

## **A Review of the impact of Flood risk perception on preventive coping behaviors through the Place attachment component**

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### **Abstract**

Place attachment examines one's relationship and sense of the environment, which gives human life a stable sense of themselves with a sense of continuity as well as meaning. However, there is no consensus about its role in the relationship between environmental risk perception and coping behaviors. In other words, it should be mentioned that little is known about how place attachment would affect natural hazard risk perception and coping. Since place attachment is strongly related to place-specific dimensions of one's own identity and may be linked to spatial-biases, it is hypothesized that place attachment directly moderates the relation between environmental risk perception and prevention behaviors enacted to cope with environmental risks spatially floods cause among other environmental risks, floods are those highly linked to climate changes. The present research represents a systematic and structured starting point for the study of a new research topic, which is, the moderating role of an affect-based and place-specific social-psychological cue, including place attachment in the relationship between environmental risk perception and the related preventive behaviors. The purpose of this research is to investigate the impact of place attachment on risk perception and preventive behaviors using a literature review. The results of the study disclosed the fact that place attachment negatively affects the relationship between perception of environmental risk and preventive behaviors implemented to cope with environmental risks and there is a direct relationship between them and also, some cases had shown that an attachment to a place in the event of danger, acted as a defense mechanism, which this effect become stronger where the threat was indeed more concrete. It indicated that higher rates of risk perception may have a positive impact on improving people's ability to cope with environmental risk and sometimes this effect is weaker when it is associated with strong place attachment.

**Keywords:** Place attachment, Risk perception, Preventive coping behaviors.

## **1. Introduction**

Currently, societies are facing various problems due to severe climate change, such as rising rainfall, rising sea levels and floods (IPCC 2014). Such factors are rising natural disasters, and there is growing anxiety around the world about the occurrence of natural hazards. Floods are one of the natural disasters which cause a great deal of damage each year. In other words, floods are closely related to climate change, among other environmental threats (Environment Agency 2009; Kay, Davies, Bell, and Jones 2009; Nirupama and Simonovic 2007); It should be noted that they cause almost a third of the world's environmental disasters and cause irreparable economic losses (White 2000), on the other hand, the social and economic costs of natural hazards are significant, not only as costs of damage but also as a result of recovery (Alexander 1993; Alc'antara-Ayala 2002; Twigg 2002). Unfortunately, more than half of all the world's deaths attributable to the disaster are due to floods (White 2000). Recent studies, suggest that changes in severe weather that cause floods will turn into changes in economic losses (Dumas, Hallegatte, Quintana-Segui, and Martin 2013).

The constant increase in environmental problems, as well as the huge increase in the number of people affected by these problems, increases the need to pay attention to how people risk perception and perform preventive behaviors. In general, it is important to understand this risk and to take preventive behaviors, so as climate change increases the probability of extreme weather events, it is important to understand from a social psychological perspective which processes improve or reduce preventive behaviors to cope with the increasing environmental risk., therefore, it becomes important to guide attitudes and effectively educate at-risk people with relevant and efficient communication methods to prepare them to face that risks. However, O'Sullivan et al. (2012) they found that people are usually less willing to respond to environmental disasters. Indeed, recent studies indicate that multiple social-psychological variables can affect perceptions of individuals to environmental risks. Such variables can boost the willingness of individuals to deal with imminent environmental risks, such as flood risk (De Dominicis et al, 2014). Although some research has been directed to understand variables enhancing citizens' resilience (e.g., Bradford et al. 2012; De Dominicis et al. 2014; Johnson, Siegel, and Crano 2012; Miller, Adame, and Moore 2013; Raaijmakers, Krywkow, and van der Veen 2008), there is still a lack of research aiming at studying how person-environment transactions mitigate individuals' willingness to face up to impending disasters.

The concept of place refers to the subjective experience in the material world of an articulated human identity. It is a paradoxical concept with a meaning readily grasped but hard to describe. Low and Altman (1992) they have concluded that a comprehensive theory of place has not yet been proposed, so researchers have always been concerned about the lack and conceptual incoherence of the word place in studies. Patterson and Williams (2005) suggest that there has been no formal philosophy of place since the field of place study consists of multiple empirical frameworks focused on somewhat specific, frequently contradictory epistemological principles and metaphysical premises regarding the essence of fact, in other words, psychological relations with places are central to the perception of the person-environment. Environmental psychology conceptualizes them with constructions such as place attachment, sense of place and place of identity (Stedman 2002). Attachment to the place could be generally described as an emotional and cognitive interaction that connects people to places. Attachment to a position requires human considerations and personal values and traditions (Low and Altman 1992).

Beyond these attempts there is still a lack of systematic scientific attention to the connection between place attachment and risk perception and coping. Although studies address other "subjective" factors related to risk perceptions (Weinstein, 1984) But there are still investigations in their infancy. According to recent developments in the field (Devine-Wright 2013), our aim is to examine the effect of place attachment on risk perception and preventive behavior. In addition, maybe it can be argued that, among other variables, place attachment itself is one of the fundamental predictors of preventive and coping behaviors (Slovic 1987).

## **2.Theoretical literature of research**

### **2.1. Place attachment**

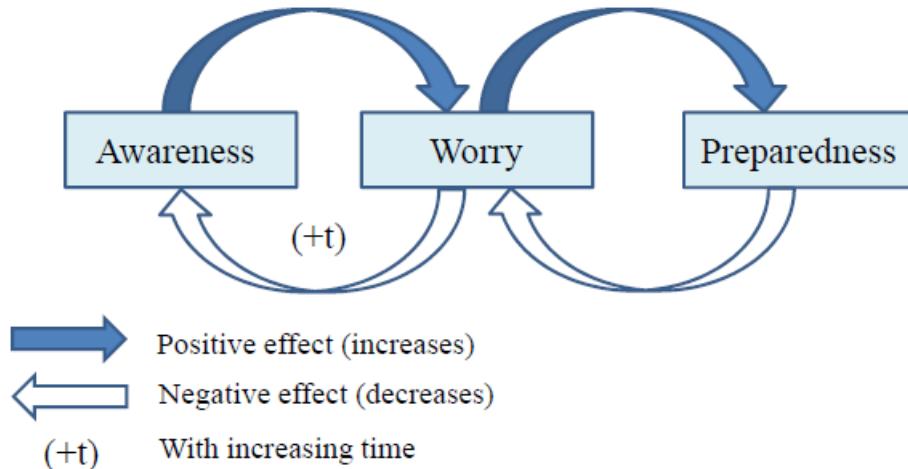
Place attachment was first introduced by Stokols and Shumaker (Stokols, D. and Shumaker, S. 1981). Place attachment is a psychological concept that reflects people's interaction with the environment (Bonnes, Lee and Bonaiuto 2003), originating from Bowlby's (1988) theory of attachment, which refers to the connection of people to places by feelings and affections from place. Shumaker and Taylor (1983) describe place attachment as 'a positive relationship among individuals and their surroundings. Several concepts have been used in literature for this connection, including place identity, place dependence, sense of place, and rootedness (Stedman 2002). Despite different conceptualizations, the majority of researchers agree that physical, socio-cultural, symbolic and psychological aspects are involved in place attachment (Relph 1976). Scannell and Gifford (2010) suggested that place attachment is defined by three interrelated dimensions, including person (individually or jointly defined usage and definitions), psychological mechanisms (affective, cognitive, and behavioral components), and place (the relational elements, including social context and social meanings, and the physical environment, including natural or built).

In fact, these feelings and affective reactions to the places in which we live and where we form during our lives, give us a healthy sense of self and consistency (Twigger-Ross and Uzzell, 1996). Place attachment also makes our lives important and determines our personalities (Giuliani 2003). If people live in a certain place for a long time, they feel a strong interest in that place and it causes the place to become part of their identity (Hay 1998). However, Proshansky, Fabian, and Kaminoff (1983) coined the phrase "place identity" to reflect the role of the physical environment in defining the human sense of self. According to Knez (2005), place attachment, which is a very strong emotional connection with place and makes place a part of people's identity, plays a very effective role in social processes and can act as an incentive or deterrent to place-related behaviors (Twigger-Ross et al. 2003).

### **2.2. Risk perception**

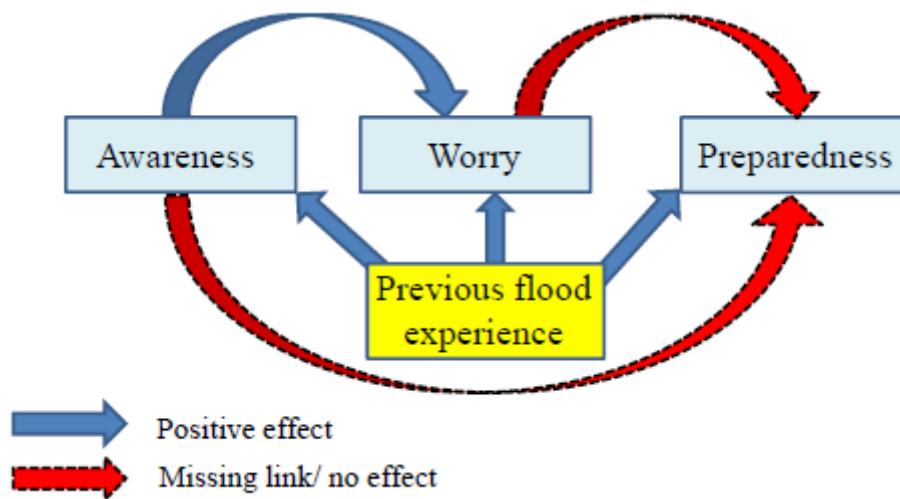
Risk perception by people is different from identification and risk perception by scientists, which is due to the complexity of the concept of risk. According to the scientist Risk is defined by Eq. (UNISDR 2012; Cron 2002); Risk = hazard × vulnerability × exposure.

In general, risk perception can be seen as an individual's view or experience based on an awareness of a specific hazard that may possibly affect loss of life or property Wilson (1990) examines perception in the sense of transforming input (e.g. flood warning) into output (e.g. prevention response). Slovic (2000) describes risk perception as an intuitive judgement of groups and individuals, of risks in the sense of restricted and ambiguous information. Raaijmakers et al. (2008) describes this term and describes perception through the relationship of a particular set of risk characteristics: awareness, concern and preparedness. Increasing any or a combination of these, increases the risk perception and, lead to enhanced flood resistance.



**Fig 1.** Relationship between elements of risk perception (from Raaijmakers et al. 2008).

As can be seen in Figure 1, risk concern plays a very important role in risk awareness and preparedness. In other words, a large number of people, while being aware of the possibility of danger, ignore its effects, but are worried and anxious about the danger and seek to deal with it, so it can be said that awareness of the danger has led to concern and as a result, preparedness to take risks also increases. Additionally, a separate analysis (Fig. 2) for the present research indicates no association between the degree of worry or awareness and the level of preparedness. Worry is therefore not considered to be the core feature of the relation between awareness and preparedness. However, the results emphasise the importance of direct flood exposure in increasing these three elements of perception. Findings suggest that while risk perception is connected to this risk issue, awareness and worry are not associated with high rates of preparedness that should help to improve resilience.



**Fig 2.** Relationship between elements of risk perception (from Raaijmakers et al. 2008).

### 2.3. Place attachment and risk perception

Risk perception among lay individuals is closely linked to how risk is placed in a network of factors known as "risk dread" including lack of control, risk and "unknown risk," which are characterized as the perception of uncertain, unknowable risks. With few exceptions, the relationship between place and either risk perception or the ability to cope with environmental risk is discussed (Bonaiuto et al. 2011; Ruiz and Hernández 2014; Mishra, Mazumdar, and Damodar 2010). Lack of studies are investigating the moderating role of place attachment throughout the relation of associated coping behaviors and environmental risk assessment. For instance, in some researches a negative association between place attachment and risk

perception were suggested: for example, the Armas findings (2006) indicate that a deep effective bond (feelings towards the residential neighborhood) creates a sense of protection and leads to indifference and even complete ignorance of the danger associated with seismic risk in Bucharest. People scoring high in place attachment display higher perception of flood risk and relevant flood worry, but only for those residing in low-risk areas in Italy (Bonaiuto et al. 2011) and findings in India, reveal that genealogical and economic attachment positively correlates with flood preparedness, display that religious attachment does not affect preparedness behavior (Mishra et al. 2010). In contrast, Bird, Gíslad'ottir and Dominey-Howes (2011) found that place attachment for rural residents in Iceland linked negatively to the confirmation of evacuation plans and also to resilience. all examples, display how the direct relationship between risk coping and place attachment is not obvious, either positive, absent or negative. One explanation is that based on the various acts and activities observed, this relationship may shift.

In reality, Bihari and Ryan (2012), researching wildfires in the US, demonstrate that previous familiarity with wildfires and stronger place attachment greatly affects social capital and risk preparedness: individuals with greater place attachment are more conscious of the wildfire danger and are more interested in local associations. Once again, in a qualitative Australian research, Paton, Burgelt, and Prior (2008) found that sense of belonging to a place (measured in terms of home and property attachment) enhances the interaction between positive future expectation and both intentions and behaviors to cope with bushfire environmental danger. Additionally, not only it has been found that "place attachment does not simply result in place security but can also underlie acts that are self-detrimental or destructive to one's place (Brown, Altman, and Werne 2012; Devine-Wright 2009; Devine-Wright and Howes 2010). Individuals with a deep place attachment would need to accept risk sources as an integral component of space, so they need to reshape their effective structures to lower their sense of danger.

these types of findings, while are conflicting, highlight the importance of analyzing attachment effects on perception and behavior, taking account of risk-different places.

the relationship between risk coping and place attachment can also be uncertain (Bonaiuto et al. 2011). Therefore, further research is needed to fully test the moderating effects of place attachment, especially as it relates to crucial dependent variables including coping behaviors, and actions within environmental risk, in fact, it is still doubtful whether place attachment apply its effect at the cognitive or behavioral level. Thus, it is important to concentrate on the direct or moderating impact of place attachment at the level of perception and risk assessment; and to concentrate on place attachment effects at the level of risk management behavior and acts.

## **2.4. Preventive coping behaviors**

Environmental crisis management research indicates that perception of disasters during peaks and after occurring of an environmental hazard, but it declines rapidly among disaster events (Stefano De Dominicis et al. 2015). People seem to have short term memories, and in addition, they appear to overestimate flood risk (Baan and Klijn 2004). Penning-Rowsell (2003) indicated that concern is decreasing rapidly, and flood risk returns to underestimation after a few years. even though, under conditions of high risk perception, people are abler and more likely to participate in protective behaviors (Stefano De Dominicis et al. 2015), there is still no consensus about what specifically causes individuals to engage in preventive behaviors to cope with environmental danger. It is also obvious that it is not enough to simply warn people to inspire them to change their normal behavior (Schultz 2011).

There are a variety of forms in which our relationship with place is represented and classified in sociological, psychological, and human geography literature (Tara Quinn 2014). The definitions in place are still being challenged; with various research threads attempting to delineate various scenarios in which individuals relate to place and how they can empirically capture such relationships (Lewicka 2011; Williams 2013). Some of these approaches is to use the place attachment's psychological effect on preventive coping behavior.

## **2.5. Place attachment and Preventive coping behavior**

Among psychological literature on risk prevention, several theories discuss psychological preparedness, prevention, and dealing behaviors at any group of individuals group level (see Hallman and Wandersman 1992). Some exceptions have made this person-place relationship operational in terms of "vested interest" demonstrating that it is important to reinforce the connection between actions in the natural environment and risk coping scenario (De Dominicis et al. 2014). Nonetheless, these two literatures are not integrated well; there is currently no systematic correlation between environmental risk perception, place attachment and environmental coping responses. It can be emphasized that natural environmental danger is a worldwide problem and provides opportunity for cross - disciplinary collaboration (Swim et al. 2011). In order to make that happen, the importance of place attachment must be understood, because place attachment and the experiential nature of the place could be essential to people's response towards places in (Swim et al. 2011) and may also be important to react to environmental risks.

## **3. Conclusion**

current study is a starting point for the study of the moderating effect with an impact-based and place-specific socio-psychological connection, including interaction among both related preventive behavior and perception of environmental risks. Therefore, it was expected that the place attachment serves as a significant moderating factor for preventive behaviors correlated with high awareness of environmental danger in environments where the danger to the environment is high. Research's on this topic has shown that the following relationship that exist among risk perception and place attachment: (a) either negative and positive relationships among natural environmental risk perception and place attachment; (b) either negative and positive relationships among risk management and place attachment; and (c) moderating relationships. In fact, the findings suggest that: (a) people who attached to place strongly, interpret natural environmental risks but neglect their possible effects; (b) individuals who strongly attached to place, are unable to migrate when confronted with natural environmental threats and therefore willing to return to vulnerable areas after a natural environmental disaster; (c) place attachment serves as both a moderating and mediating variabilities Place attachment should play a significant role in controlling natural hazards.

Studies demonstrate that in some situations having a place attachment in case of hazard serves as a defensive measure ((Bonaiuto et al. 1996). This effect would be higher if the danger is potentially more real, i.e. higher than a lower target and perceived risk background, typically it could conclude that there is a direct relationship between attachment to place and perception of risk and performing preventive behaviors and Higher rates of risk perception could have a positive impact on increasing individual's ability to deal with environmental hazard, and this impact is often lower when related to high place attachment.

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