I don't go fishing for that reason because there are loads of*
 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 Penfoullic if I see the oyster*
 332 *farmers, they're not oyster farmers, they're shellfish farmers. If they're slogging away, it means the*
 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
 343 justified on more ideological grounds: *'You shouldn't interfere with living beings, full stop! It's not a*
 344 *question of morals, it's a question of survival. It's not a rejection of science either; I was trained as a*
 345 *scientist. But this is sheer stupidity.'* (household 18, October). This point of view extended even
 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/market</i> (225, 188, 85), <i>acheter/to purchase</i> (163, 314, 62), <i>fête/celebration</i> (132, 96, 89), <i>dimanche/Sunday</i> (123, 115, 83), <i>samedi/Saturday</i> (101, 65, 94), <i>famille/family</i> (98, 82, 82), <i>mois/month</i> (95, 102, 77), <i>semaine/week</i> (94, 101, 77), <i>ami/friend</i> (87, 75, 81), <i>aller/to go</i> (84, 12, 48), <i>dernier/last</i> (74, 86, 73), <i>envie/craving</i> (71, 111, 67), <i>fois/times</i> (67, 313, 51), <i>week-end/weekend</i> (66, 57, 84),	<i>eau/water</i> (-120, 19, 6), <i>goût/taste</i> (-97, 15, 6), <i>citron/lemon</i> (-53, 2, 2), <i>ouvre/open(s)</i> (-45, 8, 6), <i>pêche/fishing</i> (-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

351 ‘Purchasing’ referred to the common spaces in which the oysters were purchased (see Table 3). In
 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*
 361 *parents are the same. And we got it from there really, for a family dinner, it was the typical starter.*
 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*
 369 *you, especially when it’s in the Mediterranean or wherever, there’s toxic algae getting into the*
 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
<p><i>goût/taste (267, 221, 59), laiteuse/milky (245, 93, 75), qualité/quality (203, 83, 78), plat/flat (198, 205, 53), creuse/cupped (190, 109, 60), prix/price (179, 75, 77), Fine (167, 46, 92), Marennes (161, 55, 89), taille/size (147, 61, 78), Oléron (134, 41, 90), numéro/size (133, 77, 66), cher/expensive (130, 81, 63), charnu/plump (130, 43, 90), Claire (124, 44, 81), différent/different (118, 68, 65), satisfaction/satisfaction (101, 31, 88), bonne/good (77, 103, 44), meilleur/better (74, 46, 60), gros/large (72, 83, 49), noisette/nutty (72, 21, 95), provenance/provenance (67, 19, 90)</i></p>	<p><i>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)</i></p>

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
<p><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)</p>	<p><i>acheter</i>/to purchase (-36, 27, 6), <i>ostréiculteur</i> /oyster farmer (-33, 3, 2), <i>goût</i>/taste (-27, 14, 5), <i>aimer</i>/to love (-22, 25, 8), <i>marché</i>/market (-22, 8, 4)</p>

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*
 395 *usually save them for Sundays. It's a bit of a celebration meal. Even if it's not really really expensive,*
 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/lemon</i> (659, 118, 84), <i>beurre/butter</i> (621, 83, 96), <i>pain/bread</i> (500, 88, 86), <i>cru/raw</i> (435, 88, 78), <i>échalotes/shallots</i> (408, 55, 98), <i>natures/plain</i> (358, 67, 82), <i>blanc/white</i> (262, 56, 65), <i>vin/wine</i> (250, 54, 67), <i>vinaigre/vinegar</i> (245, 34, 97), <i>cuite/cooked</i> (226, 45, 77), <i>four/oven</i> (168, 24, 92), <i>sauce/sauce</i> (167, 27, 88), <i>mâcher/to chew</i> (162, 36, 81), <i>fourchette/fork</i> (159, 32, 91), <i>gober/to swallow whole</i> (152, 34, 82), <i>couteau/knife</i> (145, 33, 68), <i>bouche/mouth</i> (128, 24, 72)	<i>aller/to go</i> (-34, 37, 5), <i>acheter/to purchase</i> (- 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*
 424 *I swallow them whole* (household 27, December). Chewing: *You've got to chew them because, I*
 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**

441 The aim of this study was to identify the social representation of oysters among French consumers in
442 order to highlight the potential risks associated with their consumption. This involved, most notably,
443 determining whether the elements linked to the contamination of these bivalves by toxic algae
444 (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 Dutch oyster
450 consumers that are ready to pay more for oyster of specific flavor or cultivation area. This last point
451 is particularly important for regular consumers (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 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 (Debusquet
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

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504

505 **References**

506 Abric, J-C. (2001). A structural approach to social representations. In K. Deaux, & G. Philogène (Eds.),
507 *Representations of the social: Bridging theoretical traditions* (pp. 42-47). Malden: Blackwell
508 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).
- 537 DePaola, A., Jones, J. L., Woods, J., Burkhardt, W. 3rd, Calci, K. R., Krantz, J. A., Bowers, J. C., Kasturi,
538 K., Byars, R. H., Jacobs, E., Williams-Hill, D., & Nabe, K. (2010). Bacterial and viral pathogens in live
539 oysters: 2007 United States market survey. *Applied and Environmental Microbiology*, 76(9), 2754-
540 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.
- 547 Farama, E., Lesne, J., Tournon, A., & Wallet, F. (2008). Vibrions non cholériques dans les eaux littorales
548 et les produits de la mer : caractérisation des expositions humaines. *Environnement, Risques & Santé*,
549 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>

552 Geneste, C., Dab, W., Cabanes, P. A., Vaillant, V., Quilici, M. L., & Fournier, J. M. (2000). Les vibrioses
553 non cholériques en France : cas identifiés de 1995 à 1998 par le Centre National de Référence.
554 *Bulletin Épidémiologique Hebdomadaire*, 9, 38–40.

555 Gergen, K. J. (1996). Social psychology as social construction: the emerging vision. In C. McGarty, & S.
556 A. Haslam (Eds.), *The message of social psychology: perspectives on mind in society* (pp. 113-128).
557 Oxford: Blackwell.

558 Giddens, A. (1990). *The consequences of modernity*. Stanford: Stanford University Press.

559 Grize, J-B., Vergès, P., & Silem, A. (1987). *Salariés face aux nouvelles technologies: vers une approche*
560 *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.

563 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.

566 Hoagland, P., Anderson, D. M., Kaoru, Y., & White, A. W. (2002). The economic effects of harmful
567 algal blooms in the United States: estimates, assessment issues, and information needs. *Estuaries*,
568 25(4b), 677-695.

569 Hoagland, P., & Scatasta, S. (2006). The Economic Effects of Harmful Algal Blooms. In E. Granéli, & J.
570 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,
572 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.*
575 *Technical report*. Retrieved from
576 [http://www.issc.org/Data/Sites/1/media/publications/2004%20raw%20oyster%20consumer%20surv](http://www.issc.org/Data/Sites/1/media/publications/2004%20raw%20oyster%20consumer%20survey.pdf)
577 [ey.pdf](http://www.issc.org/Data/Sites/1/media/publications/2004%20raw%20oyster%20consumer%20survey.pdf)

578 Jodelet, D. (1999). Représentations sociales: Un domaine en expansion. In D. Jodelet (Ed.), *Les*
579 *représentations sociales* (pp. 47-78). Paris: PUF.

580 Joffe, H. (2003). Risk: from perception to social representation. *British Journal of Social Psychology*,
581 42, 55-73.

582 Kecinski, M., Messer, K. D., Knapp, L., & Shirazi, Y. (2017). Consumer preferences for oyster
583 attributes: Field experiments on brand, locality, and growing method. *Agricultural and Resource*
584 *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.

588 Lam, Y. H., Kaassis, M., & Calès, P. (2004). Choc infectieux au retour du bord de mer chez un malade
589 atteint de cirrhose. *Hépatogastro & Oncologie Digestive*, 11(5), 385–387.

- 590 Lassus, P., Amzil, Z., Baron, R., Sechet, V., Barille, L., Abadie, E., Bardouil, M., Sibat, M., Truquet, P.,
 591 Berard, J. B., & Gueguen, M. (2007). Modelling the accumulation of PSP toxins in Thau Lagoon oysters
 592 (*Crassostrea gigas*) from trials using mixed cultures of *Alexandrium catenella* and *Thalassiosira*
 593 *weissflogii*. *Aquatic Living Resources*, *20*, 59-67.
- 594 Lassus, P., Baron, R., Garen, P., Truquet, P., Masselin, P., Bardouil, M., Leguay, D., & Amzil, Z. (2004).
 595 Paralytic shellfish poison outbreaks in the Penze estuary: environmental factors affecting toxin
 596 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.
- 598 Levy, A. S., Choinière, C. J., & Fein, S. B. (2008). Practice-specific risk perceptions and self-reported
 599 food safety practices. *Risk Analysis*, *28*(3), 749–761.
- 600 Lin, C. -T. J., & Milon, J. W. (1993). Attribute and safety perceptions in a double-hurdle model of
 601 shellfish consumption. *American Journal of Agricultural Economics*, *75*, 724–729.
- 602 Luhmann, N. (1979). *Trust and power*. Chichester: Wiley.
- 603 Luhmann, N. (1988). Familiarity, confidence, trust: problems and alternatives. In D. Gambetta (Ed.),
 604 *Trust: Making and breaking cooperative relations* (pp. 94–107). Oxford: Basil Blackwell.
- 605 Michel-Guillou, E., & Meur-Ferec, C. (2016). Living in an “at risk” environment: the example of so-
 606 called “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.
- 609 Moscovici, S. (2001). Why a theory of social representations? In K. Deaux, & G. Philogène (Eds.),
 610 *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.
- 613 Navarro-Carascal, O., & Michel-Guillou, E. (2014). Analyse des risques et menaces
 614 environnementales: un regard psycho-socio-environnemental. Dans D. Marchand, S. Depeau, & K.
 615 Weiss (Eds.), *L'individu au risque de l'environnement* (pp. 271-297). Paris: In Press.
- 616 Pol, E. (2007). Blueprints for a history of environmental psychology (II): from architectural psychology
 617 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.
- 619 Reinert, M. (1999). Quelques interrogations à propos de l'"objet" d'une analyse de discours de type
 620 statistique et de la réponse "Alceste". *Langage & Société*, 57-79.
- 621 Reinert, M. (2002). Alceste : Un logiciel d'aide pour l'analyse de discours. *Manuel de référence,*
 622 *Fichiers, Glossaire & Paramètres*. Editions CNRS.
- 623 Rincé, A., Balière, C., Hervio-Heath, D., Cozien, J., Lozach, S., Parnaudeau, S., Le Guyader, F. S., Le
 624 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.

- 627 Sierra-Beltran, A.P., Cruz, A., Nunez, E., Del Villar, L.M., Cerecero, J., & Ochoa, J.L. (1998). An
628 overview of the marine food poisoning in Mexico. *Toxicon*, 36, 1493-1502.
- 629 Simmel, G. (1978). *The philosophy of money* (translated by Tom Bottomore and David Frisby). London
630 and Boston: Routledge & Kegan Paul.
- 631 Simmel, G. (2009). *Sociology: Inquiries into the construction of social forms* (translated and edited by
632 Anthony J. Blasi, Anton K. Jacobs, Mathew Kanjirathinkal ; with an introduction by Horst J. Helle).
633 Leiden and Boston: Brill.
- 634 Van Dolah, F.M. (2000). Marine algal toxins: origins, health effects and their increased occurrence.
635 *Environmental Health Perspectives*, 108(1), 133-141.
- 636 World 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

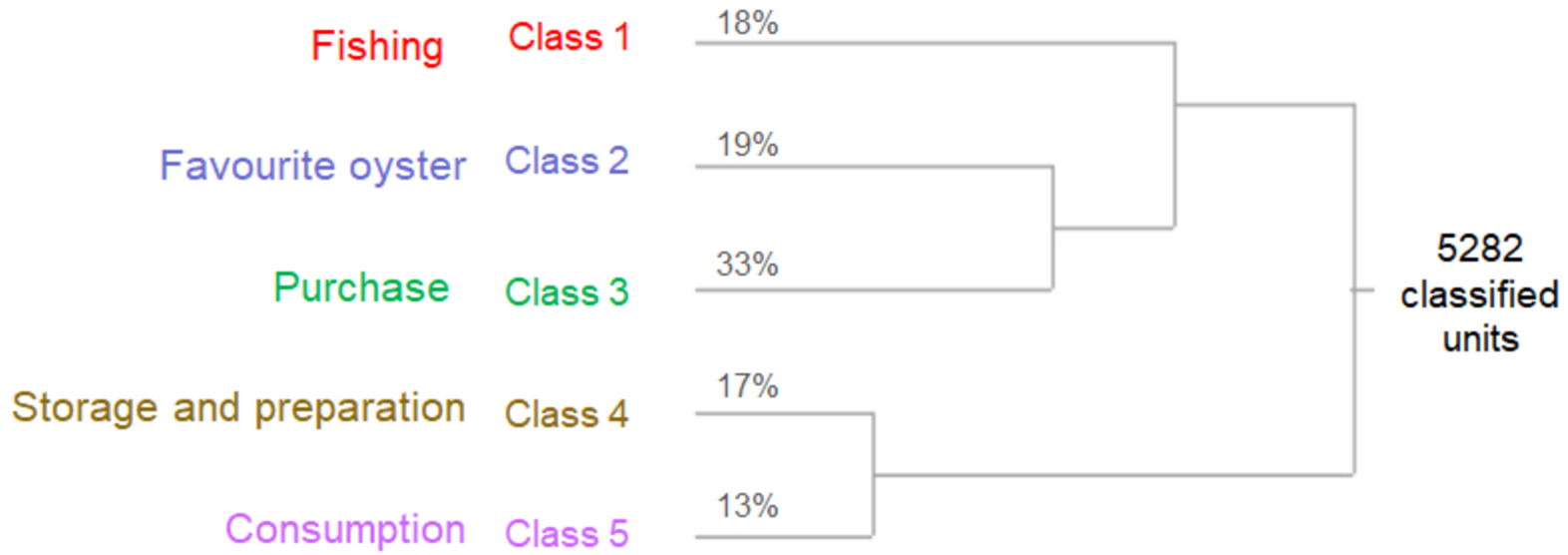


Table 1. The consumption log

<p style="text-align: center;">Page 1</p> <p style="text-align: center;">Intention to purchase/fish oysters (number__)</p> <ul style="list-style-type: none"> • Date: -- / -- / 2015 • Intended purchase/fishing location <ul style="list-style-type: none"> ✓ Beach ✓ Fishmonger ✓ Oyster farm ✓ Supermarket ✓ Restaurant ✓ Others: _____ • Information gathered before shopping/fishing trip • Motivation(s) • Did you buy/fish oysters? <ul style="list-style-type: none"> ✓ Yes, go to page 2 ✓ No, explain: _____ 	<p style="text-align: center;">Page 2</p> <p style="text-align: center;">Purchasing of/fishing for oysters</p> <ul style="list-style-type: none"> • Date: -- / -- / 2015 • Actual purchase/fishing location <ul style="list-style-type: none"> ✓ Beach ✓ Fishmonger ✓ Oyster farm ✓ Supermarket ✓ Restaurant ✓ Others: _____ • Information used to purchase/fish the oysters • Has the motivation changed? Explain • Have you consumed the oysters? <ul style="list-style-type: none"> ✓ Yes, go to page 3 ✓ No, explain: _____
<p style="text-align: center;">Page 3</p> <p style="text-align: center;">Consumption of the oysters</p> <ul style="list-style-type: none"> • Date: -- / -- / 2015 • Consumption location (at home...) • Information concerning the preparation and consumption of the oysters 	<p style="text-align: center;">Page 4</p> <p style="text-align: center;">Post-consumption</p> <ul style="list-style-type: none"> • 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 • 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
<p><i>pêche</i>/fishing (252, 110, 77)*, <i>pied</i>/foot (174, 71, 75), <i>ramasser</i>/to collect (137, 80, 63), <i>malade</i>/ill (131, 90, 61), <i>pêcher</i>/to fish (120, 32, 91), <i>maladie</i>/disease (111, 35, 89), <i>coquillage</i>/shellfish (107, 47, 70), <i>parc</i>/farm (104, 44, 73), <i>naissain</i>/spat (93, 27, 96), <i>interdit</i>/prohibited (81, 22, 100), <i>bigorneau</i>/winkle (77, 30, 85), <i>zone</i>/zone (75, 23, 95), <i>interdiction</i>/ban (71, 21, 95), <i>bienfait</i>/benefit (69, 25, 84), <i>élevage</i>/farming (65, 20, 86), <i>pollution</i>/pollution (65, 25, 79), <i>sanitaire</i>/health (64, 15, 100), <i>pêcheur</i>/fisher (62, 17, 89), <i>dinophysis</i>/dinophysis (38, 9, 100)</p>	<p><i>manger</i>/to eat (-42, 110, 12), <i>plat</i>/flat (-35, 15, 5), <i>marché</i>/market (-33, 5, 3), <i>goût</i>/taste (-30, 16, 6), <i>creuse</i>/cupped (-28, 7, 4)</p>

*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.*

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), <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)	<i>eau</i> /water (-120, 19, 6), <i>goût</i> /taste (-97, 15, 6), <i>citron</i> /lemon (-53, 2, 2), <i>ouvre</i> /open(s) (-45, 8, 6), <i>pêche</i> /fishing (-41, 6, 5)

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

Favourite oyster	
Characteristic forms	Absent forms
<i>goût/taste</i> (267, 221, 59), <i>laiteuse/milky</i> (245, 93, 75), <i>qualité/quality</i> (203, 83, 78), <i>plat/flat</i> (198, 205, 53), <i>creuse/cupped</i> (190, 109, 60), <i>prix/price</i> (179, 75, 77), <i>Fine</i> (167, 46, 92), <i>Marennnes</i> (161, 55, 89), <i>taille/size</i> (147, 61, 78), <i>Oléron</i> (134, 41, 90), <i>numéro/size</i> (133, 77, 66), <i>cher/expensive</i> (130, 81, 63), <i>charnu/plump</i> (130, 43, 90), <i>Claire</i> (124, 44, 81), <i>différent/different</i> (118, 68, 65), <i>satisfaction/satisfaction</i> (101, 31, 88), <i>bonne/good</i> (77, 103, 44), <i>meilleur/better</i> (74, 46, 60), <i>gros/large</i> (72, 83, 49), <i>noisette/nutty</i> (72, 21, 95), <i>provenance/provenance</i> (67, 19, 90)	<i>eau/water</i> (-35, 23, 7), <i>ouvre/open(s)</i> (-33, 0, 0), <i>heure/time</i> (-29, 1, 1), <i>marché/market</i> (-27, 9, 5), <i>repas/meal</i> (-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)	<i>acheter</i> /to purchase (-36, 27, 6), <i>ostréiculteur</i> /oyster farmer (-33, 3, 2), <i>goût</i> /taste (-27, 14, 5), <i>aimer</i> /to love (-22, 25, 8), <i>marché</i> /market (-22, 8, 4)

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

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