

What meaning do individuals give to coastal risks? Contribution of the social representation theory

Colin Lemée, Marie Guillard, Nathalie Krien, Céline Chadenas, Etienne Chauveau, Michel Desse, Marie Coquet, Mélisande Lamarre, Oscar Navarro-Carrascal

▶ **To cite this version:**

Colin Lemée, Marie Guillard, Nathalie Krien, Céline Chadenas, Etienne Chauveau, et al.. What meaning do individuals give to coastal risks? Contribution of the social representation theory. Marine Policy, 2019, 108, pp.103629. 10.1016/j.marpol.2019.103629 . hal-02344041

HAL Id: hal-02344041
https://hal.science/hal-02344041

Submitted on 20 Dec 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/S0308597X18305360
Manuscript_a722dc641a8b3a7cc64cfc2e554b8779

What meaning do individuals give to coastal risks? Contribution of the social representation theory

C. Lemée[a]*, M. Guillard[a], G. Fleury-Bahi[a], N. Krien[a], C. Chadenas[b], E. Chauveau[b], M. Desse[b], M. Coquet[c], M. Lamarre[b], and O Navarro[&],

[a] Laboratoire de Psychologie des Pays de la Loire (LPPL), Université de Nantes, Nantes, France ; [b] LETG –UMR 6554, Université de Nantes, Nantes, France ;[c] Institut de Géographie et d'Aménagement (IGARUN), Nantes, France

Corresponding author: colin.lemee@univ-nantes.fr ; +336 60 96 48 20

Acknowledgements: This research is part of the EVADrisk (EValuation de la vulnérabilité et ADaptabilité aux RISques côtiers) project funded by University of Nantes. It brings together researchers from environmental psychology and geography (AAPP Interdisciplinaire 2016).

Conflict of interest: none

© 2019 published by Elsevier. This manuscript is made available under the CC BY NC user license
https://creativecommons.org/licenses/by-nc/4.0/

What meaning do individuals give to coastal risks? Contribution of the social representation theory

Abstract

Coastal areas are small spaces with a high concentration of various vulnerabilities. Coastal risks can be extremely complex to understand and to interpret for non-experts. Considering the social representation theory, these individuals will develop a common knowledge, socially constructed and shared among a group, to make sense of any particular risk issues to deal with the complexity of risk. In order to understand the thinking patterns associated with coastal risks, we identified the content and structure of coastal erosion and coastal flooding social representations of 208 participants living in coastal risk areas. We demonstrated that their representations varied according to their risk experience and that inhabitants without risk experience have less complex and less functional representations.

Keywords

Coastal Risks; Coastal flooding; Coastal Erosion; Social Representation Theory; Risk Experience

I. Introduction

Coastal areas are small spaces concerned by significant human, economic, environmental stakes and various vulnerabilities. In addition to the expected rise in sea levels in 2100 (IPCC, 2014), real estate development, anthropogenic pressure and concentration issues increase the vulnerability of coastal areas to coastal risks (Torabi, Dedekorkut-Howes, & Howes, 2017).

Coastal flooding risk can be defined as "a temporary flooding of the coastal zone by sea in severe weather and tide conditions" (Ramsay & Bell, 2008). For France it is estimated that five million people are living in a coastal flood area, following a rise of two meters (Kolen et al., 2010). It is a relatively rare but brutal phenomenon that results from the combination of extreme climatic phenomena (atmospheric depression, storms, etc.) and strong tides (Chaumillon et al., 2017).

On the other hand, coastal erosion is the result of a negative sediment balance (i.e. a lack of sediments in the coastal system) (Aubié & Tastet, 2000). It proves difficult to provide an accurate estimation of coastal erosion but studies have demonstrated that 70% of the world's sandy coasts are undergoing erosion (Aubié & Tastet, 2000) and several hundred million people worldwide are concerned (Chaumillon et al., 2017).

It also seems important to take into account the impact of climate change on both coastal risks. Leatherman, Zhang and Douglas (2000) have shown that there is a “highly multiplicative” (p.55) relationship between sea level rise and coastal erosion, even if the exact mechanism that explains this correlation is still unknown. Similarly, the sea-level rise would certainly amplify the risk of flooding, even if further research is still necessary (Wadey et al., 2015).

Within the field of geography, several studies give a list of measures to reduce vulnerability and identify strategies that are efficient with regard to their costs (Creach, Pardo, Guillotreau, & Mercier, 2015), but it is known that the perception of a risk by non-experts individuals (i.e. inhabitants of risk zones) will differ from the perception and knowledge of the "experts" and managers (Chauvin, 2014; Slovic, Finucane, Peters, & MacGregor, 2004). The inhabitants most directly concerned by coastal risks generally underestimate the impact of coastal risks (Michel-Guillou & Meur-Ferec, 2016) and the lack of manager experiences in participatory

approaches is also a major challenge for coastal risks management (Schumacher, Schernewski, Bielecka, Loizides, & Loizidou, 2018).
Thus, if the national coastal risk management strategy in France favors “relocation of stakes and activities”, the inhabitants of coastal areas clearly reject this strategy (Goeldner-Gianella, Bertrand, Oiry, & Grancher, 2015; Michel-Guillou & Meur-Ferec, 2016).

How to go beyond the opposition between expert and non-expert perceptions?
However, the strict opposition of these two kinds of perception is extremely restrictive. Given that previous studies had already demonstrated the pertinence of social representations in understanding inhabitant’s perception of coastal areas (Audouit et al., 2017), it seemed more interesting to consider that non-experts who live on areas at risk take into account more aspects, including contextual and personal variables in their perception of the risk. In particular, the work of Krien and Michel-Guillou (2014) highlighted that inhabitants of coastal areas at risk of coastal flooding or erosion integrate elements about costal risk management policies in their social representation and that they are often more preoccupied by these policies than by the actual risk. In this perspective, the Social Representation Theory (SRT) has the potential to explain how environmental risks are perceived by non-experts and to overcome the opposition between an objective risk perception and a subjective one.
SRT may have been marginalized in favor of cognitive and individualizing psychologies in Great Britain and the United States (Moscovici & Marková, 2000), however over the last 40 years, we observed a growing attraction for this more explicitly social theory (Howarth, 2006). For Joffe (2003), mainstream risk researches do not focus on the particular meaning of risks. On the contrary, SRT “emphasizes the specific, complex content of common-sense thinking regarding particular risks” (Joffe, 2003, p. 68).
According to SRT, individuals will develop a common knowledge, socially constructed and shared among a group to deal with the complexity of risks (Joffe, 2003). More importantly, this knowledge serves as a motor for the actions and behaviors (Howarth, 2006). Thus, a better understanding of the representations of coastal risks seems crucial to understand how inhabitants of coastal areas at risk make meaning of these risks and what functions these representations have for them, in order to help change these representations and promote adapted policies (Michel-Guillou & Meur-Ferec, 2016).

Social Representation Theory
Social representation can be defined as a common knowledge transmitted by social groups and societies that allows individuals and groups to organize and interpret their environment (Breakwell, 2001). These representations have an eminently practical orientation (Howarth, 2006) and they will differ from one group to another (Brunel et al., 2017). It is necessary to consider these representations in order to understand people’s relationship to risk, as they affect the choice of sources of information, the selection of information and their interpretation of it (Moscovici & Marková, 2000), and will determine the individual’s reaction to risk as it will encourage, justify or legitimize certain behaviors (Lloyd & Duveen, 1990).
In terms of content, a social representation of a risk is "an organization of socially constructed opinions" in relation to this risk (Roussiau & Bonardi, 2001, p. 12). This supposes the existence of salient and organizing elements, regrouped into a central core. They are non-negotiable and shared between the members of a social group, while more peripheral elements will serve as an interface between this core and everyday experiences (Abric, 1993). In the case of coastal flooding and erosion, it appears that there is no consensus about these risks and that different social groups give different meanings to elements linked to these risks. This lack of consensus and the importance of costal risks in the physical and social environment of

inhabitants tend to justify the use of the social representation theory to understand how people understand these risks and how they react to these risks.
In that sense, Michel-Guillou and Meur-Ferec (2016) have demonstrated that the core of the representation of coastal risks varies according to one's status and experiences, and that it play a role in the social practices. It confirms that a good understanding of the representation of coastal risks is a key point to comprehend how individuals make meanings of coastal risks. However, a more precise study is necessary to identify the content and structure of these social representations and the impact of direct or indirect risk experience on them.

Aims and objectives
The main aim of this research was to identify how the inhabitants of coastal areas at risk of coastal flooding or erosion represent these risks, in order to provide tools for experts to overcome the rejection of coastal risk management policies. To achieve this goal, we relied on the social representation theory as it has the potential to identify the content and structure of non-experts' representation.
More precisely, two objectives conducted this research. First, to pursue the study of the social representations of coastal risks. Thus, using a quantitative methodology, we sought to identify for each of these risks (coastal flooding and coastal erosion) the content and organization of the social representation. The second objective was to account for the way in which risk experience (having already experienced directly or indirectly a coastal risk) impacts the representation of these risks and to determine which aspects of the risk would be perceived as more important depending of their experience.

II. Method

II.1. Site selection and participants

To identify the social representation of coastal risks of inhabitants of risk areas, seven study sites were selected on the basis of the coastal risk prevention plans (PPRL), which define for each risk zone different perimeters that correspond to flood or erosion scenarios (Préfet de la Vendée, 2015). According to the typology established by Vinet et al. (2012) to distinguish coastal cities according to their activities and stakes, these municipalities are all geographically close, are towns of modest size (under 15 000 inhabitants in 2014), have a high rate of summer tourism and are all oriented towards the sea. These towns have a recent history with coastal flooding. They are close to the town of La Faute-sur-Mer (about 40kms away), where the natural disaster Xynthia led to a massive episode of coastal flooding in 2010 that caused 29 deaths (Chauveau et al., 2017).
The sample consisted of 208 participants (mean age = 52; SD = 16.35) and included 27 participants who had directly or indirectly experienced coastal flooding, and 77 who had directly or indirectly experienced coastal erosion. By indirect experience, we mean that a relative, family or friend of the participant had an experience of coastal flooding or erosion. There were more women (60.6%) than men (39.4%). The large proportion of seniors is representative of the over-representation of elderly people in the littoral territories (Vendée Expansion Service d'Observation et d'Information Economiques, 2014). More details about the sample are presented in Table 1.

Table 1 here

II.2. Material

If research projects had already examined the representation of coastal risks, they used word-association questions to examine how respondents represented coastal risks (Michel-Guillou & Meur-Ferec, 2016). We chose to use a characterization questionnaire instead: the use of

such questionnaire makes it possible to apply a certain number of statistical operations. It is possible to determine a characterization rate for each element and to compare different groups or different representations. It is easy to develop and studies have already shown the relevance of this method in the study of environmental risks (Bertoldo & Bousfield, 2011).
Two characterization questionnaires (one for each risk) were developed from an exploratory study, using in-depth interviews with 25 inhabitants of areas at risk in the same areas. In details, these in-depth interviews were all structured using a three parts interview guide (coastal risk perception, implication for oneself and means of action) and a descendant hierarchical classification (DHC) analysis was performed on the corpus with the help of the Iramuteq software in order to identify the main elements of the representation of the coastal risks. 20 elements were identified as central in the case of the coastal flooding risk, and 15 elements in the case of erosion. 13 elements were common between both questionnaires; additional elements are about specific consequences or means of protection related to both risks. For each item, participants were asked to indicate on a 5-point scale, whether they considered the item to be characteristic or not of the risk (from 1, not at all characteristic to 5, completely characteristic).
To account for the impact of risk experience, participants were asked two different questions. The first one asked participants if they had any direct or indirect experience of coastal flooding while the second one asked if they had any direct or indirect experience of coastal erosion. It was specified that indirect experience implied any risk experience by someone close to the participant (family, friend…).

II.3. Procedure

The survey was carried out between June and August 2016. In order to ensure the widest possible dissemination of the questionnaire, an online version of the questionnaire was distributed. Associations, local press and public institutions agreed to relay the questionnaire link to their collaborators, members, etc. in the different areas concerned.

II.4. Data analysis

II.4.1. Content of the social representations

To meet the different objectives of the research, we chose first to split the answers in two poles: a characteristic pole (responses 4 and 5: characteristic and absolutely characteristic) and a non-characteristic pole (responses 1, 2 and 3 to the scale: not at all characteristic, not characteristic, neither characteristic nor not). Our aim was to identify the stable and non-negotiable elements of the representations. According to Moliner, Rateau and Cohen-Scali (2002), we considered that an element with a characterization rate of 75% belonged to the core of the representation. This first analysis allowed us to identify the central elements but it also enabled us to compare social representations of inhabitants with and without risk experience using a χ^2 test and to highlight differences of representation.

II.4.2. Structure of the social representations

To establish the structure of the social representations, we used matrixes of correlations (Kendall's τ-b) to highlight the major links between the elements of the representations of both coastal risks and both conditions (with or without risk experience). It made possible to represent the relations of similarity, proximity and antagonism between the elements above the threshold of .35 (Moliner et al., 2002). Considering the role of core elements, the graphical representation of the most frequent associations between these core elements is crucial to understand how certain ideas are intertwined inside representations. We compared the graphs of inhabitants of coastal risk areas for both coastal risks and took into account the possible impact of their risk experience.

III. Results

III.1. Content of the representation of coastal flooding risk

If we consider the characterization rate of 75% as a threshold then four of the propositions of the characterization questionnaire constitute the core of the representation for both the people with and without experience of a coastal flooding (table 2). The most characteristic items are related to the implementation of regulations.

Indeed, the item related to the "application of coastal risk prevention plans" is considered characteristic by inhabitants of coastal areas with experience of coastal flooding (95.8%) and by inhabitants without this experience (85%), without significant difference (χ^2 (1) = 2.1, p = .15). The item related to the "application of urban planning plans" was considered characteristic by inhabitants with risk experience (91.3%) and without risk experience (86.6%), without significant difference (χ^2 (1) = 0.4, p = .52).

Items relating to the development of coastal areas are also in the core of the representation. People with experience of coastal flooding have a higher score to the item related to the "adaptation of buildings" as more characteristic (83.3%) than people without flooding experience (80.2%) but the difference is not significant (χ^2 (1) = 0.13, p = .72)

Finally, the item relating to the "disappearance of inhabited areas" was perceived as characteristic by inhabitants with coastal flooding experience (75%) and without coastal flooding experience (80.1%), without significant difference (χ^2 (1) = 2.27, p = .13).

III.2. Structure of the representation of coastal flooding risk

Three elements are closely intertwined in the core of the coastal flooding representation for both inhabitants with and without risk experience (Figure 1). For participants without risk experience, we observe that the element "risk prevention plans must be applied" is linked to the application of urban planning documents (τ-b 0.58, p< .001) and to the adaptation of buildings (τ-b 0.4, p< .001). Between the "adaptation of buildings" and the "application of urban planning documents", a link is also observed (τ-b 0.45, p< .001).

The same relations are observed for participants with risk experience, but with higher coefficients: between "risk prevention must be applied" and "adaptation of buildings" (τ-b 0.82, p< .001), between "risk prevention must be applied" and "the application of urban planning documents" (τ-b 0.64, p< .001) as well as between "adaptation of buildings" and "application of urban planning documents (τ-b 0.62, p< .001). Finally, the fourth element "disappearance of inhabited areas" is associated with the increase of coastal flooding risk in the future (τ-b 0.40, p< .05), an element of the periphery, which is also associated to the adaptation of buildings (τ-b 0.42, p< .001).

Table 2 here

III.3. Content of the representation of coastal erosion

The most characteristic item was related to the adaptation of buildings and was perceived as characteristic by both people with coastal erosion experience (90.2%) and people without experience (85.9%), without significant difference between the two groups (χ^2 (1) = 0.69, p = .41) (Table 3).

The item relating to the "necessity to relocate houses" was also perceived as characteristic by people with risk experience (88.3%) and without this experience (81.9%). Also, the characterization rate did not differ significantly (χ^2 (1) = 1.27, p = .26).

Also, the disappearance of inhabited areas was perceived as a characteristic element by inhabitants with risk experience (85.2%) but doesn't seem to be considered as characteristic by inhabitants without experience (73.4%), with a tendency (χ^2 (1) = 3.37, p = .06).
Furthermore, two items were related to the implementation of regulations in both groups. The item related to the application of urban planning documents was perceived as slightly more characteristic (92.2%) by participants without risk experience, but the characterization rate did not differ significantly between them (χ^2 (1) = 1.41, p = .23) and inhabitants with risk experience (86.9%).
The item relating to the "enforcement of regulations" was perceived as characteristic by inhabitants with coastal risk experience (85.2%) and inhabitants without such experience (85.3%) with no difference between both groups (χ^2 (1) = 0.001, p = .99).
Finally, the item related to the "fragility of the dunes" was perceived as characteristic by the inhabitants with risk experience (83.6%) but not by the inhabitants without experience (59.2%). The characterization rate differed significantly (χ^2 (1) = 11.45, p< .001).

Table 3 here

III.4. Structure of the representation of coastal erosion

Four elements appear to be linked to the core of the social representation of coastal erosion of participants without risk experience (Figure 1). The element "Enforcement of regulations" is linked to the application of urban planning documents (τ-b 0.65, p< .001), to the adaptation of buildings (τ-b 0.54, p< .001) and to the relocation of the population (τ-b 0.49, p< .001). Also, the application of urban planning documents is perceived as linked to the adaptation of buildings (τ-b 0.55, p< .001) and to the relocation of the population (τ-b 0.39, p< .001).
On the other hand, the participants with direct or indirect coastal erosion experience have a more complex representation of this risk. They associate the application of urban planning documents with the reinforcement of regulations (τ-b 0.60, p< .001). They also perceive reinforcement of regulations as associated with the adaptation of buildings (τ-b 0.39, p< .005) and to the disappearance of inhabited areas (τ-b 0.37, p< .005). The disappearance of inhabited areas is associated with the relocation of population (τ-b 0.47, p< .005) and to the adaptation of buildings (τ-b 0.39, p< .005). Finally, they associate the adaptation of buildings with the fragility of the dunes (τ-b 0.49, p< .001).

Fig 1 here

IV. Discussion

Public risk management policies in the case of coastal flooding and erosion are often rejected. In this study, we relied on the social representation theory to understand the representation of non-expert inhabitants regarding these risks. More specifically, we decided to identify the content and structure of the core of this representation. This core plays a central role in the organization and meaning of the representation and impacts the social practices linked to the object (Howarth, 2006).
Our study reveals that, in terms of content, the same four elements, related to regulations and consequences, are considered as part of the core of the representation, no matter if the participants had any direct or indirect risk experience or not. In terms of structure, we observed that the representation is denser (i.e. the links between the elements are more numerous and stronger) for participants with previous risk experience. It also appears that the disappearance of inhabited areas is seen as related to the increase of the coastal flooding risk in the future, which is linked to the necessity to adapt the buildings. Considering that the increase of the coastal flooding risk belongs to the periphery of the representation, such

configuration would mean that the disappearance of inhabited areas is not clearly established for participants but it is seen as conditional: “if the risk increases in the future”, it would imply the “disappearance of inhabited areas”.
Thus, it seems that the social representations of individuals are rather focused on political aspects. In this sense, Krien and Michel-Guillou (2014) showed that individuals focus more on risk management actions and policies than on the risk itself. It is also possible that the social representation is not functional because new elements related to risk management and mitigation are emerging and that individuals are slowly incorporating these elements to their representations.
A similar pattern is observed for coastal erosion. The representation of participants with risk experience is more complex, in both its content and structure, though it shares the same elements. These common elements are related to coastal risk management. This core is relatively similar to the core of coastal flooding representations also. Interestingly, the participants with risk experience incorporated the "disappearance of inhabited areas" and "the fragility of the dunes" as key elements of their risk representation, which could indicate more awareness of the risk and its consequences on the coastal regions. In other words, erosion victims would associate this phenomenon with danger while individuals without experience would not. The latter seems to refer more to the regulations about erosion phenomena. Also, it should be noted that if people without erosion experience consider the need to relocate individuals as a preventive measure, it is not clear if they would consider this possibility for themselves.
Given these different elements, in a future research, it would seem interesting to go further and study the links between social representations of coastal risks and attitudes towards prevention and protection policies and policy makers.
Moreover, the structure of their representation suggested an organization in two poles. Elements relating to risk management (application of urban planning and prevention plans) are opposed to direct consequences (disappearance of inhabited areas) and mitigation measures (adaptation of buildings) which are respectively linked to the relocation of populations and the fragility of the dunes. This second pole can be described as functional as it assumes the contextualization of the representation and conducts the social practices (Moloney & Walker, 2002).
The lack of functional elements in the representations of participants without risk experience, for both risks, could mean that these participants do not feel particularly concerned. Considering that every participant lived in a coastal risk area, it seems necessary to make participants feel more involved to accompany the change of practices linked to risks.
Indeed, differences between representations could be explained by the personal involvement towards the object (Dany & Abric, 2007). Baggio and Rouquette (2006) showed that personal involvement towards flooding had an impact on the content and structure of representations of flooding. In order to make inhabitants feel more involved about coastal risks, it would be necessary to make these risks more concrete to them. Work on the subject shows that making an object concrete in the eyes of individuals can increase concerns (Jones et al., 2017). In addition, the social representations are formed by processes of anchoring and objectification (Roussiau and Bonardi, 2014), that is to say that the individual appropriates an object of social representation as it gets more concrete and familiar. Moreover, experiencing a natural hazard can be a traumatic experience for individuals and these traumatic events are known for their impact on the risk perception and the perception of the consequences of the threat (Pérez-Sales et al, 2012 ; Olivos et al., in press). Consequently, inhabitants with such experience will represent and assess the risk and its consequences differently. In this perspective, communication about coastal risks should rely on the testimonies of victims to

convince people in areas at risk about the potential threat they are living with and help others to adapt their living place or envisage the implementation of means of protection.

We can advance the hypothesis of a greater involvement of individuals with an experience of coastal risks. In addition, between the two types of coastal risks, erosion being the most probable and visible one, erosion could also be the origin of a greater involvement, which in turn could explain the largest number of elements and relations in the core of the representation.
If we consider that risk management policies are generally seen as intrusive and are rejected, personal involvement and change of representations are necessary to develop risk awareness.
The small number of participants with risk experience could be seen as an immediate limit of this study, but this difficulty had been anticipated. The consistency of the group of participants with direct or indirect experience, residing in risk areas, allowed us to work on a small sample, without impacting the scope of this study. Despite a small number of participants, a careful selection of the areas allowed us to highlight effects relating to risk experience.
It should also be noted that this work relies on a small number of elements identified through a complex process of qualitative data analysis, organized in two different characterization questionnaire, though, it remains possible that the social representations of the two coastal risks studied comprised other elements if other contexts are considered. Especially, we focused here on cities of medium size whose activity is mainly linked to the sea and summer tourism. Moreover, it would be interesting in future works to analyze the links between the content and structure of social representations and the rejection of risk management policies.

Our study confirms the significance of the social representation theory in the study of environmental risks, as it is a rich approach which focuses on heuristics and patterns of thinking (Wagner, Valencia, & Elejabarrieta, 1996). This study highlights the divergence of point of view between experts and non-experts and emphasizes the need to consider the point of view of non-expert inhabitants in the case of coastal risks management. Thus, it would be relevant for policy makers and risk managers to rely more on the knowledge and testimonies of victims for prevention and to promote the implementation of protective behaviors, as the victims seems more aware of the risk and incorporate more elements to their representation. Finally, this work shows the importance of considering the specificities of populations, particularly in terms of their experience of risk, in order to understand how they perceive them.

References

Abric, J. C. (1993). Central system, peripheral system: their functions and roles in the dynamics of social representations. *Papers on Social Representations*, *2*(2), 75–78.

Aubié, S., & Tastet, J.-P. (2000). Coastal Erosion, Processes and Rates: An Historical Study of the Gironde Coastline, Southwestern France. *Journal of Coastal Research*, *16*(3), 756–767.

Audouit, C., Pasqualini, V., De Wit, R., Flanquart, H., Deboudt, P., & Rufin-Soler, C. (2017). Comparing social representation of water quality in coastal lagoons with normative use of ecological indicators. *Marine Policy*. https://doi.org/10.1016/j.marpol.2017.08.023

Baggio, S., & Rouquette, M.-L. (2006). La représentation sociale de l'inondation : influence croisée de la proximité au risque et de l'importance de l'enjeu. *Bulletin de psychologie*, *Numéro 481*(1), 103–117. https://doi.org/10.3917/bupsy.481.0103

Bertoldo, R. B., & Bousfield, A. B. S. (2011). Représentations sociales du changement climatique: effets de contexte et d'implication. *Temas Em Psicologia*, *19*(1), 121–137.

Bonardi, C., & Roussiau, N. (2014). *Les représentations sociales*. Paris: Dunod.

Breakwell, G. M. (2001). Mental models and social representations of hazards: the significance of identity processes. *Journal of Risk Research*, *4*(4), 341–351. https://doi.org/10.1080/13669870110062730

Brunel, M., Launay, C., Le Floch, V., Py, J., Cascino, N., Zorapapillan, M., & Lo Monaco, G. (2017). Is the social representation of nanotechnology anchored in that of GMOs? *Journal of Risk Research*, 1–16. https://doi.org/10.1080/13669877.2017.1304976

Chaumillon, E., Bertin, X., Fortunato, A. B., Bajo, M., Schneider, J.-L., Dezileau, L., … Pedreros, R. (2017). Storm-induced marine flooding: Lessons from a multidisciplinary approach. *Earth-Science Reviews*, *165*, 151–184. https://doi.org/10.1016/j.earscirev.2016.12.005

Chauveau, E., Chadenas, C., Comentale, B., Pottier, P., Blanloeil, A., Feuillet, T., … Trouillet, B. (2017). Xynthia: lesssons learned from a catastrophe. *Cybergeo: European Journal of Geography*. https://doi.org/10.4000/cybergeo.28032

Chauvin, B. (2014). *La perception des risques: Apport de la psychologie à l'identification des déterminants du risque perçu*. Paris: De Boeck Supérieur.

Creach, A., Pardo, S., Guillotreau, P., & Mercier, D. (2015). The use of a micro-scale index to identify potential death risk areas due to coastal flood surges: lessons from Storm Xynthia on the French Atlantic coast. *Natural Hazards*, *77*(3), 1679–1710. https://doi.org/10.1007/s11069-015-1669-y

Dany, L., & Abric, J.-C. (2007). Distance à l'objet et représentations du cannabis. *Revue internationale de psychologie sociale*, *20*(3), 77–104.

Goeldner-Gianella, L., Bertrand, F., Oiry, A., & Grancher, D. (2015). Depolderisation policy against coastal flooding and social acceptability on the French Atlantic coast: The case of the Arcachon Bay. *Ocean & Coastal Management*, *116*, 98–107. https://doi.org/10.1016/j.ocecoaman.2015.07.001

Guimelli, C. (2001). Étude expérimentale de la représentation sociale comme guide pour l'action: effets de l'implication et de la perception de la situation. In M. Lebrun (Ed.), *Les représentations sociales, des méthodes de recherche aux problèmes de société* (pp. 93–108). Québec: Les éditions logiques.

Howarth, C. (2006). A social representation is not a quiet thing: Exploring the critical potential of social representations theory. *British Journal of Social Psychology*, *45*(1), 65–86. https://doi.org/10.1348/014466605X43777

IPCC. (2014). *IPCC (2014) Climate Change 2014 Synthesis Report Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernemental Panel on Climate Change*. (R. K. Pachauri & A. Reisinger, Eds.). Geneva, Switzerland: IPCC.

Joffe, H. (2003). Risk: From perception to social representation. *British Journal of Social Psychology*, *42*(1), 55–73. https://doi.org/10.1348/014466603763276126

Jones, C., Hine, D., & Marks, A. (2017). The future is now: reducing psychological distance to increase public engagement with climate change. *Risk Analysis, 37*(2), 331-341. doi:10.1111/risa.12601

Kolen, B., Slomp, R., Van Balen, W., Terpstra, T., Bottema, M., & Nieuwenhuis, S. (2010). Learning from French experiences with storm Xynthia; damages after a flood. Ministerie van Verkeer en Waterstaat,.

Krien, N., & Michel-Guillou, É. (2014). Place des risques côtiers dans les représentations sociales du cadre de vie d'habitants de communes littorales. *Les Cahiers Internationaux de Psychologie Sociale, 101*(1), 101-122. doi:10.3917/cips.101.0101

Leatherman, S. P., Zhang, K., & Douglas, B. C. (2000). Sea level rise shown to drive coastal erosion. *Eos, Transactions American Geophysical Union*, *81*(6), 55. https://doi.org/10.1029/00EO00034

Lloyd, B., & Duveen, G. (1990). A semiotic analysis of the development of social representations of gender. In B. Lloyd & G. Duveen (Eds.), *Social representations and the development of knowledge* (pp. 27–46). New York: Cambridge University Press.

Michel-Guillou, E., & Meur-Ferec, C. (2016). Representations of coastal risk (erosion and marine flooding) among inhabitants of at-risk municipalities. *Journal of Risk Research*, *49*, 145–799.

Moliner, P., Rateau, P., & Cohen-Scali, V. (2002). *Les représentations sociales: pratique des études de terrain*. Rennes: Presses universitaires de Rennes.

Moloney, G., & Walker, I. (2002). Talking about transplants: Social representations and the dialectical, dilemmatic nature of organ donation and transplantation. *British Journal of Social Psychology*, *41*(2), 299–320. https://doi.org/10.1348/014466602760060264

Moscovici, S., & Marková, I. (2000). Ideas and their Development : A dialogue between Serge Moscovici and Ivana Markova. In G. Duveen (Ed.), *Social Representations : Explorations in Social Psychology*. Cambridge: Polity Press.

Olivos, P., Pérez-Sales, P., Eiroa, F., Barbero, E., y Vergara, M. (In Press). Impacto sobre la visión del mundo, los otros y de sí mismo en supervivientes de catástrofes de la naturaleza. In P. Olivos, O. Navarro, y A. Loureiro. (Eds.). *Catástrofes: riesgo e identidad.* Spain: Universidad de Castilla- La Mancha. In press.

Pérez-Sales, P., Eiroá, F., Olivos, P., Fernández-Liria, A., & Vergara, M. (2012). VIVO Questionnaire. A measure of human worldviews and identity in trauma, crisis and loss. Validation and preliminary findings. *Journal of Loss and Trauma, 17*(3), 236-259. DOI: 10.1080/15325024.2011.61682

Préfet de la Vendée. Arrêté préfectoral n°16-DDTM85-82 portant l'approbation d'un Plan de Prévention des Risques naturels prévisibles Littoraux (PPRL) Pays d'Olonne (2015).

Ramsay, D., & Bell, R. (2008). *Coastal hazards and climate change: a guidance manual for local government in New Zealand*. Wellington, N.Z.: Ministry for the Environment. Retrieved from http://www.mfe.govt.nz/publications/climate/coastal-hazards-climate-change-guidance-manual/

Roussiau, N., & Bonardi, C. (2001). *Les représentations sociales: état des lieux et perspectives*. Sprimont: Mardaga.

Schumacher, J., Schernewski, G., Bielecka, M., Loizides, M. I., & Loizidou, X. I. (2018). Methodologies to support coastal management - A stakeholder preference and planning tool and its application. *Marine Policy*, *94*, 150–157. https://doi.org/10.1016/j.marpol.2018.05.017

Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. G. (2004). Risk as analysis and risk as feelings: Some thoughts about affect, reason, risk, and rationality. *Risk Analysis*, *24*(2), 311–322.

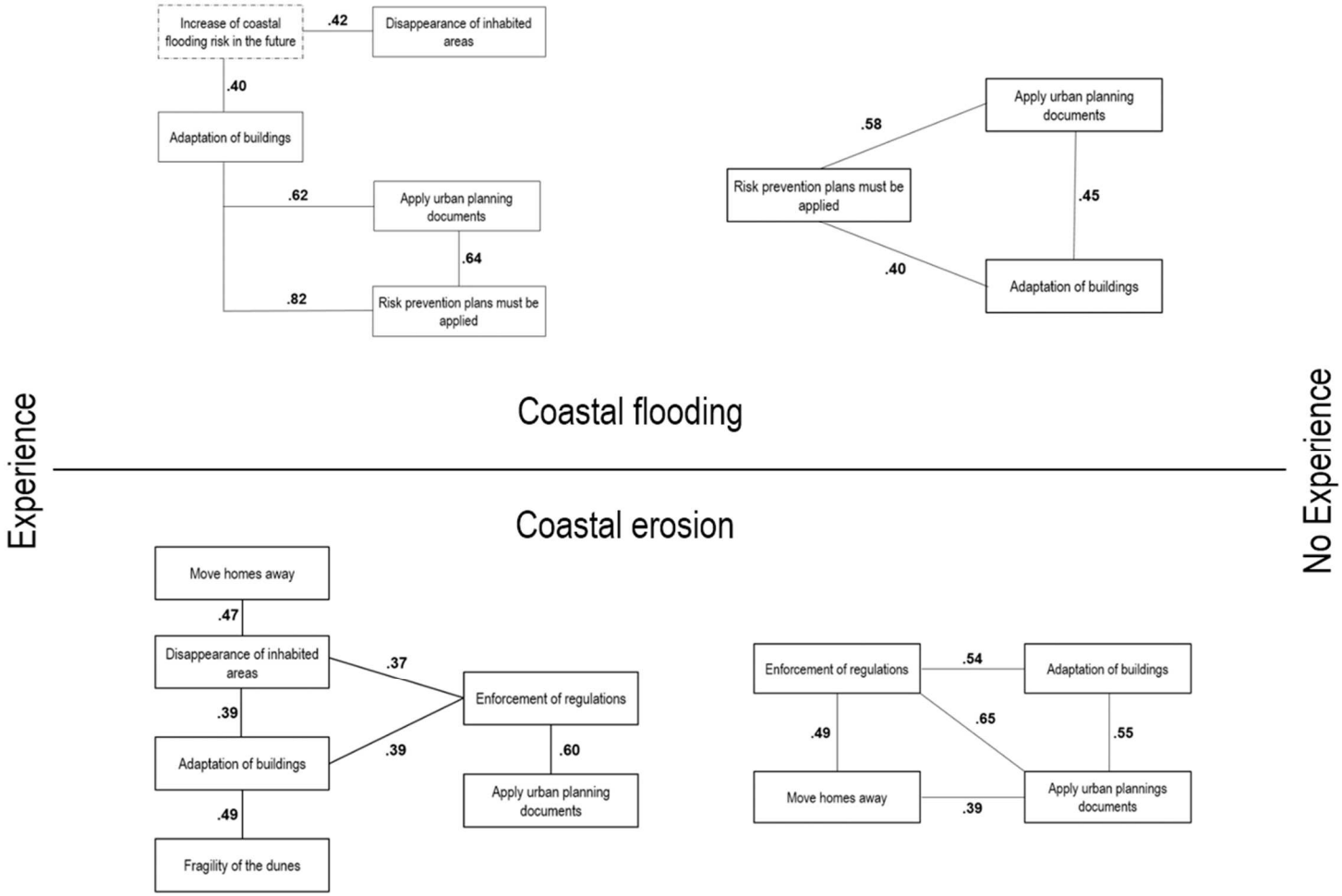
Torabi, E., Dedekorkut-Howes, A., & Howes, M. (2017). Urban Resilience to Climate-Related Disasters: Emerging Lessons from Resilience Policy and Practice in Coastal Tourism Cities. In W. Leal Filho (Ed.), *Climate Change Adaptation in Pacific Countries: Fostering Resilience and Improving the Quality of Life* (pp. 241–254). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-50094-2_14

Vendée Expansion Service d'Observation et d'Information Economiques. (2014). Evolutions socio-économiques cantonales 1999-2012. Vendée Expansion.

Wadey, M. P., Cope, S. N., Nicholls, R. J., McHugh, K., Grewcock, G., & Mason, T. (2015). Coastal flood analysis and visualisation for a small town. *Ocean & Coastal Management*, *116*, 237–247. https://doi.org/10.1016/j.ocecoaman.2015.07.028

Wagner, W., Valencia, J., & Elejabarrieta, F. (1996). Relevance, discourse and the 'hot' stable core social representations-A structural analysis of word associations. *British Journal of Social Psychology*, *35*(3), 331–351. https://doi.org/10.1111/j.2044-8309.1996.tb01101.x

Figure 1 - Graphs of similarity of coastal flooding and coastal erosion social representations, according to risk experience



Note. The element surrounded by dots belongs to the periphery of social representation. The threshold is .35

	N	%
Gender		
Women	82	39.4
Men	126	60.6
Age		
18 – 29	28	13.5
30 – 44	38	18.3
45 – 59	57	27.4
60 – 74	74	35.6
75 or over	11	5.3
Mean (standard deviation)	M = 52.0 (*SD* = 16.35)	
Work situation		
Active	112	53.8
Retired	76	36.5
Student	12	5.8
Job seeker	5	2.4
First-time job seeker	1	0.5
Stay-at-home parent	1	0.5
No response	1	0.5
Place of residence		
Brétignolles-sur-Mer	9	4.3
Brem-sur-Mer	5	2.4
Olonne-sur-Mer	45	21.6
Ile d'Olonne	45	21.6
Les Sables d'Olonne	77	37.0
Château d'Olonne	48	23.1
Talmont-Saint-Hilaire	17	8.2
Length of residence	M = 20.2 (*SD* = 17.32)	
Experience of coastal flooding experience		
Direct	5	2.4
Indirect	22	10.6
Direct and indirect	27	13.0
Experience of coastal erosion		
Direct	51	24.5
Indirect	26	12.5
Direct and indirect	77	37.0

Table 1 – Demographic characteristics of the sample

Table 2 - Characterization rate of the elements of the representation of coastal flooding, according to risk experience

Items	Characterization rate Exp[1]	No exp	χ^2	p
Risk prevention plans must be applied	**95.8**	**85.0**	2.1	0.15
Apply urban planning documents	**91.3**	**86.6**	0.4	0.52
Adaptation of buildings	**83.3**	**80.2**	0.13	0.72
Disappearance of inhabited areas	**75.0**	**80.1**	2.27	0.13
Defect of a defense structure would lead to the disappearance of a large area	69.6	50.8	2.86	0.09
I feel helpless	66.7	71.7	0.26	0.6
Reinforcement of defense structures	58.3	65.4	0.46	0.5
Coastal flooding is predictable	50.0	53.6	0.11	0.74
I can't protect myself	50.0	54.0	0.13	0.71
The coastal flooding risk will increase in the future	41.7	29.8	1.38	0.24
For people like me, the risk is well known	41.7	37.8	0.13	0.71
The breakdown of a defense structure is predictable	39.1	46.1	0.4	0.52
The authorities provide a good amount of information on erosion	37.5	22.5	2.6	0.1
Experts are familiar with coastal flooding	37.5	55.0	2.6	0.1
For managers, the risk is well-known	37.5	39.3	0.03	0.86
Coastal flooding would have little consequences	29.2	32.6	0.11	0.73
Coastal flooding makes me anxious	16.7	19.9	0.14	0.71
I feel threatened by the proximity of the coast	8.3	12.2	0.31	0.58
I plan to sell my home	8.3	4.5	0.64	0.42
I plan to go and live somewhere else	4.2	1.7	0.68	0.41

Note.[1]: direct or indirect experience.

Table 3 - Characterization rate of the elements of the representation of coastal erosion, according to risk experience

	Characterization rate			
Items	Exp[1]	No exp	χ^2	p
Adaptation of buildings	**90.2**	**85.9**	0.69	0.41
Move away from home	**88.3**	**81.9**	1.27	0.26
Apply urban planning documents	**86.9**	**92.2**	1.41	0.23
Enforcement of regulations	**85.2**	**85.3**	0.001	0.99
Disappearance of inhabited areas	**85.2**	73.4	3.37	0.06
Fragility of the dunes	**83.6**	59.2	11.45	< .001
I feel helpless	70.5	74.5	0.34	0.56
Erosion will increase in the future	70.0	57.9	2.12	0.14
Predictable disappearance of sand and dunes	63.3	63.4	0.002	0.99
Experts are familiar with erosion	60.7	62.2	0.04	0.83
For people like me, the risk is well known	45.9	32.6	3.23	0.07
For managers, the risk is well-known	45.0	43.7	0.03	0.86
Coastal erosion would have little consequences	36.1	29.4	0.89	0.34
Erosion makes me anxious	29.5	22.4	1.17	0.28
The authorities provide a good amount of information on erosion	24.6	27.1	0.04	0.84

Note.[1] : direct or indirect experience.