Towards an understanding of 'dynamic ambidexterity' in supporting managerial resilience.

Neil Turner, Elmar Kutsch, Harvey Maylor, Juani Swart

Abstract

Resilience is clearly a desirable attribute, but characterising it is challenging. Individual- and organizational-level resilience are established fields of study, whereas mid-range, managerial-level, evidence of how resilience is achieved is lacking. In this paper we develop the argument that the ability both to exploit and explore (i.e. ambidexterity) may support, and be a valuable way to analyse, resilience. We ask: *'What ambidextrous actions support managerial resilience?'*

We report on a study carried out with senior staff from five major UK-based organizations. From our qualitative data investigating critical incidents and 'near-misses' we first unpack the key actions that managers undertake, categorising them in terms of 'preparing', 'noticing', 'identifying' and 'determining potential responses'. These contain complex, interwoven, exploitative and exploratory characteristics which enable the awareness and containment of potential adversities, yet these vary over time. We posit that these actions are supported by the 'dynamics' of contextual ambidexterity which we identify and illustrate.

These findings contribute to both the ambidexterity and resilience literatures and lead to practical considerations for managers.

Introduction

Organizations inevitably face adversities (Williams et al. 2017), and there is a growing appreciation that the complexity and unpredictability of the world in which they operate mean that the need for resilience is increasing. As Hamel and Valikangas (2003, p.52) identified, "success has never been so fragile." This fragility means that formulaic approaches to deal with emerging challenges look less like tenable solutions (Fiksel et al. 2015; Maylor & Turner 2017).

The issue of resilience was recently highlighted by van der Vegt et al. (2015) in AMJ who identify the 'grand challenge' of understanding how organizations respond to adverse events, and point out that traditional risk management practices are often insufficient. Recent reviews of the resilience literature (Annarelli & Nonino 2016; Linnenluecke 2017; Williams et al. 2017) also highlight the areas of this important topic that need further investigation.

How, then, do we understand the nature of resilience? As a general concept it would appear to be a desirable trait, yet tangible aspects remain elusive, and Duit (2016, p.366) refers to the subject as "nebulous". Currently there are multiple interpretations, yet we lack a full understanding, and clear guidance for managers is not evident. Scenario planning (e.g. Nair & Sarin 1979) is valuable, but insufficient.

Linnenleucke (2017, p.4) writes that "[t]he term 'resilience' has been used at the organizational level to describe the inherent characteristics of those organizations that are able to respond more quickly, recover faster or develop more unusual ways of doing business under duress than others." Williams et al. (2017) suggest that organizational resilience not just the sum of individuals' resilience, "but rather includes the interaction between an organization, its stakeholders, and the environment while confronted with adversity." The literature review by Annarelli and Nonino (2016, p.2) summarises organizational resilience as the "ability to resist and respond to a shock (internal or external) and recover once it has occurred". These are certainly helpful but fall short of providing a full picture.

Taking a broad view, the resilience literature can be taken to span from the macro level of high-reliability organizations (e.g. Roberts & Libuser 1993; Vogus et al. 2014; Weick 1987; Weick & Roberts 1993) to the individual level (e.g. Bonanno 2004; Coutu 2002). However, there appears to be limited empirical work at the meso-level. Although this has been recognised within the ecology literature (Bergström & Dekker 2014), in the management field this still appears to be lacking in terms of the identification of specific managerial actions. We therefore take this approach to our study to understand better the nature of, and actions that underpin, this 'managerial' resilience.

We review the resilience literature in the next section. We then draw on March's (1991) idea of differentiating between exploitation and exploration, to identify if such a theoretical underpinning is beneficial in helping us understand better the responses to organizational difficulties. Sometimes risks are identified or unanticipated issues arise for which there is a recognised solution. Here an exploitative solution is appropriate, such as implementing a contingency plan or adapting a previously-used response. Alternatively, a wholly new and unexpected challenge may be faced, in which case an innovative, exploratory, solution may be called for. However, these represent the ends of a continuum and in reality a balance between exploitation and exploration is generally required. The study of how to combine these is now a major theme within the literature. Ambidexterity, the ability both to exploit existing knowledge and competencies while also generating new knowledge (Turner et al. 2013), allows us to understand how rule-based systems necessary for organizational efficiency and continuity can be balanced with the flexibility and adaptability required to deal with unforeseen difficulties and crises. Van der Vegt et al. (2015) also identify that although mechanistic systems are sufficient in stable environments, changing environments require a more organic approach. We posit that an ambidexterity lens may be valuable in understanding better how 'managerial' resilience may be enacted.

In this paper we report on a large study undertaken with five major organizations whose senior management were interested in understanding the nature of resilience and what it meant in terms of their activities. From our analysis we identify four themes that underpin the attainment of resilience ('preparing', 'noticing', 'interpreting' and 'determining potential responses') and show that these are not independent stages but interwoven aspects that combine exploitation and exploration. We demonstrate that an ambidexterity lens is helpful in addressing many of the issues raised within the resilience literature.

Literature

In this review we first discuss resilience, followed by ambidexterity, then present the rationale for combining the two.

Resilience

Much of the work on resilience has been developed from the field of ecology (Holling 1973) but has since been adopted within the management literature and has been used in a variety of fields (Bhamra et al. 2011). Linnenleucke (2017) identifies the growth of resilience within the management literature as tracing back to Staw et al. (1981) and Meyer (1982), and identifies five managerial research streams, which view resilience as "(1) organizational responses to external threats, (2) organizational reliability, (3) employee strengths, (4) the adaptability of business models or (5) design principles that reduce supply chain vulnerabilities and disruptions" (2017, p.5). She shows how the resilience literature has moved from organizational responses, through 'resilience as reliability' in the 1980s and 1990s, and post 9/11 has included areas such as managing employee strengths, the adaptability of business models, and resilient supply chains.

There is, though, no single, unifying, definition of the term 'resilience' that is widely accepted (Linnenluecke 2017). Bhamra et al. (2011) provide a summary of the key definitions from the multiple fields in which it has been used. From these, the following are pertinent to our discussion: Walker et al. (2004, p.2) (socio–ecological systems) describe resilience as "the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks"; Luthans et al. (2005, p.25) (psychology) describe it as "the ability to 'bounce back' from adversity or personal setbacks"; Coutu (2002) argues that resilient individuals demonstrate an acceptance of reality, a strong belief that life is meaningful, and the ability to improvise; and Horne and Orr (1998, p.38) (organizational) say that resilience is a "fundamental quality of individuals, groups, organizations, and systems as a whole to respond productively to significant change that disrupts the expected pattern of events without engaging in an extended period of regressive behavior." It is useful to start with a high-level systems view, and Gallopín (2006) attempts to bring clarity to some of the terminology. He looks at system vulnerability and identifies that resilience and adaptive capacity are conceptual subsets, however, these terms are used differently by different authors in multiple fields, and ambiguity in usage remains. Fiksel (2003) advocates designing systems with properties of *diversity*, *efficiency*, *adaptability*, and *cohesion* which contribute to resilience.

Williams et al. (2017) identify the acts of 'preparing' for adversity, and 'restoring' when challenges emerge. For the former, with proactive 'investment', "organizations can cultivate predisaster resilience by strengthening preventative measures, including developing networks, coordination techniques (within and between organizations), and individual members' resilience" (2017, p.746). With the latter, improvisation may be required to avoid a catastrophe or minimise its impact.

Annarelli and Nonino (2016) advocate 'resilience thinking' as a proactive approach and as a source of competitive advantage rather than as a defensive response. Considering resilience in static as well as dynamic terms is useful with regards both to the nature of activities undertaken and the response time, and should be considered a key strategic initiative. One of the areas of future research they identify is that of 'anticipatory innovation' which Teixera and Werther (2013) argue is valuable in creating resilience. The managerial ability to react effectively to internal or external threats is also a key stream of research (Muurlink et al. 2012).

These are valuable viewpoints, and understanding resilience both in terms of the ability to prevent issues growing into major difficulties in the first place, yet also to 'bounce back' would seem to be beneficial. Although these two points might appear to be somewhat juxtaposed, combining the two provides a more holistic view of how we might recognise and understand resilience in an organizational setting. This reflects one of the debates within the literature, whether resilience is a process or an outcome. We adopt the same 'middle view' as do Williams et al. (2017, p.742) who argue that a process definition of resilience includes "preadversity capabilities, in-crisis organizing and adjusting, and postcrisis resilience responding." A challenge of investigating resilience is, though, as Linnenleucke (2017, p.19) highlights, that outcomes are 'invisible' if resilient firms do not experience any disruptions or crises. Williams et al. (2017) identify key enablers of resilience, including financial slack, cognitive capability (including strong values, timely and accurate information-sharing and problem-solving capabilities), behavioural capability in terms of both organizational design and individuals' responses (including responses to 'weak signals of failure'), and relational capability including trust and effective social networks.

Lengnick-Hall et al. (2011) propose that an organization's capacity for resilience is developed through strategically managing human resources to create key competencies. Aggregated at the organizational level these allow those organizations to respond effectively to shocks. Linnenleucke (2017, p.25) also acknowledges that resilience encompasses both the individual and organizational level, yet it is still unclear how these can be linked to each other.

Summarising aspects of work by Lengnick-Hall and Beck (2005) and Lengnick-Hall et al. (2011), Akgün and Keskin (2014) describe 'resilience capacity' as having three components. These are (1) the cognitive resilience, based on a sense of purpose, core values, vision and constructive sense-making, (2) the behavioural dimension, comprising both learned routines and 'unscripted agility', and (3) contextual resilience based on psychological safety, social capital and accountability. Ortiz-De-Mandojana and Bansal (2016) find that responsible social and environmental practices aid long-term organizational performance and help firms become more resilient, and Williams et al. (2017) also advocate psychological safety as a valuable area of further research in this respect.

Burnard and Bhamra (2011) develop an organizational resilience model that looks at threat detection and response, and incorporates learning to feed back into enhanced monitoring. They recommend work that looks at the enabling conditions of organizational resilience and the dynamics of responses. This learning aspect is referred to as 'adaptive resilience' by Duit (2016).

Although the resilience perspective has been used in the operations management (e.g. Hearnshaw & Wilson 2013; Maull et al. 1990; Smith et al. 1994; Stevenson & Busby 2015) and supply chain literatures (Gunasekaran et al. 2015; Ivanov et al. 2014; Kamalahmadi & Parast 2016; Soni et alo. 2014; Tukamuhabwa et al. 2015), as yet there does not seem to be a general set of principles to be adopted for the wider organizational context. Linnenleucke (2017) also acknowledges that we cannot as yet recognise the factors that predict effective organizational resilience to future conditions.

Linnenleucke (2017, p.26) argues that 'organizing for resilience' is still poorly understood, and asks "What capacities bring about resilience really? And how do they originate? How do certain capacities (i.e. resources, structures, processes) lead to resilience, and what is their relative importance?" Williams et al. (2017, p.752) also writes that "[f]uture research can make a substantial contribution to the literature by exploring the role of leadership in preparing for, adjusting to, and responding to adversity as well as building endowments in a way that promotes greater resilience, thereby avoiding a triggering event and the need for crisis management."

Bhamra et al. (2011) highlight that there are a lack of empirical studies on resilience and how organizations, particularly small and medium enterprises, can achieve this. They advocate case studies on how organizations can achieve resilience, of which there are few (Jaaron & Backhouse 2014). 'Resilience' revolves around the capability to contain, withstand and bounce back from adversity. However, any form of containment should be attempted based on sufficient situational awareness, yet this does not appear to be a prominent theme. It is therefore an area we sought to look at further using case studies, which we present below.

In summary, resilience is a multifaceted concept to which there are no 'simple' rules. However, it is apparent that authors to date have identified both systematic routines and procedural aspects that can be called upon, combined with the need for new and imaginative solutions in uncertain environments. This aligns closely with role of exploitation and exploration in organizational survival, indicating that this may be an appropriate lens for furthering our investigation of this subject.

Ambidexterity

The ambidexterity literature has developed based on the concept of accommodating both exploitation (refinement of existing knowledge) and exploration (the search for new solutions). These are two opposing requirements which create an inherent tension (March 1991). However, too narrow a focus on exploitation in the short term risks longer-term decline, yet reliance on exploration for new paths (many of which will not be successful) is similarly risky (Levinthal & March 1993). The ability to accommodate paradox and balance seemingly opposing requirements is the basis of ambidexterity (Ahn et al. 2006; Andriopoulos & Lewis 2010), including in relationships outside of the firm (Bednarek et al. 2016; Kauppila 2015). However, realising and even conceptualising this in practice is not straightforward, and the extensive body of publications addressing this is testament to this

challenge. The rewards for organizations which can achieve it are financial and other performance benefits (see Birkinshaw & Gupta 2013; Junni et al. 2013; O'Reilly & Tushman 2013; Turner et al. 2013 for reviews). However, despite the broad acceptance of the desirability of ambidexterity, studies to date have not fully explained the mechanisms by which it can be achieved. Three major approaches are advocated (Turner et al. 2013). In temporal ambidexterity (Tushman & O'Reilly 1996) an organization uses the two modes sequentially according to their perceived need at the time. In structural ambidexterity (O'Reilly & Tushman 2004), an organization manages both exploitation and exploration simultaneously by running each as separate, parallel, entities with their own appropriate operating procedures. Finally, contextual ambidexterity (Gibson & Birkinshaw 2004) is "the behavioral capacity to simultaneously demonstrate alignment [exploitation – adherence to goals] and adaptability [exploration – situation-dependent flexibility] across an entire business unit." (2004, p.209). This contends that individuals will make sensible judgements in complex work environments, based on their experience and expertise, as to how they can most valuably spend their time. The nature of ambidextrous implementation can be designed 'top-down' by senior management and/or emerge 'bottom-up', a process in which frontline managers deliberately adopt an ambidextrous orientation (Zimmermann et al. 2015).

The measurement of ambidexterity is an ongoing theme within the literature (e.g. Turner et al. 2013). We take the view that exploitation and exploration can be viewed as orthogonal, as this is beneficial in understanding and explaining better the nature of contextual ambidexterity. Birkinshaw and Gupta (2013) show that this allows a 'frontier' of possible ambidextrous approaches, and D'Souza, Sigdyal and Struckell (2017) identify that this can also be used to compare 'relative' ambidexterity between members of a referent group. This rather 'static' approach, though, has limitations, and we return to this issue later.

The literature on ambidexterity is characterised by theoretical and empirical work that has been primarily at the organizational level (Turner et al. 2013). Analysis at the level of the individual manager has been performed (Birkinshaw & Gupta 2013; Lubatkin et al. 2006; Mom et al. 2007; Nemanich & Vera 2009) although an overarching explanation is not yet evident. Kang and Snell (2009) look at ambidexterity in terms of intellectual capital (Swart 2006), identifying that it can be exploitative and/or exploratory at multiple levels. At the *human capital* (HC) level, where knowledge is embedded within individuals, exploitative HC is *specialist* knowledge (i.e. deep expertise in one's subject), whereas exploratory HC is termed as *generalist* (i.e. wide experience in a number of fields). At the *social capital* (SC) level, where knowledge is understood to reside in the network of personal relationships, exploitative SC is when dense social networks are used to transfer complex knowledge, whereas an exploratory approach uses weaker ties to seek new knowledge (Granovetter 1973). Finally, at the organizational level, exploitative and exploratory systems are thought of in terms of *mechanistic* or *organic*, respectively (Burns & Stalker 1961). Kang and Snell's (2009) logic has been extended to managers and teams in terms of identifying these co-existing elements in the generation of ambidexterity (Turner & Lee-Kelley 2013; Turner et al. 2016; Swart et al. 2017), but the principles have not as yet been extended beyond a 'static' view, nor utilised in understanding how this may aid in promoting resilience.

Güttel and Konlechner (2009) identify key elements supporting ambidextrous organizations, including: a combination of detailed procedures and simple rules with loose-tight relationships to balance flexibility with structure; cultural values and social norms, shared language and mutual understanding are important in fostering contextual ambidexterity. The importance of key social aspects, such as culture and shared goals, is also evident (De Clercq et al. 2013; De Clercq et al. 2014; Seshadri et al. 2010; Wang & Rafiq 2014), and Seely Brown (2004) identifies the importance for an organization of being able to sense peripheral events. We note that this has parallels with the social and behavioural aspects underpinning much of the resilience literature, discussed earlier.

We sought to understand better how managers could balance exploitation and exploration to overcome emerging issues and thereby enhance their organization's resilience. Our underlying thesis was that ambidexterity would be beneficial in resolving issues before they became critical and also supporting the implementation of solutions should recovery be necessary. It was, though, unclear exactly how this would manifest in practice.

Linking resilience and ambidexterity

Perhaps surprisingly, the links in the literature between ambidexterity and resilience are very limited. Schemeil (2013) looks at global institutions, and finds that often they do not disappear once their initial remit is complete, but instead new undertake challenges (exploration) while also continuing with their original mandate (exploitation). This aids in their institutional longevity. Mamouni-Limnios et al. (2014) look at four archetypes of resilience, noting how organizational resilience may be high or low, and, importantly, whether or not this state is desirable. A highly resilient state that leads to rigidity in the face of necessary change is detrimental, and this distinction is significant. Resilience should not always be considered a positive attribute, it can on occasion be damaging. The authors identify the 'adaptability' quadrant where resilience is both high and desirable as being associated with ambidexterity, and this is the region in which we wish to focus. We posit that 'appropriate' resilience is when exploitation is balanced with the necessary exploration in times of uncertainty and when flexibility is beneficial.

Our rationale for this work was to seek to understand better the relationship between ambidexterity and resilience in organizational settings. Interestingly, Richtnér and Löfsten (2014) identify the links between resilience and creativity, and Mamouni-Limnios et al. (2014) support the idea that the ability both to exploit and explore should support resilience. The twin approaches enable the refinement of existing knowledge, yet accommodate the adaptability that underpins the capability to respond flexibly to emergent challenges and unforeseen events. This logic appears sound at the organizational level, however, empirical evidence is limited. We posit that managerial resilience is supported by ambidexterity, yet the specific actions underpinning this inter-relationship are unclear. Our research question was: *'What ambidextrous actions support managerial resilience?'* We sought to use interviews with knowledgeable practitioners to understand their actions, and examine specific incidents to understand the responses, including in terms of exploitation and exploration. The research method and subsequent findings are now discussed.

Method

This study involved five major UK-based organizations. A precursor to involvement in the study was that each organization was perceived internally by its senior management to be resilient, and shown to have a successful track record of resilience, i.e., performance in its own industry compared to its competitors using key, appropriate, performance metrics.

These organizations comprised a major new power system product development group ('EngineCo), two multinational insurance companies ('InsureCo1' and 'InsureCo2'), a large power station ('ElectricityCo') and a research company executing a set of high-tech R&D projects for their clients ('ProdDevCo'). To preserve anonymity they will be referred to by their pseudonyms.

We chose a qualitative approach because of the richness of data and the valuable insight that can be gained from such an approach (Soltani et al. 2014). We carried out a range of interviews both with senior- and middle-management (see Table 1), and these had two elements. The first was to elicit an understanding of the managers' view of resilience, and the factors that they considered important in their roles. Given the diverse responsibilities and industry contexts, this was necessarily relatively unstructured, and this flexibility is inherent in the methodology that we used (described below). The

second part was based on critical incident analysis (Flanagan 1954) to understand how managers viewed and interpreted specific events. However, we defined critical incidents as including 'near misses', to investigate events that did not themselves result in major injury, damage or failure, but which interviewees believed, based on their experience and judgement, had the potential to do so. The process did not explicitly incorporate the ideas of exploitation or exploration, the ambidexterity lens was intended as a basis for analysing the data subsequently. The interviews were face-to-face and all were recorded and fully transcribed for analysis in NVivo.

Firm	Number of interviews	Example Job Titles
EngineCo	17	Programme Manager, Programme Lead, Project Manager, Solution Architect, Account Manager, Programme Management Director.
InsureCo1	14	UK Managing Director, UK CFO, CEO (EMEA), Chief Risk Officer, UK Head of Legal
InsureCo2	8	CEO (UK), Chief Risk Officer, CEO (Division), Head of Sales, Chief Actuary.
ElectricityCo	9	Head of Risk and Corporate Finance, SVP Corporate Development, Engineering and Safety Manager, Operations Director, Director of Corporate Affairs, Head of Development.
ProdDevCo	9	Chairman, CFO, CEO, Project Manager

Table 1: Interviews for the study.

The critical incidents were researched retrospectively. The initial step was to provide an overview of the event from the perspective of each interviewee. We asked the respondents to provide their account, including their estimate of potential impact and the likely ramifications. In order to provide a holistic picture about how events were managed, we asked people throughout the hierarchy of each organization to provide their view on the critical incident in order to gain multiple opinions. We wanted to understand whether, and how, risks were identified and responded to. We sought to extract the underlying actions – what do those involved in these day-to-day activities actually do under these circumstances?

For the managerial analysis, we drew upon on the methodology of Corley and Gioia (2004) to enable a more rigorous and transparent analysis for the qualitative data, as this is a key challenge for interpretive research (e.g. van Maanen 1979).This was refined in subsequent papers and described in detail by Gioia et al. (2013). It provides a structured method for deriving themes from data, and the characteristic three-stage analysis scheme (as used in Figure 1, shown shortly) has been used recently in a wide range of studies in major journals including the Academy of Management Review (Ben-Menahem et al. 2016; Byron & Laurence 2015; Huy et al. 2014; Neeley & Dumas 2016; Schabram & Maitlis 2017; Smith 2015; Sonenshein 2014; Strike & Rerup 2016), Organization Studies (Calabretta et al. 2017; Delacour & Leca 2017; Moisander et al. 2016; Müller 2017; Überbacher et al. 2015), Human Relations (Dy et al. 2017; Mühlhaus & Bouwmeester 2016; Zikic & Richardson 2016) and Administrative Science Quarterly (Lawrence & Dover 2015; Vuori & Huy 2016).

The 'Gioia Method' relies on the interviewees being 'knowledgeable agents' who can articulate their thoughts, intentions, and actions. "This means that we make extraordinary efforts to give voice to the informants in the early stages of data gathering and analysis and also to represent their voices prominently in the reporting of the research" (Gioia et al. 2013, p.17). The first stage of the analysis was the '1st-order' coding of the data. This relied on "informant-centric terms and codes" (Gioia et al. 2013, p.18), i.e. coding using the respondents' words and phrases as much as possible, with limited

interpretation at this stage. This is akin to Strauss and Corbin's (1998) process of 'open coding'. The next stage was to identify the '2nd-order' themes. These relied on "researcher-centric concepts, themes, and dimensions" (Gioia et al. 2013, p.18). We attempted to collect the 1st-order concepts into these clearer themes where similarities were evident, a process in lines with Strauss and Corbin's (1998) 'axial coding'. We can then use these to identify high-level 'aggregate dimensions' which we present in the following section:

Findings

Overview

The coding results, in line with Gioia et al. (2013), are shown in Figure 1. The initial coding of the transcripts produced over 150 different codes. Note that our consistency in using as much of the interviewees' language as possible led to some possible overlaps. For example, 'audit', 'measure', 'report' and 'track' are similar but distinct, so we opted to keep these four terms (as identified by the respondents) rather than combining them and thereby losing the granularity and specificity of the particular language use.

From this multitude of codes we then grouped them into appropriate themes, reviewing the context of the coding where necessary to ensure consistency. Note that each set of first-order concepts is identified as primarily exploitative, exploratory, or both. A notable exception is the set which lead to the second-order theme of 'Acknowledge Failure' which we identify as 'Zero' (i.e. neither) and we discuss this shortly. We then aggregated these 2nd-order concepts into four aggregate dimensions, namely 'preparing', 'noticing', 'interpreting' and 'determining potential responses'. This involved repeated interrogation of the data and iterating between the analysis and the transcript data (Eisenhardt & Graebner 2007) to establish the context of the 1st-order concepts to ensure that the themes were in line with the respondents' meaning and to ensure that our subsequent groupings were justified. Two of the authors developed and agreed this coding scheme through repeated analysis of the transcripts.

The first stage of the investigation was to analyse these data to answer the question *'What ambidextrous actions support managerial resilience?'*

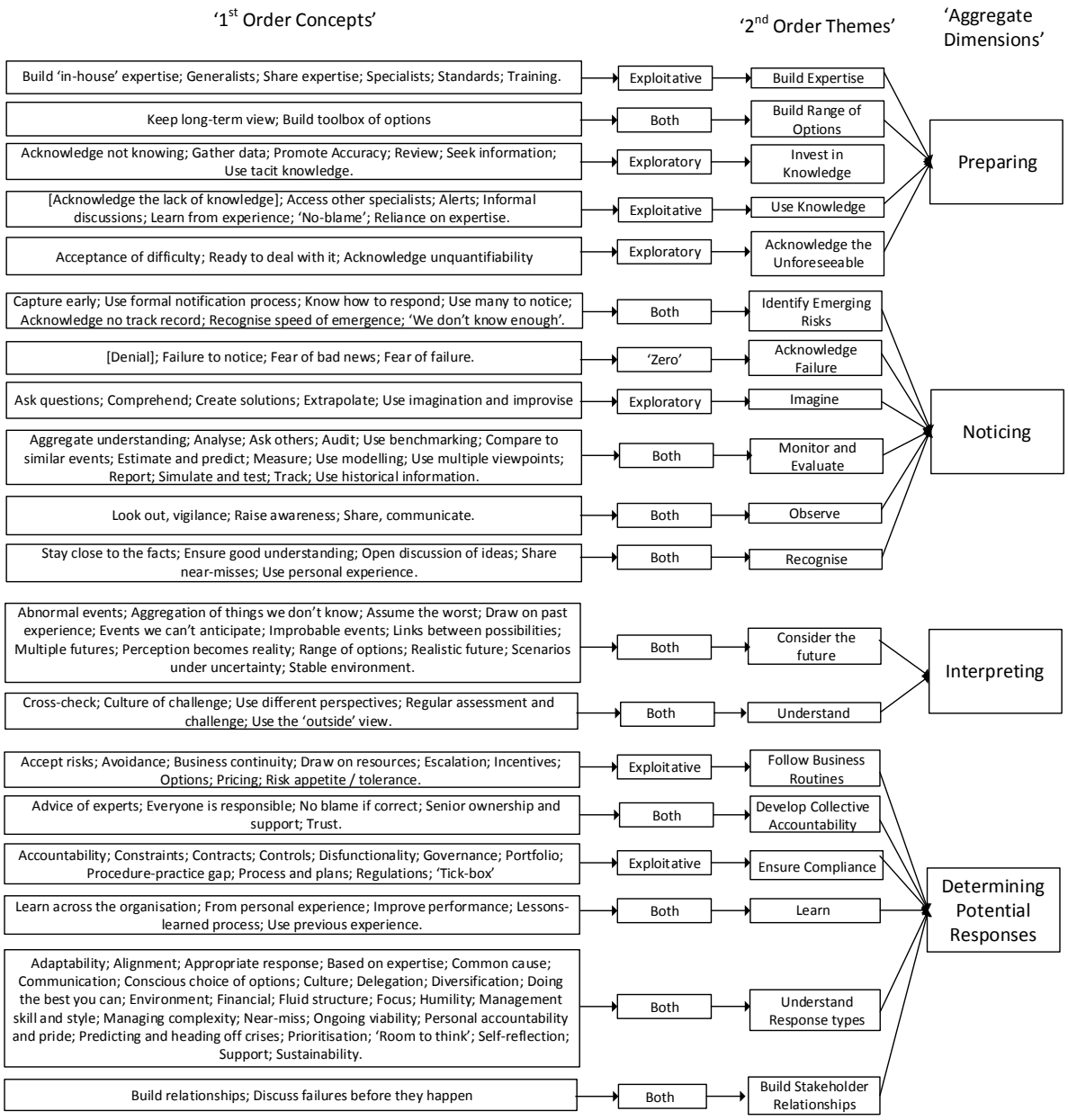

Figure 1: Managerial-level coding

The four Aggregate Dimensions

We now discuss the results in detail whilst addressing the complex nature of the inter-relationship between the themes that we have identified. In our analysis of the resilience actions it became apparent that ambidexterity was valuable as a theoretical lens. It was clear that exploitation was used in terms of the knowledge and experience from which informed decisions were made, yet this was augmented with an exploratory approach since context-specific novelties precluded the mere re-use of previous solutions. Novelty and uncertainty indeed led to exploratory activities. This established the existence of ambidexterity – the combination of both exploitation and exploration – although a clear delineation between the two was not always apparent. Although theoretically they may be considered as polar opposites, in practice and while coding the detailed data they could be hard to disentangle (see also Turner & Lee-Kelley 2013).

'Preparing'

The ‘Preparing’ aspect, the first of the four aggregate dimensions, involved building the capability and expertise to address risks effectively, and also the mechanisms to share that through formal and informal means. Respondents additionally discussed the long-term nature of some decision-making, acknowledging that some aspects are not knowable in advance, and that accepting this was important. The most highly coded theme (i.e. the highest scoring / most frequently referred to) was that of ‘Build expertise’, with the most referenced element being that of ‘Build ‘in-house’ expertise’, closely followed by ‘Specialists’, indicating the importance of this knowledge-building activity.

> “We’ve got various people who have been in leading Finance Director or risk positions and so on, one of the ways we do this I guess is we appoint very senior people onto our board and then we put them through training as well.” [InsureCo2 i/v 3].

The next highest scoring concept was that of ‘Long-term view’, emphasising the actions that are focused on the future as well as the present.

> “People will get overloaded, that’s a natural process. So in the light times, that’s an opportunity to do some more longer-term things or learning things, and so on… So we focus very much on feeding the pipeline, keeping it going and being responsive.” [ProdDevCo, i/v 5]

In ambidexterity terms, ‘Preparing’ involves both knowledge generation and accumulation, together with the ability to deploy and exploit this.

‘Noticing’

The ‘Noticing’ of risks highlighted that the organizations used a variety of methods to identify and understand risk better. This also involved using language and numbers to convey both qualitatively and quantitatively what risks mean. It is valuable to treat small on-going failures as indicators of potential systemic risk and a possible precursor to a gradual breakdown of performance. Of great importance is to capture emerging risks early and to try and craft a response. Actions involved: imagining (thinking in extremes, e.g. through the use of scenario planning); monitoring and evaluating (including actively finding out more, and using quantitative analysis and simulations); observing (looking out and sharing pertinent information effectively); and recognising (including using the knowledge of those closest to the work, and building on personal and team experience). From the data, the theme of ‘Monitor and evaluate’ was the most coded, with over 40% of that theme’s codes. Within this, ‘Track’ and ‘Analyse’ scored highest, closely followed by ‘Use modelling’ and ‘Simulatw and test’.

> “We use modelling tools and other things providing maps and providing flood plains and earthquake zones and tsunami areas and we are able to map exposures on that. It’s not perfect and it doesn’t map all our exposures, but certainly we use whatever industry tools are available and they’re developing and improving all the time, as you’d expect.” [InsureCo1 i/v 2].

‘Noticing’ involves a strong exploratory mind-set, acknowledging the limitations of specific knowledge at that moment in time, in conjunction with a systematic approach to draw on existing expertise and analysis techniques. Notably, the failure to notice issues and organizational impediments to sharing concerns represent an inability either to explore or exploit. This ‘Zero’ aspect as part of the ‘mix’ of exploitation and exploration is particularly interesting as it represents non- or poorly-functioning aspects. This indicates *ambisinisterity* (‘both left hands’) – the opposite of ambidexterity which considers both hands as being equally dextrous (and derives from right-handedness).

‘Interpreting’

These activities were used to make sense of potential risks by interpreting how they would 'play out' in the complex work environments. This 'Interpreting' covered the multiple futures that may unfold, including the use of boundaries in the consideration of extreme best- and worst-case situations. Numerous scenarios could be identified, and sense-making could be aided by ensuring that different voices were heard in the discussions. Regular challenge from peers to offer alternative options was viewed as valuable if undertaken positively. Aspects such as optimism bias and the acknowledgement of uncertainty could be discussed, and opening the interpretation to a wider group (both formal and informal) and bringing in others' expertise offers a greater range of perspectives to aid sense-making. This can aid in countering an individual's overly optimistic view. These activities continuously comprised exploitation (using systems and tools as part of business operations) and also exploration (trying new ideas and problem-solving).

The most significant concept in this dimension was 'Scenarios under uncertainty', followed by 'Culture of challenge', indicating both that uncertainty was acceptable to articulate within the organization, and that opposing views could be voiced to ensure valuable discussions regarding key points.

> "We still have a daily plan for the [project] and that will change, absolutely. Every couple of days something will change, whether it's something we've found through our own internal testing or something that [supplier] have requested, or a [customer] request to do something different." [EngineCo i/v 15]

> "…there was also a change in the leadership environment where the top people that filled various roles in the company were much more open to chat, I can't say that strongly enough, in fact I think that the culture has gone so far as to say that if you're sitting in a meeting and you're not providing any challenge that would be looked on negatively, as opposed to 'who's this guy causing trouble or asking questions?'" [InsureCo1 i/v 4].

'Interpreting' therefore necessarily balances a recognition of multiple possible future states, given the conditions of uncertainty, yet uses the combined knowledge and experience of individuals to attempt to bring clarity.

'Determining potential responses'

The data in the 'Determining potential responses' dimension showed a wide range of codes. These encompassed exploitative aspects such as following business routines (the sequence of actions regularly used) and ensuring compliance (adherence to rules and procedures, which could be a help or a hindrance). Other issues included the benefits of collective accountability, encouraging and supporting more exploratory solutions, the role of organizational and individual learning, and the key theme of wider stakeholder engagement under conditions of uncertainty. A range of issues were identified under the category of 'Understand response type', including aspects such as adaptability, recognition of a 'Common cause' among participants, communication, personal accountability and pride, prioritisation, and 'Room to think'. The variety of issues indicates that responses are complex, dynamic, situated, and not amenable to 'straightforward' solutions.

Within this dimension, the largest number of codes (48%) were within the 'Understand response type' theme, and within this the highest scorers were 'Culture' followed by 'Financial'. Interestingly, the culture codings tended to emphasise qualities such as professionalism, continuous improvement, integrity, supporting learning, and customer-centric behaviours. This broadly emphasised a more exploratory approach, together with more effective exploitation. The financial aspects, in contrast, tended to emphasise the constraints of the commercial realities of the environment.

> "It's probably worth saying that we like people making mistakes. As in the honest ones… It's the culture, the Board is effectively responsible for the culture and promulgating that." [ProdDevCo, i/v 8]

'Determining potential responses' encompasses a wide range of exploitative organizational systems, built and refined over time, together with in-the-moment adaptations based on individual judgement and sanctioned within the organization. Contextual ambidexterity is therefore implicit in the nature of the work within each of the case organizations and shown in all four aggregate dimensions. This is also evident in the respondents' quotes above.

Relationship between the Aggregate Dimensions

In terms of the relative weightings of the coding, 'Preparing' accounted for 14%, 'Noticing' 25%, 'Interpreting'10%, and 'Determining potential responses' 51%. We cannot claim that these weights represent their relative importance, but the distribution is nonetheless interesting and, we believe, instructive. The emphasis is on awareness (noticing) and containment (responding). However, in attempting to understand better how this is enacted in practice, we identified that a 'simple' model is inappropriate. Although Figure 1 indicates a linear progression of preparing – noticing – interpreting – determining potential responses, the data did not fully support this. Although much of the coding was categorised according to the structure shown, some of the quotes did not fall into a single category. This multiple categorisation indicated that issues could be coded in several aggregate dimensions, rather than representing a single theme only. Through this parallel-coding (King 2004), also known as simultaneous coding (Saldaña 2013), we identified that the four aggregate dimensions were, to some extent, interwoven, rather than separate.

For example, the following section was coded as both 'Long-term view' (Preparing) and also 'Looking out, vigilance' (Noticing).

> "We spend a lot of time networking and we spend a lot of time talking to our customers, whether it's sensing the risks or whether it's sensing opportunities, for us is the same survival and growth thing. Where's it going, you know?" [ProdDevCo, i/v 7]

Another example was coded as 'Simulation and testing' (Noticing), 'Scenarios under uncertainty' (Interpreting), and 'Conscious choice of options' (Determining potential responses):

> "You do it [testing] on the basis of the test packs that you have in place, you test the conditions that you find, any negative conditions that you find you make a decision as to whether or not you need to address them, and you undertake testing to ensure that the level of risk that you take with you when you finally do go live, is supportable." [EngineCo, i/v 17]

The following extract was coded as 'Acknowledge not knowing' (Preparing), 'Multiple viewpoints' (Noticing), 'Culture of Challenge' (Interpreting) and 'Advice of experts' (Determining potential responses), thereby encompassing all four dimensions.

> "You're not showing sign of weakness by saying 'I don't know how to deal with this' or 'I've never seen this before', I think sometimes perhaps from the outside we could seem like an aggressive group of people in terms of the way that if you're a fly on the wall in a meeting we'd regularly challenge each other technically and what's the right things to do on how we're managing things, or whatever it might be, so there's a lot of that going on but its positive, really, because we want to be able to really look at it from every angle so we're not too proud to think that we know best… the first thing to do is go and talk to people that have had experience of that, so 'what would you do in this situation?', you might collect a few opinions, sometimes it might be that you want to pull in someone who's had nothing to do

with the project and is just an independent, 'can you come and have a look?'" [ProdDevCo, i/v 3]

We therefore argue that although the four identified aggregate dimensions are conceptually separate, they cannot exist in isolation. Actions cannot be undertaken without prior preparation, and the interweaving of preparing, noticing, interpreting and determining potential responses in a complex environment is also logical. The coding data show that this is in fact the case, and a linear, sequential, interpretation of the four parts would represent an incomplete understanding.

This indicates the complexity of understanding the nature of resilience. As mentioned, Williams et al. (2017) identify the acts of 'preparing' and 'restoring', and we have unpacked more detail in this investigation that uncovered not only a wide range of actions that underpin the four aggregate dimensions, but also that they are in fact interwoven in their operation.

The key role of ambidexterity dynamics

How, then, do we understand this in terms of ambidexterity? Much of the resilience literature focuses on the aspect of containment, and bouncing back from adversity. However, as we identified, that containment can only work in conjunction with methods for situational awareness and systems for practical responses.

This mix of exploitative and exploratory activities identified in Figure 1 (together with the 'Zero') indicate that at the managerial level a single representation of ambidexterity is unrealistic. Instead, multiple points may exist and interact over time. For example, exploratory data-gathering, failure to identify issues, ambidextrous interpreting of new events and exploitative governance of implemented solutions hint at a practical dynamism to ambidexterity that has not previously been identified. These dynamics are far more intricate than the high-level approaches of organizational temporal ambidexterity, and represent the co-existence and interweaving of multiple actions over time. This is illustrated in Figure 2 (developed from Birkinshaw & Gupta 2013) and shows how single points do not account for the activities undertaken by managers and teams. Birkinshaw and Gupta (2013) identify the 'frontier' of ambidextrous capability, but we suggest that there are ongoing dynamics which mean that multiple points under the curve are in fact utilised. Indeed, since the four aggregate dimensions of Figure 1 can (and are likely to) co-exist, multiple dynamics could be expected, and any 'simple' mapping will likely be insufficient.

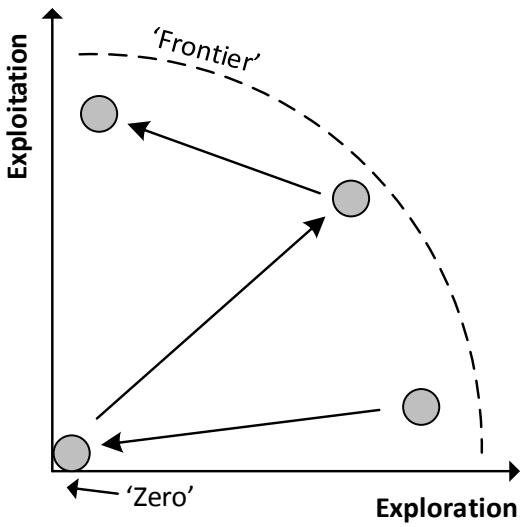

Figure 2: Illustration of the dynamics of contextual ambidexterity (based on Birkinshaw and Gupta, 2013)

We note also that the multi-level elements of Kang and Snell (2009) are apparent within the first-order concepts shown in Figure 1. The human capital is both exploitative (a focus on knowledgeable specialists and expertise) and exploratory, with generalist knowledge valued also. The social sharing of knowledge is a key factor in terms of asking colleagues but also in ensuring wider access across the organization. At the organizational level, mechanistic processes and systems are vital for smooth operations, but these are augmented with organic flexibility. The utilisation of each aspect is a dynamic process, though. Whereas previous studies have identified the co-existence of the aspects as supporting ambidexterity (e.g. Turner & Lee-Kelley 2013), the data from these cases would indicate that a process view of resilience can consider ambidexterity itself as a far more nuanced and flexible concept than previous literature has envisaged. The high-level concepts of structural, temporal and contextual ambidexterity are valuable but incomplete. Examples we saw at the case organizations included the use of 'tiger-teams' (groups of expert staff, set up as necessary) sent in to support evolving incidents, and the empowerment of key individuals to go beyond 'normal' procedure when emerging problems are identified. These demonstrate temporal aspects of structural and contextual ambidexterity respectively. This flexible approach relies on management judgement and is highly dependent on the particular context. In ProdDevCo, for example, flexibility and a tendency towards an exploratory approach were the norm as this is the nature of their business and their market. In contrast, EngineCo was more rules-based and exploitative, as may be anticipated. However, in each case we could observe the complex interplay between the human capital necessary at the time, the use of social capital in enabling responses, and shifting organizational capital priorities regarding the balance between supporting in-the-moment flexibility and retaining control. Indeed, it may be possible to map the multi-level Kang and Snell (2009) components dynamically over time in line with Figure 2, although our data did not specifically investigate that.

This is necessarily a complex picture and represents a much more detailed representation of the factors which underpin contextual ambidexterity (Gibson & Birkinshaw 2004) in the attainment of resilience. Effectiveness stems from noticing risks beyond a 'most likely' future; understanding risk better by getting 'close' to it while being challenged in one's expectations; establishing a wide response repository to deal with any risk; and being allowed flexibility to enact a response, if necessary in violation of existing rules and procedures. A multitude of concepts were identified, although they were not all apparent in a single organization, and this sheds light on the complexity of the requirement to be contextually ambidextrous in supporting resilience. The richness of the respondents' descriptions gives much more insight into the facets required than had been previously been documented within the literature.

Discussion

In this paper we began with the broad research question *'What ambidextrous actions support managerial resilience?'* As a result of an uncertain environment (captured by an exploration of critical incidents), managers develop a set of contextually-specific actions, and these we identified from five cases via the Gioia method (Figure 1). We identified four aggregate dimensions of 'preparing', 'noticing', 'interpreting' and 'determining potential responses', yet the coding within each of these categories showed a complex mix of activities. The use of parallel-coding within the data revealed these facets were not mutually exclusive and do not necessarily represent a purely linear, ordered, progression, but could overlap and co-exist, revealing still further intricacies.

The attainment of resilience can also be understood in terms of the balance between exploitation and exploration. The logic of considering resilience in terms of this interplay appeared to be valuable, yet this has not to date been an approach widely taken within the literature. Our research looked at managerial actions, and we confirmed that exploitation and exploration were indeed present in each (i.e. an ambidexterity view was justified). The data did not show a clear-cut, 'straightforward', link

between resilience and ambidexterity, yet gave great insight into the practical manifestation of both. Exploitative and exploratory aspects were evident, and could be identified across the multiple levels put forward by Kang and Snell (2009). These combined in complicated ways as organizational issues emerged, and no straightforward explanation became apparent. 'Simple' structural ambidexterity, with the partitioning of exploitative and exploratory elements, was not evident from the data. Similarly, clear-cut temporal ambidexterity with a shift from one mode to another was also not evident, as particular incidents were far more subtle. Attempting to distinguish and categorise exploitative and exploratory activities misses the practical nature of their day-to-day activities where these must be blended together based on situated human judgement. Our data show a far more nuanced picture of how we can understand contextual ambidexterity (Gibson & Birkinshaw 2004) in the context of resilience. By considering the broadly cyclical nature of the four aggregate dimensions (albeit with the overlaps and co-existences), knowledge gained at the human, social and organizational level can be used in the next cycle (i.e. responses give insight that can feed future preparation, and so on), in line with Burnard and Bhamra (2011). Building on Birkinshaw and Gupta (2013) we illustrated how the dynamics of ambidexterity may be understood. Rather than existing as a static point, contextual ambidexterity may be understood as an evolving combination of exploitation, exploration, both simultaneously, or a 'zero' (failure to do either effectively). This temporal analysis shows how resilience can be built through a combination of past-informed knowledge-building and present-informed interpretation and analysis.

Following the process view, we note also the importance of organizational culture and social attributes that were highlighted in both the ambidexterity and resilience literatures. This would indicate that the human resource management aspect is indeed central to this form of contextual ambidexterity, as supported by Swart et al. (2017), and that this is similarly important in supporting organizational resilience.

Conclusion

Resilience is a key issue of great importance to managers and their organizations. To date, though, the literature has taken multiple approaches and appears somewhat fragmented. Our purpose with this research was to use the ambidexterity lens to understand better how managers achieve resilience within their organizations, responding to the call from van der Vegt et al. (2015).

Our contributions are as follows. First, using the Gioia method, we identified four underpinning features of resilience (namely 'preparing', 'noticing', 'interpreting' and 'determining potential responses'). These each contain multiple concepts, showing that the attainment of resilience is both complex and situation-specific, and we identified that they are not stand-alone but are interwoven. Second, in considering these findings in terms of ambidexterity, we showed that exploitation and exploration are inherent in these ideas, and require both in-the-moment judgement and also a longer-term perspective in building a culture which supports this capability. Third, building on Birkinshaw and Gupta (2013), we showed how ambidexterity dynamics may be understood and represented, as this is an aspect that the literature does not seem to have captured. This moves beyond the existing ideas of temporal ambidexterity and reveals the dynamics of contextual ambidexterity not only in terms of exploitation and exploration, but also the 'zero' point where neither are achieved.

These ambidexterity dynamics are central to managerial practice and both support and are supported by the actions of the four aggregate dimensions identified. It is not yet evident from the data, however, whether there are forms of responses in terms of the first-order concepts and patterns of exploitation and exploration which are beneficial or 'correct', or if the specifics of each case and its incidents require a bespoke combination of actions. This line of argument implies that the actions (preparing, noticing, interpreting, and determining potential responses) appear common, yet can result

in different ways of responding when (potential) disruption occurs. It is as yet unclear whether particular archetypes of how resilience is implemented can be identified, although this offers a very interesting extension of this work.

The practical implications for managers of this are that we offer these idea as means of creating awareness of possible options, and we have used this with executive groups to prompt discussion and reflection. The ideas of 'unscripted agility' (Akgün & Keskin 2014) and 'adaptive resilience' (Duit 2016) have been unpacked here and these can be aligned with the detailed actions underpinning contextual ambidexterity and its dynamics.

This study is limited by the relatively small number of cases, and the data collection via self-reflection of managers. It would be valuable for further studies to take a longitudinal approach to data-gathering so that the unfolding events can be studied with less chance of recollection bias. A specific multi-level approach (e.g. Kang & Snell 2009) may also give more detailed insight. The cases were also deemed to be successful organizations, and it would therefore appear to be valuable to understand the operation of unsuccessful work as a comparison.

To conclude, we have shown that ambidexterity is a valuable lens through which to investigate resilience, and that this exploratory research has shown that combining these two literatures is insightful for both scholars and managers. The positive aspects of ambidexterity have been demonstrated in the literature and we believe that its contribution to resilience is another reason for managers to seek to promote ambidexterity within their organizations. We hope that these initial findings can provide a platform from which to expand our knowledge, with both qualitative and quantitative data, to enhance our understanding.

References

Ahn, J.-H., Lee, D.-J. & Lee, S.-Y., 2006. Balancing Business Performance and Knowledge Performance of New Product Development. *Long Range Planning*, 39(5), pp.525–542.

Akgün, A.E. & Keskin, H., 2014. Organisational resilience capacity and firm product innovativeness and performance. *International Journal of Production Research*, 52(23), pp.6918–6937.

Andriopoulos, C. & Lewis, M.W., 2010. Managing Innovation Paradoxes: Ambidexterity Lessons from Leading Product Design Companies. *Long Range Planning*, 43(1), pp.104–122.

Annarelli, A. & Nonino, F., 2016. Strategic and operational management of organizational resilience: Current state of research and future directions. *Omega*, 62, pp.1–18.

Bednarek, R. et al., 2016. Dynamic Client Portfolios as Sources of Ambidexterity: Exploration and Exploitation Within and Across Client Relationships. *Long Range Planning*, 49(3), pp.324–341.

Ben-Menahem, S.M. et al., 2016. Coordinating knowledge creation in multidisciplinary teams: evidence from early-stage drug discovery. *Academy of Management Journal*, 59(4), pp.1308–1338.

Bergström, J. & Dekker, S.W.A., 2014. Bridging the macro and the micro by considering the meso: Reflections on the fractal nature of resilience. *Ecology and Society*, 19(4).

Bhamra, R., Dani, S. & Burnard, K., 2011. Resilience: the concept, a literature review and future directions. *International Journal of Production Research*, 49(18), pp.5375–5393.

Birkinshaw, J. & Gupta, K., 2013. Clarifying the Distinctive Contribution of Ambidexterity to the Field of Organization Studies. *Academy of Management Perspectives*, 27(4), pp.287–298.

Bonanno, G.A., 2004. Loss, Trauma, and Human Resilience: Have We Underestimated the Human Capacity to Thrive After Extremely Aversive Events? *American Psychologist*, 59(1), pp.20–28.

Burnard, K. & Bhamra, R., 2011. Organisational resilience: development of a conceptual framework for organisational responses. *International Journal of Production Research*, 49(18), pp.5581–5599.

Burns, T. & Stalker, G., 1961. *The Management of Innovation*, London: Tavistock.

Byron, K. & Laurence, G.A., 2015. Diplomas, photos, and tchotchkes as symbolic self-representations: understanding employees' individual use of symbols. *Academy of Management Journal*, 58(1), pp.298–323.

Calabretta, G., Gemser, G. & Wijnberg, N.M., 2017. The Interplay between Intuition and Rationality in Strategic Decision Making: A Paradox Perspective. *Organization Studies*, 38(3–4), pp.365–401.

De Clercq, D., Thongpapanl, N. & Dimov, D., 2014. Contextual ambidexterity in SMEs: the roles of internal and external rivalry. *Small Business Economics*, 42(1), pp.191–205.

De Clercq, D., Thongpapanl, N. & Dimov, D., 2013. Shedding new light on the relationship between contextual ambidexterity and firm performance: An investigation of internal contingencies. *Technovation*, 33(4–5), pp.119–132.

Corley, K.G. & Gioia, D.A., 2004. Identity Ambiguity and Change in the Wake of a Corporate Spin-off. *Administrative Science Quarterly*, 49(2), pp.173–208.

Coutu, D., 2002. How Resilience Works. *Harvard Business Review*, pp.46–55.

D'Souza, D.E., Sigdyal, P. & Struckell, E., 2017. Relative Ambidexterity: a Measure and a Versatile Framework. *Academy of Management Perspectives*, 31(2), pp.124–136.

Delacour, H. & Leca, B., 2017. The Paradox of Controversial Innovation: Insights From the Rise of Impressionism. *Organization Studies*, 38(5), pp.597– 618.

Duit, A., 2016. Resilience Thinking: Lessons for Public Administration. *Public Administration*, 94(2), pp.364–380.

Dy, A.M., Marlow, S. & Martin, L., 2017. A Web of opportunity or the same old story? Women digital entrepreneurs and intersectionality theory. *Human Relations*, 70(3), pp.286–311.

Eisenhardt, K.M. & Graebner, M.E., 2007. Theory building from cases: Opportunities and challenges. *Academy of Management Journal*, 50(1), pp.25–32.

Fiksel, J., 2003. Designing Resilient, Sustainable Systems. *Environmental Science & Technology*, 37(23), pp.5330–5339.

Fiksel, J., Croxton, K.L. & Pettit, T.J., 2015. From Risk to Resilience : Learning to Deal With Disruption. *MIT Sloan Management Review*, 56(2), pp.78–86.

Flanagan, J.C., 1954. The critical incident technique. *Psychological bulletin*, 51(4), pp.327–358.

Gallopín, G.C., 2006. Linkages between vulnerability, resilience, and adaptive capacity. *Global Environmental Change*, 16(3), pp.293–303.

Gibson, C.B. & Birkinshaw, J., 2004. The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of Management Journal*, 47(2), pp.209–226.

Gioia, D.A., Corley, K.G. & Hamilton, A.L., 2013. Seeking Qualitative Rigor in Inductive Research: Notes on the Gioia Methodology. *Organizational Research Methods*, 16(1), pp.15–31.

Granovetter, M., 1973. The strength of weak ties. *American Journal of Sociology*, 78(6), p.1360–1380.

Gunasekaran, A., Subramanian, N. & Rahman, S., 2015. Supply chain resilience: role of complexities and strategies. *International Journal of Production Research*, 53(22), pp.6809–6819.

Güttel, W.H. & Konlechner, S.W., 2009. Continuously hanging by a thread: managing contextually ambidextrous organizations. *Schmalenbach Business Review*, 61(2), pp.150–172.

Hamel, G. & Valikangas, L., 2003. The Quest for Resilience. *Harvard Business Review*, 81(9), pp.52–63.

Hearnshaw, E.J.S. & Wilson, M.M.J., 2013. A complex network approach to supply chain network theory. *International Journal of Operations & Production Management*, 33(4), pp.442–469.

Holling, C.S., 1973. Resilience and Stability of Ecological Systems. *Annual Review of Ecology and Systematics*, 4, pp.1–23.

Horne, J. & Orr, J., 1998. Assessing behaviors that create resilient organizations. *Employment Relations Today*, 24(4), pp.29–39.

Huy, N.Q., Corley, K.G. & Kraatz, M.S., 2014. From support to mutiny: shifting legitimacy judgments and emotional reactions impacting the implementation of radical change. *Academy of Management Journal*, 57(6), pp.1650–1680.

Ivanov, D., Sokolov, B. & Dolgui, A., 2014. The Ripple effect in supply chains: trade-off "efficiency-flexibility-resilience" in disruption management. *International Journal of Production Research*, 52(7), pp.2154–2172.

Jaaron, A.A.M. & Backhouse, C.J., 2014. Service organisations resilience through the application of the vanguard method of systems thinking: a case study approach. *International Journal of Production Research*, 52(7), pp.2026–2041.

Junni, P. et al., 2013. Organizational Ambidexterity and Performance: A Meta-Analysis. *Academy of Management Perspectives*, 27(4), pp.299–312.

Kamalahmadi, M. & Parast, M.M., 2016. A review of the literature on the principles of enterprise and supply chain resilience: Major findings and directions for future research. *International Journal of Production Economics*, 171, pp.116–133.

Kang, S.-C. & Snell, S. a., 2009. Intellectual Capital Architectures and Ambidextrous Learning: A Framework for Human Resource Management. *Journal of Management Studies*, 46(1), pp.65–92.

Kauppila, O.-P., 2015. Alliance Management Capability and Firm Performance: Using Resource-based Theory to Look Inside the Process Black Box. *Long Range Planning*, 48(3), pp.151–167.

King, N., 2004. Using templates in the thematic analysis of text. In G. Cassell, C., Symon, ed. *Essential Guide to Qualitative Methods in Organizational Research.* London: Sage, pp. 256–270.

Lawrence, T.B. & Dover, G., 2015. Place and Institutional Work: Creating Housing for the Hard-to-house. *Administrative Science Quarterly*, 60(3), pp.371–410.

Lengnick-Hall, C.A. & Beck, T.E., 2005. Adaptive Fit Versus Robust Transformation: How Organizations Respond to Environmental Change. *Journal of Management*, 31(5), pp.738–757.

Lengnick-Hall, C.A., Beck, T.E. & Lengnick-Hall, M.L., 2011. Developing a capacity for organizational resilience through strategic human resource management. *Human Resource Management Review*, 21(3), pp.243–255.

Levinthal, D.A. & March, J.G., 1993. The Myopia of Learning. *Strategic Management Journal*, 14, pp.95–112.

Linnenluecke, M.K., 2017. Resilience in Business and Management Research: A Review of Influential Publications and a Research Agenda. *International Journal of Management Reviews*, 19(4), pp.1–27.

Lubatkin, M.H. et al., 2006. Ambidexterity and Performance in Small- to Medium-Sized Firms: The

Pivotal Role of Top Management Team Behavioral Integration. *Journal of Management*, 32(5), pp.646–672.

Luthans, F., Vogelgesang, G. & Lester, P., 2005. Developing the Psychological Capital of Resiliency. *Human Resource Development Review*, pp.25–44.

van Maanen, J., 1979. The Fact of Fiction in Organizational Ethnography. *Administrative Science Quarterly*, 24(4), pp.539–550.

Mamouni-Limnios, E.A. et al., 2014. The resilience architecture framework: Four organizational archetypes. *European Management Journal*, 32(1), pp.104–116.

March, J.G., 1991. Exploration and Exploitation in Organizational Learning. *Organization Science*, 2(1), pp.71–87.

Maull, R. et al., 1990. A Methodology for the Design and Implementation of Resilient CAPM Systems. *International Journal of Operations & Production Management*, 10(9), pp.27–36.

Maylor, H. & Turner, N., 2017. Understand, reduce, respond: project complexity management theory and practice. *International Journal of Operations & Production Management*, 37(8), pp.1076–1093.

Meyer, A., 1982. Adapting to Environmental Jolts. *Administrative Science Quarterly.*, 27(4), pp.515–537.

Moisander, J.K., Hirsto, H. & Fahy, K.M., 2016. Emotions in Institutional Work: A Discursive Perspective. *Organization Studies*, 37(7), pp.963–990.

Mom, T.J.M., Van Den Bosch, F. a J. & Volberda, H.W., 2007. Investigating managers' exploration and exploitation activities: The influence of top-down, bottom-up, and horizontal knowledge inflows. *Journal of Management Studies*, 44(6), pp.910–931.

Mühlhaus, J. & Bouwmeester, O., 2016. The paradoxical effect of self-categorization on work stress in a high-status occupation: Insights from management consulting. *Human Relations*, 69(9), pp.1823–1852.

Müller, M., 2017. "Brand-Centred Control": A Study of Internal Branding and Normative Control. *Organization Studies*, 38(7), pp.895– 915.

Muurlink, O. et al., 2012. Managerial Autism: Threat-Rigidity and Rigidity's Threat. *British Journal of Management*, 23, pp.S74–S87.

Nair, K. & Sarin, R.K., 1979. Generating Future Scenarios - Their Use in Strategic Planning. *Long Range Planning*, 12(3), pp.57–61.

Neeley, T.B. & Dumas, T.L., 2016. Unearned status gain: evidence from a global language mandate. *Academy of Management Journal*, 59(14–43).

Nemanich, L.A. & Vera, D., 2009. Transformational leadership and ambidexterity in the context of an acquisition. *The Leadership Quarterly*, 20(1), pp.19–33.

O'Reilly, C.A. & Tushman, M.L., 2013. Organizational Ambidexterity: Past, Present, and Future. *Academy of Management Perspectives*, 27(4), pp.324–338.

O'Reilly, C. a & Tushman, M.L., 2004. The Ambidextrous Organisation. *Harvard Business Review*, 82(4), pp.74–81.

Ortiz-de-Mandojana, N. & Bansal, P., 2016. The long-term benefits of organizational resilience through sustainable business practices. *Strategic Management Journal*, 37(8), pp.1615–1631.

Richtn??r, A. & L??fsten, H., 2014. Managing in turbulence: How the capacity for resilience influences creativity. *R and D Management*, 44(2).

Roberts, K.H. & Libuser, C., 1993. From bhopal to banking: Organizational design can mitigate risk.

Organizational Dynamics, 21(4), pp.15–26.

Saldaña, J., 2013. *The Coding Manual for Qualitative Researchers* 2nd ed., London: Sage.

Schabram, K. & Maitlis, S., 2017. Negotiating the challenges of a calling: emotion and enacted sensemaking in animal shelter work. *Academy of Management Journal*, 60(2), pp.584–609.

Schemeil, Y., 2013. Bringing International Organization In: Global Institutions as Adaptive Hybrids. *Organization Studies*, 34(2), pp.219–252.

Seely Brown, J., 2004. Minding and Mining the Periphery. *Long Range Planning*, 37(2), pp.143–151.

Seshadri, S., Piderit, S. & Kristingiridharadas, R., 2010. How many minds does a team have? Contextual ambidexterity and goal harmony in healthcare. *Academy of Management Annual Meeting Proceedings*, pp.1–6.

Smith, S. et al., 1994. Strategies for Managing the TQ Agenda. *International Journal of Operations & Production Management*, 14(1), pp.75–88.

Smith, W.K., 2015. Dynamic decision making: a model of senior leaders managing strategic paradoxes. *Academy of Management Journal*, 1015(1), pp.58–89.

Soltani, E. et al., 2014. Qualitative middle-range research in operations management. *International Journal of Operations & Production Management*, 34(8), pp.1003–1027.

Sonenshein, S., 2014. How organizations foster the creative use of resources. *Academy of Management Journal*, 57(3), pp.814–848.

Soni, U., Jain, V. & Kumar, S., 2014. Measuring supply chain resilience using a deterministic modeling approach. *Computers & Industrial Engineering*, 74, pp.11–25.

Staw, B.M., Sandelands, L. & Dutton, J.E., 1981. Threat-Rigidity Effects in Organizational Behavior: A Multilevel Analysis: *Administrative Science Quarterly*, 26(4), pp.501–524.

Stevenson, M. & Busby, J., 2015. An exploratory analysis of counterfeiting strategies. *International Journal of Operations & Production Management*, 35(1), pp.110–144.

Strauss, A. & Corbin, J., 1998. *Basics of qualitative research: Techniques and procedures for developing grounded theory* 2nd ed., Thousand Oaks, CA.: Sage.

Strike, V.M. & Rerup, C., 2016. Mediated sensemaking. *Academy of Management Journal*, 59(3), pp.880–905.

Swart, J., 2006. Intellectual capital: disentangling an enigmatic concept. *Journal of Intellectual Capital*, 7(2), pp.136–159.

Swart, J. et al., 2017. Who does what in enabling ambidexterity? Individual Actions and HRM practices. *International Journal of Human Resource Management*, in press.

Teixeira, E. de O. & Werther, W.B., 2013. Resilience: Continuous renewal of competitive advantages. *Business Horizons*, 56(3), pp.333–342.

Tukamuhabwa, B.R. et al., 2015. Supply chain resilience: definition, review and theoretical foundations for further study. *International Journal of Production Research*, 53(18), pp.5592–5623.

Turner, N. et al., 2016. Making it happen: How managerial actions enable project-based ambidexterity. *Management Learning*, 47(2), pp.199–222.

Turner, N. & Lee-Kelley, L., 2013. Unpacking the theory on ambidexterity: An illustrative case on the managerial architectures, mechanisms and dynamics. *Management Learning*, 44(2), pp.179–196.

Turner, N., Swart, J. & Maylor, H., 2013. Mechanisms for managing ambidexterity: A review and research agenda. *International Journal of Management Reviews*, 15(3), pp.317–332.

Tushman, M.L. & O'Reilly, C.A., 1996. Ambidextrous Organizations: Managing Evolutionary and Revolutionary Change. *Harvard Business Review*, 38(4), pp.8–30.

Überbacher, F., Jacobs, C.D. & Cornelissen, J.P., 2015. How Entrepreneurs Become Skilled Cultural Operators. *Organization Studies*, 36(7), pp.925–951.

van der Vegt, G. et al., 2015. Managing Risk and Resilience. *Academy of Management Journal*, 58(4), pp.971–980.

Vogus, T.J. et al., 2014. The affective foundations of high-reliability organizing. *Journal of Organizational Behavior*, 35(4), pp.592–596.

Vuori, T.O. & Huy, Q.N., 2016. Distributed Attention and Shared Emotions in the Innovation Process: How Nokia Lost the Smartphone Battle. *Administrative Science Quarterly*, 61(1), pp.9–51.

Walker, B. et al., 2004. Resilience, Adaptability and Transformability in Social-ecological Systems: find articles, books, and more. *Ecology and Society*, p.5.

Wang, C.L. & Rafiq, M., 2014. Ambidextrous Organizational Culture, Contextual Ambidexterity and New Product Innovation: A Comparative Study of UK and Chinese High-tech Firms. *British Journal of Management*, 25(1), pp.58–76.

Weick, K. & Roberts, K., 1993. Collective mind in organizations: Heedful interrelating on flight decks. *Administrative Science Quarterly*, 38(3), pp.357–381.

Weick, K.E., 1987. Organizational Culture as a Source of High Reliability. *California Management Review*, 29(2), pp.112–127.

Williams, T.A. et al., 2017. Organizational response to adversity: fusing crisis management and resilience research streams. *Academy of Management Annals*, 11(2), pp.733–769.

Zikic, J. & Richardson, J., 2016. What happens when you can't be who you are: Professional identity at the institutional periphery. *Human Relations*, 69(1), pp.139–168.

Zimmermann, A., Raisch, S. & Birkinshaw, J., 2015. How Is Ambidexterity Initiated? The Emergent Charter Definition Process. *Organization Science*, 26(4), pp.1119–1139.