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Cognitive shifts within leader and follower teams: Where consensus develops in mental models during an organizational crisis

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ABSTRACT

This empirical study investigates cognitive shifts in both leader and follower teams when developing consensus or agreement in how to resolve a slowly emerging organizational crisis over time. The cognitive maps of leaders and followers are analyzed in team settings to explain where consensus is formed. The findings indicate that consensus, or the agreement on the causal beliefs held to be critical to organizational adaptation and success, builds over time within both leader and follower teams. However, when comparing the development of consensus longitudinally, the findings confirm that the mental models of leadership teams converge towards follower teams, and not the other way around, during the crisis. The study provides new insights into the importance of the causal beliefs of follower teams when developing a vision to coordinate action to resolve a crisis.

Introduction

Organizational crises are high-impact events that threaten the viability of organizations (Pearson & Clair, 1998). Consequently, formulating and directing a vision to resolve a crisis is a significant challenge for leaders (Mumford, Friedrich, Caughron, & Byrne, 2007). One initial task is to make sense of the ambiguous conditions thrown up by the crisis, because different interpretations of the same events can occur even within teams in individual firms (Combe & Carrington, 2015; Kilduff, Angelmar, & Mehra, 2000; Markóczy, 1997). In this context, leaders' mental models are held to be critical to leader performance, because they provide the basis of sensemaking for vision formation to take place (Mumford et al., 2007). So in the face of a crisis, a key task for leaders is to develop a new consensual prescriptive mental model, consisting of shared causal beliefs for understanding and responding to the crisis (Mumford et al., 2007; Weick, 1995).

Prior research points to two major hurdles that need to be overcome to successfully resolve a crisis. One, is that leaders need to develop new mental models to fit with the new environmental conditions thrown up by the crisis (Barr, 1998; Barr, Stimpert, & Huff, 1992; Hodgkinson, 1997). This development requires cognitive shifts to overcome any cognitive inertia. Two, consensus, or shared agreement with others in management teams, is required to ensure full commitment to a vision needed to resolve the crisis (Markóczy, 2001). We define consensus in individuals' mental models when envisioning a response to a crisis, as the agreement on causal beliefs held to be critical to organizational adaptation and success (see Markóczy, 2001). If consensus is not reached, and leaders disagree on the way forward, they cannot coordinate remedial action with followers within their organization.

However, while prior research has highlighted that cognitive shifts are required in leaders so that their mental models fit with any new crisis conditions (Barr et al., 1992; Foldy, Goldman, & Ospina, 2008), the links to followers' mental models has received very limited research attention. Followers are important for strategy implementation (Balogun & Johnson, 2005; Raes, Heijltjes, Glunk, & Roe, 2011; Rouleau & Balogun, 2011). Consequently, unless we also study how followers contribute to the resolutions of crises, we will have an incomplete understanding of organizational adaptation. Surprisingly, empirical research showing how both leaders and followers change their mental models to form consensus around an envisioned future to resolve a crisis is lacking. The purpose of the current paper is to address this gap in knowledge.

We contribute to a further understanding of sensemaking and consensus within vision formation required to resolve an organizational crisis. There is an expectation, based on vision formation theory (Mumford & Strange, 2002) that leaders make sense of the new situation first. They then develop a new consensual prescriptive mental model on how to respond to a crisis. Leaders are then thought to communicate this mental model to followers through a process of sensegiving, so that followers also change. There is some limited

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empirical support to give weight to this expectation, because leaders' communication has been found to be important to the development of followers' mental models. In a laboratory setting, Marks, Zaccaro, and Mathieu (2000) found that one-way communication from leaders influenced mental models in follower teams, thereby improving performance in novel environments. Likewise, shared team mental models have been found to converge, based on different leadership styles and settings (Dionne, Sayama, Hao, & Bush, 2010). However, there are no studies investigating the spread of consensus within the mental models of both leaders and followers facing a crisis within a naturalistic setting. Without additional knowledge of followers' mental models, we will have a poor understanding of how a vision to resolve a crisis materializes to coordinate remedial action.

We begin with a discussion of the theoretical background relating to dealing with organizational crises. After a discussion of vision formation theory, we outline the prior research into mental models in the context of sensemaking and the development of new mental models during crises. Subsequently, we discuss shared mental models in teams before outlining the available evidence on the sources of influence on mental models. Finally, we present our hypotheses, method and findings.

Theoretical background and hypothesis development

Vision formation theory

Definitions of a vision can be summarized as a set of beliefs about how people should act, as well as interact, to attain some idealized future state (Mumford & Strange, 2002; Strange & Mumford, 2002). Cognitive vision formation theory (Mumford and Strange, 2002) provides an explanation of how leaders develop a vision for the future following reflection on key issues and problems through a process of sensemaking (Weick, 1995). More recently, Mumford et al. (2007) have developed this theory to provide a sequential model of vision formation during crises. In this theoretical model, vision formation first involves the activation of descriptive mental models, which describe the system as it is. Then, cognitive shifts to a more consensual prescriptive mental model are required, which conceptualizes a vision for the future (Mumford et al., 2007). Developing a vision around a solution to the problems thrown up by the crisis is critical to galvanize remedial action quickly. In contrast to envisioning the future within non-crisis conditions, leaders are under considerable stress and time pressure. After developing a vision, leaders are usually required to reconfigure resources to enable a successful adaptation to a crisis, but this may be stressful for followers (Yukl, 2008). So obtaining agreement on the way forward is a major challenge.

While vision formation theory suggests that leaders make sense of a crisis, and then envision the future to give meaning to followers in a sensegiving process, there is a lack of empirical support for this expectation within naturalistic settings. Therefore, additional knowledge is required to understand how both leaders and followers form consensus to resolve a crisis. This knowledge would throw more light on the reasons for successful organizational adaptation.

Sensemaking and the development of new mental models during crises

When first encountering a crisis, one initial challenge for leaders is to make sense of the ambiguous conditions (Gioia & Chittipeddi, 1991). This is not a simple task as there is much complexity faced by leaders when making sense of ambiguous conditions during a crisis. Weick (1995) points out that sensemaking is associated with understanding the cognitive filters that people use. Individuals simplify complexity through their mental models, so as not to be overwhelmed by data (Daft & Weick, 1984). Thus, sensemaking highlights a major issue that influences leader performance. Due to the effort of analytical decision making (Evans, 2008) and limitations of human information processing

(Miller, 1956), humans tend to use automatic information processing based on mental representations of the world. Mental models are representations in the mind (Gentner & Stevens, 1983; Johnson-Laird, 1983) based around the notion that thought predicts events and models reality (Craik, 1943). They are useful mechanisms for describing a system's purpose, explaining its functioning, and predicting future states (Rouse & Morris, 1986).

Mental models are useful in many decision-making situations. However, they are likely to be of historical environments, because they are developed through case based or experiential knowledge (Mumford et al., 2007) and learning (Kiesler & Sproull, 1982). This is a problem when confronting crises, because historically developed mental models may not fit with the new conditions encountered. As mental models used in sensemaking are developed through prior experience, they are likely to be partially idiosyncratic and stable, so difficult to change (Barr et al., 1992).

Prior research into the antecedents of mental models confirms that they are difficult to develop and change. This is especially problematic when facing organizational crises, because of the speed of change required due to time pressure. Empirical studies confirm that heterogeneous mental models exist within individual firms. Thus empirical findings fit with the notion that different experiences, as well as the alternative job roles based around different task environments, shape mental models (Daniels, Johnson, & Chernatony, 1994; Hodgkinson & Johnson, 1994). However, in contrast, other researchers have found homogeneous mental models within specific industries (Porac, Thomas, & Baden-Fuller, 1989). Likely explanations for similarities in mental models are cited as core assumptions around organizational identity and competition and the presence of environmental stability (Hodgkinson & Johnson, 1994).

Prior longitudinal empirical research into the ability to change mental models is rather scant. An early empirical study concluded that developing new beliefs about causality is not easy (Barr et al., 1992). A small number of more comprehensive longitudinal studies followed, involving larger samples, which found evidence of cognitive inertia (Hodgkinson, 1997; Reger & Palmer, 1996). These studies concluded that in turbulent environments, changes in mental models lag behind external environmental changes. Similarly, in another study (Lindell, Melin, Gahmberg, Hellqvist, & Melander, 1998), researchers found that a framework of strong stable beliefs, values and assumptions were present in individuals over long periods of time. When considering these empirical findings, it is possible to conclude that developing new mental models to deal with novel crisis conditions is neither quick nor easy.

The development of consensus as shared mental models in teams[1]

After changing mental models to fit crisis conditions, the next stage is to form consensus around a vision to resolve a crisis. A number of scholars have highlighted the importance of shared mental models within a team settings to facilitate coordinated action (see Burke, Stagl, Salas, Pierce, & Kendall, 2006; Cannon-Bowers, Salas, & Converse, 1993; Day, Gronn, & Salas, 2004; Klimoski & Mohammed, 1994; Marks et al., 2000). Leading the response to a crisis within more complex organizations is likely to require leaders to orchestrate effort due to the presence of multi-teams at different hierarchical levels (DeChurch, Hiller, Murase, Doty, & Salas, 2010). Empirical research on the effects of leadership on the performance of multi-teams has highlighted the

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[1] As the focus of this current empirical research was on consensus in mental models directed at decisions to resolve a crisis we focused on the content of mental models as discussed in the decision-making literature. The literature on the content of shared mental models delineates between team mental models and task mental models (see Mohammed, Ferzandi, & Hamilton, 2010, for a thorough review).

importance of training leaders (DeChurch & Marks, 2006). However, teams cannot be trained for every contingency when resolving organizational crises. In crisis conditions, teams have limited experience of the problems they have to face, because these are invariably novel (LePine, 2005). Individuals not only have to make sense of ambiguous events and overcome any cognitive inertia, but also agree on the way forward.

Prior research confirms that when faced with complex problems, collective sensemaking helps by pooling expertise (Eden & Ackermann, 2010; Seidl & Werle, 2018). Salas, Rosen, and DiazGranados (2010) point to the importance of different levels of expertise in leaders due to the effect of domain-specific knowledge on pattern recognition when making sense of the environment. Different expertise is likely to generate a more extensive discussion of strategic options to implement when responding to a crisis (see Lant, Milliken, & Batra, 1992; Miller, Burke, & Glick, 1998). However, this requires diversity in thinking which sets up a dilemma when attempting to resolve organizational crises. While cognitive diversity helps alleviate errors of judgement, when pooling expertise during sensemaking, this diversity may be a main reason why forming consensus to resolve crises is difficult later on.

Longitudinal empirical evidence of cognitive shifts in mental models within team settings as they reach consensus are rare. Markóczy (2001) provides one rare example of more detailed empirical evidence of changes to mental models and the development of consensus over time. The longitudinal study was focused on individual managers within three firms as they grapple with external change. The findings point to cognitive shifts and the development of consensus occurring in an interest group, whose members benefited from the direction of a strategic change. In another more recent longitudinal empirical study, Combe and Carrington (2015) found cognitive shifts to consensus occurred within specific leadership teams when responding to an organizational crisis. In other words, consensus developed in teams, rather than the leadership as a whole. However, followers were not the focus of the study, so the development of consensus within both leaders and followers as they respond to a crisis is poorly understood.

When considering prior research into the development of consensus in team settings, scholars point to the importance of different opinions during collective sensemaking. This cognitive diversity aids a thorough analysis of crisis conditions and the development of strategic options. Then, consensus must be reached within both leader and follower teams, so that a unified response can occur. Therefore, we offer the following hypothesis:

Hypothesis 1. In response to a crisis, consensus in beliefs in how to achieve success within their organization will form within both leader and follower teams over time.

Consensus will be demonstrated by similarities in beliefs thought to be important to achieve organizational success (including similarities in objectives, means or strategies to achieve them and other causal beliefs) within the same firm as leaders and followers address the same crisis.[2]

As crises do not neatly conform to existing mental models, cognitive shifts are required for a response to a crisis to take place (Marcy & Mumford, 2010). It is this individual cognitive shift from one mental model to another (Foldy et al., 2008) which makes forming consensus possible (Ospina & Foldy, 2010). Dionne et al. (2010) demonstrate how individuals' mental models can converge to form consensus. Consequently, a shift in cognition requires flexibility in thinking and it is this that can trigger organizational adaptation particularly when facing novel environments (Gupta, 1984; Walsh, 1995). However, there is limited empirical research into the cognitive shifts experienced by

leaders and followers as they respond to a crisis. Based on vision formation theory discussed above, we assume that leadership teams will make sense of the crisis first. Therefore, leaders will change their thinking most in the initial response to a crisis, because it is their role to consider the strategic issues facing the organization. Therefore, we put forward the following hypothesis:

Hypothesis 2. In response to a crisis, initially, leadership teams will have a higher degree of cognitive shift than follower teams.

The source of influence in mental models during crises

Shared team mental models facilitate coordinated action when teams face novel circumstances. Experimental studies have confirmed that shared team mental models are important for team effectiveness and performance (see Mathieu, Heffner, Goodwin, Cannon-Bowers, & Salas, 2005; Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000). Shared task mental models also influence performance (Lim & Klein, 2006). However, empirical research on the source of influence in terms of leaders and followers is rather limited. As noted above, prior empirical research into the source of influence on the content of mental models has largely focused on social and cultural environmental effects and the functional job roles of top managers (Daniels, Johnson, & de Chernatony, 2002). More recently, in a study of team composition, Fisher, Bell, Dierdorff, and Belohlav (2012) found that a personality trait, agreeableness, was positively related to similarities in team mental models.

Very limited attention in prior research has been devoted to investigating the influence of leader mental models on follower mental models, or vice versa. The empirical study by Marks et al. (2000) is a notable exception. The researchers found that teamwork training and leaders' communication in briefings increased the level of shared team mental models, which influenced the performance of teams. Leaders' communication also influenced the flexibility of mental models, which changed to adapt to novel environments. However, this evidence is based on an experimental research design. Leaders had prior knowledge of the task and were able to give advice to follower teams via unidirectional one-way communication. Organizational crises in naturalistic settings present a different set of challenges. Leaders will not necessarily have prior knowledge of responding to a crisis, so will have difficulty passing on knowledge to followers. Both leaders and followers will be attempting to make sense of the ambiguous conditions. Another difference is that two-way communication is likely so followers can also influence leaders.

Building on this previous research, it is noteworthy to conclude that prior research into team mental models has started to investigate leaders as a source of influence into shared mental models. However, research into the similarities and differences between leader mental models and follower mental models is lacking. Marks et al. (2000) found a relationship between leader briefings and the content of follower mental models in team settings in the laboratory, but leaders' mental models were not investigated for direct comparison. In this current study we aim to address this limitation. We investigate similarities and differences in the mental models of both leader and follower teams, as they respond to a crisis over time in a naturalistic setting.

When considering prior research into the source of influence in mental models, theory suggests that during a crisis the leaders of an organization will develop and communicate the vision for the future to followers. As a result, there is an expectation that consensus in how to resolve the crisis will develop first in the leaders so they can envision the future for followers. Therefore, we put forward the following hypothesis:

Hypothesis 3a. In response to a crisis, leadership teams will be the initial locus of consensus or shared beliefs in how to achieve success within their organization.

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[2] We did not introduce the issue of crisis into our data collection as we thought that labeling any issues would bias responses. Consequently, we investigated the content of mental models when directed at the standardized task of achieving success of the organization.

Much of the research into vision content and vision communication assumes that leaders envision the future for followers. This might be a valid assumption in non-crisis conditions, but even in these conditions, followers are theorized to have an important role (see Stam, Lord, Knippenberg, & Wisse, 2014). However, in crises conditions some prior research suggests that the assumption that leaders agree on a way forward first, and then convey this to followers is too simplistic. Research that emphasizes the political nature of strategic decision making within team settings has an alternative message. Researchers such as Walsh and Fahey (1986), for example, have long pointed to the interplay between individuals' beliefs and self-interest in strategy formulation processes. In other words, the self-interest of followers may encourage them to influence a vision for the future for their own ends. Additionally, the more recent follower-centric leadership research has begun to highlight the possibility of a complex picture of influence (Carsten, Uhl-Bien, West, Patera, & McGregor, 2010; Kohles, Bligh, & Carsten, 2012; Sy, Côté, & Saavedra, 2005; Uhl-Bien, Riggio, Lowe, & Carsten, 2014).

Empirical evidence suggests that sensemaking can be outside the control of top managers, especially in decentralized organizations (Balogun & Johnson, 2004). Managers in non-leadership roles can make sense of change for others (Balogun, 2003). Additional empirical evidence also confirms that sensegiving by *non-leaders* is present in organizations, and this can be triggered by issues where leaders are perceived to be incompetent (Maitlis & Lawrence, 2007). Responding to a crisis may be one of these issues, especially if problems were possibly foreseen, and leaders were perceived to be dragging their feet.

Therefore, an alternative possible explanation for influence in vision formation, based on some empirical evidence, is that followers can be involved in sensemaking and sensegiving. The input of followers may be encouraged when action to resolve a crisis is considered at an operational level, closer to their experience. The leadership role may be distributed to include followers (Friedrich et al., 2014) due to the presence of teams (Burke, Fiore, & Salas, 2003). Consequently, a process of co-development of a vision by leaders and followers may occur when responding to a crisis (Valcea, Hamdani, Buckley, & Novicevic, 2011).

In short, the expected linear top-down sensegiving from leaders to envisage the future for followers may or may not occur. Currently, when responding to an organizational crisis we do not know if leaders shape the shared mental models in follower teams or these teams shape leaders' mental models or if co-development takes place. This is a complex research agenda for studies in naturalistic settings, however, due to the amount of communication and influence that can take place during an organizational crisis. In this current study, our more modest aim is to investigate the results of the expected influence, based on vision formation theory. While this theory suggests that consensus will spread from leadership teams to follower teams when resolving an organizational crisis, an alternative hypothesis is suggested as follows:

Hypothesis 3b. In response to a crisis, follower teams will be the initial locus of consensus or shared beliefs in how to achieve success within their organization.

In this current empirical study, we investigate the content of mental models, or *what* individuals think about a particular domain, in team settings. Following Markóczy (2001) we conceptualize the content of mental models to include beliefs about a stimulus domain and the causal relationships between these beliefs. Most prior research investigates consensus by studying ends (objectives and goals) and means (strategies) used in strategic decision making (see Kellermanns, Walter, Lechner, & Floyd, 2005). However, Markóczy (2001) advocates a more holistic investigation, because leaders and followers have different job roles. An investigation of only ends and means may bias the research to focus on issues important to leaders only, due to their more strategic job roles. Consequently, in this current study we adopt a holistic investigation and analyze shifts in the content of mental models in terms

of beliefs, including causal beliefs, held to be critical to organizational adaptation and success (Markóczy, 2001).

Method

To investigate cognitive shifts in leaders and followers when responding to a crisis we used a research design that ensured the generation of rich data which included the complexity of similarities and differences in mental models at an individual level (see Bougon, Weick, & Binkhorst, 1977; Combe & Carrington, 2015; Hodgkinson & Johnson, 1994; Markóczy, 1997; Wacker, 1981; Walsh, 1988; Weick, 1979). A single case study method was used (see Yin, 2013) as the most suitable to allow the in-depth study of mental models during the crisis at all levels within an organization.

The case study firm and context

The chosen case study firm is a not-for-profit organization, that for the purposes of this research, is anonymized as 'Health Change UK'. The organization operates in the United Kingdom's health sector, which over recent years has undergone dramatic changes. These changes were due to major political reforms to the healthcare system, which transformed the process of commissioning for public service contracts (the sector's principle funding source). The government deregulated the public service sector, which allowed for increased competition from the private sector. This radical change, imposed by government, eventually led to a financial crisis within the firm due to the loss of contracts worth 27.2% of turnover over a three-month period. As the loss of contracts was an early direct result of government intervention outside their control, the organization questioned the viability of the organization in this new competitive landscape. While the government reforms were sudden or abrupt, the crisis itself can be described as leaning more towards the smoldering and cumulative type (Hwang & Lichtenthal, 2000; James & Wooten, 2005). The viability of the organization was only questioned after the loss of several large contracts over a very short period of time. The speed of the losses contributed significantly to the shock and the realization that the organization was operating in a completely new competitive landscape.

Sample

The initial participants consisted of 40 permanent members of staff. This number represented approximately 20% of the full time workforce. The sample included the entire leadership team (the whole of the board of directors and regional middle managers) as well as followers lower down in the organizational hierarchy. However, due to sample attrition over the 18 months from phase 1 to phase 2 of data collection, only 31 participants were included in phase 2 (for descriptive statistics following sample attrition see Table 1). In subsequent analysis, we focus on these 31 longitudinal responses only.

Using a stratified sampling method, the participants were chosen randomly based on their position in the organization (from all levels and job classifications), the period spent at the company (well-established and newer staff) and their service locations (the full range of six staff locations). Respondents also completed a short questionnaire to verify and provide additional information on age, gender, job role, location of work, and time spent at the company. Table 2 provides further information regarding the leaders and followers in the organization.

Cognitive mapping

To support the investigation of the mental models in leadership and follower teams and to triangulate the data, an interview protocol with different stages was developed to include a variety of data collection techniques (Combe & Carrington, 2015). We used sorting technique, common in psychological research (Rosenberg, 1982), as the starting

Table 1
Sample descriptive statistics.

	Original	Useable	Leaders	Followers
No. of interviewees	40	31	12	19
TR - Trustees (Executive Committee)	3	2	2	–
TM - Top Management Team (Inc. CEO)	4	4	4	–
MM – Middle Managers	7	6	6	–
HO - Head Office Staff	6	6	–	6
PR - Practitioners (Client Facing Staff)	20	13	–	13
Leaders	14	12	–	–
Followers	26	19	–	–
Female	25	19	5	14
Male	15	12	7	5
Average age (years old)[a]	43.10	42.45	50.17	37.58
Average time at company (months)[a]	78.40	73.61	119.33	44.74

[a] Captured at the start of data collection in Phase 1.

point to the standardized procedure for eliciting cognitive maps outlined by Markóczy and Goldberg (1995). This standardized procedure was used because it offers advantages when cognitive maps are compared and contrasted. In alternative, idiosyncratic procedures, differences in cognitive content may not be due to differences in participants' beliefs, but a direct result of the interview length if more issues are discussed. The standardized elicitation procedure overcomes such errors, because there is no direct communication between the interviewer and respondent during the card sort procedure and the elicitation of the cognitive maps (see Walsh, 1988).[3] Another main advantage is that the

full content of mental models can be assessed, because beliefs and the causal relationship between beliefs, are included in data collection for analysis. In contrast, other alternative methods in the study of team mental models are common. For example, repertory grid has been used in several studies (see Marks et al., 2000; Mathieu et al., 2000; Mathieu et al., 2005). This alternative method has some advantages in terms of the extensive pairwise comparisons of the similarities and differences between factors investigated, but does not capture causal connections between beliefs for data collection or analysis (Brown, 1992). Therefore, due to this inadequacy, and considering the importance of causal beliefs in resolving crises, the repertory grid method was not used in this current study.

All the face-to-face interviews were designed to identify each manager's beliefs about important factors for success of the organization. We did not want to label the difficulties experienced by the organization as 'a crisis' as we were concerned that this label might bias the responses. Consequently, in both sets of interviews we continued to use the standard procedure for elicitation of cognitive maps outlined by Markóczy and Goldberg (1995) which standardizes the goal for each interview as 'factors important for success (of the organization)'. We asked the participants to generate their own cognitive maps in real-time during the interviews. We used this approach because it is possible to verify the accuracy of the cognitive maps produced by the participants during the remainder of the interviews, and alleviates the need for any post hoc interpretation by the researcher (see Hodgkinson, Maule, & Bown, 2004).

Both leaders and followers were twice subjected to face-to-face in-

Table 2
Details of leaders and followers included in the study.

Leaders	
Trustees	These are a non-executive board of directors. The trustees also consist of a chair of the trustees as well as the treasurer (these were both included in the sample). Collectively, the trustees appoint the CEO as well as governing and having legal responsibility for the organization. The executive committee, which includes trustees and the top management team, meet quarterly to discuss strategic issues alongside other subcommittees.
Top Management Team	The TMT consisted of four senior managers that were all included in the sample. They comprised of the Chief Executive Officer, Finance Manager (CFO), and two Area Managers, one of which was the Practice Development Manager. The Finance Manager had oversight of the head office support staff (Team 8) but no middle manager. One Area Manager oversaw two middle managers, which looked after two teams (Teams 1 and 2), whilst the other oversaw four middle managers and their respective teams (Teams 3 to 6). The TMT would exclusively meet monthly in Senior Manager Team meetings.
Middle Managers	The middle management team consisted of seven regional service managers. However, one was unavailable for the research project. These service managers had oversight of the various service locations across the UK. The services operated as satellites with middle managers permitted some autonomy over budgets and strategic direction of services to respond to local needs. The six middle managers ran the respective services, which comprised of teams of followers (Teams 1 to 6). All service managers along with the TMT would meet monthly in the organization's 'Business and Performance' meetings.
Followers	
Practitioners	The practitioner level of the organization was the client-facing staff or the equivalent to frontline employees. These employees made up the vast majority of the staff base in the organization. Additionally, the employment costs of this group were the foremost expenditure for the organization. Due to the sheer volume of this group, not all could be included in the research project. These followers were divided into teams (Teams 1 to 7) based
Teams 1 to 7	on service location and headed up by middle managers in all but one team (Team 7) who directly reported to an Area Manager. Each team of client-facing staff consisted of senior practitioners, practitioners, and support workers all of which had varying levels of responsibility. Weekly team meetings would occur with middle managers as well as ongoing supervision. Beyond that, this group was also given some autonomy in terms of dealing with their own cases with clients. Each team provided quarterly staff representation on the staff council where the CEO of the organization sat. Additionally, the organization's staff survey and annual conference provided many opportunities to bring all levels of the organization together for discussion.
Head Office Support Staff	This team of followers (Team 8) had varying functions and responsibilities within head office. Although based in Head Office they were the support function for the whole organization. The Finance Manager headed this team up. Not all of this group could be included in the research sample. However, the sample included a HR administrator, a Finance administrator, administrative assistants, a Data and ICT officer and the Contracts and
Team 8	Development Officer. This team also had representation on the staff council as well as attendance at the annual conference. Additionally, as this team was based at head office they were in constant contact with the TMT.

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[3] This approach does have implications for the study of the level of consensus or shared cognition. Early studies assumed consensus as a unidimensional construct and investigated it as either present or not. In this vein, some prior researchers took a strict view of consensus and saw it as the agreement by all members of a team, rather than just the majority (see Dess & Origer, 1987). More recent studies have concluded that consensus is multi-faceted (Markóczy, 2001; Wooldridge & Floyd, 1989) so a larger array of issues and priorities has been included in studies taking a more holistic approach to the content of consensus (see Markóczy, 2001). Consequently, due to the increased number of

terviews by the same researcher (the lead author); once in 2011 and again 18 months later in 2013. This time-frame was chosen due to the cumulative nature of the crisis. The crisis itself was not predicted at the

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(footnote continued)
beliefs and additional complexity being studied, it is highly unlikely that individuals can achieve complete consensus. We address this issue in more detail in relation to our data in the method and analysis sections.

outset of the research. However, the dramatic changes in the funding process were known. These changes were a major cause of concern to the leadership during early discussions when planning the research.

Development of pool of factors

The first stage of the standardized method of eliciting causal cognitive maps is to develop a sorting procedure (Markóczy & Goldberg, 1995). The essence of sorting technique is that participants sort a predefined large identical pool of factors into two piles; those important for success of the organization and those not. The factors themselves were generated based on prior research (see the factors listed in the appendices of Markóczy & Goldberg, 1995; Walsh, 1988). This technique was used to standardize the elicitation of cognitive maps, which is vital when they are to be compared and contrasted. The elicitation technique outlined in Markóczy (2001) and Markóczy and Goldberg (1995) provided a rich source of data to analyze consensus (Hodgkinson & Healey, 2008) as studying demographics alone is no longer a valid substitute for cognition (Kaplan, 2011).

The wording of these factors was adapted through six pilot interviews to make them relevant in the organizational context.[4] The 54 factors used in the sorting task by each participant are listed in Appendix 1. At the end of the card sort participants were asked (instructions in writing) to choose the ten most important factors for success.

Eliciting cognitive maps

These ten factors were then used to generate cognitive maps in real time by asking (instructions in writing) each participant to place the ten cards on a blank sheet of A3 paper and then draw arrows to indicate relationships between the factors (i.e., whether one factor influences the other). Participants were also asked to rate the strength of the relationships between factors ranging from -3 (strongly negative) to $+3$ (strongly positive) at intervals of absolute 1. This provided the participant with six potential strengths to consider, as zero would indicate no relationship between the factors. The direction and strength of relationships between factors forms both 'indegrees' and 'outdegrees' for each factor from the pool of constructs and can be presented in an expanded association matrix to aid subsequent statistical analysis.

In-depth interviews

The cognitive mapping procedure was followed by an in-depth interview to develop a more detailed understanding. We asked participants what they meant by each factor, to clarify meaning, and why each factor chosen for inclusion in the cognitive maps was important for success of the organization. In addition, in phase 2 of data collection, we asked participants at the end of the interview to reflect on any changes in beliefs between phases 1 and 2. To facilitate this reflective account, we presented the cognitive map produced by the respondent in phase 1 of the data collection so they could accurately comment on the differences. The 62 interviews (both phases) generated a total of 418 A4 pages of transcriptions.

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[4] The factors used in the research are based on a standardized method of eliciting cognitive maps presented in prior research. The main idea is that each participant is presented with the same standard set of a priori factors and then each choses the 10 factors most relevant to their management situation. The standard aim of success of the organization is also given to ensure that the same task is completed by each participant. The factors were not linked to the crisis per se because we did not want to lead or bias participant's responses in any way. The standard elicitation procedure, based on the sorting task, involves no direct communication between researcher and participant and has been recommended as a way to reduce interaction and bias in qualitative data collection (see Walsh, 1988).

Calculation of distance ratios

Each hand-drawn map was transferred to the statistical software package 'Cognizer' for detailed analysis (Clarkson & Hodgkinson, 2005). To investigate consensus within the organization, individual differences between pairs of maps (or expanded association matrices) were analyzed (see Markóczy & Goldberg, 1995). When one cognitive map is compared to another, a distance ratio can be calculated to demonstrate the difference between the two maps (e.g., A and B). The calculation for the distance ratios (See Fig. 1) given by Markóczy and Goldberg (1995) is a development of formula 12 presented by Langfield-Smith and Wirth (1992).

The general principle of the formula is to calculate all of the differences between the two maps including their individual nodes (factors), arcs (relationships) between nodes, and the strength of these arcs. Subsequently, the distance ratio provides a statistical value between 0 and 1. Following Markóczy and Goldberg (1995), if a value of 0 is present then the two maps are exactly identical in terms of nodes and arcs, whereas a value of 1 represents two completely different cognitive maps (maximum difference) with no nodes shared. To produce all the distance ratios required in this study each participant's cognitive map was individually compared to all of the other participants. The sample of 31 participants in phase 1 of data collection, for example, generated 465 pairs of distances.

Analysis and results

Table 3 highlights various information regarding how similarities (consensus) and dissimilarities (diversity) change over time. Similar to earlier discussions regarding distance ratios closer to zero, more consensus is reflected by a lower mean score. The mean values of the pairs of maps within a group in phase 1 (e.g., the differences between all the leaders in phase 1) and within the same group in phase 2 are generated to allow further comparison of change in the degree of consensus. For example, the degree of consensus within the leadership group in phase 1 is calculated by taking the mean score of the distance ratios generated by comparing the 66 pairs of maps based on the 12 leaders (see Table 3). This procedure is repeated for phase 2. Consequently, a lower mean in phase 2 when compared to phase 1 would indicate a building of consensus.

In support of H1, the initial results in Table 3 highlight that consensus did build within the organization between phases 1 and 2. A paired sample *t*-test demonstrates a significant difference between the phase 1 score for all pairs of maps (i.e., comparing the distances of all leaders and followers in phase 1) and the phase 2 score for all pairs of maps ($\bar{x}_1 = 0.779$, $\sigma_1 = 0.146$; $\bar{x}_2 = 0.710$, $\sigma_2 = 0.147$; $t(464) = 8.596$, $p < .001$). Therefore, this is a significant finding, because it indicates the building of organization wide consensus as the radical environmental change was starting to be understood. This finding is also consistent with prior longitudinal cognitive research into the scope of consensus conducted by Markóczy (2001). An increase in the scope of consensus refers to an increase in the number of individuals that agree on the factors important for success within the organization.

Table 3 also indicates that there are changes in the degree of consensus, or how strong individuals agree within their respective groups (Markóczy, 2001). A paired sample *t*-test demonstrates a significant difference between the within phase 1 leadership group score and the within phase 2 leadership group score ($\bar{x}_1 = 0.819$, $\sigma_1 = 0.123$; $\bar{x}_2 = 0.735$, $\sigma_2 = 0.139$; $t(65) = 3.655$, $p = .001$). Likewise, there was a significant difference between the within phase 1 follower group score and the within phase 2 follower group score ($\bar{x}_1 = 0.730$, $\sigma_1 = 0.159$; $\bar{x}_2 = 0.682$, $\sigma_2 = 0.160$; $t(170) = 3.577$, $p < .001$). Consequently, we find additional support for H1 in that consensus does emerge within both leader and follower teams over time. Furthermore, there was a significant difference between the group score when each leader was compared to each follower in phase 1 and the group score when each

$$DR(A,B) = \frac{\sum_{i=1}^{p} \sum_{j=1}^{p} \text{diff}(i,j)}{(\varepsilon\beta + \delta)p_c^2 + \gamma'(2p_c(p_{u_A} + p_{u_B}) + p_{u_A}^2 + p_{u_B}^2 - \alpha((\varepsilon\beta + \delta)p_c + \gamma'(p_{u_A} + p_{u_B})))}$$

$$\text{diff}(i,j) = \begin{cases} 0 & \text{(i)} \quad \text{if } i = j \text{ and } \alpha = 1; \\ \Gamma(a_{ij}, b_{ij}) & \text{(ii)} \quad \text{if either } i \text{ or } j \notin P_c \text{ and } i,j \in N_A \text{ or } i,j \in N_B; \\ |a_{ij} - b_{ij}| + \delta & \text{(iii)} \quad \text{if } a_{ij}b_{ij} < 0; \\ |a_{ij} - b_{ij}| & \text{(iv)} \quad \text{otherwise.} \end{cases}$$

$$\Gamma(a_{ij}, b_{ij}) = \begin{cases} 0 & \text{(a)} \quad \text{if } \gamma = 0; \\ 0 & \text{(b)} \quad \text{if } \gamma = 1 \text{ and } a_{ij} = b_{ij} = 0; \\ 1 & \text{(c)} \quad \text{otherwise.} \end{cases} \qquad \gamma' = \begin{cases} 0 & \text{if } \gamma = 0; \\ 1 & \text{otherwise.} \end{cases}$$

"Where A and B are two extended association matrices, a_{ij} (or b_{ij}) is the value of the ith row and jth column of A (or B), and where p is total number of possible nodes. P_c is the set of nodes common to both maps, p_c is the number of such nodes. p_{u_A} is the number of nodes unique to map A and p_{u_B} is the number of nodes unique to B. N_A and N_B are the sets of nodes in the maps A and B" (Markóczy & Goldberg, 1995, p. 314).

The following five parameters were set for calculating the distance ratios in this study. Firstly, $\alpha = 0$ (self-loops) as there are variable amounts of direct self-influence in the matrices. Secondly, $\beta = 3$ (maximum absolute strength) as this is the maximum strength of relationships between nodes. Thirdly, $\gamma = 2$ (nodes mismatch) to exclude the values of potential arcs (or relationships). Fourthly, $\delta = 0$ (polarity change) as no additional weight given to a polarity change between intervals in the strength of relationships. Finally, $\varepsilon = 2$ (influence relations) as there are two possible polarities, + and -.

Fig. 1. Generalized distance ratio formula (Markóczy & Goldberg, 1995, p. 314).

Table 3
Longitudinal intra-subgroup distances.

	M_1	N_1	M_2	N_2	$\bar{x}_1$	$\bar{x}_2$	t	p	σ_1	σ_2	$\Delta\bar{x}/\sigma$
All	31	465	31	465	0.779	0.710	8.596	.000	0.146	0.147	0.469
Leaders	12	66	12	66	0.819	0.735	3.655	.001	0.123	0.139	0.604
Followers	19	171	19	171	0.730	0.682	3.577	.000	0.159	0.160	0.300
B.G.		228		228	0.805	0.724	7.300	.000	0.132	0.137	0.591

M_1 = number of maps (i.e., number of participants) in phase 1. M_2 = number of maps (participants) in phase 2. N_1 = number of pairs of distances between the maps within subgroups for phase 1. N_2 = number of pairs of distances between the maps within subgroups for phase 2. $\bar{x}_1$ = mean distance between maps within subgroups in phase 1. $\bar{x}_2$ = mean distance between maps within subgroups in phase 2. t = t-value comparing means through a paired samples t-test. p = p-value (or calculated probability). σ_1 = standard deviation within groups in phase 1. σ_2 = standard deviation within groups in phase 2. $\Delta\bar{x}/\sigma$ = shows how many standard deviations away is the new mean from the previous one, calculated as $(\bar{x}_1 - \bar{x}_2) / \sigma_2$. B.G. = between groups.

leader was compared to each follower in phase 2 ($\bar{x}_1 = 0.805$, $\sigma_1 = 0.132$; $\bar{x}_2 = 0.724$, $\sigma_2 = 0.137$; $t(227) = 7.300$, $p < .001$). These results indicate that not only did consensus build across the organization as a whole but that consensus also formed within both leadership and follower groups. To overcome any issues around the normality of these distance ratios, Wilcoxon tests were also conducted producing similar findings.[5]

As part of considering H2 we report on the cognitive shifts of individuals and whether leaders are more prone to cognitive shifts than followers or vice versa. To examine cognitive shifts, each individual's cognitive map from phase 1 was compared to their cognitive map from phase 2 of data collection 18 months later. Due to the longitudinal data collection each pair of maps was used to calculate for similarity and dissimilarity following Markóczy and Goldberg (1995). When

Table 4
Individual cognitive shifts within groups.

	Leaders				Followers			All
	TM	TR	MM	Total	HO	PR	Total	
n	4	2	6	**12**	6	13	**19**	31
$\bar{x}$	0.697	0.839	0.536	**0.640**	0.523	0.508	**0.513**	0.562
σ	0.140	0.071	0.153	**0.175**	0.139	0.209	**0.186**	0.189
Median	0.672	0.839	0.573	**0.667**	0.477	0.533	**0.488**	0.550
Max	0.889	0.889	0.693	**0.889**	0.797	0.917	**0.917**	0.917
Min	0.553	0.788	0.328	**0.328**	0.424	0.158	**0.158**	0.158
Range	0.336	0.101	0.365	**0.561**	0.372	0.758	**0.758**	0.758

n = number of maps (participants). $\bar{x}$ = mean. σ = standard deviation. Max = maximum. Min = minimum. TM = Top Managers. TR = Trustees. MM = Middle Managers. HO = Head Office Staff. PR = Practitioners.

comparing the maps from both phases, the closer the distance ratio is to the value of 1 (maximum difference) then the higher the level of cognitive shift.

Table 4 indicates the individual cognitive shifts within leader and follower groups.

An independent samples t-test demonstrates that there was not a significant difference at the 0.05 level for cognitive shifts between the within leadership group score and the within follower group score ($\bar{x}_{w\_leader} = 0.640$, $\sigma_{w\_leader} = 0.175$; $\bar{x}_{w\_follower} = 0.513$, $\sigma_{w\_follower} = 0.186$; $t(29) = 1.899$, $p = .068$). Consequently, this result does not offer full

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[5] All four of the Wilcoxon signed-rank tests support the initial findings of the paired samples t-tests:

- All in Phase 1 ($Mdn = 0.797$) Phase 2 ($Mdn = 0.705$), $z = -7.915$, $p = .000$
- Leaders in Phase 1 ($Mdn = 0.814$) Phase 2 ($Mdn = 0.757$), $z = -3.191$, $p = .001$
- Followers in Phase 1 ($Mdn = 0.716$) Phase 2 ($Mdn = 0.682$), $z = -3.448$, $p = .001$
- Across in Phase 1 ($Mdn = 0.822$) Phase 2 ($Mdn = 0.710$), $z = -6.655$, $p = .000$

Table 5
Intra-subgroup distances.

	M	N_w	N_a	$\bar{x}_w$	$\bar{x}_b$	σ_w	σ_b	t	p
Phase 1									
All	31	465		0.779		0.146			
Leaders	12	66	228	0.819	0.805	0.123	0.132	0.817	.415
Followers	19	171	228	0.730	0.805	0.159	0.132	−4.982	.000
Phase 2									
All	31	465		0.710		0.147			
Leaders	12	66	228	0.735	0.724	0.139	0.137	0.567	.571
Followers	19	171	228	0.682	0.724	0.160	0.137	−2.829	.005

M = number of maps (participants), N_w = number of pairs of distances between the maps within subgroups. N_b = number of pairs of distances between the maps between subgroups. $\bar{x}_w$ = mean distance between maps within subgroups. $\bar{x}_b$ = mean distance between members within and outside subgroups. σ_w = standard deviation within groups. σ_b = standard deviation between groups. t = t-value comparing means through an independent samples t-test. p = p-value (or calculated probability).

support for H2. Therefore, based on this finding alone being a member of a particular group or team (leader or follower) does not significantly increase or decrease the amount of cognitive shift during the crisis.

In considering H3a and H3b, Table 5 presents similar information as Table 3 but provides further analysis on differences within and between leaders and followers. Again, more consensus is reflected by a lower mean score as distance ratios are closer to zero indicate higher levels of similarity. The mean values of the pairs of maps within groups (e.g., the differences between all the leaders) and between groups (e.g., the differences leaders and followers) are generated to allow further comparison. For example, the degree of consensus within the leadership group is calculated by taking the mean score of the distance ratios generated by comparing the 66 pairs of maps based on the 12 leaders. To calculate the degree of consensus between groups the mean score of the distance ratios produced by comparing the 228 pairs of maps between the 12 leaders and 19 followers (see Table 5).

Comparing within group against between group mean scores demonstrates the locus of consensus (Markóczy, 2001). Therefore, a lower mean in the within group compared to the between group would indicate that the locus of consensus is in the within group. In support of H3b and indicated in Table 5, an independent samples *t*-test demonstrates a significant difference between the within follower group score (i.e., when each follower is compared to each of the other followers) and the between group score (i.e., when each follower was compared to each leader) in phase 1 ($\bar{x}_w = 0.730$, $\sigma_w = 0.159$; $\bar{x}_b = 0.805$, $\sigma_b = 0.132$; $t(325.96) = -4.982$, $p < .001$). Likewise, there was a significant difference between the within follower group score and the between group score in phase 2 ($\bar{x}_w = 0.682$, $\sigma_w = 0.160$; $\bar{x}_b = 0.724$, $\sigma_b = 0.137$; $t(397) = -2.829$, $p < .01$). However, we do not find support for H3a as there was not a significant difference between the within leadership group score (i.e., when each leader was compared to each of the other leaders) and the between group score (i.e., when each leader was compared to each follower) in phase 1 ($\bar{x}_w = 0.819$, $\sigma_w = 0.123$; $\bar{x}_b = 0.805$, $\sigma_b = 0.132$; $t(292) = 0.817$, $p > .05$). Similarly, there was not a significant difference between the within leadership group score and the between group score in phase 2 ($\bar{x}_w = 0.735$, $\sigma_w = 0.139$; $\bar{x}_b = 0.724$, $\sigma_b = 0.137$; $t(292) = 0.567$, $p > .05$). These significant results clearly indicate that during this organizational crisis followers are the initial locus of consensus rather than leaders. Therefore, consensus first forms in followers in response to the crisis.

In addition to Table 5, an independent samples *t*-test demonstrates a significant difference between the within leadership group score and the within follower group score in phase 1 ($\bar{x}_{w\_leader} = 0.819$, $\sigma_{w\_leader} = 0.123$; $\bar{x}_{w\_follower}, = 0.730$, $\sigma_{w\_follower;} = 0.159$; $t(151.95) = 4.610$, $p < .001$). There was also a significant difference

between the within leadership group score and the within follower group score in phase 2 ($\bar{x}_{w\_leader} = 0.735$, $\sigma_{w\_leader} = 0.139$; $\bar{x}_{w\_follower}, = 0.682$, $\sigma_{w\_follower;} = 0.160$; $t(235) = 2.374$, $p < .05$). This finding indicates that at phase 1 of the data collection, at the onset of the crisis, there is a significant difference in consensus between leaders and followers. There were higher degrees of consensus within follower groups than their leaders (hence the lower scores) particularly in phase 1. This significant finding further demonstrates the lack of consensus within the leadership group at the onset of the crisis. However, the results also indicate that the differences between the two had started to converge by the second phase of data collection. Again, to overcome any issues around the normality of these distance ratios, Mann-Whitney tests were also conducted producing similar findings.[6]

To investigate the contribution that followers make towards consensus it is important to triangulate the data to find further support for followers being the locus of consensus. Therefore, to obtain a deeper understanding of the contribution of leaders and/or followers to consensus in responding to a crisis, central maps of both groups were developed to aid a comparison of the two groups (see Markóczy, 1997; Markóczy & Goldberg, 1995). Central maps are produced by choosing the nodes (or factors important for success), that are present in over half of the individuals' cognitive maps in the relative sample; 12 maps for leaders and 19 maps for followers. The arcs (or relationships) between the nodes (or factors) that are present and the mean value of the strengths of these relationships are then elicited to form a central map. Following this process for both groups in both phases enabled the production of four central maps. Figs. 2–5 illustrate the central maps of both leaders and followers in both phases.

In phase 1 of data collection, the central map for the leadership as a whole (see Fig. 2), indicates only two nodes were selected by more than half of the leadership group. It is evident that at the beginning of the crisis there was a limited shared mental model within the leadership apart from agreement on these two factors important for success. These two factors were critical because this agreement occurred around the organization's strategic objectives, but there was no consensus on the strategies that should be adopted to achieve these objectives. This finding reflects the difficulties that the leadership experienced at the beginning of the crisis when attempting to understand what changes were relevant and significant. It is unlikely, therefore, that the leadership could present a unified vision on how to resolve the crisis, due to this substantial lack of agreement. Although consensus was lacking in the leadership group, the followers appeared to have a stronger consensus around four main factors important for success in phase 1 of data collection, near the onset of the crisis (see Fig. 3).

At phase 2 of data collection it was clear that the leadership groups had a much stronger understanding of the current situation and had formed more consensus around several factors (see Fig. 4). The data indicates a limited prescriptive mental model existing in the leadership during phase 1 of data collection, but by phase 2 leaders had achieved more consensus and now placed further emphasis on the importance of

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[6] All six of the Mann-Whitney tests support the initial findings of the independent samples *t*-tests:

- Phase 1 Leaders within ($Mdn = 0.814$) across ($Mdn = 0.822$), $U = 7186.5$, $p = .578$
- Phase 1 Followers within ($Mdn = 0.716$) across ($Mdn = 0.822$), $U = 14,186.5$, $p = .000$
- Phase 1 Leaders within ($Mdn = 0.814$) Followers within ($Mdn = 0.716$), $U = 3827.0$, $p = .000$
- Phase 2 Leaders within ($Mdn = 0.757$) across ($Mdn = 0.710$), $U = 7056.5$, $p = .442$
- Phase 2 Followers within ($Mdn = 0.682$) across ($Mdn = 0.710$), $U = 16,680.0$, $p = .014$
- Phase 2 Leaders within ($Mdn = 0.757$) Followers within ($Mdn = 0.682$), $U = 4532.0$, $p = .019$

	20	42
20	0.00	2.33
42	2.50	0.00

20. Helping clients achieve 'recovery'
42. Relationships with partner agencies / organizations / services

Fig. 2. Central map for Leaders in Phase 1.

service quality, responsibility to funders and the motivation of staff. In other words, at phase 2 of data collection, leaders displayed more consensus, because five factors (instead of two previously) they thought important for success were shared by more than half of the leadership group. Additionally, by phase 2 followers had built even stronger consensus (see Fig. 5). They now shared consensus around an additional three factors; service quality, developing staff, and promoting the service. In other words, at phase 2 of data collection followers displayed considerable consensus, because seven factors (instead of four previously) they thought important for success were shared by more than half of the follower group.

These findings emphasize that limited shared mental models in the leadership group at the beginning of the crisis caused confusion over time. Followers are likely to have experienced difficulty concurring with the leaders' vision for the future when the leadership was unclear of their own prescriptive mental model. Based on the lack of consensus it is likely that different leaders put over different visions for the future, which caused confusion for followers.

We then compared the central maps of leaders and followers between phase 1 and phase 2 to find similarities and differences. The distance ratios between these central maps were calculated based on Markóczy and Goldberg (1995). See Table 6.

The followers by phase 2 were more closely aligned to their mental model from phase 1 (0.312), showing that their beliefs were similar to their own initial reference group, rather than their leaders. However, the data also indicate that leaders changed considerably between phases 1 and 2 (0.470), which is also reflected in a higher score for

cognitive shift. This begins to lend support for H2, that higher cognitive shifts were present in leaders rather than followers.

Most interestingly, the data highlights the extent that consensus has spread from the leadership teams to the follower teams or vice versa during the crisis. The findings point to the notion that the prescriptive mental model of leaders in phase 2 is much more similar to followers from phase 1 (0.329), than to their own reference group from phase 1. The expectation that as the crisis developed the mental models of follower teams in phase 2 would be similar to leaders in phase 1 (0.669), did not materialize. In sum, leaders have converged in thinking more towards followers than vice versa. Further supporting H2, that leadership teams will have a higher degree of cognitive shift than follower teams in response to a crisis. Consequently, the data indicate the possibility that in times of crisis followers are just as important as leaders in determining a prescriptive mental model for the future.

Next, the distances ratio between each individual and the central maps in both phases was calculated. Table 7 highlights how much an individual in each phase of data collection is closer to either a leader group mental model or follower group mental model from phase 1 or phase 2.

The findings confirm that in phase 2, individuals within the organization as a whole are more likely to be closer in thinking to the followers' central map of phase 1 than that of their leaders. In sum, the findings support H3b; that followers will be the initial locus of consensus, but not H3a. During the crisis, the mental models of leadership teams converge towards follower teams, and not the other way around.

Our expectation at the start of our research, predicted by theory, was that leaders' beliefs would change to be in-line with the new environmental conditions and followers would catch up later. This expectation did not materialize, so we now turn to a brief investigation as to why there was a spread of consensus from followers to leaders. At the end of the interview in phase 2, we asked participants to reflect on any changes to their beliefs. Each participant was presented with a copy of their cognitive map from phase 1 so it could be compared with the map from phase 2. The participants were asked to reflect on the changes. Interestingly, most prominent in leaders' quotations is the notion of integrating the perceptions of followers into their strategic direction:

	31	20	42	51
31	0.00	2.83	3.00	3.00
20	3.00	0.00	3.00	3.00
42	2.67	3.00	0.00	2.00
51	3.00	3.00	3.00	0.00

31. Motivation of staff
20. Helping clients achieve 'recovery'
42. Relationships with partner agencies / organizations / services
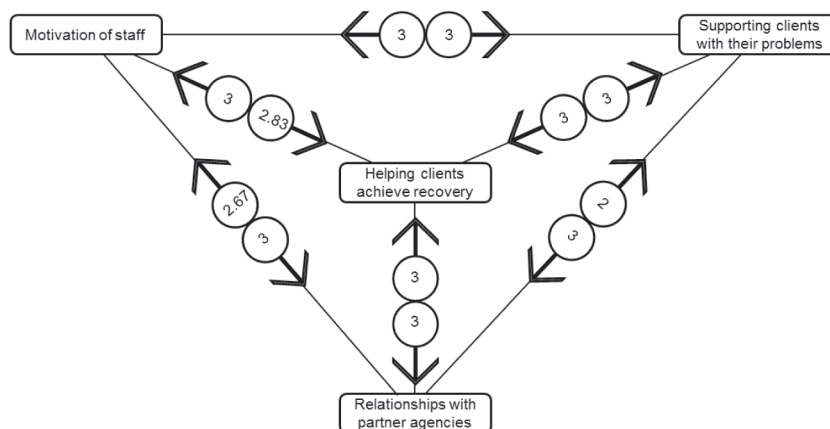**51.** Supporting clients with their problems

Fig. 3. Central map for Followers in Phase 1.

	45	42	20	31	43
45	0.00	2.25	3.00	2.75	2.25
42	2.00	0.00	2.50	2.00	3.00
20	3.00	2.50	0.00	3.00	0.00
31	3.00	2.50	3.00	0.00	-1.00
43	2.00	1.00	-0.50	-1.00	0.00

45. Service quality
42. Relationships with partner agencies / organizations / services
20. Helping clients achieve 'recovery'
31. Motivation of staff
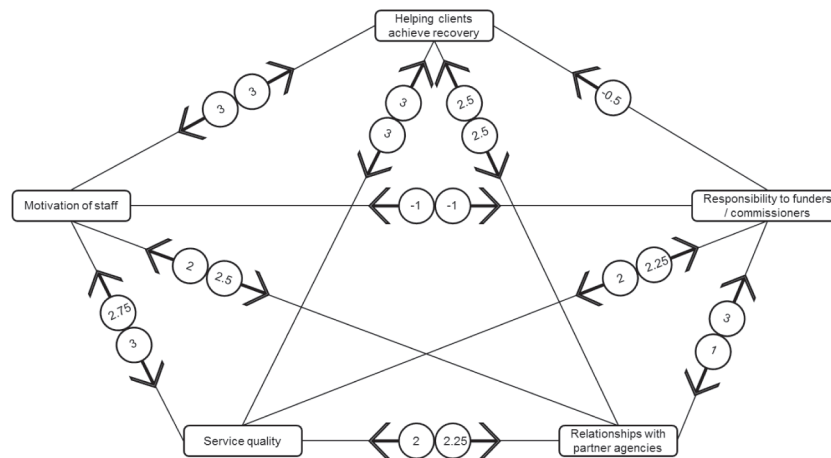**43.** Responsibility to funders/commissioners

Fig. 4. Central map for Leaders in Phase 2.

"*I think everybody who works in this organization is a resource … often the people on the ground have the best solutions. … we need to be able to make them part of the solution and listen to their innovative ideas and try to encapsulate them in our way forward.*"

Top Manager 02

"*…it's just a joy actually being involved with more new staff and seeing their freshness, their ingenuity and I think where you've got managers and seniors that generate creativity I think generally people are becoming hugely more flexible than they were… I just think of how [the TMT] have changed over the last six months and obviously that has a model effect on us and, as I say, I think [The CEO] has moved out of sorting our messes out and taken a very firm view on "You sort it out. You work out between you how you're going to change it and come and tell me about it".*"

Middle Manager 03

"*…I think it's about that forward thinking, … if you're actually thinking "What can I do next? How can we make that better?" or there's a problem and "How can we solve it?" And I think if you can get a team and stuff together and thinking of that they get motivated to sort of be solution focused or to plan.*"

Middle Manager 04

"*…now perhaps I'm more confident that we can achieve the targets and I balance making sure staff are completely on board and are attended to as well, whereas perhaps it might have been a bit too one dimensional in the past*"

Middle Manager 06

This shift in focus to include followers into the change process further supports the findings of the importance of shared mental models in followers during slowly emerging cumulative organizational crises. Consequently, as the crisis developed leaders also highlighted significant changes to communication within the organization as a positive:

"*Last year I felt very adrift strategically and just wasn't sure where we were going. I'm not entirely sure we know where we're going now, but I think at least people are talking about it and we've got some ideas and some plans.*"

Top Manager 01

"*I think there was an improvement in communication. … I think the communication was there, but sometimes there were some ulterior messages…We talk more openly about the problems we're facing as an organization in meetings which I think is a good development.*"

Middle Manager 02

"*I have a feeling that there is more overt discussion about what we're learning how we're changing.*"

Middle Manager 03

The previous quotations add further insights into a potential mechanism through increased two-way communication as to how followers started to potentially influence the movement of leaders' mental models between phases 1 and 2. Finally, several leaders discussed that the initial multitude of changes to their environment was eventually stabilized. This was completed through focusing on staff as a key asset and their role in the importance of service delivery and quality in the survival of the organization:

"*I think that 12 months ago we needed to go through a sort of shake down and rediscover ourselves a little bit and part of the rediscovering ourselves is a realization of the importance of good quality staff. Not that it wasn't important or not realized back then, but I think it's becoming even more important.*"

Top Manager 02

"*For me personally I believe that this is a good quality organization and I believe that it has a passion for delivering quality services… The case is about how you can do things as cheaply as possible and I don't think that is at the heart of our values. So for me the trouble we've got currently economically is about good services being able to weather the storms really and to be there.*"

Top Manager 04

	20	45	42	31	51	13	39
20	0.00	2.00	3.00	3.00	2.80	0.00	0.00
45	2.71	0.00	2.50	2.67	3.00	2.00	3.00
42	3.00	2.50	0.00	0.00	3.00	0.00	3.00
31	3.00	2.17	0.00	0.00	3.00	3.00	3.00
51	2.80	3.00	3.00	3.00	0.00	0.00	0.00
13	3.00	2.80	0.00	2.67	2.50	0.00	0.00
39	2.00	3.00	3.00	3.00	0.00	0.00	0.00

20. Helping clients achieve 'recovery'
45. Service quality
42. Relationships with partner agencies / organizations / services
31. Motivation of staff
51. Supporting clients with their problems
13. Developing staff
39. Promoting the service
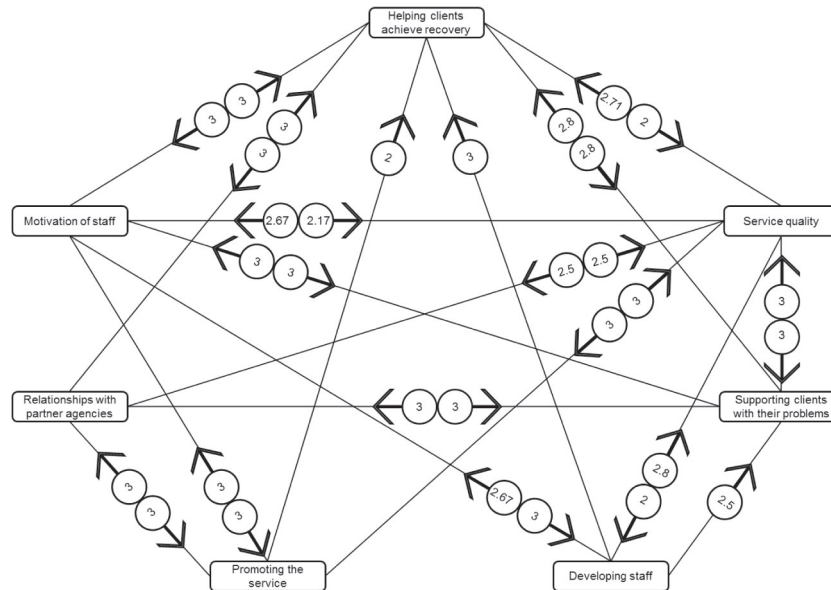

Fig. 5. Central map for Followers in Phase 2.

Table 6
Distance ratios between central maps of leaders and followers in both phases.

	Leaders Phase 1	Followers Phase 1	Leaders Phase 2	Followers Phase 2
Leaders Phase 1	–			
Followers Phase 1	0.366	–		
Leaders Phase 2	0.470	0.329	–	
Followers Phase 2	0.669	0.312	0.366	–

Leaders Phase 1 refers to the central map of leaders in phase 1. Likewise, Followers Phase 1 refers to the central map of followers in phase 1 and so on.

"*Well, I think it's [service quality] implicit in all the contracts we've got, but in any case I think it's the heart of what I believe should be the philosophy of the organization.*"

Trustee 01

"*I think that unless you're a service that provides good quality work, then you're not going to get funding in the future and I think that we've seen other organizations fail bids and so on and we've gained tenders where there have been qualities of poor service before.*"

Middle Manager 03

"*Because if we're not delivering a quality service, then I don't think clients will come to us or come back to us or they'll disengage, … also has an impact on the funding and everything because obviously if we're delivering a quality service, then commissioners and that will be more inclined to either fund us or continue to commission us.*"

Middle Manager 04

It appears that going through a period of panic brought about by the loss of contracts and successfully tendering for new contracts has made the leadership realize the need to focus on service quality. This focus was required to maintain existing contracts (making sure that they do not lose any more) and to service the new contracts they had gained to resolve the crisis.

Discussion

Our main findings demonstrate that leaders mental models, over the two phases of data collection, change and increase in similarity to those of followers at the onset of the crisis. Therefore, the findings support hypothesis 3b; that followers are the initial locus of consensus rather than leaders. It is significant to note that during slowly evolving cumulative organizational crises, shared mental models can emerge in follower teams before the leadership. The convergence in mental models is also reflected in the partial support for hypothesis 2; that higher cognitive shifts occurring in leaders during a crisis. Our key findings confirm, that during organizational crises, followers can play a central role in the process of forming consensus to resolve a crisis.

In this current study, through analyzing the mental models of both leaders and followers in a naturalistic setting, we have been able to identify where consensus first forms during a crisis. Our findings

Table 7
Comparing means of individual distances from central maps.

	All N = 31		Leaders N = 12		Followers N = 19	
	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
Ph1 - Distance from leaders' central map in phase 1	0.897	0.066	0.912	0.072	0.888	0.063
Ph1 - Distance from followers' central map in phase 1	0.781	0.128	0.853	0.130	0.736	0.107
Ph1 - Distance from leaders' central map in phase 2	0.754	0.097	0.801	0.110	0.724	0.077
Ph1 - Distance from followers' central map in phase 2	0.703	0.186	0.801	0.165	0.640	0.175
Ph2 - Distance from leaders' central map in phase 1	0.889	0.068	0.894	0.076	0.887	0.065
Ph2 - Distance from followers' central map in phase 1	0.779	0.128	0.824	0.126	0.751	0.125
Ph2 - Distance from leaders' central map in phase 2	0.688	0.138	0.652	0.158	0.711	0.123
Ph2 - Distance from followers' central map in phase 2	0.613	0.172	0.685	0.141	0.567	0.178

N = number of maps (participants). $\bar{x}$ = mean of individuals' distances from central maps. σ = standard deviation. Ph1 = Phase 1 respondents. Ph2 = Phase 2 respondents.

question whether a coherent prescriptive mental model was in place in the leadership teams of the organization shortly after the onset of the crisis (Combe & Carrington, 2015; Mumford et al., 2007). Developing a prescriptive mental model for the future would require leaders to have a substantial cognitive capacity to simplify events in such a way that a viable vision can be formulated (Partlow, Medeiros, & Mumford, 2015, p. 466). Our findings raise serious concerns that leaders are able to do this easily.

Our findings suggest that cumulative organizational crises can intensify a dynamic exchange between the mental models of leaders and followers. Here, followers may have just as much influence on leaders than leaders on followers. This concurs with prior research undertaken by Carsten et al. (2010) who also confirm that followers can be challenging and should not be viewed as just passive and obedient. Particularly as strategic planning can fail when those involved in implementation are excluded, participatory planning to include non-leaders becomes essential (Ketokivi & Castañer, 2004). Furthermore, a strategy is less likely to be sabotaged if disagreements are synthesized into a common vision (Olson, Parayitam, & Bao, 2007).

Prior empirical research suggests that alternative job roles based around different task environments, shape mental models (Daniels et al., 1994; Hodgkinson & Johnson, 1994). While we did not study antecedents to cognition, our findings point to a similar conclusion. Initially, it seems that the role or position of an individual within the organization did have some influence on their beliefs in how to respond to the crisis. Followers, in client facing roles emphasized operational issues, such as service quality, from the start of the crisis, while top managers focused on a variety of more strategic issues.

We now turn to the potential reasons for our findings not supporting the expectation that consensus to resolve a crisis will first develop in leaders. One main reason is based on the context of this current study, because the resolutions to resolve the crisis were more operational, rather than strategic, in nature. Redesigning the process for tendering for new contracts, to resolve the financial crisis brought about by the loss of major contracts, required coordinating data and analysis on previous performance in service delivery. This data already existed in the organization, but was not used in the tendering submissions previously. The more robust demonstration of successful service delivery in existing and past contracts, resulted in the award of several large new contracts, which resolved the financial crisis. The increased focus on service quality was required to meet client expectations, because the firm started to emphasize previous high levels of service delivery in the tendering process. As service delivery is largely the domain of followers it is perhaps not surprising that followers took the lead in thinking of this focus as a way forward.

Another possible explanation for our findings is that followers are closer to key external actors, such as customers and suppliers (Ketokivi & Castañer, 2004, p. 341), and can articulate change from their perspective, first to each other, and then to leaders. In cumulative organizational crises, interaction with these external actors is likely to take up a major part of the followers' time in their job roles, and be influential in their thinking about overcoming crises. After interacting with key external actors, followers may be more willing to criticize each other's thinking than leaders, so that critical reflection and cross understandings could occur more in followers than leaders during cumulative organizational crises (Huber & Lewis, 2010).

Limitations

The findings are based on a single in-depth case study when leaders and followers confront an organizational crisis, so the study only offers analytical generalization (generalization to theory), rather than statistical generalization. Specifically, the case study is based on a cumulative type of organizational crisis (financial crisis) and its resolution over an 18-month period. While the findings are limited to cumulative organizational crises, the scope and generalizability are likely to be large. The findings are likely to be applicable to organizational contexts involving operational problems, where followers have a better understanding than leaders of key challenges and their solutions.

However, the involvement of followers is unlikely to occur when crises develop abruptly, such as can occur in some military situations. Abrupt crises can emerge in hours and require an immediate response (Hwang & Lichtenthal, 2000; James & Wooten, 2005). Despite occurring quickly and unpredictably, the causes of abrupt crises may be clearer compared to the ambiguity faced during cumulative crises (Hwang & Lichtenthal, 2000, p. 134). Therefore, mental models of both leader and follower teams are likely to attain higher levels of consensus during abrupt crises, rather than cumulative ones. Likewise, focusing on a not-for-profit organization added further complexity due to the presence of multiple stakeholders (Dooley, Fryxell, & Judge, 2000). In the UK heath sector there is a disparity between two customer groups. This disparity occurs because there is a differentiation between those who pay for services, such as funders and donors, and those who use the service, such as clients, patients or beneficiaries (Bruce, 1995; Shapiro, 1973; Vázquez, Álvarez, & Santos, 2002). Any limitations to the amount of generalization, however, need to be balanced with a major advantage. Single case study method can provide deep understandings into the responses to the same crisis in a naturalistic setting.

A focus on mental models has meant that other effects have not been studied. For example, we did not investigate any antecedent effects such as the influence of power dynamics on cognition (Balogun, Jacobs, Jarzabkowski, Mantere, & Vaara, 2014; Dess & Priem, 1995; Weick, Sutcliffe, & Obstfeld, 2005). Furthermore, different types of leadership such as charismatic, ideological, and pragmatic leaders (Mumford, Antes, Caughron, & Friedrich, 2008) were not investigated. A study of different types of leaders could shed further light on the vision formation process between followers and their leaders (Strange & Mumford, 2002).

Additional data would also help understand any relationship between strategic thinking and strategy implementation. It is possible that the implementation of a particular strategy during the crisis was reflected initially in the cognitive maps. However, our research design makes it difficult to trace how leaders' and followers' mental models relate to the strategy of the firm and whether this was emergent in nature (Mintzberg, 1978; Mintzberg & Waters, 1985). The firm did focus on improving service quality (which is present in the cognitive maps) as part of introducing a new robust tendering process, and this focus eventually led to gaining new large contracts to overcome the financial crisis.

While the findings do highlight that the expected causal link predicted by vision formation theory did not materialize, we did not fully investigate causality. To strengthen the evidence of causality three alternative research designs should be considered. One, an experimental research design could potentially isolate the causal effects. However, conducting such a study in a naturalistic setting with control groups could be problematic and compromise its external validity. Two, a research agenda that incorporates longitudinal participant observational data from meetings, as well as documentary evidence, to back up claims of influence could add to the initial work set out in this current study. Three, developing the longitudinal research design, to capture pre-crisis data would allow researchers to identify whether the cognitive maps before the onset of the crisis contained similar beliefs to those found in either phases of this study. However, to identify a suitable focal organization(s) before a crisis occurs could be extremely difficult due to the problem of forecasting a crisis in advance.

While we did trace cognitive shifts in leaders and followers and the locus of consensus over time as a crisis developed, we did not trace the performance implications of similarities and differences in mental models. Leader performance is key during crises (Barrett, Vessey, & Mumford, 2011; Mumford et al., 2007) but tracing the links between mental models and performance at different organizational levels was beyond the scope of this study. Tracing these links has proved particularly difficult as the performance effects of consensus and diversity remains equivocal despite the abundance of research investigating the relationship (Fiol, 1994; Gonzalez-Benito, Aguinis, Boyd, & Suarez-Gonzalez, 2012; Miller et al., 1998; Smith et al., 1994; West & Schwenk, 1996).

Finally, the findings are based on a small longitudinal sample size of 31. Due to the longitudinal research design, the initial sample of 40 individuals did suffer some sample attrition over the 18 months from phase 1 to phase 2 of data collection. Increasing the initial sample size would have alleviated this problem to some extent. However, high personnel turnover is often a consequence of radical change and subsequent crises so sample attrition is difficult to eliminate from longitudinal studies into crises.

Contributions to theory

This study is the first to address the temporal issues of sensemaking and vision formation during a slowly emerging cumulative organizational crisis within both leaders and followers in a naturalistic setting. Previous studies have largely neglected these important issues under crises conditions at different hierarchical levels in team settings. The longitudinal analysis has allowed us to capture shared mental models within and between leader and follower teams over time. Therefore, building upon prior research, our study makes a key contribution to the literature on vision formation during crisis conditions.

When theorizing around sensemaking, researchers highlight the importance of cognitive diversity and collective sensemaking when confronting novel environments (Eden & Ackermann, 2010; Seidl & Werle, 2018). However, empirical research tends to highlight the importance of different management perspectives and downplay the inclusion of followers in the sensemaking process. Our research suggests that through shared mental models, followers can have a considerable

input into sensemaking and the development of a prescriptive mental model, as the basis of vision formation (Valcea et al., 2011). Through studying shared mental models, we have found that followers, collectively, can make sense of a crisis prior to the leadership. The findings revealed that later in the crisis, the mental models of leaders were similar to the initial shared mental model held by followers. In other words, the findings also challenge the assumption that communication and influence between leaders and followers is strictly one-way (Marks et al., 2000) and top-down (Bourgeois, 1980; Dess, 1987). Consequently, our findings point to a dynamic exchange occurring between the team mental models of both leaders and followers.

Implicit in the prior literature is the notion that cognitive shifts are required for shared mental models to emerge (Dionne et al., 2010; Markóczy, 2001). Following Foldy et al. (2008) and Ospina and Foldy (2010) we contribute to theory through demonstrating that during a cumulative organizational crisis individuals have varying degrees of cognitive shift. Specifically, our findings offer partial support for subsequent higher cognitive shifts occurring in leaders. Therefore, the leaders' initial vision for the resolution to the crisis required most change. This evidence of cognitive shift in the leadership, when first facing new environmental conditions, concurs with prior research that has found a time lag in developing new mental models to match novel conditions (Barr, 1998; Barr et al., 1992; Hodgkinson, 1997; Reger & Palmer, 1996).

The reasons suggested in prior empirical studies for cognitive inertia in leaders have been that learned recipes (Spender, 1989), and routinized ways of thinking (Nelson & Winter, 1984) play prominent roles. There are additional potential reasons for initial cognitive inertia when resolving crises. One, the leaderships' inability to listen to others so they were not responsive. Two, inertia may have been caused by the opposite; the leadership engaged in collective sensemaking so they were listening to too many different perspectives, which caused a time lag. Three, inertia may have been caused by errors, myopia, and competitive blind spots (Marcy & Mumford, 2010; Ng, Westgren, & Sonka, 2009; Porac et al., 1989; Skilton & Dooley, 2010). This last suggestion aligns with prior empirical research, which highlighted the possibility that crisis environments are partially socially constructed, leading to errors of judgement (Porac et al., 1989).

An alternative potential explanation is also suggested by the findings presented in this current study. As a time lag occurred for the leadership to be aligned with the mental models that first emerged within followers during the crisis, it may be that the leaders experienced a crisis themselves. The leaderships' power and authority may have been undermined by inconsistent sensemaking, and lack of consensus in how to respond to the crisis, which caused them to retrench. Therefore, our findings point to the need for further theory development to incorporate additional antecedents into explanations for cognitive inertia during crisis conditions.

Contributions to practice

Leaders need to be aware of the alternative insights that followers can bring to resolving crises. Understanding the evolving mental models of followers is a key task for leaders in responding to cumulative organizational crises. Therefore, leaders can call upon followers to help make sense of the crisis, in the knowledge that followers will need to respond quickly to implement the strategic response. While strategic decisions during crises need to be taken speedily, the success of these decisions are dependent on the commitment and consensus with others (Dooley et al., 2000; Eisenhardt, 1989; Eisenhardt & Bourgeois, 1988). Due to the presence of multi-teams at different hierarchical levels (DeChurch et al., 2010), orchestrating the strategic response swiftly can be problematic. In other words, to enable effective and coordinated remedial action following a crisis, shared mental models are required (Burke et al., 2006; Cannon-Bowers et al., 1993; Day et al., 2004; Klimoski & Mohammed, 1994; Marks et al., 2000) in both leader and

follower teams. Consequently, leaders should prioritize consensus and coordination with their followers to ensure a swift organizational response. To aid in this endeavor leaders need to involve followers in workshops for collective sensemaking and crisis resolution.

Organizations may also benefit from receiving training and development in causal analysis to help prepare for crises (Marcy & Mumford, 2010). Likewise, cognitive mapping itself and other cognitive decision aids could improve decision quality. For example, organizational workshops using cognitive mapping could highlight key differences in mental models between leaders and followers at an early stage. Furthermore, these intra-organizational workshops may help shared understandings and aid consensus development (Ackermann & Eden, 2011; Eden & Ackermann, 2010). These cognitive workshops could allow for guided reflection which can enhance performance (Gurtner, Tschan, Semmer, & Naegele, 2007). Such reflexivity through cognitive mapping could also help overcome biases (Narayanan, Zane, & Kemmerer, 2011).

Future directions

There are several possible explanations for our findings, which require further research. One potential explanation for the importance of followers in our particular case study is that the solutions to overcome problems may have been required at the operational level, rather than the strategic level. If this was the case then the role of vision provider can become unclear. Consequently, differentiating between strategic and operational solutions to different crises is an important future research direction to build on vision formation theory.

The interaction between followers in day-to-day communication is also likely to be much more common than interaction between leaders, which gives more opportunity for followers to influence each other. Therefore, future research should investigate the quantity and substance of interactions to investigate influence between leaders and followers. The influence between leaders - leaders and followers - followers also needs to be included in future studies. In this current study, we focused on examining individual mental models within team settings. We did not investigate the interaction and streams of communication (Ocasio, Loewenstein, & Nigam, 2015), between and within leader and follower teams. In practice, organizational actors attempt to not only make sense of ambiguous situations, but also influence others (Fiss & Zajac, 2006; Gioia & Chittipeddi, 1991; Maitlis, 2005; Maitlis & Lawrence, 2007). Future research should integrate the insights that can be made by investigating individual mental models based on sensemaking, with more detailed research on influence through sensegiving.

In this current study, the antecedent effects of the influence of power dynamics on mental models during the crisis were not studied (Dess & Priem, 1995). Therefore, further studies into sensemaking, to examine power and politics in more detail, are required (Balogun et al., 2014; Weick et al., 2005). Particularly, future research could also focus on the role and influence of the CEO in the leadership teams (Bromiley & Rau, 2016; Georgakakis, Greve, & Ruigrok, 2017). As a result, additional data would help to understand the influence of power dynamics when responding to crises. Another possible fruitful future research would be to understand the influence of types of leadership and leadership styles in crisis conditions.

Conclusions

In conclusion, our study takes a step towards understanding the spread of consensus within team mental models of leaders and followers. During cumulative crises, our findings start to challenge the conventional view of one-way communication and influence from leaders to followers. This study opens up the possibilities that leader team mental models can converge towards that of followers under certain conditions. We hope we inspire future work to examine further the emergence of and transmission between shared mental models in both leader and follower teams.

Appendix 1. List of factors in the sorting task

1 Accessibility
2 Barriers to change within the organization
3 Building resources for the future – financial/equipment/human
4 Company brand image
5 Competitor analysis
6 Control of service costs
7 Cooperation across all departments and service locations
8 Coordinating operations
9 Current resources – financial/equipment/human
10 Delegating tasks to others
11 Detailed analysis of company finances
12 Detailed information/data on customers
13 Developing staff
14 Differentiation of services from competitors
15 Economic conditions
16 Employee flexibility
17 Employee relationships
18 Geographical position of services
19 Government policy
20 Helping clients achieve 'recovery'
21 Innovative services
22 Internal efficiency
23 Knowledge of competitors
24 Knowledge of customers
25 Knowledge of internal operations
26 Layout of services
27 Learning to improve
28 Level of funding
29 Management intuition
30 Measuring customer achievements
31 Motivation of staff
32 Open communication
33 Personal leadership style
34 Personal motivation
35 Personnel turnover
36 Planning ahead
37 Predictable change
38 Price differentiation from competitors
39 Promoting the service
40 Public relations
41 Range of extra services
42 Relationships with partner agencies/organizations/services
43 Responsibility to funders/commissioners
44 Responsibility to trustees
45 Service quality
46 Service space
47 Shared corporate culture
48 Speed of response to change in customers' needs
49 Staff income
50 Support from head office

51 Supporting clients with their problems
52 Taking risks in decision-making
53 Target focused
54 Targeting new funders

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