Interest of Social Representations Theory to grasp coastal vulnerability and to enhance coastal risk management

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Interest of Social Representations Theory to grasp coastal vulnerability and to enhance coastal risk management / *Interés de la Teoría de las Representaciones Sociales para entender la vulnerabilidad costera y para mejorar la gestión de los riesgos costeros*

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Abstract: This theoretical paper provides a new perspective on coastal vulnerability analysis by combining geography and psycho-social approaches. Most studies on perceptions of coastal risks report that people who are exposed have a low level of perceived vulnerability (they are not anxious), strong place attachment (they love their living place and want to live close to the sea) and are resistant to changes in adaptation strategies (they do not want to move away). For natural scientists and managers, these findings usually appear as paradoxes that enhance vulnerability and lead to these people being labelled 'irrational', 'in denial', 'uninformed' or 'uneducated'. Based on our long-term studies among coastal inhabitants in France, we believe that using Social Representations Theory (SRT) in this context enables us to go beyond these preconceived and individual-centred ideas towards a more contextualized view. This position extends theoretical risk/vulnerability research and is applicable to coastal risk management.

Keywords: coastal risks; vulnerability; Social Representations Theory; social psychology; geography

Resumen: Este artículo teórico aporta una nueva perspectiva sobre el análisis de la vulnerabilidad costera, mediante la combinación de enfoques geográficos y psicosociales. La mayoría de estudios sobre las percepciones de los riesgos costeros encuentran que las personas expuestas tienen un nivel bajo de vulnerabilidad percibida (no están nerviosos), un fuerte apego al lugar (aman el lugar en que habitan y quieren vivir cerca del mar) y son resistentes a los cambios a las estrategias de adaptación (no quieren mudarse a otro lugar). Para los científicos y gestores procedentes de las ciencias naturales estos resultados a menudo parecen paradojas que potencian la vulnerabilidad y llevan a etiquetar a estas personas como 'irracionales', 'en fase de negación', 'desinformados', o 'sin educación'. Basándonos en nuestros estudios a largo plazo con habitantes de zonas costeras en Francia, creemos que

emplear la Teoría de Representaciones Sociales en este contexto nos permite ir más allá de estas ideas preconcebidas e individualistas, hacia una visión más contextualizada. Esta posición amplía el alcance de la investigación teórica sobre riesgo/vulnerabilidad y es aplicable a la gestión de riesgos en el litoral.

Palabras clave: riesgos costeros, vulnerabilidad; Teoría de las Representaciones Sociales; psicología social; geografía

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Research context: coastal vulnerability<<t/s: Head1>>

In today's context of growing urbanization and climate change, coastlines are especially vulnerable to erosion and sea flooding (e.g., Birkmann, 2006; IPCC, 2013; Nicholls & Cazenave, 2010). On the one hand, the natural coastal dynamic is frequently modified by human actions, and is globally affected by climate change–related sea level rises. In terms of erosion and sea flooding risks, this situation exacerbates hazards: coastlines tend to retreat inland and lowlands are flooded more often. On the other hand, residential and tourism settlements are becoming more and more concentrated near the sea as people are attracted to the proximity of waterfront amenities. As a result, there is an increase of vulnerability for coastal territories, a trend that is likely to grow in the coming decades.

In consequence, because coastal vulnerability is multifactorial, to understand it, we must take into account a systemic approach (Hellequin, Flanquart, Meur-Ferec, & Rulleau, 2013; Henaff & Philippe, 2014; Meur-Ferec, Deboudt, & Morel, 2008). This approach brings together societies and nature in an advanced interdisciplinary study of coastal risks. We consider vulnerability to be the result of four main interactive components: (i) hazards

(natural processes of erosion and sea flooding, sometimes reinforced by human actions); (ii) stakes (what is at risk of being lost, people and goods exposed to hazards); (iii) management (public risk-management policies, protection/safeguarding measures); and (iv) perception/representations (of risk, place and adaptation among stakeholders and inhabitants) (see Figure 1).

In vulnerability studies, the 'representations' component often seems to be neglected (Becerra & Peltier, 2009). Our article highlights the importance of this component in the coastal vulnerability model and proposes a theoretical reflection based on the development of researches, combining the geographical and psychological views. In particular, we show that the integration of Social Representations Theory (SRT) (Moscovici, 1976, 2001) in the analysis of vulnerability helps to understand individuals' positions towards coastal risks and preferred strategies.

Our theoretical approach: risk and social representations<<t/s: Head1>>

Many studies about risk perception differentiate the layperson from the expert. They compare the layperson's perception with the expert's assessment or with an unquestionable measured physical process ('scientific' measures) (Slovic, 2000). Consequently, this approach underlines the differences between the two forms of thought (layperson/expert) in risk conception. These differences are interpreted in terms of cognitive biases in individual perceptions.

Another approach, based on SRT, aims to understand how people represent risks according to their groups of belonging which enrol them in societies' power dynamics (Breakwell, 2001; Joffe, 2003; Michel-Guillou & Meur-Ferec, 2016b). Social representations consist of common sense knowledge (Moscovici, 1976, 2001) that allows individuals to understand their environment, communicate in it and act on it. This social thought, anchored in a particular culture, enables people to find meaning in what seems strange or unusual. Representations therefore enable communication through the sharing of ideas, values and beliefs (Doise, 1993). Moscovici developed his theory to understand how scientific theories and concepts are appropriated by common sense and allow the transformation the 'unfamiliar', the novelty or the strange, into a familiar sense for people. It is not our intention in this article to develop more the theory of social representations (Moscovici, 1976, 2001), which has been largely developed elsewhere (e.g., Breakwell, 1993; Deaux & Philogène, 2001). We just focus on the interest of this theory for studying

'risks'. The risk representations approach takes into account the social-cultural context in which individuals who are likely to be affected by a given risk live (rather than pre-defined categories such as age, gender, education level, etc.). It proposes linking the representations with other concepts such as identity or place identity. On the matter, Breakwell's theory, linking social representations, risks and identity processes, is especially relevant. In the Identity Process Theory (Breakwell, 2001), social representations contribute to the social or personal identity. But in return, identity can play a role in the construction of representations, particularly in the case of uncertainty and changes. Changes in environment may threaten the identity of individuals. In response to that threat, coping strategies are implemented to protect, often by a change in social representation, to incorporate the novelty.

The link between identity and social representations was highlighted in several researches on place identity (Bonaiuto, Breakwell, & Cano, 1996; [AQ1]Devine-Wright, 2009). In these studies, the researchers showed that there are 'objectives' characteristics (social, economic, environmental …) to define a place. But when changes or disruption appear, these are not the objective characteristics which play a major role in the position towards these changes. The representation of the characteristics of this place and the way in which these characteristics contribute to the construction of identity are important in the interpretation of changes (in terms of positive or negative). This representation can thus explain why in some cases the risk is perceived (objected) for some groups and not perceived for other groups. Thus, to understand the dynamics of groups and their concern about a given risk, it seems important to study the social representations of the different groups involved, in order to know their positions and their interpretation of the situation.

Consequently, SRT was chosen here to explore representations of coastal risks. We believe that when this risk is seen as a danger, it can threaten identity. A social construction process consequently takes place to deal with this danger. This symbolic coping involves appropriation of the object of risk (submersion) and familiarization with the unfamiliar to make it intelligible and communicable (Wagner & Kronberger, 2001), which in turn may lead to the construction of a social representation of coastal risks.

Our research objective is to propose another theoretical approach to understand the positions and the social logics of inhabitants who live in exposed locations towards these risks, and their preferences in terms of adaptation strategies. This knowledge is an important factor for explaining some perceived paradoxes and overcoming some of the difficulties involved in the implementation of public policies. Consequently, this paper

synthetically develops three topics based on three perceived paradoxes by natural scientists and managers: (i) how individuals can be aware of but not worried about risks; (ii) how individuals can be strongly place-attached but also think about risk; (iii) how individuals want to take action on climate change but not move house. We will first describe these paradoxes leaned on our research's results and literature. After, we will discuss how these paradoxes can be reinterpreted in light of our theoretical proposal. We focus on the inhabitants of exposed coastal municipalities in France. Interviews and questionnaires were conducted and qualitative and quantitative data analyses were used (for more details, see: [AQ2]for anonymity, the references will be added after the reviewing process).

Description of three commonly perceived paradoxes

Aware but not worried

When coastal inhabitants talk about risk as a whole in their municipality, most of them do not class coastal risks as the most important. Respondents evoke most often 'low concern' or 'no risk', or risks of daily life (road traffic, etc.) or environmental risks. In coastal municipalities, most emphasis is placed on risks related to seasonality effects (tourism and second-home growth) and gentrification, which threaten the municipality's regular economic activities and social diversity. A risk of devitalization, associated with population ageing, is also mentioned, along with agriculture-related pollution risks (nitrates, green algae, safe drinking water, etc.). Inhabitants often cite regulation policies on urbanization as a risk because such policies restrict building permits. Indeed, it is not so much the fear of suffering damage from the sea that emerges, but that of being penalized by building permit restrictions, especially since 2010 in the wake of storm Xynthia[1] (Krien & Michel-Guillou, 2014). When asked explicitly about coastal risks, inhabitants generally show a low level of concern (Michel-Guillou, Lalanne, & Krien, 2015). Erosion and sea flooding are usually experienced as occasional or exceptional, or put into perspective. They show a low level of perceived vulnerability to coastal risks and do not seem to be worried by them.

In this type of situation, the classic hypothesis is to think that these people are ill-informed, unaware, in denial or uneducated (Boyer-Villemaire, Bernatchez, Benavente, & Cooper, 2014; Koutrakis et al., 2011). But yet almost all surveyed inhabitants acknowledge

the existence of erosion and submersion phenomena. They talk about coastal processes and past damage, and in some municipalities, these phenomena have even been specially addressed and given media coverage. Through the widespread media coverage (internet, TV and the press) of climate change, people are becoming increasingly informed about coastal risks. Not being worried does not seem to be attributable to a lack of information. And thus a paradox is created: many people are aware of and informed about coastal risks, but they are not worried about them.

Inhabitants cite risks but are strongly place attached

Nevertheless, our surveys found that some inhabitants spontaneously cited sea-related risks when talking about risks in general in their municipality. This percentage varies in time and space, but there is always a significant proportion of people who live near the sea and who have coastal risks in mind. This significant proportion can appear inconsistent, because to live in a place in which risks spontaneously come to mind might create cognitive dissonance (Festinger, 1957), and therefore a feeling of uneasiness. However, in our surveys we did not find this problem of well-being.

On the contrary, the findings from all our surveys showed that almost all inhabitants are attached to the place they live in. They consider that living in a coastal community is primarily an advantage and even a 'privilege', owing to the beauty of the landscape, the view, the proximity of the beach and the sea, and the quality of life. Living here is an asserted choice.

These results are in line with the findings of many psychology studies showing that place attachment is an affective bond encouraging people to stay close to a place and to feel good there (Hidalgo & Hernández, 2001; Lewicka, 2011). Place attachment contributes to enhancing people's identity insofar as the place with which they identify allows them to distinguish themselves from others (Twigger-Ross & Uzzell, 1996). An individual's living place thus contributes to maintaining or enhancing self-esteem and sense of self-efficacy (Wester-Herber, 2004). It is not surprising, therefore, that the inhabitants feel privileged to live in coastal locations, areas with strong place identities that allow people to positively differentiate their place from others. For Breakwell (2010), this distinctiveness is one of the principles on which identity is based. However, such place attachment hardly appears to be compatible with worrying about coastal risks. Indeed,

many studies have shown that people who are emotionally close to the place in which they live tend to minimize risks of their daily life (Billig, 2006; Flanquart, 2012; Weiss, Colbeau-Justin, & Marchand, 2006). The more individuals are attached to a place, the more they feel safe and the less they perceive risk. Their representation of the place where they live allows them to be not particularly worried about coastal risks.

This brings us to our second paradox: inhabitants who spontaneously think about coastal risks feel privileged to live in that place.

Local willingness to take action but resisting change in adaptation strategies

As we have seen before, habitants are aware of the processes of erosion and sea flooding. For them, the risk is real today and will be reinforced in the future related to climate change. This awareness tends to reinforce their willingness to get involved in managing the risk. Consequently, a majority of inhabitants believe that doing nothing is a poor option. Most inhabitants think that coping strategies must be put in place 'to combat' coastal risk. But there is a disparity between inhabitants' outlook and the French national coastline management strategy. Here two ways of social logic or rationality are opposed. The inhabitants are driven by a short-term and local perspective, linked to welfare and coastal place attachment. On the contrary, the government, which promotes the French national coastline management strategy, is driven by a long-term and global perspective of reduction of vulnerability and adaptation to climate change. And hence, the latter promotes relocation whereas the inhabitants prefer to resist and hold the line with 'hard' defences (Michel-Guillou & Meur-Ferec, 2016a). Moreover, most inhabitants believe that protection should be mostly provided by public authorities. According to this willingness to stay, most people have a clear stance against the 'rolling-back process' or 'managed retreat' adaptation strategies (Michel-Guillou & Meur-Ferec, 2016a). In all interviews, inhabitants never evoked relocation as a preferred strategy. Thus, while recognizing the overall importance of taking action and in particular adapting to climate change, most inhabitants prefer to defend their living place close to the sea.

Research on coastal risk shows that generally the risk of submersion or erosion is known to inhabitants, especially because it is identified in prevention documents, urban

planning rules. But what is more 'worrying' to inhabitants is not the phenomena of submersion (or erosion) in themselves, but the fear of their consequences in terms of town-planning constraints (non-buildable lands, ban of house extensions, etc.), poor insurance coverage and compensation for damages, or relocation projects (Krien & Michel-Guillou, 2014; <<t/s: link>>Mineo-Kleiner & Meur-Ferec, 2016). Thus, coastal hazards (erosion and submersion), in terms of risk or threat, do not reach the inhabitants in their identity. They are not or little worried about it. On the other hand, the constraints of town planning, the fear of being relocated, may reach them in their identity because these people feel privileged to live in a valued place ([AQ3]Michel-Guillou & Meur-Ferec, 2016). According to Breakwell (2010) and Duveen (2001), resistance can be seen to be one strategy to defend its identity, when individuals' beliefs, values and ideas are threatened. In this sense, the construction or reconstruction of social representations protect and maintain beliefs and values in the face of external threats. In our case, one coping strategy is, for example, 'not to move house', 'refuse relocation'; another is the construction of positive representations of a risk-free place (Krien & Guillou, 2018). Thus, individuals construct social representations to defend themselves against the novelties. Here, the concept of place attachment (e.g., Hidalgo & Hernández, 2001), and more globally that of sense of place (e.g., Jorgensen & Stedman, 2006), is very relevant.

Discussion and conclusion

Explanation of these three paradoxes

Inhabitants who are informed but not worried may seem to be in denial of the risk. However, from our theoretical perspective, we argue that there is no denial: inhabitants know and recognize the physical process of erosion and sea flooding but they do not consider it as a threat (they are not worried), so there is no denial process ([AQ4]Baumeister, Dale, & Sommer, 1998).

In fact, coastal dynamics, including erosion and storm surges, are not spontaneously cited by the majority of inhabitants as risks. Sea hazards are elements that people have chosen to live with, without thinking about them daily in terms of risk. A process of objectification (Moscovici, 1976, 2001) is at play. For inhabitants, the definition of submersion is an extreme event, when water levels rise to roof levels, like a tsunami. This representation has been derived from media images/information. Their personal experience of coastal risks does not include this kind of extreme event. So, by an objectification

process, coastal risk has become 'flood' or 'wet feet', the storm a 'strong gust of wind' or a 'scene', etc. (Bousquet & Miossec, 1991). It is not represented as a serious danger, not a 'submersion'. In that sense, many inhabitants do not mention coastal risks (erosion/submersion) at their local level. Such risks are situated outside of their places of residence. Risks are also shifted to a time scale beyond the inhabitants' lifetimes. In the same vein, people might consider that rising sea levels are important at the global level, but they do not necessarily have an effect at the local level. This distancing from risk may contribute to increased feelings of well-being insofar as it places the dangerous phenomenon further away, thus making it an abstraction (Trope & Liberman, 2010).

In consequence, coastal risks can be a concern for individuals without being perceived as an insurmountable problem. Studies on river flooding risks (Bonaiuto, De Dominicis, Fornara, Ganucci Cancellieri, & Mosco, 2011; Weiss, Girandola, & Colbeau-Justin, 2011) have found that when people recognize the existence of erosion and submersion, this gives them a sense of control. In the same way, Luis et al. (2015) found that awareness of coastal processes reinforces reliance on preventive protective measures — that is, people believe the risk can be managed. Knowledge of environmental processes combined with a sense of control allows individuals to maintain a positive place identity in a risky environment.

Furthermore, living near the sea is seen primarily as an advantage, and even a privilege, defined by the beauty of the landscape, the view, access to sea-related leisure and quality of life. The literature confirms this positive image of the coastline and its attractiveness in contemporary Western societies (Kelly & Hosking, 2008). This 'coast desire' (Corbin, 1988) results in elevated property prices. However, the sea is the driving force of coastal hazards too (Meur-Ferec, 2006), responsible for flooding and coastal erosion (IPCC, 2013). Among considerations of risks in general, coastal risks are very specific because the hazard vector — the sea — is also an amenity. Taking this ambivalence into account helps to explain why people can be sensitive to coastal risks but simultaneously feel that it is a privilege to live close to the sea.

Their preference for holding the line (Costa, Ferreira, & Martinez, 2016; Friesinger & Bernatchez, 2010; Roca & Villares, 2012) is in accordance with their strong place attachment. This desire to control coastal erosion, reinforce sea defences and maintain what already exists can be linked to the identity dimension of place attachment. Thus, adaptation strategies are accepted as long as they do not lead to stigmatizing changes to the environment or a forced relocation (Wester-Herber, 2004) and, therefore, do not interfere

with place identity (Twigger-Ross & Uzzell, 1996). Otherwise, a resistance process takes place. Knowledge of representations can help to understand these 'resistance to change' expressed at the local level. Various forms of resistance lead to individuals generally approving of national measures while at the same time highlighting the impossibility of their local application (Castro & Michel-Guillou, 2010).

Beyond this psychological place attachment, political and historical factors linked to the French tradition of a centralized and welfare state contribute to explaining the 'hold the line' position adopted by inhabitants (André, Montfort & Bouzit, 2013; Deboudt, 2010). In fact, in France, victims of natural disasters benefit from a system of public compensation founded on national solidarity. Undoubtedly, this strong government interventionism to repair damage and compensate owners tends to reinforce individuals' sense of control and willingness to hold the line. Nowadays, however, in a context of public funds shortages and rising sea levels, and after the catastrophic event of Xynthia in 2010, the French government advocates the relocation inland of most exposed property (André, Boulet, Rey-Valette, & Rulleau, 2016; MEDDE, 2012; Meur-Ferec & Rabuteau, 2014; <<t/s: link>>Mineo-Kleiner & Meur-Ferec, 2016). The welfare state is showing a gradual withdrawal. This new position of the government appears to be far removed from the position of most coastal residents, who are used to being supported by public funds to protect their private property. So, all these explanatory factors help with understanding the difficulties to implement some public policies at the local level.

The appeal of an interdisciplinary approach

To sum up, coastal inhabitants have a mixed position, based on cognitive, affective and behavioural dimensions, when it comes to coastal risks: they have knowledge of the hazards of erosion and sea flooding (cognitive dimension) but feel privileged to live near the sea (affective dimension). In terms of adaptation preferences, their strong trend to hold the line (behavioural dimension) is far from the recent French strategy in favour of relocation. This paper proposes another approach to a better understanding of the stances adopted by inhabitants of at-risk areas. They show the links between the representations of coastal risks, place attachment/place identity and adaptation strategy preferences.

Our approach is nourished by interdisciplinary [AQ5]research combining social psychology and coastal geography. A crossed perspective of these two disciplines throws

another light on what is often interpreted as paradoxes and allows going beyond bias and denial. Figure 2 provides a summary of this approach.

Moreover, this interdisciplinary approach seems to be a relevant contribution towards the sustainable management of coastal risks. Knowledge about residents' representations can shed light on the difficulties in connecting global and local scales. What can appear clear and rational from a theoretical and deterritorialized point of view (stopping coastal construction and rolling back the most exposed buildings) may be difficult to implement when faced with residents' positions and place attachment (purchasing and constructing houses along the coastline). As long as living at the seaside remains attractive and something that is socially and economically valued, then it seems very difficult to implement a relocation strategy.

Note

1. In France, the storm surge Xynthia caused more than 30 deaths from flooding in 2010. This was a dramatic [AQ].

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Figure 1. Systemic vulnerability model.

Figure 2. A psycho-geographical approach to go beyond bias and denial to analyse coastal risk vulnerability.