Chapter 4
Responding to Flood Risk in the UK

Tim Harries

Abstract This chapter considers the response of UK householders to the country's most widespread and damaging natural hazard, flooding. Although flood risk affects 3 million UK residents and major floods in 1998, 2000, 2005, 2007 and 2009 received extensive media coverage, few at-risk householders take any action to reduce their risk exposure. Research conducted in London, Reading and Leeds suggests that people who have insufficient confidence in their ability to manage their exposure to the material impacts of flooding choose instead to adopt anxiety-avoidance strategies such as blame and fatalism. These strategies protect social representations that enable citizens to achieve a feeling of safety in their lives but they also de-legitimise the discourse of risk mitigation. The research suggests that protection of self-identity and social identity also play a role. Only when traumatic or repeated experiences of flooding force changes to identity and make the retention of old representations untenable are these psychological strategies abandoned. When this occurs, individuals either learn to accept the existence of the risk or else fall into a state of disabling anxiety.

4.1 Introduction

Although 60% of at-risk residents in England and Wales claim to be aware that they live in flood risk areas, only 39% of those with experience of flooding and 6% with no such experience have taken any action to reduce their risk exposure (Harries 2008a). This chapter asks why this is so. It argues that people's apparently irrational refusals to prepare for flooding are functional when seen in the context of a lack of

T. Harries (✉)
Behaviour and Practice Research Group, Business School,
Kingston University London, Kingston-upon-Thames KT2 7LB, UK
e-mail: t.harries@kingston.ac.uk

H. Joffe et al. (eds.), *Cities at Risk: Living with Perils in the 21st Century*,
Advances in Natural and Technological Hazards Research 33,
DOI 10.1007/978-94-007-6184-1_4, © Springer Science+Business Media Dordrecht 2013

confidence in the available mitigation measures and their assessments of the negative effects associated with them. It argues that people fail to protect themselves when they doubt their ability to do so effectively and fear that adaptive action will have a detrimental impact on anxiety levels and will threaten self-esteem and the sense of belonging.

Flooding is the UK's most common and costly form of natural disaster. Over 400,000 households and 1.5 million people in England and Wales have a greater than 1.3% annual chance of having their homes flooded by a fluvial or tidal flood event (Defra 2008a; Evans et al. 2004) and perhaps as many again are at risk from flooding caused by the incapacity of drainage systems to cope with heavy rain.

After decades of relatively few floods of national significance, in the last fifteen years numerous events have attracted the interest of national media and policy-makers. In 1998, the 'flood of the century' (Guardian 1998) affected thousands of homes and businesses across England and Wales, causing £300 million of damage. Two years later, heavy rain in already saturated areas led to flood damage of £1bn and the evacuation of 11,000 people across England and Wales (Johnson et al. 2008). In 2005 and 2009, large parts of the county of Cumbria were flooded. Finally, in 2007, the first nationally significant event caused by surface water flooding led to a second 'flood of the century' (Observer 2007) that affected 48,000 homes and caused £6 billion of damage across English towns and cities.

These events contributed to an emerging consensus amongst flood professionals that the frequency of flooding and the extent of exposure were increasing faster than existing management strategies could cope with. An investigation into the impacts of climate change (Evans et al. 2004) concluded that if expenditure on flood defence was maintained at existing levels, flood damage in England and Wales would rise to between £2 billion and £30 billion per year by the 2080's and the number of people living in high risk areas would increase from 1.6 million in the year 2000 to between two and four million.[1] Furthermore, it was recognised that demographic change, demand for housing, and policies favouring the development of river catchment areas and brown-field sites were maintaining the pressure for more homes to be built on at-risk land (Evans et al. 2004; McCarthy et al. 2001; Smith and Ward 1998). At the same time, there was growing awareness of the health impacts of flooding, with research suggesting that a third of flood-victims suffer long-term adverse physical effects (Tapsell et al. 1999; World Health Organisation 2002) and that the anxiety, relationship strain and general disruption that comes in the wake of flooding is associated with increases in mental ill-health (Tunstall et al. 2006).

As a result of these developments, the UK government recognised that engineered flood defences alone were inadequate to the task of mitigating the nation's flood risk and that a "portfolio" of approaches was needed (Defra 2005, p. 8). This "portfolio" included steps that householders themselves could take (Johnson et al. 2005) – i.e. measures to slow or prevent the ingress of floodwater into individual

[1] The large differences between estimates are the result of the use of different assumptions about future economic systems and policies and different assumed levels of economic growth.

Fig. 4.1 Examples of flood barriers: (**a**) sandbags; (**b**) a home-made door-board made of marine ply, and (**c**) commercially available airbrick covers (*Source*: The author)

homes (Fig. 4.1) or reduce the damage incurred when water does gain ingress (e.g. the use of water-resistant fixtures and fittings). However, early attempts to promote the use of these physical mitigation measures were far from effective (Pitt 2008) and by 2008 only approximately 10% of households in high risk areas had implemented any such steps (Harries 2008a).

4.2 The Research

Research on the barriers and incentives for the implementation of property-level mitigation measures was conducted by the author between 2004 and 2010 across a range of urban and rural areas of England and Wales, using both qualitative and

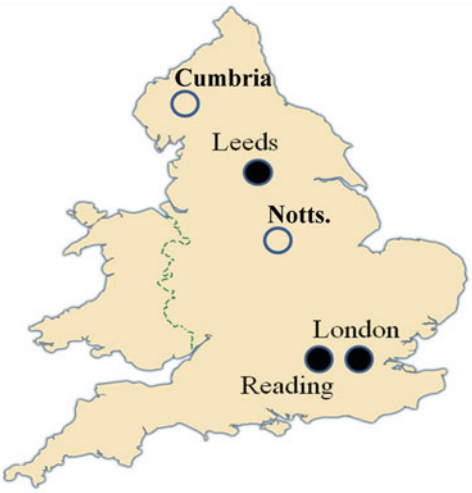

Fig. 4.2 Map of England and Wales showing the fieldwork locations for the qualitative data collection (*Source*: The author)

quantitative methodologies. This work was sponsored by the Economic and Social Research Council, the Environment Agency and the Department for Environment, Food and Rural Affairs (Defra), with additional support from King's College London and the Flood Hazard Research Centre at Middlesex University.

4.2.1 Qualitative Research

The qualitative research analysed the language and arguments that householders use when they talk about flooding and flood risk. It aimed to identify not only expressed justifications for taking or not taking mitigating measures, but also underlying reasons for these justifications and what they revealed about people's hopes, fears and fundamental motivations.

To this end, exploratory 'semi-structured' interviews and focus groups were conducted with at-risk and flooded householders in six parts of England, including the cities of London, Reading and Leeds (Fig. 4.2).

Many parts of London's ethnically diverse population of 7.5 million are threatened by flooding. In the centre of the UK's capital, both the financial City and the political quarter lie within the floodplain of the Thames. However, central London was last flooded in 1928 and now benefits from a high standard of flood defence, so most fluvial flooding occurs in the suburbs and is largely caused by the overtopping of urban streams, many of them canalised and some of them also acting as sewers (Fig. 4.6). For example, in 2000, the overtopping of defences on the River Roding in north-east London caused flooding to 230 properties (London Assembly 2002). An additional 680,000 properties are at risk of pluvial flooding due to the incapacity of ancient drainage systems in coping with heavy rainfall events (Fig. 4.3) (Greater London Authority 2010).

Fig. 4.3 (**a**) A typical suburban London street. (**b**) A nearby canalised urban stream that is prone to flooding (*Source*: The author)

Flooding from urban watercourses and surface water is hard to predict. Residents often receive little warning but floodwater dissipates quickly, so seepage through brickwork and floors is not usually a problem. The London research reported here was conducted in one area that suffers from run-off flooding after severe rain and one that experiences flooding from a canalised urban stream. Both were last flooded a few years before the research and neither is threatened by other natural or industrial hazards.

With a population of over 230,000 the second urban area, Reading, is one of London's largest commuter satellite towns. Parts of Reading are flooded from the River Kennet and the River Thames. Although wide-spread flooding occurs

Fig. 4.4 Thames-side properties in Reading (*Source*: The author)

relatively infrequently (1894, 1910, and 1947), two smaller events during the past ten years have raised fears that the frequency might be increasing. Qualitative research was conducted in two areas near the Thames: a newly-built estate of social housing set back from the river and an area of private housing abutting the river (Fig. 4.4).

The third urban fieldwork area is in Leeds, a city of 800,000 residents that forms part of the West Yorkshire metropolitan area. A major manufacturing centre in the eighteenth and nineteenth centuries, Leeds experienced economic decline before emerging as a centre for tertiary activities such as call centres and corporate offices. Interviews were conducted in a small estate of semi-detached, mid-value private homes in a city suburb where there had been three floods in the previous 10 years. Residents had actively lobbied to have the nearby dredged and widened and had recently received door-boards and airbrick covers as part of a government pilot scheme.

Householders in all the areas were recruited on the door-step and offered small cash incentives for their participation. In all, 50 residents of urban flood risk areas were interviewed in focus groups; paired interviews and a one-to-one interview. The composition of this sample is shown in Table 4.1.

Interviews were transcribed verbatim and analysed using a technique developed from *textually based discourse analysis* (Fairclough 2003) and *discursive psychology* (Potter and Wetherell 1987). This analytical method sees language as performative as well as communicative and as constituting reality, not just describing it (Austin 1962; Halliday 1994; Wittgenstein 1958). Analysts sensitise themselves to the different rhetorical and linguistic strategies that might be used and read texts with these strategies in mind, uncovering constructions and intentions that might otherwise be overlooked. They critically interrogate their own presuppositions and unexamined techniques of sense-making, asking, "Why am I reading this passage in this way?" and "What features [of the text] produce this reading?" (Potter and Wetherell 1987, p. 168).

Table 4.1 Characteristics of participants in the qualitative research

Social grade[a]	ABC1 – 18	C2DE – 32	–	–	–
Housing tenure	Owner-occupiers	Social tenants	Private tenants	–	–
	36	11	3	–	–
Household composition	Living alone	With friends/relatives	With partner only	With partner and children	Single parent
	12	2	18	15	3
Flood experience	Direct experience	Experienced near-miss event	Home flooded while away	Never flooded	–
	19	22	2	7	–
Implementation of mitigation measures	Own measures to keep water out	Own measures to reduce vulnerability of fixtures/fittings	Grant-funded mitigation	No mitigation	–
	11	8	10	21	–

[a]'ABC1' refers to people engaged in non-manual work, including professionals, managers and owners of small businesses. 'C2DE' refers to manual workers and those with long-term dependency on the state (see Market Research Society 2002)

4.2.2 *Quantitative Research*

Findings from the early phases of the qualitative research were used to inform the design of a telephone survey commissioned by Defra in 2007 (see Thurston et al. 2008). In this survey (known from now on as *Survey 1*), people living in flood risk areas were asked whether they had used any of a range of mitigation measures and whether they agreed with a selection of statements describing barriers and facilitators to mitigation (Fig. 4.7). The survey sample was drawn from lists of telephone numbers provided by data supply companies for postcode areas with a greater than 80% concentration of properties in areas where the annual probability of flooding was at least 1.3% – the level of risk classified as 'significant' by UK government bodies. As the research was focused on the actions of people already aware of the risk, a question at the start of the survey was used to screen out those not previously aware ("Before we approached you to take part in this survey, did you believe your home to be at risk of flooding?"). The achieved sample of 555 respondents represented a completion rate of 28%. Less than 10% of these 555 reported having taken any kind of property-level measure to reduce their exposure to flood risk.

Quantitative findings are also reported here from secondary analyses of two further Defra surveys. The first, *Survey 2* (collected in 2002), involved 1,400 face-to-face interviews with respondents in flood risk areas, all of whom were aware of the risk and 1,000 of whom had experienced household flooding (see RPA et al. 2004). The second, *Survey 3* (collected in 2005), involved 280 householders, 94% of whom had experienced flooding (see Tunstall et al. 2006). Respondents in all three surveys were asked whether they had implemented any flood risk mitigation measures and those in surveys 1 and 2 were also asked about the barriers and incentives for such actions (Fig. 4.5).

Survey data was analysed using chi-square tests and multivariate logistic regression – the former to narrow the range of possible predictors of adaptive behaviour; the latter to reduce the effect of spurious associations and discriminate between direct associations and associations via intervening variables (Bohrnstedt and Knoke 1984).

The findings of both the qualitative and quantitative elements of this research are outlined below. Section 4.3 describes the importance of the perception of mitigation measures – their cost, the implications of their use on property prices and their reliability – before Sects. 4.4, 4.5, and 4.6 describe some of the less obvious barriers to the use of these measures. Section 4.4 suggests that people who lack confidence in their ability to choose the right mitigation measures sometimes focus, instead, on reducing the feeling of risk. Section 4.5 considers the influence of identity and trust on a second determinant of take-up levels: the attribution of responsibility for the management of flood risk. Finally, Sect. 4.6 argues that the strategies described in Sects. 4.4 and 4.5 become less tenable with increased experience of flooding and that people who experience particularly numerous or traumatic floods either become psychologically resilient to the risk or else fall into a state of debilitating anxiety.

People have given reasons for NOT putting in place measures to minimise the damage to their homes from flooding. I'm going to read out a list of these reasons. Please say whether you agree, disagree or don't know.

... I feel it would be too expensive

... I don't think it's my responsibility

... I don't want to be reminded of the risk of flooding

... If I'm selling my home, I don't want people to see it's at risk of flooding

... My home is covered by insurance so I don't need to worry

Some people prefer to put in place measures to prevent or minimise damage to their homes from flooding. I'm now going to read out a list of reasons that they have given for having this attitude. Please say whether you agree, disagree or don't know.

... It would make me feel safer

... My insurance premiums would go down or not go up so much

... It would increase the value of my property

... It would decrease the hassle/disruption if there was a flood

Fig. 4.5 Survey questions regarding perceptions of flood risk mitigation

4.3 Perceptions of the Mitigation Measures – Cost, Stigma and Reliability

Although this chapter focuses on the latent drivers of mitigation, it is important to recognise the existence of the overt justifications that people give for their behaviours.

For example, the low uptake of mitigation measures is sometimes attributed to their cost. A full set of commercially available protection measures costs between £2,900 (Defra 2008b) and £4,000 per property (Harries 2010a). However, although 57% of respondents in Survey 1 said they were deterred from implementing mitigation measures because they believed they would be "too expensive", there was no statistical association between perceptions of cost ("I feel [mitigation] would be too expensive" – agree/disagree/neither) and the adoption of such measures (χ^2 [2, $N=519$] $=4.23$, $p>.05$). Furthermore, participants in the semi-structured interviews rarely mentioned cost as a factor unless prompted (Harries 2008a).

A second practical issue is concern over effects on real-estate value. The permanent and visible fittings required by some protective barriers (Fig. 4.6) draw attention to the fact that a property is at risk; as do features such as raised electricity sockets. Twenty-four percent of owner-occupiers hesitate to take adaptive measures in order to avoid revealing the flood risk to prospective buyers (Survey 1) and this view is negatively related to the implementation of such measures (χ^2 [2, $N=431$] $=7.17$, $p<.05$; $OR=0.32$). As one Reading resident put it, "if you're over-prepared, it looks like you're [at high risk]. Even though the reality might be that actually you're prepared [and] therefore flooding wouldn't matter, it would still put [people] off [buying your property]".

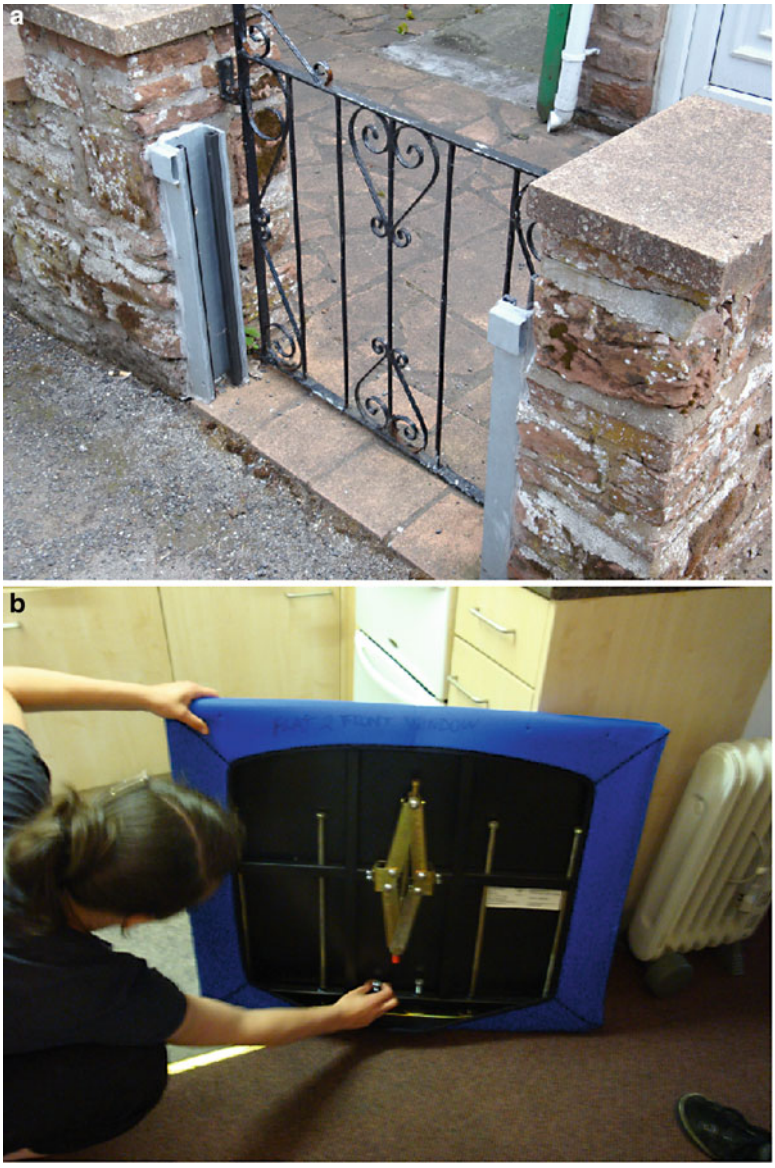

Fig. 4.6 (**a**) Fittings for a deployable flood barrier. (**b**) A type of barrier that requires no permanent fittings because it expands into doorways, window-spaces and gateways (*Source*: The author)

A third practical issue concerns the perceived reliability of mitigation measures. Unreliable measures increase anxiety and the emotional impact of an environmentally destructive event is exacerbated when human error (such as the choice of a wrong measure) is seen to have contributed to the destruction (Brown et al. 2005).

In Survey 1, 27% of respondents agreed with the statement, "I don't think I'd be able to choose the right way to protect my home"[2] and participants in the qualitative interviews expressed concern that they would feel or look foolish if it later became evident that they had made wrong choices or been 'ripped-off' by those selling flood protection products.

In the UK, the significance of these three types of barriers is gradually reducing. Some local authorities and charities offer support with the costs of mitigation measures; insurance companies sometimes agree to pay for flooded homes to be adapted after a flood; newer mitigation measures are more subtle in appearance, and a small number of independent experts are willing to give advice on the selection of measures. For the time being, however, there is little public awareness of these developments and their use remains patchy.

4.4 Anxiety, Fatalism and Vulnerability

Furthermore, qualitative analysis (Harries 2008b) suggests that these more overt justifications for not mitigating flood risk are not necessarily the most influential. The more important motivating factor, it suggests, might be the desire to protect those core elements of social representations that are important for what Giddens (1991) calls *ontological security* – the feeling of existential safety and meaningfulness that results from a belief in the continuity of one's identity and existence.

Social representations theory posits that people's representations of the world consist of networks of peripheral elements that cluster round a central core (Abric 1984; Bangerter 2000). Any threat to the core elements of this representational system causes profound anxiety (Wilkinson 2001) and threatens ontological security, so unfamiliar information, concepts and experiences are normally assimilated in such a way as to prevent any impact on the core and are only allowed to affect outer layers of the representational network.

The response to new information about flood risk typifies this phenomenon. To accept the existence of a flood risk would be to jeopardise core elements of three social representations that are fundamental to ontological security. It would be to accommodate within the representation of 'home', the concept of danger; to include in the representation of 'society', the idea that it is sometimes incapable of protecting its citizens, and to represent 'nature' as a source of threat as well as of pleasure and satisfaction.

One way of protecting core representational elements is to employ fatalism and blame as means of attributing flood risk to external factors rather than to intrinsic characteristics of nature, home and society. Fatalism implies that events are governed by chance rather than by any kind of pattern and allows people to

[2] Agreement with this statement was not statistically associated with reported use of mitigation or protection measures.

consider the likelihood of their experiencing a flood as identical to that of others. If their home is flooded, this is considered as 'bad luck', an 'act of God' or a 'freak event', but not as indicative of any pattern. Similarly, attributing blame to an external individual implies that the situation can be ameliorated once that person changes their behaviour and that the state of risk is not inherent to the core essence of 'home', 'nature' or 'society'. Blame and fatalism are not compatible with the discourse of mitigation and lead, therefore, to a reluctance to take practical risk reduction steps.

Qualitative analysis of interview data suggests that blame and fatalism discourses are associated with lack of access to the skills necessary for making practical adaptations to flood risk – i.e. the ability to understand and intervene in the relationship between human-made structures and water. Those with occupational backgrounds that furnish them with the relevant abilities and confidence – e.g. engineering or farming – are more able to make practical adaptations and therefore have less need of blame and fatalism; and the same is true for those whose social networks include such people. For example, in the Cumbrian town of Appleby, building and agriculture were such common professions that most residents either had the relevant skills themselves or could access them via social networks. Here, there was little evidence of fatalism. In London, by contrast, social networks were more widely distributed, the sharing of practical skills was less viable and most residents worked in professions not consonant with the skills relevant to practical flood risk management. Here, fatalism and blame were more evident.

4.4.1 The Representation of 'Home'

The first of the social representations that is protected in this manner is that of 'home'. In Western societies, 'home' generally elicits notions of continuity, safety, relaxation, privacy and familial affection (Cooper 1976; Mallett 2004; Saunders 1989; Smith 1994) – even where, as is often the case (e.g. Mallett 2004), this does not reflect lived experience. As people spend time in their homes, the routines they develop there, the aspects of their identities that they project onto the building fabric and the accretion of personal and inter-personal memories all imbue the place with their sense of who they are (Tuan 1974). Indeed, 'home' can be seen as a fixed and sacred spot from which people can create a version of the universe that fits in with their desires (see Cooper 1976). Any invasion of the home therefore undermines ontological security (Dupuis and Thorns 1998) and the temporary loss of home due to forced relocation after flooding is associated with deterioration in mental health (Ohl and Tapsell 2000; Tapsell et al. 1999).

The importance of this representation reveals itself in a reluctance to consider mitigation measures that would lessen the conformity of people's homes to the idealised norm. This is illustrated by an interview with a professional woman who, 2 years previously, had returned to find that a sudden flood had washed through the ground floor of her home.

Interviewer	If you were able to do things you could just leave in place and forget about… I don't know what that might be. It might be… raising your doorway for example your floor a little bit taking some measure permanently. Would that be better?
Martha	[…] I think we don't really want to (pause) change it – I like my house to look nice – I don't want to have a door that is like a bit daft because I raise the (laugh). And each time when we have friends or people coming through, you say well, you know, 'can you please step higher' (laughter).

A second excerpt is taken from a focus group of working class respondents:

Interviewer	Someone I spoke to […] he got this big whacking board that he can screw in across his front door […]
Marc	Yeah but then again, you'd feel like a prisoner (laughter)—a prisoner in your own home init (laughter)!
Pat	Yeah, prisoner in your own home!
Marc	Prisoner in your own home (laughter) […] you might get squatters moving in while you're out! (Laughter)
Freddy	The trouble is, you've got no flood coming in, but then a fire starts and you've had it! (Laughter)

Here, the respondents defend the concept of the home as a place of conformity to norms and represent it as a place of safety and comfort. The idea of barring the gateway between home and the rest of the world is interpreted as restricting freedom ("prisoner in your own home"), and inviting invasion ("you might get squatters") and danger ("then a fire starts and you've had it!"). The laughter and hyperbole in this excerpt seem to be an example of what Konrad Lorenz calls 'a controlled form of aggression' (cited in Morreall 1983, p. 6). Laughter appears to be employed as a means to ridicule invasive, alien representations that might threaten respondents' own representations of their homes as places of safety; and the use of hyperbole enhances the opportunities for ridicule by exaggerating the incongruity between the idealised concept of home and the alien concepts being mooted.

4.4.2 The Representation of 'Society'

The representation of society, too, plays a role in protecting people's ontological security against natural hazards. If they can represent society as essentially just and effective, as providing rescue and recompense or as preventing destructive events from ever occurring, then they can more easily represent their homes as safe and feel ontologically secure. In most of the Western world, society is represented as one of the main guarantors of the security of people's homes. Somewhat counter-intuitively, the frequent use of the discourse of blame amongst respondents suggests that they are attempting to protect that notion, for blaming a body implies that it retains the capacity to behave otherwise and even that (in the normal course of things) it *should* behave otherwise.

4.4.3 The Representation of 'Nature'

A final pillar of support for the phenomenological safety of home is the representation of nature as benign. Although increasingly challenged by the climate change discourse, this representation has been a dominant one in the West, where nature is often represented as a realm of positive moral influence (Macnaghten and Urry 1995; Soper 1995) and the destructive aspects of its character are not usually treated as part of the normal spectrum of human-environment relations (see Hewitt 1983). Hence, in spite of being aware of natural disasters such as the 2004 Boxing Day tsunami in Asia and the recent flash flood in Boscastle, most respondents still represented the role of nature in their own lives as essentially positive. As the following passage illustrates, such a representation makes flooding seem less threatening. Although these respondents' cottage is regularly threatened by flooding, the comparison with burglary indicates a representation of natural events as relatively benign ("It's a natural phenomenon, isn't it"):

George	I'd sooner have water [than burglary] I think.
Interviewer	How comes?
George	It's a natural phenomenon, isn't it.
Margaret	You can't help that.
George	Water, to me, it's natural—apart from all the buildings created it—you might say.
Interviewer	Yeah, yeah.
George	It's a normal…natural phenomenon, I think—flooding. It's from rain and flood, isn't it. Act of God, you could…Would that just about cover it? […]

George's suggestion that burglary is less acceptable than flooding because of the presence of intent and malice is echoed by other respondents. As one indicates, floods that are attributed to people are more detrimental to the feeling of security than floods that are attributed to nature (which, in the following passage, is equated with 'God'):

Florence Then they started to think about regulating the flooding and opening and shutting the doors of the Thames and that; and I must say that since then, I personally have felt that it was no longer an act of God which was happening, but controlled by the powers that be. In other words, the last [time…] we felt that whoever it was had decided to flood us rather than flood the centre of Reading. So my perception is now—from fatalistic, before: 'floods will happen; the river is a risk; we're ready to take it'… […] I would say that over the last 10 years I've become a bit cynical, in the sense that I felt much more regulated by a central flooding control, which means that if they decide to flood us, they will. […] And we heard it said that they decided not to flood the centre of [name of their town] because there was electricity generators [there] and therefore we've … I felt a lot more insecure.

Florence's construction of the causality of floods, like George's construction of the nature of floods, limits damage to ontological security by blaming the more threatening floods on human intervention and thereby preserving the representation of nature as benign. Flood risk is represented as a threat to ontological security only as long as people continue their malign interference and if left to behave 'naturally' Florence's home would suffer no adverse effects. Seen from within this representational framework, it is human interventions that disturb the natural system, and Florence's home is not inherently at risk because the situation will change as soon as humankind begins to behave differently.

This tendency to attribute more 'risky' floods to people rather than to nature is evident throughout the sample and is independent of the type of respondent or the source of the floods: rivers, groundwater, sewers etc. Rather than resulting from a perception of what is the material cause of a flood, the attribution of blame is a convenient tool for the protection of a particular representation of nature and of the security that this representation allows.

Blame and fatalism are added to the representational network in order to protect the inner core of representations designed to avoid anxiety. However, although they are instrumentally useful for the protection of essential feelings of security, they also de-legitimise discourses that promote local adaptation. In other words, there is a measure of incompatibility between ontological security and the implementation of practical measures to ensure the practical protection of health and property.

4.5 Identity, Trust and Responsibility

Blame de-legitimises the adaptation discourse not only at the individual level but also at the level of society. This is because it is antithetical to two of the essential components of adaptive behaviour: trust and responsibility. To help explain this, a theory of social identity is now introduced to the reader.

Social identity theory (Abrams and Hogg 1990; Hogg and Abrams 1988; Tajfel 1982; Turner 1982, 1985) examines the role that groups play in determining the thoughts, feelings and behaviours of their individual members. SIT theorists argue that categorisation is essential for the creation of understanding and identity (Tajfel 1972) and that successful self-categorisation as a group member is a necessary part of functional success in the social world.

Self-categorisation, it is asserted, prompts social comparisons of the self with other members of the group, leading to pressure for conformity of thoughts, feelings and actions. People rely on those with similar categorisations to themselves for both information about social reality and for approval of their beliefs, feelings and behaviours. This produces a tendency to conform to what is known as the group-prototype – the characteristics and behaviours of the notional person who embodies the group's core ideals.

This is not a deterministic process. Individuals choose the category of people with whom to identify and how much they wish to conform to the norms of that

group. According to social identity theory, the outcomes of this first choice are context-dependent – people's identities are multi-faceted and the facet they choose to emphasise at any time depends on the situation. On each occasion, it is argued, they choose the dimensions of identity that are most salient to the current circumstances and then select the social category – and social identity – that provides the closest fit along those dimensions (Hogg and Abrams 1988). When the issue in question is flood risk, the most salient social dimension is exposure to the flood risk or experience of flooding. As a result, even where no pre-existing identity groups match the catchment of a flood risk, such a group will normally be formed during and immediately after a flood event. This is illustrated in the following excerpt from an interview with a resident of Reading who had experienced relatively minor flooding:

> Everybody was there; we were all involved in the same process of deciding whether the middle pathway was going to be closed – whether the postman would deliver or if we had to go and pick up our post. As if we were becoming a kind of a little community which was surviving an act … you know, an act of God

This quote illustrates the nascent sense of belonging that can be generated by the experience of flooding. A social identity focused on residents' experiences is suggested by the stress on collective action ("we were all involved in the same process"), the affectionate use of the diminutive noun phrase "little community" and the association of 'community' with 'survival' ("we were becoming a kind of little community which was surviving").

After the excitement of the flood itself, however, the focus of the social identity group often turns from survival to questions of blame; and it is to members of *out-groups* that blame is usually attributed. Social identity theory maintains that in order to protect group identity and the benefits that it brings, groups maximise the positive difference between their representations of themselves (the *in-group*) and their representations of other groups (*out-groups*). Hence, they accentuate positive characteristics of the in-group and attenuate their negative characteristics; and they do the reverse for out-groups. As a result, when there has been a flood, victims tend to idealise the qualities of the in-group that comprises themselves and fellow victims and to attribute negative qualities, including blame, to members of out-groups such as government agencies and local authorities.

This has numerous consequences for the behavioural response to the risk of future flooding. Attempts to emphasise the demarcation between *in-groups* and professional flood risk managers inevitably reduce the possibility of successful information sharing and mutual assistance. Environment Agency staff often experience people from flooded areas as hostile and aggressive. When they respond by distancing themselves, either emotionally or by avoiding contact, this confirms the prejudices of the flood victims, who now see themselves as faced with a group of professionals who cannot relate to them and seem insensitive to their suffering or anxieties. Although the intensity of these responses reduces as memories of the flood event become more distant, the nature of the relationship between residents and professionals will often have been set.

This, in turn, has implications for views on who is responsible for managing the flood risk. As long as blame is attributed to outsiders, so too is responsibility for remedying the situation; for if flood victims were to accept responsibility themselves, this would raise the question of why they did not do so before the flood and would, therefore, weaken the positive representation of in-group qualities. This assertion of in-group identity can also be seen as a reaction against the rising trend towards individualisation (Bickerstaff and Walker 2002). Under advanced liberalism, governments increasingly seek to influence as well as to command, and use the discourse of individual responsibility as an alternative means to control populations (Raco and Imrie 2000). What is sometimes interpreted as a strategy to avoid changing habitual behaviour and save decision costs (Lindbladh and Lyttkens 2002) can therefore also be seen as a form of resistance against attempted control and, consequently, as a defence of social identity. Blaming public bodies is represented as a means of resisting the state, maintaining the boundaries between the in-group and the out-group and preserving identity. There is evidence of this amongst tenants of social housing in flood risk areas, where the suggestion of property-level flood resilience measures was in one instance represented as a contravention of human rights.

Geoff	That laminated flooring in my hall last year – I didn't think, 'oh I better not put this down because it might flood', I don't think that. […]
Rob	What about sofas, are we allowed them?
Interviewer	Yeah sofas, nothing [inaudible]…
Stuart	That's breaking human rights, init?
Jackie	That's comfort. They've got their comforts! Would they walk about on concrete floors? You just don't think that way.
Stuart	You don't see Tony Blair living on a concrete floor, do you!

When the maintenance of social identity precludes the acceptance of responsibility for flood risk, the implementation of mitigation measures by individuals becomes stigmatised and those that take such steps risk exclusion from the in-group. In one interview, the one resident on a street to have purchased a flood-board is represented as undermining local solidarity; and to preserve the positive identity of the in-group, he is spoken of with condescension and his actions disparaged. In the same interview, the prototypical in-group member who has made no preparations for flooding continues to be described as "very down-to-earth", "educated" and "practical".

An excerpt from a focus group also shows the assertion of in-group values in action:

Rob	You don't think, "I'll get this because this might happen". People just don't think that. You think, "I'll deal with it when it happens" […] If I met [a neighbour] today, putting sand in sandbags, and he said to me: "Just in case it floods", I'd be thinking, "he's nuts!" [*General laughter*]
Interviewer	How about if your neighbour was bolting [new floodgates] to his door?
Stuart	I'd ask him who's paying for it! […]
Jackie	"More money than sense", I would say!

In this discussion, participants use two rhetorical means to encourage compliance with group norms. They assert that it is not normal to plan for such eventualities ("people just don't think that way") and they ridicule such behaviour ("I'd be thinking, he's nuts!"; "More money than sense, I would say!").

Such social barriers to adaptive action disappear only when the relevant behaviours themselves are seen as typical characteristics of the in-group – i.e. either when they are adopted by in-group members who are seen to embody the characteristics of the proto-typical member (see Rogers' (1987) *diffusion of innovations theory*) or when the boundaries of the group are perceived to soften.

Evidence of both these phenomena was found in the case of the town of Appleby (see Harries 2010b). Here, staff from the Environment Agency and the district council approached the issue of property-level mitigation strategically by only approaching the question of property-level mitigation once historical differences between the authorities and the townspeople had been resolved and this out-group/in-group distinction much reduced. Rather than immediately trying to suggest a solution to the flood risk problem and confronting the residents with their failure to find a solution themselves, they offered to help townspeople implement their own solution (the more efficient distribution of sandbags), even though this was not perceived as very practically effective. This valorisation of local social identity helped undermine the negative representation of the flood risk professionals and weakened the demarcation between the townspeople and the professionals from outside the town. Consequently, when the more effective idea of property-level mitigation was mooted, it was readily accepted by residents of the town.

A key issue in this story is trust. The residents of Appleby had seen no evidence of the performance of either the mitigation measures being suggested nor of the flood risk management professionals – who heretofore had been seen to fail to adequately deal with the issue of flood risk in the area. As a result, there were few grounds for *calculative trust* – confidence based on evidence of past behaviour (Earle 2010; Rousseau et al. 1998).

In situations of acute flood risk, calculative trust will often be lacking. The desire to tackle a flood risk problem usually implies recent experience of flooding and this, in turn, implies that the problem has not yet been successfully tackled. Actors in the Appleby story overcame the absence of calculative trust by cultivating a substitute: *relational trust*. Relational trust stems not from experience of other people's actions but from an estimation of their values and intentions (Earle 2010) and it causes people to turn to friends and family for advice on risk issues before they turn to professionals (Rogers 1987). In Appleby, the professional flood risk managers developed relational trust by nurturing friendships with local people and convincing them that they shared a similar value-base and intentions. As a result, the operational distinction between out-group and in-group became blurred and the views and suggestions of the professionals became regarded with greater respect.

The existence of relational trust between two different social identity groups creates opportunities for new norms of behaviour. Where, previously, residents of Appleby might have seen the use of door-barriers as a vindication of the arguments of an antithetical group of outsiders, they now viewed it as a positive sign

of how the town was working in partnership with a valued group of professionals who happened to come from outside the town. Furthermore, the presence of relational trust seems to have generated a desire to supplement the bond between town and the professional flood risk managers with evidence that the confidence of the former in the latter had been well-founded ("let's show them what we can do!"). Instead of denying responsibility in order to shift blame onto an out-group, the town took responsibility for managing the risk and, indeed, made this an additional source of pride for the town.

This suggests an interdependence between relational and calculative trust (see Earle 2010). In the long term, relational trust needs to be accompanied by evidence to justify calculative trust. In both Appleby and Leeds, although a sense of shared values and intentions facilitated a good relationship between residents and flood risk management professionals, it did not generate confidence in the effectiveness of the professionals' actions. An improved relationship had allowed the introduction of new behavioural norms, but these norms had yet to be fully tested. Residents remained sceptical of the effectiveness of the new norms and reserved judgement with regard to their new partners in flood risk management. In Leeds, residents had not experienced another flood since the installation of the mitigation measures and reported that they were only moderately less anxious than they had been before their installation. In Appleby, the good performance of the measures in a recent flood had reinforced the town's new relationship with the authorities, and residents placed greater confidence in their professional advice.

Identity, trust and responsibility are inextricably linked. The absence of trust creates identity demarcations that, in turn, incentivise the renunciation of responsibility. The examples of Appleby and Leeds suggest that the generation of relational trust between risk management professionals and at-risk communities can overcome some of the barriers to local adoption of responsibility and normalise the notion of mitigation in the at-risk community.

4.6 Event Experience and Frequency

A further critical ingredient in the recipe for successful urban adaptation is experience of the type of event in question. Numerous quantitative studies have shown experience to be a significant predictor of protective behaviour against natural hazards such as flooding (e.g. Grothmann and Reusswig 2006; Laska 1990; Siegrist and Gutscher 2008). This, it is argued here, is because experience of flooding transforms core social representations and the social identities that they support (Fig. 4.7).

In Survey 1 and Survey 3 there are significant relations between experience of flooding and the adoption of adaptive measures. Survey 1 reveals a strong relation between the use of flood barriers and the frequency of experience (χ^2 [3, $N=511$] $=57.92$, $p<.005$). This is independent of housing tenure, housing type or whether households had contents insurance (Table 4.2) and increases in strength with the number of floods experienced. People who had experienced one or two

Fig. 4.7 Flooded street in Appleby, 2009 (Karen Morley-Chesworth. Permission granted)

Table 4.2 Results of logistic regression onto the variable 'protective action taken' (Survey 1, $N=427$)

								95.0% C.I. for Exp(B)	
	N	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Occupants own/have a mortgage on the property	375	.274	.516	.282	1	.596	1.315	.478	3.618
Number of experiences of flooding in the home[a]		.770	.155	24.626	1	.000	2.160	1.594	2.928
Occupants have contents insurance	391	.386	.647	.355	1	.551	1.471	.414	5.228
Home has more than one floor (i.e. it is a house rather than a bungalow or flat)	336	.267	.344	.600	1	.439	1.305	.665	2.563
Constant	–	−2.760	.695	15.758	1	.000	.063	–	–

[a]Continuous variable

floods ($N=127$) were 3.92 times as likely to have taken such measures compared with those who had never been flooded ($N=368$), but those who had been flooded more than twice were 6.33 times as likely to have done so ($N=16$) (Table 4.3).

This finding is broadly confirmed by analysis of Survey 3, in which respondents were asked whether they had (1) obtained sandbags and sand, (2) installed pumps, flood-barriers or airbrick covers or (3) built new drains or protective walls. Once again there was a significant relationship between number of floods experienced and the use of barriers (χ^2 [3, $N=276$] = 10.82, $p<.05$) and this was independent of other available and salient variables: social class, housing tenure, age of respondent and

Table 4.3 Cross-tabulation of 'number of times flooded in the home' against 'protective action taken' (Survey 1)

		Protective measure taken by household?		
		No	Yes	Total
Number of times flooded in the home[a]	None	339	29	368
	One	57	29	86
	Two	30	11	41
	More than two	8	8	16
	Total	434	77	511

[a]The continuous variable in the original dataset has here been converted into a categorical variable

Table 4.4 Results of logistic regression onto the variable 'protective action taken' (Survey 3, $N = 266$)

								95.0% C.I. for Exp(B)	
	N	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Occupants own/have a mortgage on the property	243	.146	.490	.089	1	.766	1.16	.443	3.023
Number of experiences of flooding[a]	–	.379	.122	9.61	1	.002	1.46	1.15	1.855
Social grades C2, D or E	104	−.323	.275	1.38	1	.239	.724	.423	1.240
Costs incurred by most recent flood were not covered by insurance	156	−.248	.262	.891	1	.345	.781	.467	1.306
Age – 18–34	19	–	–	1.89	2	.389	–	–	–
Age – 35–54	94	.568	.565	1.01	1	.315	1.77	.583	5.346
Age – 55 and over	153	.727	.546	1.77	1	.183	2.07	.709	6.034
Constant	–	−1.178	.678	3.02	1	.082	.308	–	–

[a]Continuous variable

whether the most recent flood had incurred any net cost (Table 4.4). However, in this dataset experience of flooding only became significant when people had lived through at least three flood events. Respondents with experience of three or more floods were 1.67 times as likely to have taken protective measures as people who had never been flooded ($N = 18$) and 1.59 times as likely as those who had only been flooded once ($N = 171$) (Table 4.5).

One possible explanation for this phenomenon is that experience of multiple floods makes it more difficult for individuals to hold on to the social representations of 'nature', 'home' and 'society' that allow them to feel secure. It was argued above that people filter out evidence that might contradict these representations by depicting floods as 'freak' events or blaming others for their occurrence. The more, and the more vivid, the experiences of flooding, the harder it is to deny the evidence these experiences provide and the harder it is to protect core representations that depict home life as secure. The qualitative evidence suggests that when the pressure

Table 4.5 Cross-tabulation of 'number of times flooded' against 'protective action taken' (Survey 3)

		Protective measure taken by household?		
		No	Yes	Total
Number of times flooded in the home[a]	None	11	7	18
	One	101	70	171
	Two	14	16	30
	More than two	20	37	57
	Total	146	130	276

[a]The continuous variable in the original dataset has here been converted into a categorical variable

to revise these representations becomes too great, people either fall into a state of anxiety or rely on a self-representation that depicts them as capable of dealing with the wconsequences of living in a less safe world.

4.6.1 When Existing Representations Have to Be Abandoned – The Stoical Response

Those who respond to multiple flood experiences in the latter manner normalise flooding and integrate the ongoing risk into their representations of everyday life. Rather than being perceived as an existential threat, flooding is defined as a threat to material security only. As a result, these householders no longer need to deny the risk and have need neither of the social representations described above, nor of the discourses of blame and fatalism that are often used to protect them.

This conclusion is supported by evidence from Survey 3 and the qualitative research. In Survey 3, respondents were asked whether they agreed with the statement "I prefer not to think about scary things like floods". Of those that had been flooded just once, 70% agreed with this statement ($N = 169$). However, the figure dropped to 22% for those with two or more experiences of flooding ($N = 87$). In the qualitative analysis, the more 'stoical' participants do not try to represent the threat of flooding as controllable or to represent themselves as able to neutralise the destructive effects of floods; nor do they represent life as innately safe, blame flooding on others or attribute it to 'bad luck'. Rather, they assert that they "accept…quite well" that flooding and flood risk are a "part of life"; that they are "philosophical" about flooding and do not get upset about it; that they are not "scared" of flooding like other people are, and that they are "tenacious" in the face of the risk. In other words, the risk of flooding is integrated into a representation that depicts it as normal for life to include losses as well as gains.

'Stoics' are able to describe the causes of flooding using a discourse that is predominantly technical and with little evident emotionality. The risk is not denied, but

neither does it provoke anxiety. This, as the following excerpt from the focus group with Reading professionals illustrates, allows everyday life to go on.

Craig	[…] I'm old enough and long enough in the tooth to realise that a bit of wet carpet and a little bit of re-decorating, actually in the overall scheme of life, isn't that important. Um, and there are other things that are much more important. And therefore if it costs a couple of grand – even out of my own pocket – to replace a fridge, a freezer, some carpet and a bit of kitchen, which I might want to change anyway
Christopher	You're hoping it will flood, really, aren't you! [*Laugh*]
Craig	You know, how incredibly important is that? You do weigh that up against the hassle of moving, the cost of moving, the fact that you like where you live and so on.
Interviewer	But yet there *is* worry. You *are* worried about water coming in. Even though, yes, on the one hand you're saying it's only possessions and it would only be, like, a bit of re-decorating; but on the other hand it is a cause of concern, isn't it?
Craig	Yes, but it doesn't fill my every waking moment.
Joan	No [*Laugh*].
Craig	And that's it; at the end of the day, it is a *concern*.

Craig seems to want to present himself as not worried about the flood risk. Although he admitted earlier in this interview that he experienced some fear when floodwaters were about to enter his home, it is clear from the final sentence of this excerpt that he prefers to be seen as concerned rather than fearful ("at the end of the day, it is a *concern*"). Furthermore there is no sense in Craig's talk that flooding threatens anything other than his material possessions, for he stresses that his home has "no particular sentimental value". His language, too, implies a rational appraisal of the risk and not an emotional one (i.e. "weigh[ing] up"; "costs"; "hassles" and "facts"). In keeping with other stoics in the sample, flood risk does not seem to undermine Craig's ontological security. His fear that his home seemed about to be flooded has not overflowed into his everyday life, so there is no long-term anxiety about possible future flooding.

4.6.2 The Response When Existing Representations Have to Be Abandoned – Anxiety

Experiences of flooding only seem to reduce anxiety, however, if they are not too traumatic. Rather than being stoical, flood victims that are traumatised by their experiences of flooding enter an emotional crisis. No longer being able to sustain the representations of 'nature', 'society', 'home' and 'self' that protected their ontological security, they fall into a state of anxious insecurity.

In Survey 2, a series of questions designed to measure Post Traumatic Stress Disorder (PTSD) was used as a proxy for the loss of ontological security. PTSD is indicated by the re-living of the traumatic event, a numbing of general responsiveness and persistent symptoms of general arousal (e.g. irritability, difficulty sleeping and lack of concentration) (American Psychiatric Association, 1994, as cited in Joseph et al. 1997). It was measured in the survey using a version of the Post Traumatic Stress Scale that had been adapted to relate specifically to experience of household flooding (Dua and Scott 2001). In the dataset, 2% of flooded individuals had 'high' or 'extreme' PTSD scores that suggested the loss of ontological security.

There were two apparent examples of anxious insecurity in the qualitative sample. One respondent, a labourer, says that his flat is the "first stable home" he has had and that he would "go crazy" if it were flooded again. This suggests heavy dependency on 'home' as a place of safety and stability and also that this representation is vulnerable to challenge. Furthermore, the respondent shows faith neither in his own ability to mitigate the risk of another flood nor in that of the local authority ("the council wouldn't even put down a bit of grit on the road if it snowed, never mind spend money on [flood risk alleviation]").

A second example of anxious insecurity is a professional who had twice been evacuated as a result of a flood and whose home had on both occasions been badly damaged. She represents 'nature' as callous and destructive and, after the failure of collective local action against the local authority, despairs of receiving any help from the state. Having seen her home stripped of all its homeliness ("what was a home […] suddenly just becomes bricks"), she seems to have abandoned the representation of her flat as a safe centre for her life and identity and to have no faith in household-level mitigation measures or her own ability to protect her home ("there's nothing you can do"; "all the nuts and bolts and sandbags are not really…are not going to solve this"). As a result she too reports a lack of emotional security:

Interviewer How does it feel during the summer when you are aware that there could be flooding around? Some people have told me that there's a kind of anxiety involved…

Vikki I get hysterical, absolutely hysterical. This last time, when we didn't get flooded, I found I was getting really in a state about things. I was getting panicky and I was on the internet every single night looking at the weather forecast and going into all the details. And then this flood warning thing you can look up as well; and it was ridiculous, I found myself doing it every single day and I was a nervous wreck […] I get hysterical when it happens. I start shaking and I can't speak, it's almost like I'm in shock.

Patterns in the qualitative data suggest that the severity of the flood experience might be one important predictor of this loss of ontological security – particularly the speed at which floodwaters rise, perceived pollutant levels and the extent of the actual or potential damage and disruption. This finds some support in previous analysis of the Survey 2 data by Tunstall et al. (2006), who found that high PTSD scores amongst flooded householders correlated with, *inter alia*, the experience of evacuation, the depth of the flooding in the main rooms of the home, the time it took to return to normality and the perceived contamination of the floodwaters.

4.7 Conclusion

For many householders in the UK, the perceived costs of taking adaptive measures against flood risk are greater than the anticipated gains. UK citizens have become habituated to the idea that the state will protect them from natural hazards such as flooding. As a result, the representation of 'home' as a place of innate safety continues to form a key pillar of ontological security for many people and the notion of property-level mitigation has yet to be assimilated into the corpus of 'normal' behaviours. At the same time, the reliability of such measures and the trustworthiness of their proponents are often doubted by members of the public. As a result, the risk involved in implementing mitigation measures is sometimes seen as greater than the reduction in risk that they will bring. Although it would be reductionist to assume that people use any such rational form of cost-benefit analysis to reach their decisions, this argument makes it clear that the decision not to adopt practical adaptations can be seen as just as instrumental as the decision to adopt them.

Relatively high levels of take-up in the areas benefitting from Defra's grant scheme suggest that some of these barriers can be overcome. Not only did the scheme pay for the purchase and implementation of measures; it also provided expert advice on what were appropriate measures. Doubts over which measure to take exacerbate anxiety about regret and increase the likelihood of inaction (see Zeelenberg et al. 2002), especially where, as is the case with flood risk, inaction is the norm (see Tykocinski and Pittman 1998). The UK police and fire services already offer expert, individually tailored guidance on the prevention of burglaries and fires, and there is a need for similar independent advice to be made available for situations of flood risk.

A further advantage of the Defra scheme was its engagement of householders at the collective level. In those areas that participated in the scheme, no single householder had to take the exposing step of being the first to install a door-board, airbrick cover etc. Communities were approached collectively, so individuals were able to reduce their risk of blame or stigma by sheltering behind the decisions of the group. Furthermore, research in the pilot scheme areas in Appleby and Leeds suggests that where local authorities and the Environment Agency were able to foster a relationship of partnership with at-risk groups, the boundary between in-group (the flood victims) and out-group (the authorities) was weakened (Harries 2009, 2010b). Where this occurs, residents are less able to use the strategy of blame and fatalism and will be more amenable to the notion of property-level mitigation.

However, experience of flooding is also critical to the take-up of mitigation measures. The government grant scheme only applied to areas where the probability of flooding was particularly high and there had been repeated recent flooding. Although it is not possible to gauge what the scheme's impact would have been on less flood-prone areas, the evidence presented in this chapter indicates that it would have met with far less success. Experience, it has been suggested here, wears down the defences that people use to protect the representational structures that allow them to feel secure. If the representations that replace the old, discredited ones include the

idea that natural hazards can be survived, then denial is no longer an instrumentally functional strategy and physical adaptations become more emotionally viable.

This chapter has made an argument for greater consideration of the role of *anticipated emotions* – feelings that people believe they will feel in hypothetical future scenarios (Bagozzi et al. 2000), particularly regret arising from counterfactual comparisons (Loomes and Sugden 1982). Although researchers have become increasingly aware of the significance of emotions in determining risk response (Harries 2012; Slovic 2000; Slovic et al. 2004), practitioners too often assume that perceptions are the result of the intellect alone. To avoid this error, it is necessary to look beyond people's *post hoc* justifications for taking or not taking adaptive steps and to try to understand the latent drivers of behaviour. This chapter has attempted to do this. It suggests that before they will act to protect themselves, their families and their property, people not only need information and the necessary financial resources, but also reassurance about the implications of protective action for their emotional security.

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