

Why it takes an 'ontological shock' to prompt increases in small firm resilience: Sensemaking, emotions and flood risk

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Abstract

This study uses the sensemaking approach to explore influences on small businesses' responses to the threat of external shocks. By analysing semi-structured interviews with owners of flooded small businesses it seeks to understand how owners process flood experiences. It also explores why such experiences do not consistently lead to the resilient adaptation of business premises. It concludes that part of the explanation for low levels of adaptation is owners' desire to defend their existing sensemaking structures and associated identities against information that challenges them. Sensemaking structures are only revised if these structures are not critical to business identity or if a flood constitutes an 'ontological shock' that renders untenable existing assumptions about long-term business continuity. These findings have implications for adaptation to the growing risk of flooding and to climate change and external shocks in general. The study suggests that future research into external shocks would benefit from using the sensemaking approach and that survey studies should include measurements of 'ontological' impact as well as material and financial damage. In addition, those designing information campaigns should take careful account of businesses' resistance to information that appears to threaten their existing sensemaking structures and social identities.

Key words: floods; resilience; sensemaking; external shocks; climate change adaptation; business continuity; emotions

Introduction

This study aims to understand how the interpretation frameworks of small business owners influence what they learn from experiences of external shocks – and how this impacts on subsequent behaviour. Research into the resilient responses of small business to external shocks and crises is rare (Bullough et al, 2014; Herbane, 2013; Sullivan-Taylor and Branicki, 2011), enquiries into this topic having seen a brief blossoming in the early 1980s before being overtaken by resilience research that focused on internal systems and, post 9/11, the resilience of business models and supply chains (Linnenluecke, 2017). In this study, we argue that the subject of how small businesses respond to external shocks needs revisiting and that attention should be paid to the influence of risk perception. Commentators agree that risk perception is important and that dangers are perceived differently, but do not usually interrogate the reasons for this (e.g. Bullough et al, 2014). We propose the sensemaking approach for investigating this question. In doing so, we look at flooding – a type of shock that has received little attention in the small business literature (though see Wedawatta et

al., 2014, and McGuinness & Johnson, 2014). In particular, we focus on an aspect of flood response that is of particular policy relevance in the UK (see Bonfield, 2016; Cabinet Office, 2008) and elsewhere (Bubeck et al., 2015): the implementation of physical measures that would reduce the damage incurred in any subsequent flood.

Flooding is an important issue in the UK, where 20% of non-domestic property is already at risk (Fielding, 2015) and the probability and geographical spread of the flood risk is growing. The floods of Summer 2007 affected over 7,000 businesses (Cabinet Office, 2008), causing average damage of somewhere between £56,000 and £90,000 (Chatterton et al., 2010). Subsequently, Winter 2013-14 saw more than 3,100 businesses sustain an average damage of £82,000 (Chatterton et al., 2016) and in Winter 2015-16, a further 5,000 businesses were flooded (Marsh et al., 2016). On average, small businesses lose over 50 working days when they are flooded and take 6-9 weeks to get back in business (Crichton, 2006; Kreibich et al., 2007). In one part of England (Calderdale and Kirklees) recent flooding caused damage equivalent to 5.4% of Gross Value Added (Sakai et al., 2016).

In contrast with shocks caused by situations of enduring crisis, UK floods are localised in time and space. In many streets, estates and localities only a minority of businesses are directly affected, and indirect impacts (e.g. loss of electricity and transport infrastructure) usually last no more than a matter of hours. This distinguishes UK floods from shocks such as earthquakes and conflict, in which long-term changes to the business environment can be as consequential as the immediate destruction and disruption (e.g. Battisti and Deakins, 2017; Cheung and Kwong, 2017; Dahles and Susilowati, 2015; Doern, 2016; Dolfman et al., 2007). In the UK, a flood can cause a crisis for a particular business without constituting a disaster for the local area or economy as a whole, or ushering in lasting changes to the business environment. This has implications for the choice of theoretical approach. For example, the dynamic capabilities approach has been applied to disaster scenarios that cause long-term shifts in the strategic context (e.g. Battisti and Deakins, 2017), but is less relevant where adaptation is needed to the emergence of low-probability events of short duration.

This study makes several contributions to the literature on small businesses and external shocks. Firstly, it adds to the evidence for the importance of risk perception as an influence on the response to external shocks. Secondly, it provides new insights into how risk perceptions distort the learning that results from external shocks and how this leads to path dependency and the under-use of more effective ways of responding to the risk of future shocks. Thirdly, it proposes the notion of the *ontological shock* to

distinguish events that challenge business identities from those whose effects can be assimilated into existing interpretation frameworks. Fourthly, it questions the contention that increases in resilient behaviour can result from the repetition of minor shocks. Finally, the research provides evidence of the importance of emotional denial and of the need for further research into emotional aspects of small business owners' responses to external shocks.

The manuscript is structured as follows. In the first section, we discuss the international literature on the impacts of flooding on small businesses. In the second, we review the literature on sensemaking and risk response. Subsequent sections detail the research methods used, present the findings of the data analysis and discuss the conclusions and implications of the research.

Small businesses and flooding

As awareness has grown of the inadequacy of large-scale engineered flood defences in the face of increasing risk of flooding, governments have begun to talk about a *portfolio approach* to flood risk management that includes the actions of individual businesses alongside the actions of the state (Harries, 2013; Johnson et al., 2005). Both resilience and flood resilience are complex concepts that have been defined in a wide range of ways. In this study, we focus on the dimension of resilience sometimes known as *robustness* (Twigger-Ross et al, 2014): the ability of a system to retain desired characteristics despite changes to elements of that system. In particular, we look at one important contributor to robustness, *property level resilience (PLR)*, and when/why PLR is introduced after a flood experience.

PLR aims to protect IT equipment, data, products, stock and raw materials (Climate East Midlands, 2012; climateprepared.com, 2015) and includes measures such as raising door thresholds, dry-lining walls and raising electrical sockets (Environment Agency, 2015). Such measures can reduce the cost of flood damage by around three-quarters (Joseph et al 2011; JBA Consulting 2012; Royal Haskoning 2012).

PLR can be particularly beneficial for smaller businesses. Although such businesses are more resilient (Branicki et al, 2017), more practised at crisis response (Atherton, 2003) and particularly adaptable during climate events (Sullivan-Taylor and Branicki, 2011), they are also more vulnerable than larger firms to crises such as extreme weather events (Clemo, 2008; Irvine and Anderson, 2004). Highly localised sale and supply networks increase the vulnerability of the customer base (Webb et al., 2002) and many

small businesses operate from single locations and are therefore unable to relocate functions to unaffected areas (Kroll et al., 1990). Also of importance are limited access to finance and constraints associated with human resources (Vossen, 1998; Bhattacharya-Mis et al., 2015). Underinsurance, too, is an issue (Alesch et al., 2001). Less than a third of small businesses has cover for business interruption or loss of earnings and less than 50% of the total cost of flooding to small businesses is covered by insurance (BMG Research, 2011; Clemo, 2008; Crichton, 2006; Zhang et al., 2009). Partly for this reason, small firms are limited in their ability to deal with the financial impacts of floods and other shocks (Sullivan-Taylor and Branicki, 2011; Webb et al., 2000).

Despite these high levels of vulnerability and underinsurance, few small businesses install PLR. High-quality national data on this issue is hard to obtain because of imperfections in databases of at-risk areas, gaps in the contact details listed in central business registers and low survey response rates. However, one national survey (n=537) found that only a third of small businesses in areas of high flood risk had implemented PLR or similar measures (Thurston et al., 2008) and another (n=40; conducted in two areas affected by the 2007 UK flooding – Bhattacharya-Mis et al., 2015, p52) found that just 10% of owner-occupiers of commercial properties had implemented “permanent resilience measures” and 8% had installed “resilient fittings” (no compound figure was provided).

These findings are consistent with evidence that smaller firms are generally less likely to adapt to flood risk (Evans, 2013; Kreibich et al., 2005) and climate change (Dahlhamer and D’Souza, 1997; Howe, 2011 – though see Battisti and Deakins, 2017; Herbane, 2015). This is sometimes explained by reduced access to financial resources (e.g. Vossen, 1998; Alesch et al., 2001), lack of information about the risk and the available mitigation options (e.g. Alesch et al., 2001) and a lower capacity to absorb new knowledge and technology (Vossen, 1998). We argue that these explanations only tell part of the story. Not all PLR measures require substantial capital investment and many small businesses have sufficient innovation and bricolage skills to overcome capital constraints (McGuinness and Johnson, 2014). Likewise, although information can be helpful, it can also exacerbate equivocation (Weick, 1995) and can reduce the likelihood that SMEs engage in formal risk planning (Herbane, 2015). In this study, we focus, rather, on the cultural factors that influence how information about flooding is processed and used. By doing this, we aim to explore the reported inattention of small business owners to crisis management (Sullivan-Taylor and Branicki, 2011) and their preference for muddling-through (Spillan and Hough, 2003).

Following an established tradition in business research (Huber, 1991) we focus on whether and when experiences of external shocks elicit cultural changes that extend a business' ranges of adaptive behaviours. We ask whether business owners' apparent ignorance about flood risk and PLR might be the result not of a lack of information but of the deliberate, if unconscious, interpretation of that evidence in a manner that facilitates the survival of existing interpretative systems. In doing this, we look at how small business owners make sense of flooding and flood risk.

Sensemaking

To understand small businesses' willingness to use PLR, we employ Weick's (1995) notion of *sensemaking* – a way of understanding the (usually unconscious) process of understanding ambiguous or confusing events (see Brown et al., 2015). According to the sensemaking perspective, when choosing a course of action, actors minimise disruption to pre-existing *interpretative frameworks* by “distorting information slightly to make it fit into existing, and familiar, [causal] maps” (Morrison, 2002, p7). These interpretation frameworks contextualise the cues people receive from their environments and are the lens through which they view the world around them (Daft and Weick, 1984; Smircich and Stubbart, 1985; Weick et al., 2005) and determine how to act (Sandberg and Tsoukas, 2015).

Sensemaking is “grounded” in organisational identity (Sandberg and Tsoukas, 2015: p8) and is the vehicle through which social identities shape how people understand events (Weick, 2001). Shared interpretation frameworks therefore improve the instrumental effectiveness of organisations by providing common purpose and identity and enhancing functional effectiveness (Scott, 2005; see also Meyer and Rowan, 1977).

Interpretation frameworks are only revised when new experiences challenge their legitimacy sufficiently to facilitate the unlearning that, as Hedberg (1981) first showed, is the precursor to new learning (Appelbaum and Goransson, 1997; Cope, 2003; Krasner, 1988; Shepherd, 2003). This requires sufficient cognitive disorientation to cause sensemaking to become, briefly, a conscious and reflective process (Weick et al, 2005; Mezirow, 1997). When the evidential challenge is less robust and interpretive ambiguity allows room for subjective attributions of responsibility, accountability and liability, the sensemaking process ensures the preservation of existing interpretation frameworks (see Levitt and March, 1988). Such ambiguity allows business owners to: regulate the effects of an event by focussing on aspects of the experience that are

consistent with existing sensemaking structures; overlook other aspects of the experience (Sandberg and Tsoukas, 2015; Weick, 1988), and find explanations that do not bring these structures into question (Maitlis and Christianson, 2014). Such path dependency (see Cheung and Kwong, 2017) encourages reliance on “the exploitation of old certainties” (March, 1991: p71) and leads businesses to eschew more radical, creative approaches (Berkhout et al., 2006). This, Berkhout (2012) argues, explains why many adaptations to climate risks are based on existing organizational capabilities, practices and technologies, and fail to draw on external inspiration and fresh ideas.

Emotions

The cognitive disorientation just discussed is an antecedent of emotions that, according to the literature on sensemaking amongst owners of small businesses, play an important determining role in emotional responses to shock. Here the term ‘emotions’ refers to the “running commentaries” on people’s concerns (Archer, 2000) that allow them to orient themselves to situations (Burkitt, 2014): i.e. the cognitions that result from physiological arousals (see Schachter & Singer, 1962), rather than the arousals themselves (Burkitt, 2014).

According to Byrne and Shepherd (2015), cognitive disorientation alone is not a sufficient precondition for the review of interpretative frameworks. They argue that both negatively and positively valenced emotions are necessary: the former because they provide motivation for the review of these frameworks; the latter because they enhance the capacity to conduct the necessary cognitive processing. Similar arguments are made in the literature on *proactivity*, where the capacity for anger and fear to generate positive behaviour change (Lebel, 2017) is linked to Parker et al’s (2010) argument that such change requires emotional energy. Guilt, too, is said to be a key element of the essential emotional mix (Yamakawa et al., 2015), because the internal locus of control implied by a feeling of guilt is an important motivator of change (Yamakawa et al., 2015) and because self-blame results in deeper learning (Walsh and Cunningham, 2017).

The role of emotions has been considered, too, in the literature on flooding and natural hazards (Sattler et al, 2000; Siegel et al, 2003; Grothmann and Reusswig 2006). These studies, however, have produced inconsistent results. Furthermore, with the exception of research by Harries (who links householder inaction in the face of flood risk with anxiety and psychological denial – 2008, 2012) no previous studies have

looked at the mechanisms by which emotions affect the learning and adaptive behaviour that result from external shocks.

This study is amongst the first to consider the role of emotions in the transformation of sensemaking structures, and therefore contributes to the literatures on both sensemaking and emotions. It also breaks from past practice by eschewing assumptions of rational decision-making and applying an approach that focusses on why owners make sense of their experiences in certain ways. To investigate these topics, the study analyses how owners of flooded businesses talk about flooding and flood risk. It looks for evidence of interpretation frameworks influencing the rhetorical structure of talk and at evidence regarding the role of emotions in determining these rhetorical strategies.

Methodology

Research design and setting

The study used narrative interviewing (Elliot, 2005; Czarniawska, 2004), an approach often employed to reveal the mechanisms behind behavioural responses (Elliot, 2005) and the meanings of experience (Thomas, 2012). Narrative interviewing is particularly suitable for rare and emotionally connoted phenomena (Byrne and Shepherd, 2015) and is frequently used in research into business failure (e.g. Byrne and Shepherd, 2015; Yamakawa et al., 2015; Corner et al., 2017), a topic that shares with flooding features such as threats to ontological security and potential feelings of guilt.

Fieldwork was conducted in England, where three wide-spread and protracted flood events in the previous decade had raised the public profile of flooding considerably. As revealed by the authors' experiences in radio and television interviews, the UK media discourse usually focusses on the adequacy of state efforts to control flood risk, rather than on the responsibilities of individuals or organisations. Hence, despite efforts by the government and others to promote PLR (e.g. Defra, 2008; Twigger-Ross et al., 2015), business awareness remains low and there is no culture of flood risk adaptation (Bonfield, 2016). The fieldwork areas constitute contrasting geographical and social environments and include industrial estates, high streets and home-based businesses in areas that are post-industrial, seaside or semi-rural.

Sampling

A short-list of areas in England in which small businesses were known to have been affected by recent floods was identified by consulting the government body with lead responsibility for flood risk management, the Environment Agency, as well as a charity that works with flood victims. The authors then spoke to the relevant local authority emergency response teams and local Environment Agency staff to confirm the presence and scale of small business flooding, before selecting areas from southern, central and northern England.

To ensure that participants could recollect clearly how they had responded to their experience, while also allowing sufficient time for businesses to have recovered sufficiently from the floods, businesses were only invited to participate if they had been flooded between one and six years previously. These businesses were identified via Environment Agency flood maps, conversations with local people and phone calls to businesses in affected areas.

To ensure the inclusion of a range of perspectives, we used the maximum variation purposive sampling technique recommended by Lincoln and Guba (1985) – selecting as our primary sampling criterion business size and as our second, the number of floods experienced. Recruitment was by the authors, who approached the owners of businesses by email, telephone and by calling at premises in person. The study included the owners of fourteen businesses. Five had between ten and twenty employees and so would be termed ‘small businesses’ according to the European Union definition, the remainder had less than ten staff and so would be termed ‘micro businesses’ (European Commission, 2003). Six had been flooded more than once, seven just once, and one had only experienced indirect flood impacts. Participants owned a range of different types of business and were fairly evenly divided in terms of tenure (See Table 1). Tenure was not, however, one of our sampling criteria; although tenancy limits the PLR options available to businesses, there are many ways of making rented premises more flood-resilient (e.g. flood-resilient flooring and furnishings; the elevation of stock and white goods).

Table 1 Characteristics of the sample (listed in order of appearance in the text)

Pseudonym	Business	Employees	Floods experienced	Tenure
Martin	Media	20	Several	Owner
Gilbert	Personal grooming	4	Several	Owner
Phillip	Restaurant	20	One	Tenant
David	Restaurant	10	One	Owner
Karen	Clothing retail	1	One	Tenant
Gary	IT services	5	Four	Tenant
Gail	Printing	4	One	Owner
Gordon	Building supplies	15	Several	Owner
Clive	Industrial parts supplier	2	Three	Tenant
Barry	Property management and vehicle repair	8	Three	Owner
Delia	Personal grooming	4	One	Tenant
Simon	Manufacturing	1	One	Tenant
John	Motor services workshop	12	One	Owner
Ewan	Restaurant	6	One	Tenant

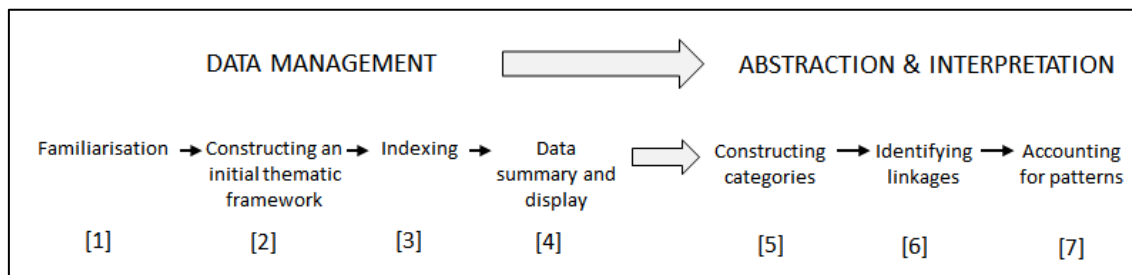
Data collection

In an effort to “activate narrative production” in the interviews (Holstein and Gubrium, 1995: p39) and reduce the post hoc rationalisation associated with reasoned accounts (e.g. Hollway and Jefferson, 2000; Czarniawska, 2004) a narrative interviewing approach was used for key research topics: the experience of being flooded; what happened after the flood, and changes made because of the flood (see Appendix 1). For these topics, participants were encouraged to talk at length and in depth about their experiences by the use of prompts – e.g. “tell me about the flood” and “tell me what happened after the flood”. In these sections of the interview, the interviewer interrupted as little as possible, reserving specific prompts until the end of each narrative section and keeping direct questions to a minimum. Other parts of the approximately hour-long interviews were more conversational and had less of a narrative structure – i.e. sections on flood awareness and the characteristics of the participant and the business.

Data analysis

The analysis process used is illustrated in Figure 1, which shows the journey from data management to interpretation. After familiarisation with the data [1] (see Willig, 2001) an initial thematic framework [2] was created that consisted of themes relating to the research question (e.g. ‘property level resilience’; ‘denial’). Next came the process of *indexing* [3] (Seale, 1999), in which all sections of the text were marked that were pertinent to the themes in the framework. Subsequently, a *framework matrix* was created [4] that summarised and displayed the indexed data using a data row for each participant and intersecting columns of data for the themes (Figure 2). This matrix facilitated an iterative interpretation process (Fram, 2013; Glaser and Strauss, 1967) in which the analyst was able to “move back and forth between different levels of abstraction without losing sight of the raw data” and to engage in “both cross-case and within-case analyses” (Spencer et al., 2014a, p283). This process led to the development of a set of higher order *categories* (or *codes* – Seale, 1999) [5] and linkages between these categories [6] (Spencer et al., 2014b), from which the study findings were generated [7].

Figure 1 The data analysis process (adapted from Spencer et al., 2014b)



Cells in the framework matrix reflected not only the overt content of interviews but also analysts’ interpretations of underlying intentions and assumptions (e.g. see Austin, 1962; Levinson, 1983; Fairclough, 2003) – for example, the use of blame or denial to defend existing sensemaking structures. This reflects the views of Weick (1995) and others that people are not necessarily cognisant of the causes of their behaviour, and follows the linguistic tradition initiated by Wittgenstein (1953), Austin (1962) and Halliday (1973, 1994), which argues that language is essentially rhetorical rather than communicative. As per Potter and Wetherell (1987) rather than using one fixed method of analysis, the authors sensitized themselves to the different strategies that can be used to construct meaning and read transcripts with these in mind, uncovering meanings and constructions that might otherwise have been overlooked. Analysts critically interrogated their own techniques of sense-making and constantly

asked: “why am I reading this passage in this way? What features [of the text] produce this reading?” (Potter and Wetherell, 1987, p168).

Figure 2 Excerpt from the framework matrix – amended to protect anonymity
(Note: verbatim quotes are in inverted quotes; analysts’ interpretations, in italics)

	Flood background	Property level resilience (PLR)	Future risk	<i>etc.</i>
Martin	<p>Flooded twice. 2nd time: no longer insured against flood; £150K damage. The community level flood defence installed after 1st flood failed in 2nd flood.</p> <p>Losses: computers; 40 days’ production; unique creative works; lost invoices led to loss of income. Used own pension fund to rescue business.</p>	<p>Confident, experienced builder, so adapting premises to flood risk “would have been quite easy”.</p> <p>No sign that concerned now that don’t have pension fund as emergency reserve and no insurance. Reliant on collective defence.</p> <p>“One or two other” local people adapted their buildings <i>Potential source of information/inspiration about adaptation?</i></p> <p>“We didn’t lose our house, so the trauma of some people losing a house is, you know [...]” <i>Comparison to those worse off is rhetorical strategy for not building wall?</i></p>	<p>Assumes it will happen again, but that communal defences will work.</p> <p>‘thought of building my own flood defences [but] we were told it would never flood again.’</p> <p><i>Reluctance to plan for repeat flood by considering what might happen.</i></p> <p>Implied by: “I don’t think about things <u>inasmuch as</u> “well what had happened if...”, you know, it didn’t so we managed to survive.” (prompt was: “what if you hadn’t had your pensions to draw on?”)</p> <p>“It’s not at risk any more”</p>	<i>etc.</i>
Gilbert	<p>“we get floods all the time but not as bad as it was [in the flood focussed on in the interview]”</p> <p>Friends and customers helped him repair/reinstate his shop. Didn’t wait for insurance process because “had to get on with the job”.</p> <p>£30K repairs, including new floor.</p>	<p>Focuses on keeping water out, which he presents as impossible.</p> <p>Has “moved furniture” and elevated sockets, but does not easily volunteer this info – <i>as if not keen to talk about it.</i> e.g. only mentions sockets after direct prompt.</p> <p>“you cannot adapt anything what nature’s bringing down”</p> <p><i>Seems to prefer a self-presentation as phlegmatic.</i> This precludes adaptation: “we don’t have to worry... it’s just one of those things”.</p> <p><i>Adaptation as destructive of identity:</i> “... I mean my [business] wouldn’t be my [business] if I had a bloody brick wall round it!” [Laughs]</p>	<p>“We’ll always have floods here; we always will but I don’t think we’ll have a flood like that for a few years yet.”</p> <p>“I don’t think it will happen for a few years – not in my lifetime anyway”</p>	<i>etc.</i>
<i>etc.</i>	<i>etc.</i>	<i>etc.</i>	<i>etc.</i>	

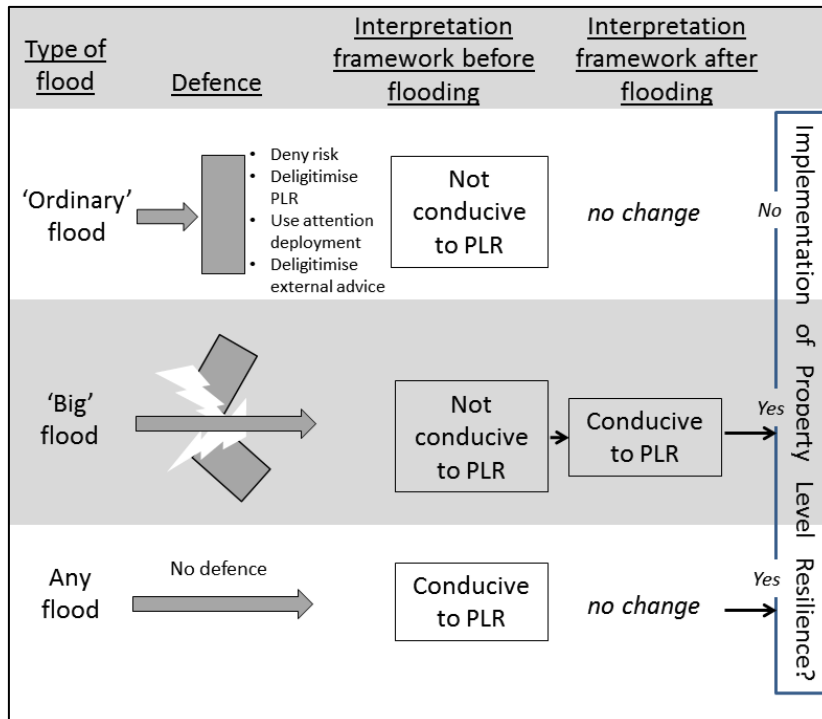
The methodological awareness necessary for this approach to analysis is indicative of the skills required to provide high-quality research in qualitative methodology, where rather than being indicated by inappropriate “strict rule following” (Seale, 1999, p34), the quality of a project is indicated by the experience, skills and reflective capacity of the research team. The quality of this study is further indicated by markers of procedural best practice: the use of verbatim interview transcripts that were produced by professional transcribers and taken from high quality recordings (Peräkylä, 1997); systematic and iterative engagement with the data (Seale, 1999); analysis of the interaction between the interviewer and the respondent (Rapley, 2001), and the avoidance of data fragmentation (Hollway and Jefferson, 2000). Data was coded by one of the authors. Although member checks and inter-coder verification are sometimes recommended, the authors took the position that the existence of “multiple constructed realities” (Lincoln and Guba, 1985, p295) renders these inappropriate. However, to allow readers to assess of the credibility of interpretations, long quotes are provided wherever possible (Willig, 2001).

This approach led to the identification of a number of analytical themes, of which the most salient to this discussion were: a. representations of PLR within the interviews, and the rhetorical strategies used to achieve/maintain these; b. representations of flooding and flood risk, and the rhetorical strategies used to achieve/maintain these; c. representations of business identity, and the rhetorical strategies used to achieve/maintain these; d. evidence of emotional responses to flooding, and e. evidence of emotion regulation strategies. The data in themes a, b and c was used to build an understanding of relevant sensemaking structures and strategies for their defence; d and e provided the data for our analysis of emotional influences whether these structures were reviewed in the light of the flooding.

Findings

The findings of the study are presented in four sections. In the first section, we discuss the category of business owners whose interpretative frameworks were not conducive to PLR and were unaffected by the experience of flooding. In the second, we present the category of owner for whom flood experience constituted a sufficiently robust shock to prompt revision of interpretative frameworks. Next, we discuss the category of owner whose interpretative frameworks were already compatible with PLR and were not therefore challenged by the flooding. These three categories are depicted in Figure 3. In the final section, we reflect on the role of emotions in the transformation of interpretation frameworks for each of these categories of owner.

Figure 3 Summary of findings in first three sections



1. Businesses for whom sensemaking structures constrained PLR use

Our discussion of the findings begins with those business owners who had interpretation frameworks not conducive with PLR and were able to preserve these frameworks because their flood experiences did not constitute sufficiently severe challenges. These owners used a range of rhetorical strategies to justify not implementing PLR (Figure 3).

One form of defence that was used by participants was the psychological denial evidenced elsewhere in the flooding literature (Grothmann and Reusswig, 2006; Harries, 2017). Martin (media business; several floods; 20 employees) denied the ongoing risk by citing the existence of a new community defence – even though this defence had recently failed and his business had flooded as a result. This denial enables him to think of his business as “not at risk” and, he indicates, informed his decision not to implement a “quite easy” PLR measure by building a flood wall. A further example is Karen (clothes store; flooded twice; one employee), who projects

her denial onto a third party by explaining that she did not suggest PLR to her landlord because, “they’ll probably look at it and say, [...] ‘is it likely to happen again?’”.

A further example of denial is provided by Gilbert (personal grooming services; flooded several times; four employees). He uses exaggeration and mockery to preserve his ability to deny future risk, counter the notion that he should protect his business from flood damage and defend the social identity of the business:

[Flood risk is] just one of those things that we accept. I don’t think it will happen for a few years – not in my lifetime anyway. I don’t think so, no. [...] There’s nothing really you could... you couldn’t bring a brick wall round it because... I mean my [business] wouldn’t be my [business] if I had a bloody brick wall round it! [Laughter]

One participant, David (restaurant; flooded once; ten employees), reveals a denial strategy that appears close to being overcome by the evidence of recent flooding:

Interviewer: So if it happened again, then what?

David: [hesitation] Well, I’ve kept some of the sandbags [self-mocking laughter]. So if it happens again, I would put the sandbags in the doors and just... you just got to pray that it doesn’t get as bad as that, you know. But then again, who’s to say – global warming and all this. Yeah. It could [hesitates] have been worse; it could get worse; you never know really. But you can never really tell I suppose. We didn’t get flooded as bad as [nearby street], you know.

Although this passage shows evidence of the rhetorical strategy of denial (“you just got to pray that it doesn’t get as bad as that”), the text is heavy with ambivalence. The discomfort, hesitation and general cognitive disorientation in this excerpt suggests an uncertainty about how to view the safety of the business and a vulnerability in existing interpretative frameworks. This is evident in David’s mockery of his own adaptations, the sense of futility hinted at by “just” and the admission that it “could get worse”. To avoid a final breakdown of the existing sensemaking structures, however, David uses the rhetorical tactic of *attention deployment* (Gross, 2015) to shift the focus of the conversation away from his own situation and onto that of others.

Alongside denial, another way of defending interpretation frameworks is to delegitimise behaviour changes that would imply changes to these frameworks. Phillip (single flood; restaurant; twenty employees) does this by finding reasons to reject the use of PLR and defend his reliance on sandbags:

We sat down and thought, “there’s nothing we *can* do”. There isn’t physically anything you can have built. But there is and it’s a ledge on the concrete that comes up. But I don’t know if it can be built. You know, like if you’ve got a car in the garage and you lift a barrier up [...] I can’t imagine it’s cheap or practical. (Stressed words are shown in italics)

The text in this passage builds equivalence between what you can *do* to mitigate the risk and what you can *have built*. By so doing, it constructs a notion of PLR that excludes measures that do not involve any building. This allows PLR to be more easily rejected. According to Phillip, the only type of built PLR that might be of help is neither “cheap” (a synonym here for affordable) nor “practical”, and this justifies Phillip’s continued reliance on sandbags and prevents him from having to revise his existing interpretation framework.

In another case, although the interpretative framework of a participant was conducive to the notion of PLR, it was not conducive to PLR suggestions from outside experts. Gary (IT business services; flooded four times; five employees) had already implemented numerous PLR measures – for example by raising expensive equipment beyond the reach of floods. As other parts of the interview confirm, he recognised the existence of an ongoing risk, admitting that the business would be “knackered” if there was a severe event and that they “got away with it” in the recent flooding. However, he says “you don’t need advice” and characterises unsolicited advice from outsiders as unwelcome interference (like living in “a nanny state”). Self-reliance is a key part of his social identity and he interprets the situation, accordingly, as one in which the risks are amenable to his skill set and do not require any outside input.

The analysis presented so far in this section suggests that some of the businesses in this study engaged less with the idea of PLR because of sensemaking structures that are integral to their social identities but not consistent with flood risk adaptation. Implementing PLR would have prevented them from denying the nature of the risk. It would have obliged them to admit that ‘muddling through’ with reactive approaches was inadequate, to let go of a notion of flooding as something “normal” and to set aside the myth of self-reliance – the *fortress enterprise* mentality (Curran et al., 1993). Rather than set aside these constructs, we suggest, the businesses in this section limited their engagement with the idea of PLR.

2. Businesses that revised sensemaking because of flood experience

In this next section, we illustrate how more ontologically significant flood experiences can overcome the defences that sustain existing interpretation frameworks (Figure 3).

The distinction between ontologically significant floods and other floods was first suggested to the analysts by Gordon (building supplies; flooded several times; fifteen employees), who distinguished between “big” floods and “ordinary” ones. The respondents discussed in this section all described floods that can be categorised as *big*, or ontologically significant. Gail (printing; flooded once; four employees) reported that she “only just got out” in time to avoid the frightening scenario of a rescue, and described the flood with the terms “terrible” and “devastation”; Clive (industrial-parts distribution; flooded three times; two employees) used the phrase “angst and heartache”; Gordon described the flood as “like a torrent” and “daren’t go in” to inspect his premises afterwards; and Barry (property management/vehicle repair; flooded three times; eight employees) described the flood risk as threatening the very sustainability of his business. We consider such floods to be examples of what we call *ontological shocks* – events that constitute a significant challenge to owners’ beliefs or assumptions and institute changes to business identify as a result.

These *big* floods caused long-lasting changes to owners’ sensemaking structures. For example, Gail reported that she would not “ever feel normal [again]”, that the flood risk was always “in the back of [her] mind” and that she had discarded her reliance on society to protect her business (“We are not a third world country; we should be able to cope with it, and we can’t.”). This led to the adoption of PLR and other adaptive behaviours. Clive relocated his business to a less flood-vulnerable unit; Gordon installed a new mezzanine floor for the safe storage of stock; Gail began to store vulnerable items above flood levels; and Barry began to market his industrial units at more “dirty”, flood-resilient businesses such as vehicle repair companies.

3. Businesses whose interpretation frameworks were compatible with PLR prior to the flooding

The data suggests that a third category of participants has interpretative frameworks that were compatible with PLR prior to experience of flooding (Figure 3). For them there was no need to defend interpretative frameworks against the notion of adaptation, acceptance of the risk or other learning from the flood. Such respondents reported having used PLR or similar adaptive strategies.

Delia (personal grooming; flooded once; four staff) describes a pre-flood interpretative framework that allowed her to accept and adapt to set-backs (“you can’t actually stop what’s happening, you have to learn from it”). Her deployment of PLR measures “without actually realising” she was doing it implies a tacit knowledge and skills in this area. Simon (manufacturer; indirectly impacted by one flood; one employee) had normalised flood risk (“everyone in town realises” and “everyone knows the issues”), had a “back-up plan” for eventualities such as floods, and had set up his workshop so that he could move vulnerable items off the floor and be quickly “up and running again”. Karen reported “just get on and deal with it” attitudes and behaviours and had applied these to the flood risk, installing a new flood barrier after a flood that she described as “not major”.

A variation on this theme is provided by Ewan (restaurant; one flood; six employees) whose interpretation framework was flexible in the face of flood risk because he had already been reviewing the nature of the business (“do we stay with the old or do we spread our wings?”). His interpretation frameworks were in flux and provided less resistance to the idea of flood risk and PLR, so he was able to move all flood vulnerable activities out of at-risk parts of the premises.

The greater openness of such business owners to PLR is illustrated by a passage in which another interviewee, John (motor services workshop; flooded once; twelve employees), reflects on the possibility of using special valve to stop sewage from being forced into his premises by floodwater:

I think we could put a big stopcock on the... probably on the soil pipes. I don’t know; I’d have to have a look at it. [Pause] But then most pipes coming back from the stopcock, you know, most soil pipes even going into the ground are just plastic. You probably need to put metal ones in, because the pressure of the water, it’s probably way beyond what the plastic pipe’s designed to cope with.

This passage marks a sharp contrast with the extract from Phillip’s interview presented earlier. Although John’s interrogation of the idea is similarly rigorous to Phillip’s the lack of resistance from his sensemaking structures leaves him more open to PLR and allows him to search for ways around the presenting challenges.

4. The influence of emotional reactions

In this final findings section, we interrogate our data for evidence of reported or expressed emotional reactions to the flooding and ask whether this might be

associated with success in defending interpretative frameworks. In particular, we look for evidence regarding Byrne and Shepherd's (2015) claim that the transformation of sensemaking systems requires both positive and negative emotional responses to a crisis event. The conclusions of this search are shown in Figure 4.

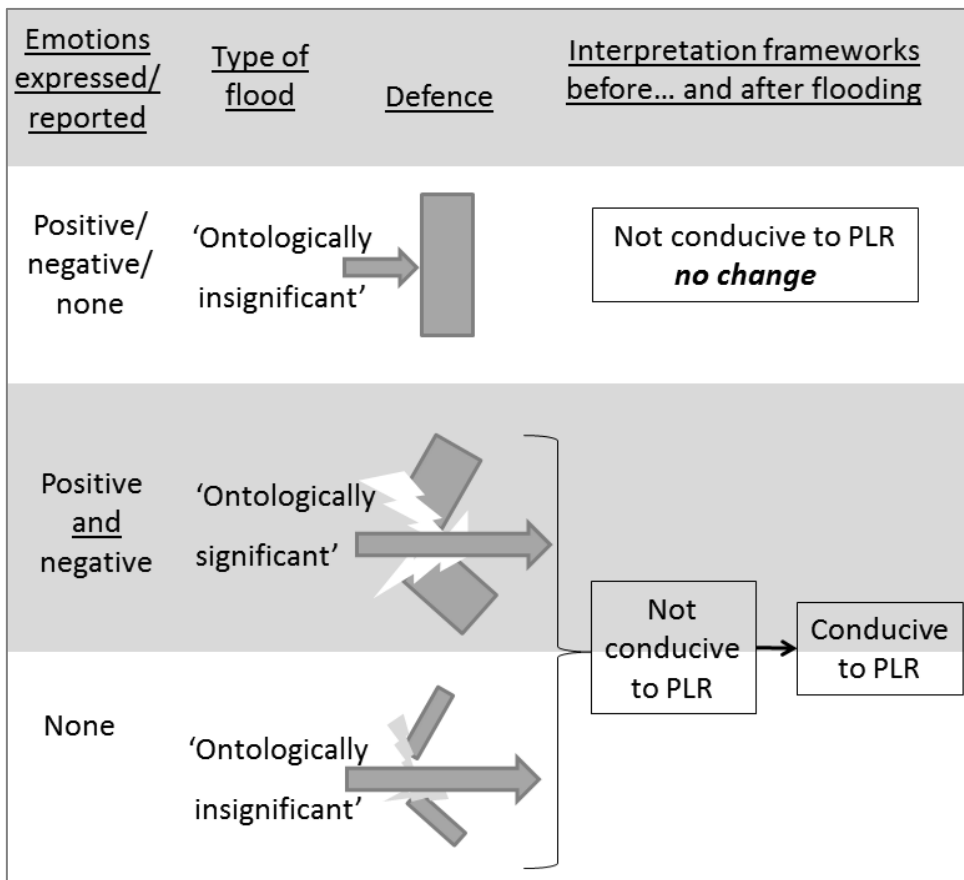
To this end, we contrast the emotional responses of businesses that changed their sensemaking structures as a result of flooding with those that continued to resist acceptance of the flood risk and PLR. Notwithstanding the small size of the sample for such an exercise, this analysis provides some support for the contention that both positive and negative emotional cognitions are required for the revision of sensemaking structures. However, it also points to the possibility that this argument is only valid for aspects of interpretative frameworks that constitute core parts of identity.

Of those whose sensemaking structures changed in response to the flooding, the data from three interviews supports Byrne and Shepherd's assertion and that from a fourth, with Barry, does not. Although Barry describes the flood as "frightening" in the speed of its arrival, in contrast to the interviews with Clive, Gail and Gordon, this allusion to fear is the only signal of negative emotion. Barry also conveys less positive emotion. Gail describes customers' response to the flooding as "really understanding" and says that her insurers were "really good"; Gordon says his insurance company and loss adjuster deserve "nothing but praise", and Clive associates positive emotions with the cleaning-up process ("cheerful staff"; getting "stuck in"; "good fun"). In contrast, when Barry describes himself as "lucky" to have been on site at the time of the flood and to have rescued threatened stock, the flat tone and absence of hyperbole convey a less positively valenced emotion.

This lack of strong emotional signals is not explored in Barry's interview. However, it is notable that the changes to his sensemaking structures and the resulting adaptive behaviours both relate to the tenanted business units, a part of the business to which he is less emotionally attached. Barry reports that he bought these units from his erstwhile landlord only because they were packaged with the freehold for his existing vehicle repairs business, and he suggests that they had never become a core part of his business' social identity. This explains why the representation of the tenanted units was not defended with as much determination; Barry did not want them to "drive down" the rest of the business so the sacrifice of this part of the business defended the sensemaking structures and identity of the business as a whole. This leads us to hypothesise that the requirement for positively and negatively valenced emotions might depend on the significance of the impacted interpretative framework to the

identity of the business. This, in turn, leads us to suggest an additional category of business owner: that for whom the defence of the relevant interpretation framework, being relatively weak, can be penetrated by a flood that is not ontologically significant.

Figure 4 Emotional responses to flooding (amongst those with interpretation frameworks not conducive to PLR)



We now turn to the interviews with those whose interpretative frameworks *did not* change. As predicted by Byrne and Shepherd's (2015) proposition, none of these interviews demonstrated negative and positive emotional responses to the flooding. Two revealed very little emotional response at all: Karen who conveyed detachment ("so there's no point in panicking about the inevitable") and Gary claimed to be "pretty sanguine". Others described positive emotions only: a determination "to be happy" (Gilbert) or a focus on the "novelty" or "comical" characteristics of the flood (Phillip).

Finally, Martin's interview demonstrated a strong negative response ("very, very upsetting"; "grim") but did not reveal any positive emotions.

Discussion

This study set out to understand the influence of interpretation frameworks and business identities on owners' learning from, and responses to, flood events. The research found some evidence to support Maitlis and Christianson's assertion that owners respond to such threats by "constructing new accounts of themselves and their organisations" (2014, p75) but also noted the use of ego defences to defend their identities and associated sensemaking structures (see Brown and Starkey, 2000). The analysis indicates that commitment to interpretation frameworks and identities can sometimes prevent owners from revising their assessments of the probabilities and likely impacts of flooding, and from extending the range of adaptive measures they consider. The interviews revealed efforts to defend pre-flood representations of businesses (as "happy", destined for success, self-reliant etc.) using rhetorical tactics such as denial, attention deployment and the externalisation of responsibility. Similarly, prompts to consider types of PLR that did not fit comfortably with owners' interpretation frameworks sometimes led to the use of rhetorical tactics to delegitimise PLR. The data suggests that only floods that are ontologically significant are able to transform frameworks that are critical to business identity, and it indicates that this effect might be mediated by the mixture of positive and negative emotions that are generated by such floods and not suppressed by emotion regulation strategies. Smaller floods, the analysis suggests, will only transform interpretation frameworks that are less central to identity.

The study has a number of limitations. Firstly, although analysis of talk is always subjective, it is especially so when the aim is to identify rhetorical strategies of which participants themselves are not cognisant. Secondly, although narrative interviewing reduces recall bias by allowing participants to gradually reconstitute their memories of past events, the historical nature of the flooding in some of the interviews may have affected data quality. Although these two limitations are undeniable, their significance for this study is constrained by the aims and epistemological framing for this study, for neither of which reliability is a relevant mark of quality. Rather than seeking reliable findings, this research set out to identify *plausible* explanations that challenge existing explanations of small business 'inattention' to crisis planning. We believe that we have found sufficient evidence to constitute such a challenge and that these findings, although tentative, warrant elaboration in further research.

A further limitation of this study is its exclusive focus on small and micro businesses. The absence of large in the sample precludes empirical commentary on differences in climate change adaptation that result from company size. However, the study's conclusions about the role of business identity do suggest an avenue for exploration. Smaller businesses are more often "tied up with the life and identity" of owners (Culkin and Smith, 2000, p149), who are usually more invested in the business' identity than are decision-makers in larger companies, which tend to have more role specialisation. This might serve to magnify the importance, in small firms, of the role of interpretation frameworks in slowing adaptation to climate change.

The findings of this study are potentially discouraging for those seeking to promote small business adaptation. However, it is worth noting that they are the result, at least in part, of the sensemaking approach's focus on individuals as the unit of analysis (Maitlis and Christianson, 2014). Although sensemaking is described as a "fundamentally social process" (Maitlis, 2005: p21), few studies take account of social influences that originate from outside the protagonist organisation (Sandberg and Tsoukas, 2015; though for an exception see Gephart, 1993). As a result, the circular relationship between sense and action (Sandberg and Tsoukas, 2015) appears to leave interpretation frameworks closed to propositional influences exerted by social entities other than the organisation itself. Complementary studies are needed that look at the discursive knowledge and learning that results from collisions between contradictory propositions within the social milieu of the small business owner.

It is also worth noting, however, that the participants appeared to have no great appetite for discursive learning that reached out beyond existing social networks. Neither spontaneously, nor when prompted, did owners say that they had, or would be willing to, consult outside experts. In fact, remarks made after the interviews indicated that they would only trust the opinions and advice of other owners of small businesses. The challenge of extending the range of sources from which owners are willing to acquire discursive knowledge is, we believe, a key issue for those wishing to promote climate change adaptation amongst small businesses.

As well as pointing to a weakness of sensemaking theory as it is currently applied, this study helps explain why only a minority of small businesses adapt to flood risk after a flood event. Our arguments illustrate how, when faced with the risk of flooding, owners' assumptive worlds and pre-existing representations restrict their capacity to gain the kind of learning that would prompt them to adapt to the ongoing flood risk. In the presence of these knowledge constructions, there seemed to be a limited

possibility of some businesses either accepting that there was an ongoing flood risk or implementing new ways of reducing their vulnerability.

Additionally, the study found no support for Burgoyne and Hodgson (1983) and Levitt and March (1988) argument that repeated low-intensity events gradually erode existing interpretation frameworks even when there is initial resistance to such change. The analysis of the interviews presents the possibility that statistical associations between repetition and adaptation are spurious findings – the result of a historical succession of small and a single, subsequent larger flood event. The analysis in this paper supports Krasner's (1988) and Appelbaum & Goransson's (1997) assertion that the revision of such frameworks is prompted by conceptual challenges to businesses' assumptive worlds, rather than by the material impacts of external shocks. It is, as Maitlis et al (2013) argue, the felt emotions associated with an external shock that "energise" sensemaking sufficiently to overcome the "cognitive, identity, and social costs" involved in adapting interpretation frameworks (p5). A series of smaller shocks would not provide this 'energisation'. This suggests, also, that Maitlis et al.'s (2013) model of the role of emotions in sensemaking requires reviewing. They propose that moderately negative emotions will prompt the revision of interpretation frameworks but that extremely negative ones will not; our analysis suggests that the force of moderate emotions is more easily deflected by defensive strategies than that of more extreme emotions.

The key question, therefore, is whether an external shock such as a flood creates sufficient emotional impact on the owner. We propose the term *ontological shock* to distinguish shocks that do from those that do not. This distinction, we suggest, will help avoid category errors in studies testing for correlations between shocks and behavioural responses to those shocks. It might also help focus attention on the emotional gravity of floods and reduce the existing, sometimes unhelpful, focus on their physical characteristics.

Alongside the intensity of the challenge to identity-critical assumptions, a second factor affecting the impact of emotions on sensemaking structures is the combination of emotional responses. Our analysis provides some support for Byrne and Shepherd's (2015) assertion that a combination of positive and negative emotional reactions is a prerequisite for the revision of sensemaking structures. The presence of blame-avoidance strategies amongst those that did not change their sensemaking structures also indicates some support for Yamakawa et al.'s (2015) argument that guilt acts as a motivator of change. The defence of sensemaking structures illustrated in this study is an example of how people manipulate their cognitive responses to initial physiological

arousals in order to minimise the latter's negative impacts (see Gross, 1998; 2015). As a result of their need to retain their focus on long-term business goals, small business owners are particularly adept at this (O'Shea et al, 2017); this, the study suggests, can reduce negative emotional cognitions to the point where there is insufficient 'energy' to fuel changes to sensemaking systems and behaviour.

Attempts at emotional regulation, this research found, also delegitimise the notion of adaptation. Owners whose sensemaking structures were not either in flux or compatible with resilient adaptations were less able to search for new ways of improving business resilience. They relied, instead, on established, familiar and trusted forms of adaptation. This begins to explain small business owners' apparent 'indifference' to crisis planning (Spillan and Hough, 2003). Although initially puzzling and contradictory to the observer this 'indifference' is, our evidence suggests, instrumental, intentional and aimed at defending identity.

Conclusions and implications

This study points to the need for a revision of both the theory and application of sensemaking. Firstly, it suggests that sensemaking should learn from theories in psychology, such as *social representations theory*, by broadening its purview beyond the business organisation itself (Weber and Glynn, 2006) and analysing the broader social context within which decision makers operate. Although owners may sometimes limit their discursive references to within their own business in-groups, it is important to understand what role is played in the formation of sensemaking structures by actors from outside their organisations. Examples suggested by this research include local authorities and professions such as building and architecture, but other examples might include trade groups, businesses associations such as chambers of commerce and even government bodies such as the Environment Agency. Expanding analyses to include such external influences on the sensemaking process is a necessary complement to the present study's attempt to understand the inertia evident in businesses' responses to flood risk and climate change.

The arguments presented in this manuscript call into question the pre-eminence of resource scarcity and information deficit explanations for the poor disaster-readiness of small firms. They elaborate alternative explanations based on questions of social identity and its role in obfuscating the meaning of information and ruling out certain behaviours. This research only looked at businesses' responses to direct experience of flooding and not at their responses to information from other sources. However, if there is validity to the sensemaking approach and to this study's conclusions about the

role of interpretation frameworks, this obfuscation is likely to apply, also, to information provided by government campaigns, websites etc. This would suggest a need to review the ongoing reliance on information provision (e.g. Defra, 2016). Our conclusions regarding the role of identity in anchoring interpretative frameworks indicate that such campaigns are likely to fail if the information is perceived as coming from an out-group or as threatening social identity.

This study throws up suggestions for the design of future research into business adaptation. Survey-based studies into the impacts of external shocks, it suggests, should distinguish between 'big', *ontological shocks* and 'ordinary' events. Further qualitative enquiry is needed into the factors that determine why floods are sometimes perceived as *big* and sometimes not.

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