



The role of social norms in climate adaptation: Mediating risk perception and flood insurance purchase



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ABSTRACT

Flood insurance plays an important role in climate adaptation by recovering insured losses in the event of catastrophic flooding. Voluntary adoption of flood insurance has been seen as a function of risk perception that is shaped by social norms. This paper attempts to clarify the relationship between these factors. It is based on a household survey conducted in the eastern cities of Australia and involving a total of 501 randomly selected residents. Results of a path analysis show that the likelihood of having flood insurance cover was associated with perceived social norms, but not perceived flood risk. In addition, perceived norms and risk were statistically related to each other. It is concluded that social norms played a mediating role between insuring decision and risk perception. Risk perception might influence the insuring decision indirectly through shaping perception of social norms. This implies that adaptive behaviour is not necessarily a function of risk perception, but an outcome of its impacts upon the ways in which the individuals situate themselves in their social circles or the society. There is a feedback process in which individual perceptions of risk manifest as both a cause and effect, shaping and being shaped by the socio-cultural context.

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1. Introduction

Economic losses from extreme weathers are rising due to climate change (Michel-Kerjan and Kunreuther, 2011; The World Bank, 2010; Warner et al., 2009). Average temperatures are projected to increase and rainfall patterns to change. Consequently, major flooding events are likely to become more intense and frequent in the decades to come. This is expected to create enormous costs to communities, in the forms of rescue operations, loss of human life, asset damage, and business disruption (McDonald, 2010). Governments at all levels are at pains to pay the damage bill. This motivates the search for protective measures against the risk of massive economic losses.

Flood insurance can supplement official disaster relief schemes and provide a foundation for economic resilience. It can spread the risk of flooding across time and space and therefore reduce the uncertainties associated with climate change impacts. Well-designed insurance arrangements can protect communities against insured damage created by floods and provide economic incentives for voluntary efforts on risk mitigation. Flood insurance thus plays an important role in climate adaptation and has attracted renewed interests (Botzen et al., 2010; Linnerooth-Bayer

et al., 2009; Penning-Rowsell and Pardoe, 2012; The World Bank, 2010; Warner et al., 2009).

Lack of interest in insuring against natural hazards is one of the barriers to climate adaptation at the household level. Some residents of flood-prone areas are reluctant to voluntarily purchase residential flood insurance cover even when it is affordable and available (Handmer and Smith, 1989). Advances in social sciences have identified a complex suite of social-cognitive factors responsible for the failures to insure (Baumann and Sims, 1978; Botzen et al., 2009; Botzen and van den Bergh, 2009; Kunreuther, 1996, 2006; Kunreuther and Slovic, 1978; Laska, 1990; Zaleskiewicz et al., 2002), and more generally, the failures to undertake adaptive behavioural adjustments (Adger, 2003; Alexander et al., 2012; Grothmann and Patt, 2005; Hulme, 2009; Raymond and Robinson, 2013; Wolf et al., 2010, 2013). Differential perceptions of risk have been cited as a key factor contributing to these failures.

However, evidence on the linkage between risk perception and behaviour is far from consistent. The standard assumption is a simple positive relationship between perceived risk and the willingness to purchase flood insurance cover (Botzen and van den Bergh, 2012; Kunreuther, 1996; Warner et al., 2009). As argued by Kunreuther (1996, p. 176), 'if the risk is perceived to be relatively high, then there is increased interest in purchasing a policy'. In reality, many individuals perceive the probability of a natural hazard causing damage to their home as being

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sufficiently low – lower than actuarial levels. Systematic misperception or under-estimation of flood risks is thus listed as the primary reason for non-insurance (Kunreuther, 1996, 2006).

Although the standard assumption has found empirical support, it also comes with a fair amount of counter-evidence. For example Baumann and Sims (1978) and Laska (1990) find no observable relationship between risk perception and flood insurance purchase. Hung (2009) even shows that these two variables are negatively related to each other. Based on a review of 16 relevant empirical studies, Bubeck et al. (2012) conclude that the explanatory power of risk perception has been overstated. Findings reported in the present paper also contradict the standard assumption. A point of departure for understanding the mixed findings is that risk perception is related to coping behaviour in some complex ways, precluding the use of over-simplistic dichotomous descriptors such as positive and negative. The present paper suggests that the linkage becomes discernible only when specific mediating factors are taken into account.

Past research has identified a number of factors contributing to the coping responses of the individuals, other than risk perception and personal socio-economic characteristics. These include social norms (Frank et al., 2011; Grothmann and Patt, 2005; Hu et al., 2006; Lo et al., 2012; Nelson et al., 2007), which are regarded as a key driver of the decision to purchase flood insurance (Kunreuther, 2006; Kunreuther et al., 2009). The dominant view holds that social norms influence perception of climate risk (Grothmann and Patt, 2005; Renn, 2011; Swim et al., 2010). Social referrals, expectations and pressures influence the individual's judgment on what is right or true, and can therefore determine the ways in which risk information is processed and anchored, moderate or constrain the sense of impact, and consequently drive or prevent changes in behaviour. Yet, recent research findings indicate that the relationships between these variables are not linear. Frank et al. (2011), for example, conclude that perception of climate risk is insufficient to motivate adaptive responses. According to Norgaard (2011) and Wolf et al. (2010), closer in-group social relations may even lead to denial or underestimation of risk. Thus, incorporating social factors into existing conceptual frameworks raise more questions than offering answers to the mixed observations regarding flood insurance purchase and climate adaptation generally. Current knowledge about the dynamics between risk perception, social norms and risk-related behaviour is far from complete.

Renn (2011) recently suggests that research into these issues, particularly in relation to climate change risk, could benefit from a conceptual framework that features the reflexive process of risk experience. It is known as the 'social amplification of risk framework' (Kasperson et al., 2003, 1988; Renn, 2011; Renn et al., 1992). The Social Amplification of Risk Framework is proposed as an interpretative framework for understanding experiences of risk and their behavioural and broader societal implications. It is based on the assumption that individuals process risk information either by amplifying signals that appear frightening or by attenuating those that are less threatening. This process is driven by or highly sensitive to social parameters, such as social norms, which are creatively described as a social 'amplifier' of risk. The functioning and transmission power of such amplifiers crucially influence the formation of risk perceptions. They operate through multiple feedback mechanisms and complicate the ways in which risk perceptions impact upon human actions. By placing social-cognitive factors at centre, the framework could offer explanations as to why risk-related behaviours appear insensitive to risk perceptions in some cases.

A source of confusion, however, is that the standard assumption between perception and behaviour is often taken for granted. Indirect pathways linking them to each other have received little

attention in the discussions of the Social Amplification of Risk Framework and other cognate theoretical accounts (e.g. Grothmann and Patt, 2005). This paper argues that one of these alternative pathways involves social norms as a mediator operating in between. It proves to be helpful for understanding the observation reported here that perceived risk is not a key predictor of flood insurance purchase. This paper seeks to clarify the interrelationships between perceived risk, perceived social norms, and behavioural engagements with a focus on the voluntary purchase of residential flood insurance. Findings of a quantitative analysis ascertain the effects of perceived risk and social norms on the likelihood of having flood insurance cover. The research has broader implications for understanding the role of social influence in enhancing the capacity for coping with probable economic impacts of natural disasters on households.

This paper is organised as follows. The next section briefly discusses the role of social norms in behavioural adaptation to natural catastrophes, with a focus on flood insurance purchase. It is followed by a further elaboration on the conceptual problems addressed by this research. The inquiry is supported by a primary dataset collected in a questionnaire survey conducted in Queensland, Australia. Research methods are introduced in the section that follows. Research findings are then presented, followed by a discussion on conceptual implications.

2. Social norms: a source of behavioural distortions?

Norms that evolve from social interactions between individuals constrain and guide their responses to known hazards. There is ample evidence supporting the claim that people's responses to projected impacts of climate change are strongly influenced by what they hear from other members of their social networks (Grothmann and Patt, 2005; Moser, 2007; Norgaard, 2011; Swim et al., 2010). These studies, however, do not specifically focus on decisions to insure against the rising risk of flooding due to climate change. In the literature the role of social norms in influencing these decisions remains unclear and contested.

The psychometric tradition of risk analysis offers the dominant theory of decision making for purchasing natural disaster insurance (Kunreuther, 1996, 2006; Kunreuther and Slovic, 1978; Slovic et al., 2000). Adherents to this approach suggest that failures to take out flood insurance stem from systematic bias in information processing and decision making on the part of the individual. These cognitive failures include underestimation of probabilities and myopia, leading to misjudgments on risk exposure and future benefits from risk-mitigating investments (Kunreuther, 2006). Conformity to social norms and social interdependencies are another example of such distortive factors (Kunreuther, 2006; Kunreuther et al., 2009).

An earlier report, dating back to 1970s, has indicated that discussions with friends, neighbours, and family members could increase the likelihood of purchasing natural disaster insurance (Kunreuther, 1978). Based on their earlier research, Kunreuther and Michel-Kerjan (2009) argue that when homeowners hear that other people have insured against flood risks, they become motivated to follow suit even without changing their beliefs about the risks they face or knowing about the cost of coverage. Social norms may also result in premature cancellation of insurance policies after some years of coverage without making any claim of insured damage (Kunreuther and Michel-Kerjan, 2009, p. 126). Homeowners observe and tend to follow the actions of their neighbours when deciding how much to spend on mitigating the flood risks they face.

Concerns have been raised about the normative role of social norms and interdependencies. Kuran (1995, p. 19) believes that social norms are social artifacts that mask individual true

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