ORGANIZATIONAL RESILIENCE:

Conceptual development, empirical findings, and managerial contradictions

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Table of contents

List of figures

List of tables

1 Introduction

"Ask yourself 'Do I truly understand – and accept – the reality of my situation? Does

my organization?' Those are good questions, particularly because research suggests

most people slip into denial as a coping mechanism. Facing reality, really facing it, is

grueling work. Indeed, it can be unpleasant and often emotionally wrenching."

(Coutu, 2002, p. 48)

This quote highlights that resilience refers to managing hard times, which individuals and organizations try to deny instead of counteracting. In my dissertation, I refer to organizational resilience as the adequate handling of challenging conditions by "the maintenance of positive adjustment" (Vogus & Sutcliffe, 2007, p. 3418) in order to secure organizations' functioning as well as their prosperity. These adjustments can either be used to simply bounce back to a previous state of normalcy and to maintain functioning (Gittell, Cameron, Lim, & Rivas, 2006; Wildavsky, 1988), while other researchers go further, saying that crises also offer opportunities for learning, positive transformation, and growth (Lengnick-Hall, Beck, & Lengnick-Hall, 2011) so that a firm "preserve[s] (or improve[s]) functioning despite the presence of adversity" (Sutcliffe & Vogus, 2003, p. 96) and "emerges from those conditions strengthened and more resourceful" (Vogus & Sutcliffe, 2007, p. 3418). While *management* can generally imply that it is possible to precisely plan and prepare for crises or even to prevent their occurrence, organizational resilience research accepts that crises are sometimes unavoidable, focusing on detecting crises early on, preventing their escalation, and/or

creatively responding to unexpected and unforeseen crises (Sutcliffe & Vogus, 2003; Vogus & Sutcliffe, 2007; Wildavsky, 1988).

From a practical perspective, asking how to increase organizational resilience is relevant: Crises and other challenging conditions can jeopardize the survival of organizations. Taken together, increasing technological and operational inter-organizational connectedness with higher complexity, higher-level problems such as climate change and terrorism, and fast-changing customer demands lead to organizations being exposed to challenging conditions more often. Thus, organizations become more vulnerable when they lack the ability to properly handle such conditions (Boin, Comfort, & Demchak, 2010; Hamel & Välikangas, 2003; McManus, Seville, Vargo, & Brunsdon, 2008).

However, researchers differ concerning which challenging conditions must be present and must be handled successfully in order for one to speak of resilient behaviors. Such challenges vary from strategic issues regarding a firm's business model (Hamel & Välikangas, 2003; Reinmoeller & van Baardwijk, 2005) to extreme weather events (Halkos, Skouloudis, Malesios, & Evangelinos, 2018; Linnenluecke, Griffiths, & Winn, 2012) or even the accumulation of minor, non-novel interruptions (Rudolph & Repenning, 2002). In this work, I adopt the view, that resilience is crucial concerning a *multitude of challenges* rather than just one specific type. At this point, I refer to Vogus and Sutcliffe (2007), who included under challenging conditions "discrete errors, scandals, crises, and shocks, and disruptions of routines as well as ongoing risks (e.g., competition), stresses, and strain" (p. 3418).

Similar to practice, the theoretical and scientific interest in organizational resilience has increased in recent years, as also reflected by the exponential increase in publications on resilience, starting with around five articles in 2000 to 60-70 in 2013 (Linnenluecke, 2017). I address the conceptual issues associated with this new construct in this dissertation.

The dissertation is a cumulative one, also know as a thesis by publication. It consists of four articles, all integrated under the overall title *Organizational Resilience: Conceptual Development, Empirical Findings, and Managerial Contradictions*. The articles are listed in Table 1-1, including further information regarding their journal submissions and review status, as well as related co-authors.

Before I turn to these articles, I will proceed as follows: First, I will present the three overarching research objectives that guided my work. Second, I will outline and summarize the key findings of all four articles and how they relate to the defined

Table 1-1: List of journal and conference contributions

	Authorship and title	Status
Article 1	Haase, A. and Eberl, P. (2017). **Towards a More Differentiated View of Organizational Resilience. Looking at Prevention, Response and Preparation**.	Peer reviewed, accepted and presented at the European Group of Organizational Studies (EGOS) 2017, Kopenhagen.
Article 2	Haase, A. and Vakilzadeh, K. (2020). **Resilience Influencing Factors - A Grounded Literature Review of Empirical Resilience Research**.	Under review in the journal "Continuity & Resilience Review". Previous versions peer reviewed, accepted and presented at European Academy of Management Conference in 2019 and 2020.
Article 3	Haase, A. and Eberl, P. (2019). **The Challenges of Routinizing for Building Resilient Startups**. Journal of Small Business Management, 57 (S2), 579-597.	Published The Journal is ranked Q1 in different subject categories within the Scimago Journal & Country Rank and ranked as B in the VHB JOURQUAL 3.
Article 4	Vakilzadeh, K. and Haase, A. (2020). **It's Not What It Seems to Be: Organizational Resilience and Competing Demands**.	Previously under review in the journal "Group and Organization Management". Peer reviewed and accepted at European Academy of Management Conference in 2020 Peer reviewed and accpeted at the Annual Meeting of the Academy of Management in 2020

research objectives, explaining why I arranged them in the chosen order. Third, I will present and discuss theoretical and practical implications.

1.1 **Research objectives**

Typical terms in organizational resilience definitions are *maintenance of positive adjustment* or *bouncing back*. They are very vague and need further specification if they are to be understood. At the beginning of my dissertation in 2016 there were hardly any comprehensive conceptual articles and review papers. Now, in 2020, there are some good conceptual articles (Darkow, 2019; Duchek, 2019; Linnenluecke, 2017; Williams et al., 2017) yet few empirical studies (van der Vegt, Essens, Wahlstrom, & Georg, 2015), which work against the development of a distinct concept by adding more and more factors, so that it is becoming harder to keep track of all factors that influence resilience. Thus, scholars increasingly refer to resilience as an umbrella concept (Darkow, 2019; Duchek, 2019; Klein, Nicholls, & Thomalla, 2003). Although resilience is a young topic in organization science, in other disciplines such as individual psychology (e.g. Cowen, 2001; Kaplan, 1999, 2005) or ecology (e.g. Bodin & Wiman, 2004; Carpenter, Walker, Anderies, & Abel, 2014), scholars seem to be avoiding the word owing to considerable conceptual blurring, calling into question the concept's overall usefulness (Klein et al., 2003). Based on these aspects, two research objectives (ROs) arose that guided this dissertation from the outset:

*RO1: **From blurry definitions to a sound construct:** Generating a resilience conceptualization that includes sequential differentiation and related capabilities.*

*RO2: **What drives resilience?** Identifying and categorizing the vast number of factors that influence resilience and that make up the umbrella construct.*

RO1 focuses on resilience's distinct core and seeks to clearly define the construct's boundaries, while RO2 seeks to map the scope and multiplicity of drivers of resilience and factors that influence resilience. Further, RO2 aims at practical recommendations on how to achieve or manage resilience, which cannot necessarily be derived directly from a clear theoretical concept, as RO1 asks.

While RO2 seeks to map and categorize all influencing factors, RO3 focuses on one such factor, which is very interesting for resilience in various ways. RO3 is based on the fact that organizational resilience needs time to develop and grow (Gittell et al., 2006; Sutcliffe & Vogus, 2003; Wildavsky, 1988). Limnios, Mazzarol, Ghadouani, and Schilizzi (2014) argued that firms in their early lifecycle are fairly *unstable* and therefore "have not yet achieved high levels of [...] resilience" (p. 112). On the other hand, scholars have emphasized the fairly high *flexibility* and *changeability* levels of young firms compared to older ones (Chen & Hambrick, 1995; Gunasekaran, Rai, & Griffin, 2011; Limnios et al., 2014; Sullivan-Taylor & Branicki, 2011), which also speak for higher resilience levels – especially post-adversity resilience. As these two arguments contrast regarding stability and change, we connected young firms' resilience to organizational routines, which are considered to be a source of both stability and

change (Feldman & Pentland, 2003). Further, empirical research on resilience-building in SMEs, including young and entrepreneurial firms, is scarce (Ates & Bititci, 2011; Demmer, Vickery, & Calantone, 2011; Sullivan-Taylor & Branicki, 2011), which calls for detailed examination. RO3 of this dissertation combines these arguments:

> *RO3: The role of organizational routines in resilience-building – especially in young firms: Examining to what extent resilience-building in young firms differ from that of older ones and analyzing organizational routines' role in this regard.*

Although we mainly analyze routines in article 3, this influencing factor is also touched on in the other three articles.

1.2 Summary of the articles' key findings

Before I will derive theoretical and practical implications, I will first summarize all four articles' key findings.

In the conceptual article, **article 1**, we begin by pointing to the criticisms raised in other disciplines against the resilience concept, calling for a more differentiated view in organization science so as to avoid problems that have occurred in other disciplines.

Overall, the article shows the central perspectives of the organizational resilience construct: a) organizational capabilities, b) crisis dimensions/phases, and c) the interplays between the capabilities within the umbrella construct. These three

perspectives are key elements in various conceptualizations. In article 1, we discuss three major resilience capabilities that are defined and understood differently in the existing literature: *prevention*, *response*, and *preparation* capabilities. Prevention capabilities comprise all capabilities in an organization that serve to quickly identify a crisis or precursors of a crisis (weak signals), combined with preventing the escalation of a crisis. Response capabilities help firms to react adequately to a crisis and to recover rapidly from it in order to return to a state of normalcy. The importance of sensemaking (for the short-term perspective) and sensegiving skills (for the long-term perspective) as the foundation of adequate response and recovery are highlighted. Preparation capabilities refer to organizational learning, because organizations prepare for future adversities by evaluating their past prevention or response activities or those of other firms (vicarious learning), and develop and train new response procedures or improve their improvisation capabilities. We highlight that both explorative and exploitative learning are relevant for resilience-building. Exploitative learning helps one to establish and stabilize routines that can be used for effective and rapid response, while explorative learning supports improvised responses during crisis, as the creative recombination of existing routines to form effective situation-specific responses. Through the feedback loop of evaluating and preparing, these response routines are stored in the organization's memory.

Because crises follow different courses, the required capabilities differ between crises. In this regard, it is made clear that, in an *accumulated crisis*, prevention capabilities are crucial, while in a *sudden crisis*, response capabilities are the decisive

factor. Further, the time available to respond affects the demands placed on organizations. For instance, the shorter the time horizon in which a decision must be made, the more important improvisation skills are. Further, crises may differ along organizational lifecycles: while a lack of stability can lead to crises in young companies, increasing rigidity (also a lack of flexibility) is a major factor in older companies, calling for different learning focuses in different lifecycle stages.

Finally, we highlight that resilience research should value the concept's umbrella character, since it enables the analysis of interdependencies and contradictions.

While article 1 addresses RO1 by clarifying the conceptual basis of organizational resilience and solving conceptual confusions, articles 2 and 3 address RO2 by examining drivers of resilience that help one to understand how to manage resilience in organizations.

Article 2 is the logical extension of article 1, since we look closely at the umbrella character indicated in article 1. We argue that studies on organizational resilience are often limited to a few individual influencing factors, which means that one can lose sight of the big picture when not integrating these factors. Motivated by these issues, we use the grounded theory approach to extract all results from empirical resilience studies, which – according to the various authors – are supposed to influence resilience. For this purpose, we examine 39 exclusively empirical articles on organizational resilience. In total, 294 paragraphs were coded, which we condensed into 111 distinct factors. All factors were categorized in seven domains:

relations, human resources, formal management and governance, organizational culture, leadership, information and communication systems, and firms' characteristics. Although different categorizations would have been possible (e.g. into cognitive, behavioral, emotional, structural, etc.), the chosen way makes it clear how many research areas from the broad management field are brought together under the umbrella construct of organizational resilience, all to serve the overall goal of successfully anticipating and handling challenging conditions. Further, we derive some implications for future resilience research, recommending that researchers focus on closely instead of distantly linked influencing factors. It became clear that researchers have empirically linked a vast number of factors to resilience that initially had no direct connection to the construct. This has led to an unnecessary extension of organizational resilience and to a blurry boundary of the construct. In chapter 1.3, I will further discuss how resilience's core and the demarcation of the construct could look like in future research.

While article 2 shows and categorizes the complete range of influencing factors, article 3 focuses on one specific influencing factor: the ability to routinize.

Article 3, which was published in the *Journal of Small Business Management*, builds on the idea that large and established organizations can rely on well-embedded routines, while startups need to first create and maintain them. We refer to this as routinizing. In the article, we show that routines' stabilizing function for building resilient SMEs (especially in startups) is pushed into the background; instead, the flexibility and changeability of routines is highlighted in the literature (Chen &

Hambrick, 1995; Gunasekaran et al., 2011; Pal, Torstensson, & Mattila, 2014; Sullivan-Taylor & Branicki, 2011). In contrast to this focus in SME research, we describe on a conceptual level that routinized essential-for-survival processes (e.g. financial planning, product development, strategic decision-making) are fundamental building blocks of resilience, because these processes need to be continued even in crises so as to secure an organization's survival. Since these essential processes are often not as well routinized in the startup context as in older organizations, routinization is a reasonable starting point to increase resilience in young companies. Thus, routinizing, which primarily belongs to pre-adversity resilience, is largely determined by a routine's perceived value. Here, we understand pre-adversity as an organization's capability to prepare for, anticipate, prevent, and mitigate potential adversity prior to its escalation, so as to secure the organization's existence and prosperity. A routine perceived as highly valuable, according to the article, can be achieved through stable patterns and predictable outcomes, and are essential for a firm's survival. These three aspects and a high perceived value of routines are facilitated by high routine comprehensibility levels, which can be achieved by translating routines into IT and the use of procedure models. Further, we found that knowledge transfer and control from outside (e.g. from business angels) as well as founders' previous work experience can increase founders' attention to establishing and maintaining routines. These high attention levels will highlight the routines' importance for a firm's survival and will foster stable patterns. The startup context, through high time and personnel constraints but also rapid growth, inhibits the positive valuation of routines and thus complicates routinizing.

Since routinizing strongly depends on individual perceptual processes, we recommend that founders invest in discussing with their employees which processes are essential for their startup's survival in order to decrease defensive reasoning such as "having no time to fulfill the routine."

Article 3 also implies that, depending on a firm's age, it tends to either focus on stability and planning or on creative improvising and responding ad hoc. Awareness of these tendencies will help founders or managers to consciously work against them. Startups find it hard to establish and maintain relatively stable routines. In this article, we deliver valuable insights on how to improve the ability to routinize.

This either/or focus relates to the management of contradictions. In addition to the implication from article 3, articles 1 and 2 also address the contradictions that must be managed if one is to become resilient. In article 2, we address the contradictions of stability vs. change, formality vs. informality as well as planned and codified responses vs. improvisation and ad hoc responses. On the basis of the accumulated knowledge so far, it became apparent that resilience is also characterized by the management of contradictions.

Thus, in **article 4**, we start by saying that, owing to the breadth of the resilience construct, previous articles usually examined individual components of it and concluded that the presence of a certain component leads to an increase in a firm's overall resilience. We challenge this view by arguing that certain components of resilience represent a competing demand for organizational members, especially for

executives. When not recognized, competing demands can decrease rather than increase an organization's resilience owing to wrong conclusions drawn by organizational actors on how to deal with challenging conditions. While previous work on organizational resilience has confirmed the existence of competing demands, we still lack a detailed classification and analysis.

We explain that the general contradictions in resilience management can best be summarized by the dichotomy planning vs. improvisation. Based on Gaim et al.'s (2018) systematic classification, we consider paradoxes, tradeoffs, dualities, and dilemmas, concluding that planning vs. improvisation constitutes a duality. Based on this insight, we emphasize that decision-makers often view the relationship between planning and improvisation as contradictory, while in fact it is not. This seeming contradiction, if not handled correctly, causes managers to focus on either planning or improvisation. Thus, organizations do not become fully resilient, which they could be if they would pursue both simultaneously. Thus, actors must become cognitively resilient-focused (e.g. through training and coaching), which means that they know about the necessity and possibility to plan and improvise at the same time.

Concerning RO1, article 4 adds the capability to manage seeming contradictions to the resilience concept. It has more of a meta-character, because it helps to combine all other capabilities and factors that influence resilience. Article 4 also contributes to RO2, because we discuss some influencing factors in detail, for instance, executive training and coaching as well as creativity and formality in firms. I

will now discuss the theoretical and practical implications that result from all four articles.

1.3 Implications for theory

In this section, I will show which overarching implications can be derived from the four articles. I will highlight what needs to be considered in future resilience research and what areas researchers could focus on.

I start by summarizing all conceptual thoughts that can be derived from the four articles, depicted in one comprehensible resilience model (Figure 1-1). Second, I will discuss that the division according to the crisis phases, namely pre-adversity and post-adversity resilience, may be mistakenly used as a synonym with the division into planning and improvising (examined in article 4). Third, I will summarize the meaning of organizational routines and company age for organizational resilience research. Fourth, I will address some issues in empirically examining resilience owing to its umbrella character and will make recommendations on how to handle these issues. Fifth, I will briefly identify some research gaps in the organizational resilience field that became apparent while writing the thesis but which I did not address.

1.3.1 A summary of conceptual thoughts: A resilience model

The visualization in Figure 1-1 seeks to serve as a summary that chronologically orders the shown resilience capabilities (specifically from articles 1 and 4). To make transparent which articles the respective findings are taken from, small indices

indicate the article that deals with the particular components. In case a component is addressed in more than one article, the article numbers in bold indicate the main contribution. Further, this section addresses RO1 and RO2, since it delivers a sound conceptualization of resilience with a sequential differentiation and the core capabilities, and includes the vast number of drivers of resilience (categorized in article 2).

Notably, there is confusion about whether organizational resilience is an outcome (Rerup, 2001), a set of capabilities (Duchek, 2019), or a process (Burnard et al., 2018), or even all of the above. Similar to my understanding, the resilience definition by Williams et al. (2017) in their review paper provides one possible answer: "resilience as the **process** by which an actor […] builds and uses its **capability endowments** […] in a way that positively adjusts and maintains functioning **prior to, during, and following adversity**" [p. 742, emphasis added]. This definition makes clear that resilience is not necessarily one or the other, but may be a combination of several components, underpinning the umbrella character mentioned throughout all four articles. Much more, the basic framework is a specific resilience process – made up of several subprocesses – in which organizations utilize and build resilience specific capabilities and resources. The model is my suggestions and integrates the influential work by Boin and van Eeten (2013), Sutcliffe and Vogus (2003), Williams et al. (2017), Burnard et al. (2018), and Vogus and Sutcliffe (2007).

The model's cornerstones are:

- an integration of all essential subprocesses (= resilience core processes)

- a separation into pre-adversity and post-adversity resilience

- a cyclical process model.

Which are the core resilience processes?

All resilience core processes are listed and defined in Table 1-2. I will now describe their interplay in some detail.

Before an organization can prevent, prepare for, or respond to a crisis, it must recognize and interpret deviations or potential adversities in the environment or in its
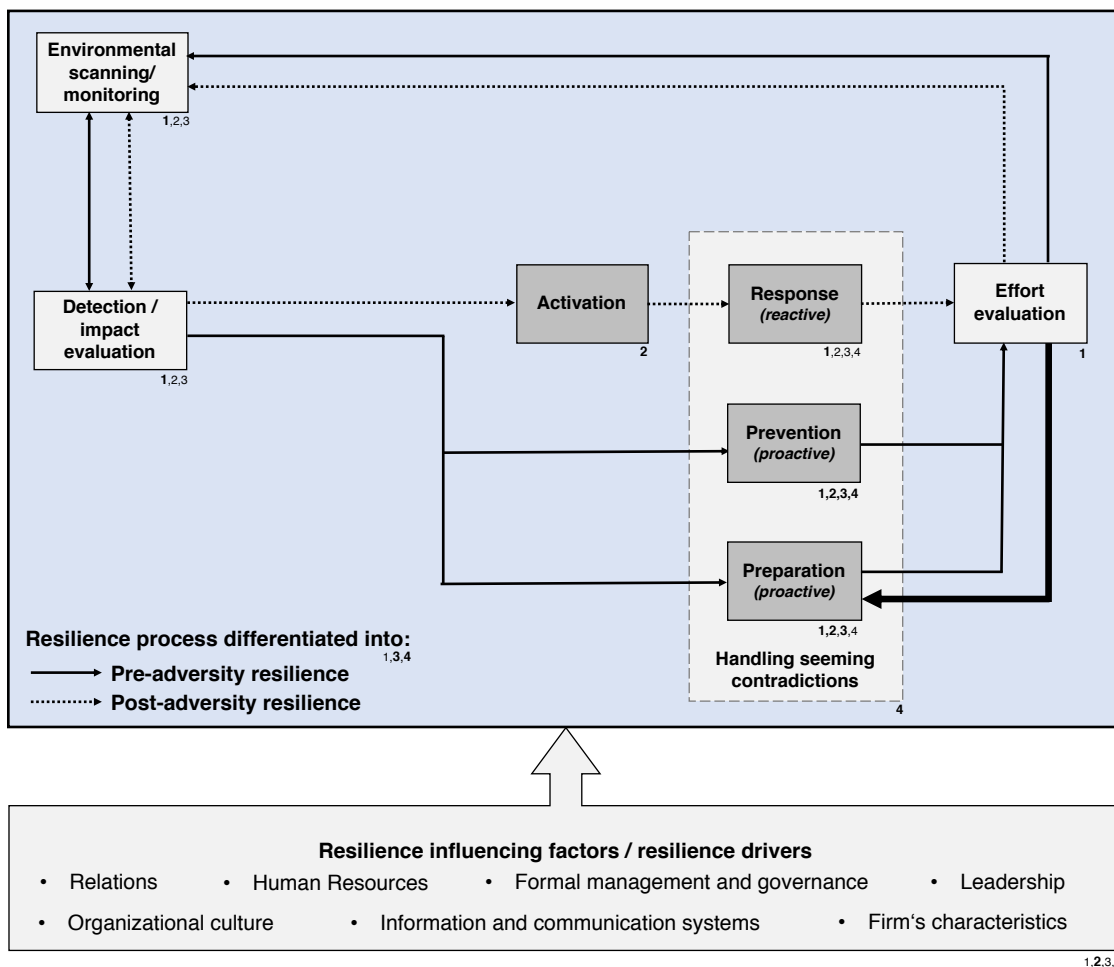
Figure 1-1: A resilience model - illustration of essential theoretical findings.
The small numbers indicate from which article the findings are taken.

own system. According to Vogus and Sutcliffe (2007, p. 3419), "monitoring and simulating [possible unexpected events] are done to improve an organization's ability to detect unexpected events sooner"; Boin and van Eeten (2013, p. 433) argued that organizational resilience "demands a form of dynamic sense-making: information must be collected, commissioned, analysed"; and Williams et al. (2017, p. 742)

highlighted an organization's "interact[ion] with the enviornment" in their definition of resilience. Burnard et al. (2018) summarized these aspects under the following subprocesses, which I adopt for the model: *environmental scanning / monitoring* and *detection/impact evaluation*. In these subprocesses, an organization utilizes such capabilities, similar to what we summarized in article 1 under scanning, detection, and anticipating.

Besides *scanning*, *detection*, and *impact evaluation*, the three main components of resilience are: a) actions taken prior to crisis to *prepare* for unexpected events, b) to *prevent* the escalation of upcoming problems

Table 1-2: Resilience core processes

Resilience Core Processes	Definition
Environmental scanning/ monitoring	Processes through which an organization monitors the internal and external environment.
Detection/ Impact Evaluation	Active processes through which the determinants or impacts of an event are recognized.
Activation	Initiation of a transition phase (in response to an acute crisis).
Response	Use of pre-defined responses and/or the creative development of new ones to recovery and/or passively absorbing an adversity's impact.
Prevention	Processes for preventing the escalation and mitigating the negative effect of emerging adversity.
Preparation	Processes through which responses for potential adversity are planned, prepared and implemented.
Effort Evaluation	Assessment of response and preparation/prevention results.
Handling seeming contradictions	Processes through which organizational members understand the possibility and importance of pursing planning and improvisation at the same time.

(Boin & van Eeten, 2013; Duchek, 2019; Hale & Heijer, 2007; Hamel & Välikangas, 2003; Rerup, 2001; Somers, 2009; Välikangas & Romme, 2013), and c) *responding* to an acute crisis (Boin & van Eeten, 2013; Lengnick-Hall et al., 2011; Meyer, 1982; Wildavsky, 1988). All three are discussed in some detail in article 1. Further, I argue that switching between *proactive* preparing and preventing and *reactive* responding is not automatic. Thus, there seems to be a specific *activation* process – identified in the grounded literature review of article 2 – which is about creating a transition from a proactive posture and business-as-usual, to a reactive posture that requires a different and "new modus operandi" (Teo, Lee, & Lim, 2017, p. 143). Later, I will show that the activation process is worth further empirical investigation.

As mentioned in articles 1 and 2, *learning* and *organizational development* are inherent components of resilience (Boin & van Eeten, 2013; Burnard et al., 2018; Sutcliffe & Vogus, 2003; Vogus & Sutcliffe, 2007; Williams et al., 2017). So, why does the model not contain a core process called organizational learning or organizational development? Learning in the context of organizational resilience is mainly the development of new processes/routines based on experiences so as to be better prepared for future adversities (Sutcliffe & Vogus, 2003). As argued in article 4, the specific development of new processes (= learning) is already represented through the core process *preparation*. To consider that learning has a reference to past experiences, I include the core process *effort evaluation*, which means that organizations evaluate the extent to which their prevention and responding activities during an (upcoming) crisis achieved the desired results or simulate the extent to which preparation activities will potentially work. If for instance predefined response

routines can be improved, then resilient organizations undertake additional preparation efforts if they seem to be useful. This preparation is then evaluated again. Thus, organizational learning and development are primarily represented through the feedback loop of *effort evaluation* and *preparation* (also discussed in article 1).

The last resilience core process is *handling seeming contradictions*, which first became apparent during the literature review of empirical articles (see article 2) and is conceptually analyzed in detail in article 4. It describes processes through which organizational members cognitively understand the possibility and importance of simultaneously pursing planning (preparing a response repertoire in advance and using these predefined responses during a crisis) and improvisation (responding flexibly and creatively with novel or newly combined behaviors during a crisis). It is depicted as a combination of the three main processes preparation, prevention, and response, because contradictions seem to arise between them. On the one hand, decision-makers can decide prior to a crisis whether to invest in contingency plans and good preventative means and/or to train and trust in the firm's improvisation capabilities. On the other hand, decision-makers must find the right response during a crisis, which can be the utilization of previously defined responses or creative improvisation. Thus, during both pre-adversity and post-adversity resilience, organizational members must understand that both are essential if the firm is to become truly resilient.

Further, Figure 1-1 shows that all resilience core processes are influenced and driven by several resilience factors that influence resilience, which we identify and

categorize into seven domains in article 2. These mainly consist of firm's resources, capabilities, and specific context factors.

Why a twofold resilience model?

Although the wording "prior to, during, and following adversity" (Williams et al., 2017, p. 742), which was mentioned in several articles, implies a threefold model, those authors describe a twofold separation (Table 1-3).

Thus, as mentioned in articles 1, 3, and 4, I followed a twofold temporal division of organizational resilience. The first perspective sees resilience as a reaction to a major disturbance and is called post-adversity or recovery resilience (Boin & van Eeten, 2013; Williams et al., 2017). According to this reactive perspective, resilience comes into play in the face of immediate danger and asks for a rapid response and a return to good organizational functioning. Notably, post-adversity does not refer to the phase in which the company has already survived and recovered from a crisis; it starts when a major disturbance has manifested (Williams et al., 2017). The subprocesses *activation* of a transition phase and *response* to major disturbances for short-term and long-term recovery (see Williams et al., 2017) belong exclusively to post-adversity resilience and make a difference to the second perspective. The second perspective incorporates prevention and preparation activities in the time before a crisis – summarized under pre-adversity resilience and including precursor resilience (Boin & van Eeten, 2013; Williams et al., 2017).

The model clearly shows that four resilience core processes are similar for post-adversity and pre-adversity resilience: a) *environmental scanning/monitoring*, b) *detection/impact evaluation*, c) *effort evaluation*, and d) *handling seeming contradictions*, so that just *preparation* and *prevention* on the one hand and *activation* and *response* on the other differ and characterize either pre-adversity or post-adversity resilience.

As discussed in article 4, the main difference between this twofold separation and threefold models (e.g. Duchek, 2019) is the classification of learning. Owing to the fact that after disruption B is the same period as before the next disruption C, it is not possible to unambiguously assign organizational learning, which happens between the two disruptions, either to pre-advesity or post-adversity resilience. Thus, threefold models classify learning as an additional third phase (named adaptation by Duchek 2019), which happens after or parallel to pre-adversity and post-adversity resilience; whereas I classify learning (= feedback loop of *effort evaluation* and

Table 1-3: References for pre- and post-adversity resilience.

	Pre-Adversity Resilience	**Post-Adversity Resilience**
Williams, Gruber, Sutcliffe, Shepherd, and Zhao (2017)	"Pre-adversity organizing: preparing and restoring" (p. 746)	"Responding to major disturbances" (p. 747)
Boin and van Eeten (2013)	Precursor resilience: "prevents budding problems from escalating into full-blown crisis" (p. 431)	Recovery Resilience: "ability to respond to singular or unique events" (p. 431)
Burnard, Bhamra, and Tsinopoulos (2018)	"develop the necessary capabilities prior to response" (p. 352)	"restore efficacy following a disruption" (p. 352)

Note: Although both Williams and Burnard use the term 'restoring', it is clear from the respective articles that Williams et al. (2017) refers to pre-adversity (mitigation of small deviations) and Burnard et al. (2018) refer to reactions to more severe disruptions.

preparation/prevention) as pre-adversity resilience (sometimes with a reference to past experiences).

Why a cyclical model?

In its core, organizational resilience contains a continuous reflection on one's own situation as well as reflection on activities undertaken to master and prevent the escalation of crises (Sutcliffe & Vogus, 2003; Vogus & Sutcliffe, 2007). This ongoing process already implies a cyclical process.

Focusing on the specific resilience core processes, a potential threat or disruption is not only *monitored*, *detected*, and *evaluated* once followed by only one *preparation and prevention* action or just a single *response*. A crisis or precursors are continuously monitored, which allows for the ongoing detection of small cues that, over time, merge into a larger picture (sensemaking) (Weick, 1995), which – in turn – enables an increasingly targeted and effective preparation, prevention, or response, since the situation is better understood. Thus, a cyclical process is applicable, which coincides with conceptualizations by Williams et al. (2017) and Burnard et al. (2018).

1.3.2 Pre-adversity and post-adversity resilience ≠ planning and improvising

Following my description of the model, I point out a theoretical specificity and subsequent implications. While at first glance it seems that *planning* is a synonym for

resilience subdivisions	Pre-adversity resilience				Post-adversity resilience	
Overarching resilience capabilities	**Preparing** for adversities by…		**Preventing** the escalation based on…		**Activation** and **coping** based on…	
	developing **plans and response procedures**	building **improvisation capabilities**	planned behavior	improvised behavior	improvised behavior	planned behavior
Existence / severity of adversity	Prior to any manifested signals or adversities		Weak signals / budding problems		Major disturbances	

Figure 1-2: Planning and improvisation in relation to pre- and post-adversity resilience

the resilience core process *preparation* (thus, pre-adversity resilience) and that *improvisation* is a synonym for *response* (thus, post-adversity resilience), this view may well change upon closer examination.

The separation into pre-adversity and post-adversity resilience relates to time or phases, while the planning-improvisation pair relates to decisions and solutions. For instance, during the pre-adversity phase, managers must decide whether to a) invest in preparation, b) rely on improvisation skills, or c) pursue both equally (Figure 1-2). Similarly, during the post-adversity phase, it must be decided whether a) to use the previously planned response procedures or b) to improvise to find new and creative solutions during a crisis (Figure 1-2). Thus, handling the seeming contradictions and making optimal decisions is a key management task when building resilience independent of the crisis phase. As discussed in article 4, I propose that the division into planning and improvisation could be as interesting for future resilience research as the temporal distinction into pre-adversity and post-adversity, because it is highly promising concerning managing contradictions and becoming truly resilient. However, many conceptual articles use a phase-based classification (Darkow, 2019; Duchek, 2019; Williams et al., 2017). Thus, while maintaining the well-established

phase dichotomy, I integrate the management of seeming contradictions into my model (Figure 1-1) to draw attention to this promising fact for resilience management.

1.3.3 The meanings of organizational routines and firms' age for organizational resilience

While the previous chapters related to RO1 and RO2, the following chapter will refer to RO3, focusing on the specific resilience influencing factor routinizing and the meaning of firms' age for organizational resilience.

All four articles, and specifically article 3 in detail, show that both topics – routines and firms' age – are closely interrelated and have important implications for managing resilience. Since organizational routines can be a source of stability but can also serve as a source of organizational change when adaptation is needed, it matches the construct of organizational resilience, which also calls for persistence and change (Bhamra & Dani, 2011; Burnard et al., 2018; Feldman, 2000; Feldman & Pentland, 2003; Lazaric, 2008). The empirical evidence underlines that routines most likely change incrementally in a path-dependent way, because organizational members refer to previous states when modifying a routine, delivering some persistence and durability (Becker, 2004). The previous state encompasses the purpose of a routine, which legitimizes its existence (Becker, 2004). Further, the levels of routine persistence and flexibility widely depend on the context in which they are carried out (Becker, 2004; Cohendet & Llerena, 2003).

The empirical findings in article 3 highlight that it can be a challenge for startups to establish and maintain organizational routines (depending on several inhibitors and facilitators, as summarized). Thus, they battle to build stability and somewhat rigid procedures. In contrast, older organizations commonly have well-embedded routines that deliver stability, but tend to be more rigid and thus are more likely to follow planned and legitimized procedures (Herbane, 2015; Tognazzo, Gubitta, & Favaron, 2016).

Overall, based on the four articles (especially article 3), it can be summarized that organizational routines can positively influence organizational resilience, because:

a) routines help to stabilize essential-for-survival processes, so that they are more likely to be carried out during a crisis and help to avoid a decline in a firm's performance (Haase & Eberl, 2019);

b) stabilizing some processes in a firm help it to be more flexible and creative in other areas (Christianson, Farkas, Sutcliffe, & Weick, 2009);

c) routines that are stored as behavioral patterns in the organizational memory can be recombined in novel ways during a crisis to deliver creative and improvised responses that are required to cope with novel issues (Meyer, Frost, & Weick, 1998; Weick, 1998).

In sum, the stability and flexibility that routines can deliver are both essential for organizational resilience. Thus, routines can be seen as important building blocks for organizational resilience.

The connections between organizational routines, firms' age, and organizational resilience can also be seen in organizational lifecycle and growth models. For instance, Larry E. Greiner (1972, 1997, 1998) argued that every organization must master revolutionary phases if it is to survive and grow. Greiner considers these phases to be organizational crises, because they threaten an organization's existence and pave the way for its survival or failure. Thus, being able to handle these crises would imply that a firm is resilient. These lifecycle and growth models imply that formal processes such as organizational routines are essential for organizations to survive and grow (Churchill & Lewis, 1983; Greiner, 1972, 1997, 1998; Scott & Bruce, 1997), also for startups, because they allow startups to efficiently use their scare resources and to achieve rapid progress (de Villiers Scheepers, Verreynne, & Meyer, 2014). Further, these models indicate that organizations face tensions during their development, for instance, a startup that builds on its creativity and flexibility but needs to become more efficient via routinized and formal processes (Churchill & Lewis, 1983; Greiner, 1972, 1997, 1998; Scott & Bruce, 1997) will hesitate to formalize and routinize in an early stage, because founders may be afraid of losing creativity. I will address this topic again in the section on practical implications.

1.3.4 Issues with the operationalization of resilience

A basic issue in organizational resilience research is how scholars have approached the resilience phenomenon. As a contrasting example, research into organizational culture has sought to first explain and conceptualize the phenomenon, which we can observe in organizations; in a second step, they have asked how it must

be managed so as to achieve outcomes that are somehow beneficial to a firm (efficiency, effectiveness, value maximation). In contrast, organizational resilience researchers have taken a different approach: They start with the outcome (e.g. bouncing back, ensuring the firm's existence, or becoming stronger after a crisis) and seek to identify factors that lead to these more or less clearly defined outcomes. To measure the *bouncing back* or *becoming stronger*, researchers have used substitutes such as firm performance prior to an adverse event and have compared them to post-crisis performance (Fainshmidt, Nair, & Mallon, 2017; Gittell et al., 2006; Lampel, Bhalla, & Jha, 2014; Tognazzo et al., 2016). Nonetheless, it remains problematic to unambiguously say that a certain organizational capability has a clear link to the firm's performance and that it is responsible for a performance rebound.

Owing to the fact that existing articles have already proposed a vast number of factors (see article 2) that are assumed to influence resilience, researchers have started reversing this approach, defining resilience less as an outcome and more as a certain set of organizational capabilities, resources, and organizational processes, all summarized under the organizational resilience umbrella. Thus, they *construe* the resilience construct, which inevitably leads to problems owing to different options and beliefs about what resilience should consist of (see article 1). For instance, they construe the boundaries differently, and the broad umbrella character makes it hard to decide which factors in fact belong to organizational resilience. Accordingly, one can ask whether and which of the 111 factors that influence resilience (identified and described in article 2) can and should be incorporated into a resilience measurement.

Are there key factors that cannot be ignored? On the other hand, are there factors that are not very descriptive that can be excluded for the operationalization of organizational resilience? For instance, are creativity and innovativeness integral parts of resilience, or do they just affect resilience capabilities (Burnard et al., 2018; Gray, Duncan, Kirkwood, & Walton, 2014; Mannen, Hinton, Kuijper, & Porter, 2012; Wastell, McMaster, & Kawalek, 2007; Wicker, Filo, & Cuskelly, 2013)? In sum, many discussions may follow in resilience research on what to include and exclude, and these discussions are vital to further develop and sharpen the construct. In addition to the aforementioned innovativeness and creativity, others factors such as *divergent thinking*, *mindfulness*, *strong relationships*, *change readiness*, or *effective coordination* – according to the review article 2 – seem to be at least closely linked to resilience capabilities or are even integral parts of them and, thus, should be included. In contrast, transformational leadership – a factor that influences resilience according to two articles (Valero, Jung, & Andrew, 2015; Wastell et al., 2007) – seems to be a distant and not necessary component when operationalizing organizational resilience, and is suggested to be excluded; yet this leadership behavior may help to build some of the aforementioned capabilities (divergent and creative thinking, mindfulness, etc.).

1.3.5 Potential research areas not addressed in this thesis

I will now address some aspects that in my view have potential for future resilience research and practice.

Based on the number of codes found in the grounded literature review (see article 2), formal management (102 codes) followed by internal and external relationships (82 codes) are by far the most important categories among the analyzed articles. Especially the domains leadership (23 codes) and organizational culture (12 codes), which relate to informality and improvisation, seem to play an important role for organizational resilience but were empirically analyzed less often, illustrating the need for further research. Further, as highlighted in articles 2 and 4, managing contradictions within resilience are a promising research area. Also, I will now discuss the two promising topics a) *the meaning of an activation phase* and b) *the careful division into operational and strategic resilience*":

The activations phase: How to switch from pre-adversity to post-adversity resilience

The activation process seems to be an essential part of managing resilience (Figure 1-1), but has seen little attention, as I will now show: Specifically, *activation* is about creating a transition from a proactive planning/preparation posture and business-as-usual, to a reactive posture that requires a different and "new modus operandi" (Teo et al., 2017, p. 143). In six of the 39 analyzed articles (in article No. 2), I found references to an activation process (Barton, Sutcliffe, Vogus, & DeWitt, 2015; Burnard et al., 2018; Edson, 2012; Powley, 2009; Teo et al., 2017; Wastell et al., 2007), of which two have *resilience activation* in their title and go into detail (Powley, 2009; Teo et al., 2017). Powley (2009) calls it "liminal suspension" because it describes a "liminal period where typical organizational routines and patterns suspend for a time"

(p. 1315). Teo et al. (2017, p. 143) used the term "ushering liminality". According to them, it must be signaled to almost all organizational members that the organization is now in a new modus, otherwise there will be no "sense of urgency" (Powley, 2013, p. 47), and no proper response will be activated. Thus, rigidity in the face of a disruption as well as low vigilance and attention to the new threat will result (Barton et al., 2015; Edson, 2012). What at first glance seems a fairly simple mechanism is, upon closer examination, highly complex. For instance, the following theoretical and practical questions arise: How can managers decide that now is the point in time or the situation in which the transition phase should be initiated? Does the entire organization really have to be put into a different modus, or is a partial activation sufficient? If the latter is the case, what should a partial activation look like and what problems could arise? Concerning what should be done at which point of time, Rudolph and Repenning (2002) noted that, in a crisis, it is a common reaction to "step back from the situation at hand, revisit their core assumptions, reframe the situation, recombine existing procedures and routines into alternative responses […] and engage in some type of higher-order evaluation, such as double-loop learning" (Rudolph & Repenning, 2002, p. 25), which exactly describes the initiation of such a transition phase. But according to them, this is not the right reaction to all types of crises. In case of a quantity-induced crisis (= too many incoming tasks exceed the given time), the aforementioned typical reaction would only worsen the crisis. To interrupt work procedures in a quantity-induced crisis will increase the number of pending non-novel tasks that must be completed, leading to higher stress levels that can negatively impact on the resolution of the crisis. Mindlessly sticking to "fixed rules

and procedures" (Rudolph & Repenning, 2002, p. 27) in this situation is more likely to solve the crisis quickly. Their study highlights that changing a modus operandi by declaring a state of emergency is not always the best solution.

Not only is the timing important; the way of communicating and the emotional influence on organizational members are critical. Edson mentioned the balancing act of conveying the "sense of urgency" on the one hand and "managing the risk of a mass exodus and panic" (Edson, 2012, pp. 512-513) on the other. In sum, the way in which as well as when the transition phase is activated can ultimately increase or decrease the subsequent response's effectiveness.

Strategic vs. operational resilience

Finally, I highlight the somewhat confusing division into strategic and operational resilience, which is interesting and important from a theoretical and conceptual perspective.

Concerning the two levels, one can distinguish between a) the type of crisis to which the organization is responding (an operational or strategic crisis) and b) the decisions to be taken in the context of resilience (operational or strategic decisions).

First, since organizational resilience describes the handling of a large number of challenging conditions, both operational and strategic challenges fall within the area of resilience (Vogus & Sutcliffe, 2007). At an operational level, it is about maintaining system functioning and thus the continuity of organizational processes/routines, for instance, finding solutions for challenges along the supply

chain (Ganin et al., 2016; Munoz & Dunbar, 2015; Sutcliffe & Vogus, 2003), while at a strategic level it "is not about responding to a onetime crisis. It's not about rebounding from a setback. It's about continuously anticipating and adjusting to deep, secular trends that can permanently impair the earning power of a core business" (Hamel & Välikangas, 2003, p. 2). In relation to this division, the aspect *time to respond – minutes to months* is discussed in article 1. If for instance technical problems occur in an airplane, it is not possible to hold several meetings over several days to collect and analyze detailed information and then offer a well-planned response; quick, "heedful interrelating" (Weick & Roberts, 1993, p. 357) and improvisation based on imperfect information are needed (Weick, 1990). Although the aircraft context is very specific, the demands on an organization or team in an acute crisis that requires quick actions are similar. The situation is different in the case of a strategic crisis; in relation to usual strategic decisions, action must be taken quickly, but there is still more time to gather and process the information and to take largely well-considered decisions as in operational crises. Thus, one can ask whether the word *improvisation* is still appropriate in the context of a strategic crisis. Further, researchers from strategic management who referred to (strategic) resilience mainly focused on innovative performance (Carmeli & Markman, 2011; Hamel & Välikangas, 2003; Hurmelinna-Laukkanen, 2012; Reinmoeller & van Baardwijk, 2005; Välikangas, Hoegl, & Gibbert, 2009; Välikangas & Romme, 2013). One aspect fundamentally separates strategic and operational resilience: Researchers of strategic resilience also include into the resilience construct the avoidance of strategic crises via continuous adaptation and innovation (Hamel & Välikangas, 2003; Reinmoeller & van Baardwijk, 2005). This

explicit avoidance of crises (not preventing their escalation) within the framework of strategic resilience contradicts the original idea of resilience, as Vogus and Sutcliffe (2007, p. 3419) note: "[Organizational resilience is] an organization's ability to detect unexpected events sooner when they are more easily corrected and to build capabilities for recovering from unexpected events rather than as a means of eliminating errors and unexpected events."

This differentiates research that sees resilience more as dealing with acute, unexpected, and operative crises (for instance Boin & van Eeten, 2013; Vogus & Sutcliffe, 2007; Wildavsky, 1988) from the concept of strategic resilience.

However, it would be interesting for researchers to test the proposition whether organizations with strategic resilience (Hamel & Välikangas, 2003; Välikangas & Romme, 2013) also show on average more resilient behaviors in the face of operational adversity. This proposition is based on the idea that both strategic and operational resilience are assumed to require adaptive capacity and mindful interactions with the environment (Hamel & Välikangas, 2003; Välikangas & Romme, 2013; Weick & Roberts, 1993; Weick & Sutcliffe, 2015).

While in the previous paragraph I looked at the type of crisis, I will now examine the decision-making level in resilience management (whether strategic or operational challenges). Resilience management happens at strategic and operational levels (Sahebjamnia, Torabi, & Mansouri, 2015). Since strategic and operational management are generally carried out at different hierarchical levels or by different people, the question arises, from both a theoretical and a practical perspective, how

to optimally link the strategic planning and implementation of resilience mechanisms (pre-adversity level) to the operative deployment of these means (pre-adversity and post-adversity levels). If this management issue is not resolved, a fundamental problem can arise: the prepared and provided resources and capabilities cannot be deployed during a crisis (Nowell, Bodkin, & Bayoumi, 2017). The idea of resilience managers who plan (strategic level) and take responsibility in crises (operational level) may be good means, but require specific persons who are qualified to take on both strategic and operational tasks and who must to be able to handle seeming contradictions, as discussed in articles 4 and 2 (informality vs. formality, improvisation vs. planning, stability vs. change).

1.4 **Implications for practice**

I will now derive some implications for practitioners from the dissertation. I will address the meanings of internal and external relationships for resilience-building and will illustrate that resilience management happens and starts largely at the cognitive level. Further, I will outline startup-specific implications.

Resilience research illustrates the benefits of relationships in dealing with adverse events. Of the 39 empirical articles we analyzed in article no. 2, 21 addressed the topic, and 82 of the 294 codes related to it. These relationships can be within organizations or with external parties. Both internal and external relationships help firms to become resilient, since they allow for rapid access to valuable information, knowledge, and resources.

To build strong internal relationships, the thesis shows that "weekly meetings" (Chewning, Lai, & Doerfel, 2012, p. 247) and "training for cross-functional teamwork, [..] conflict resolution [and] boundary spanners [as well as] feedback and rewards that are oriented toward contributions to shared goals" (Gittell, 2008, p. 30) should be used and that layoffs should be avoided (Ahn, Mortara, & Minshall, 2018; Gittell et al., 2006). To build external relations it is important "to derive legitimacy from a set of diverse stakeholders" (Kraft & Wolf, 2018, p. 82) by communicating the organization's values and practices (e.g. via its website) and to use joint trainings with "first responders, government and society" (Hernantes, Rich, Lauge, Labaka, & Sarriegi, 2013, p. 1750), which will help one to respond in a coordinated, efficient way.

Since the empirical article 3 relates to startups, it has been found that startups in particular benefit from relationships when building resilience, because they can offset their weaknesses – for instance, their relatively low resources and lack of process knowledge. Through exchanges with other founders in startup networks, business angels, and other partners, this (process) knowledge can be gained much faster rather than searching for and developing it themselves. In this regard, we discussed that experienced founders may be better at absorbing and integrating external knowledge, since they may have a broader knowledge base (West & Noel, 2009).

Besides building relationships for essential knowledge transfer, article 3 also recommends that startup founders invest in communicating and debating with their employees about which processes are essential to their startup's success. This will

help to overcome defensive reasoning and will help them to reflect on and identify essential functions. Further, we highlighted some routines that may be essential for all startup types: routines that relate to (a) managing and controlling the financial situation, (b) product or software development, (c) sales, and (d) strategic reflection.

Although we know that resilience builds on a blend of cognitive, behavioral, and other resilience drivers, the dissertation emphasizes that the foundation of resilience management is largely cognitive. Practitioners must understand that, to effectively and efficiently prepare, prevent, and respond, some aspects must be cognitively internalized and managed:

Organizational members, especially higher-level managers and decision-makers, must understand that only planning for adverse events is not enough in today's complex and volatile environments if one is to ensure a firm's survival. Weick and Sutcliffe (2007) noted that "it takes **mindful practices** that encourage imagination, foster enriched expectations, raise doubts about all expectations, increase the ability to make novel sense of small interruptions in expectations, and facilitate learning that intensifies and deepens alertness" (emphasis added, p. 29). To develop these mindful practices and "resilience-focused" awareness, firms can invest in awareness training for their employees and managers, in which managers and decision-makers are trained to become aware that apparent tensions and contradictions (shown in articles 2 and 4) can and must be overcome if the firm is to become resilient.

Both parts of the dyads flexibility vs. stability, informality vs. formality, and improvisation vs. planning are important for building resilience, no matter a company's age. However, depending on their age, organizations tend to focus more on the one or the other, because the longer a firm exists, the more experiences can be accumulated, which then results "in a move away from ad hoc responses to developed incident management systems" (Herbane, 2015, p. 590). This fits with Tognazzo et al. (2016, p. 785) findings that "older firms might be less able to cope with turbulent environments than younger firms" owing to higher organizational inertia, which "impedes the firm's ability to adapt to external changes".

Thus, both younger and older firms must become aware of their weaknesses and vulnerabilities in order to reduce and eliminate them. On average, startups should work more on their stability, formality, and planning capabilities in order to become more resilient, while older organizations should focus more on their flexibility, informality, and ability to improvise, without giving up the counterparts. Further, it can be drawn from article 3 that established organizations can learn from startups' flexible structures and informality so as to become more adaptable.

Assigning a suitable person for each side of the (seemingly) contradictory dyads may be a way to manage the contradictions if an organization has the resources to do so. In article 2, we offer the separation into *resilience manager* (mainly responsible for stability and formality, proactively planning responses and encouraging adherence to regulations) and *resilience leader* (mainly responsible for informality and change, improvising with ad hoc responses during crises and

encouraging creative and divergent thinking). However, notably, the mere division of responsibilities between these two does not automatically lead to a resilient organization. In the same way that a manager must recognize that both components are important, both the leader and the manager must appreciate the other's focus in order to cooperate and combine their benefits. If this does not occur, resilience management becomes a matter of power.

Despite all the aspects of organizational resilience examined and discussed in this dissertation, I conclude that the first step to becoming a resilient organization is accepting both the existence and inevitability of crises as well as the fallibility of one's own systems.

2 Toward a more differentiated view of organizational resilience: Prevention, response, and preparation (Article 1)

Abstract: This article is motivated by criticisms of the resilience construct raised in other disciplines, which call for a conceptual clarification in the organization science field. We show that organizational resilience should a) comprise prevention, response, and preparation capabilities, b) consider sensemaking and sensegiving, c) integrate learning processes, enhancing stability, and learning processes, enhancing flexibility into the concept, and d) consider the interplays between all different capabilities, thereby highlighting organizational resilience's umbrella character. We also investigate different crisis dimensions in order to further refine the underlying phenomenon that resilience seeks to deal with.

2.1 **Introduction**

We focus on some confusions in the organizational resilience concept. A review of the literature reveals that understandings of organizational resilience are still very diverse and even conflicting. In fact, scholars from other disciplines such as individual psychology (e.g. Cowen, 2001; Kaplan, 1999, 2005) or ecology (e.g. Bodin & Wiman, 2004; Carpenter, Walker, Anderies, & Abel, 2014) are shying away from using the word resilience owing to considerable conceptual blurs. Criticisms range from recommendations on how to better define the construct, to a questioning of the concept's overall usefulness (De Bruijne, Boin, & van Eeten, 2010; Klein et al., 2003). These criticisms from other disciplines may also be applied to organizational resilience.

As a foundation, one may say that the concept of organizational resilience is put in place to counteract organizational crises. Such crises can stem from internal sources (e.g. poor leadership, production or performance pressure) or from external sources (e.g. earthquakes, high competition) and are considered to be life-threatening (Sutcliffe & Vogus, 2003). However, there are differences over whether the concept should a) comprise anticipation and prevention of crises, b) be related to long-term responses and recovery, and c) integrate preparation in the form of learning from previous crises.

For instance, some scholars (e.g. Sutcliffe & Vogus, 2003; van der Vegt et al., 2015; Vogus & Sutcliffe, 2007; Weick & Sutcliffe, 2007, 2015; Wildavsky, 1988) look

at organizational resilience as a general capability to cope with, absorb, and recover from unanticipated and unexpected adverse events (thus, already manifested and not prevented) through positive adjustment and adaptation. They see resilience as the counterpart to traditional risk management, which builds on the idea that risks can be clearly identified, assessed, and mitigated. Against this background, the anticipation, prevention of, and specific preparation for such events would *not* be an integral part of organizational resilience, though some kind of anticipation may be essential to mitigate negative effects associated with crises.

According to these scholars, the linguistic origin of resilience suggests a relatively quick response to crisis, as *resilio* (Latin) means to jump back (Klein et al., 2003). While the idea of a material that can absorb high pressure and that can quickly bounce back without breaking serves as a metaphor to describe how systems can recover from adversity (e.g. Bodin & Wiman, 2004; Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2008), the question arises whether quick fixes are better than substantive changes.

Further, earlier models of organizational crisis (Greiner, 1972) suggested that organizations face different crises while they grow. They may not be able to learn directly from the successful management of one crisis for the next one. On the other hand, organizational resilience scholars state that organizations build a stock of responses that "can be activated, combined and recombined in new situations when challenges arise" (Sutcliffe & Vogus, 2003, p. 97), thereby integrating some preparation. However, the question is: Where do these responses come from? How

are they organizationally stored? To what extent are they an integral part of an organizational resilience capability? And: Are they applicable to different crises along an organization's lifecycle?

Taken together, the concept of organizational resilience is experiencing three major problem areas: prevention, response, and preparation/development. I will now address these in some detail. Since they are interconnected, an effective interplay between them may be essential to build organizational resilience. In sum, our paper's purpose is to get a more differentiated view of organizational resilience. We first suggest better examining the phenomenon "crises". Thus, we differentiate between three crisis dimensions: a) the courses of crises (sudden vs. accumulated crises), b) the time available to respond (minutes to months), and c) crises along organizational lifecycles. Second, we look at internal prerequisites such as evaluating weak signals, sensemaking, and learning.

2.2 **Different courses of crisis**

Before we discuss the resilience capabilities prevention, response, and preparation, we start by looking at the crisis phenomenon and whether or not early warning signals can be identified. At an abstract level, there are two courses: *sudden* and *accumulated crises*.

2.2.1 Sudden crises

Norris et al. (2008) analyzed community resilience as a response to disasters. In their definition of a disaster, they deliberately exclude crises that unfold over time, for instance, "chronic environmental hazards, ongoing community and political violence, war, and epidemics" because these may require very different responses (Norris et al., 2008, p. 128). Their definition of a disaster refers to what we call sudden crises. As depicted in Figure 2-1, these occur suddenly and thus leave no or too little time to detect early warning signals. The crisis starts and reaches its peak almost at the same time and is collectively noticed. The impact is most often disastrous and traumatic. Accordingly, organizational resilience is demonstrated in a fast response to these crises. The type of resilience needed under such circumstances must focus on response, which we will discuss later in some detail.
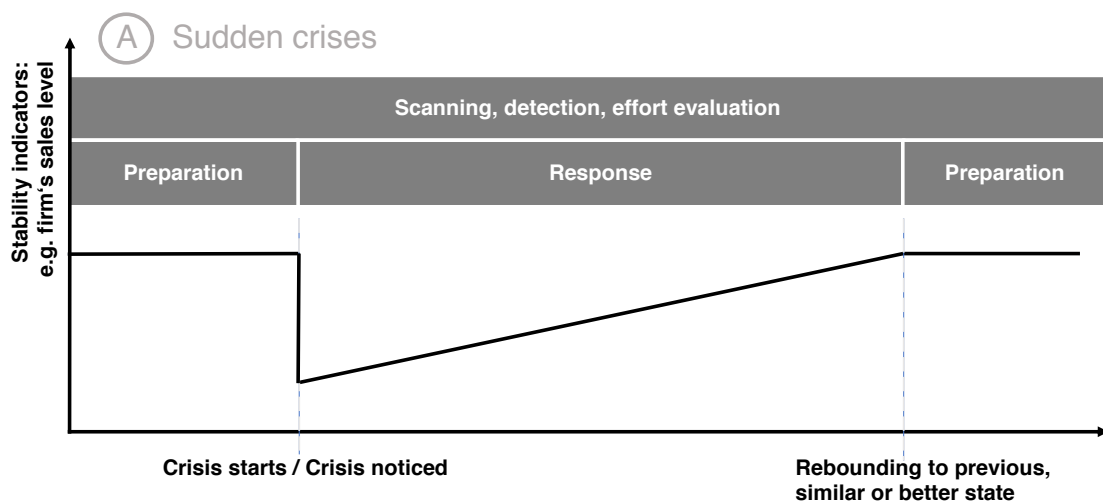
Figure 2-1: Resilience in relation to sudden crises

2.2.2 Accumulated crises

Sutcliffe and Christianson (2012, p. 843) argued that crises not only happen suddenly, but often "result from small problems, surprises, and laps that shift, grow, and escalate until they are too big to handle." Further, Rudolph and Repenning (2002) noted that not only *novel* interruptions can lead to crises; an increase in small *non-novel* interruptions also promote escalation into crises. Non-novel interruptions are usually resolved by standard procedures. Every standard procedure requires time, so that the number of non-novel pending interruptions can accumulate when there is an unusually high number of incoming interruptions or too few human resources to resolve the interruptions. In this case, the stress level increases, which would increase the speed of resolving incoming interruptions, but just up to a specific level. When the number of pending interruptions exceeds a specific number (tipping point), cognitive resources decrease, efficient responses become almost impossible, and organizational members have difficulties to stop the situation from escalating further (Rudolph & Repenning, 2002).

In the case of novel and yet less severe interruptions – often announced by weak signals – organizational members may have the cognitive resources to recognize their destructive potential, but there may several reasons why they do not counteract these weak signals, leading to an accumulated crisis. In strategic management, much research and conceptual work has been done on why organizations do not adapt to environmental changes as well as trends that are clear in retrospect. For instance, Ansoff (1975) argued that there are three main *filters* that

can explain why organizations do not recognize or react to weak signals: surveillance, mentality, and power filters (Ansoff, 1984). The *surveillance filter* describes a set of techniques and methods for collecting information from the environment. Owing to a very complex environment with diverse and conflicting information, the organization can miss some information that contain weak signals. Correspondingly, Schreyögg and Steinmann (1987) emphasized the importance of unfocused strategic control with explicitly no pre-structured control areas. Such strategic surveillance is open to any internal and external signals that constitute a fundamental threat to the organization's existence. The *mentality filter* represents the mental model of the organization, which determines how it will interpret the collected information. Some organizations are more open to change and adjustments, while others are mentally less flexible; overall, organizations as social systems tend to become stable systems (Ilmola & Kuusi, 2006). The *power filter* refers to managers and decision-makers. In case a reaction to weak signals would negatively influence them individually, the needed change may never happen. Although these findings are drawn from strategic management, the idea of filters may also apply to the early detection of crisis signals. It shows that an organization's resilience depends on many factors (leadership, organizational culture, scanning techniques, routines, structure, its history, etc.).

Taken together, the problem of both accumulated crisis types (novel/non-novel interruptions) is that the involved organizational members struggle to recognize the tendency toward crisis or notice negative impacts too late. When organizational

members finally perceive the accumulated crisis, it comes as a surprise, as in the case of sudden crises, and requires rapid responses (see Figure 2-2).
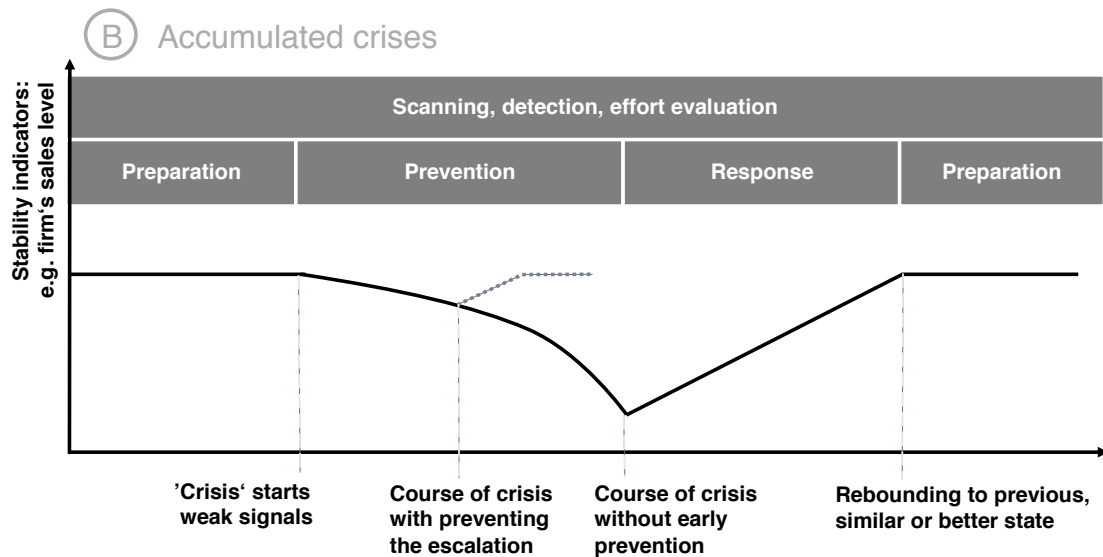
Figure 2-2: Resilience in relation to accumulated crises

Nonetheless, accumulated crises (vs. sudden crises) offer opportunities to identify tendencies toward a crisis much earlier. However, detecting early warning signals and then responding with prevention is different from responding and recovering and may require different capabilities, knowledge, and resources (Norris et al., 2008). Similarly, Boin and van Eeten (2013) suggested distinguishing between two resilience types: *precursor resilience* and *recovery resilience*. They define precursor resilience as "the type of resilience that prevents budding problems from escalating into a full-blown crisis or breakdown" (Boin & van Eeten, 2013, p. 432). "Budding problems" imply that the crisis has already manifested to some extent and that early warning signals are present. Because we understand resilience as a capabilities set, we will refer to precursor resilience as *prevention capabilities* in the
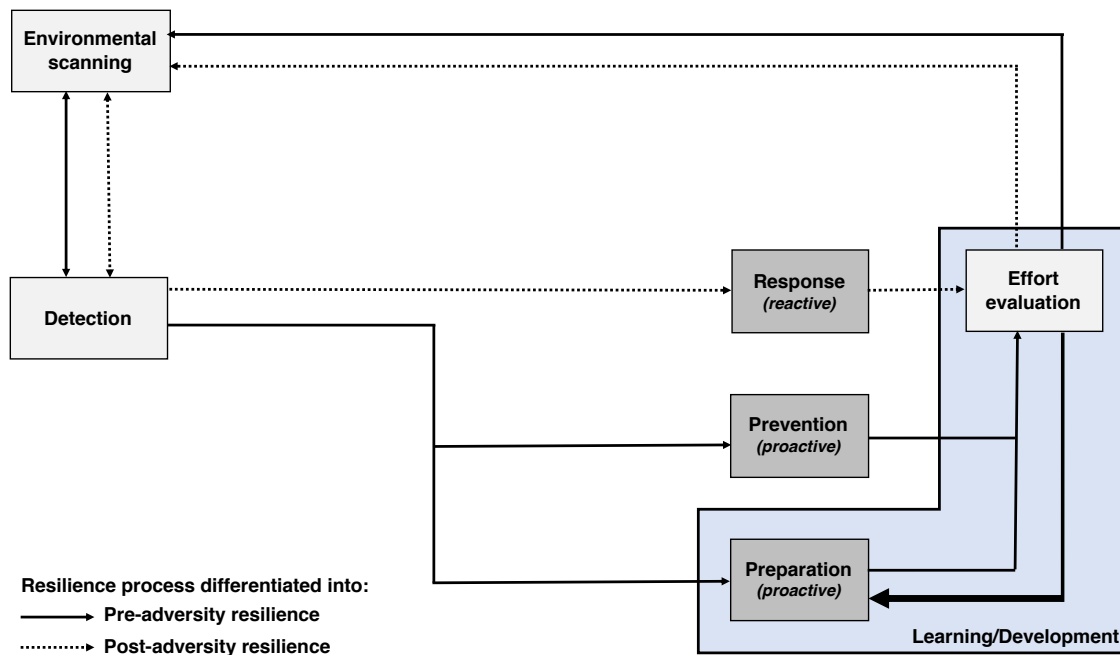
Figure 2-3: Interplay of resilience capabilities

following. In contrast, recovery resilience is defined as "the ability to respond to singular or unique events […], bouncing back to a state of normalcy" (Boin & van Eeten, 2013, p. 432). We refer to this form of action as *response capabilities*. What is left out in Boin and van Eeten's (2013) twofold separaton is preparing for crisis, which we add as a third core capability. We will now first start with the confusion about *prevention capabilities* (by discussing the words *anticipation* and *detection*); second, we will examine *response capabilities in relation to time to respond*; third, we will look at *preparation capabilities*, which build on past experiences; fourth, we will address the development of resilience in relation to organizations' lifecycles. Figure 2-3 depicts the three overarching capabilities we consider central to the resilience concept. It will become clear that prevention, response, and preparation are distinct

for different phases, whereas scanning, detection, and effort evaluation are important throughout all phases.

2.3 **Scanning, detecting, and preventing**

Social systems allow one to anticipate and adapt in advance, a capability that materials do not possess (De Bruijne et al., 2010). However, according to Wildavsky (1988) – one of the very first references to resilience in an organizational context – anticipating crises is not part of the original meaning of organizational resilience. Wildavsky (1988) addresses the distinction directly, stating that anticipation and resilience are two separate and distinct strategies to handle *risk* and *uncertainty*. He understands anticipation similarly to risk management: assessing vulnerabilities and preventing their occurrence. In contrast, he defines resilience as a "capability to cope with unanticipated dangers after they have become manifested, learning to bounce back" (Wildavsky, 1988, p. 77).

Looking closely at the problem of anticipation and prevention, they are often understood and used differently across articles. Since the words anticipation, environmental scanning, detection, mitigation, and prevention are sometimes used synonymously to address the same or similar capabilities, we will use them all in the following so as to retain the respective authors' wordings. Nonetheless, we prefer the terms *scanning, detection, and prevention* over the less precise word *anticipation*. The conceptual difficulties become clear when looking at an example of resilient behavior by Weick and Sutcliffe (2007). According to them, FedEx is said to enact resilience by

loading aircrafts only up to 60% so as to have a buffer for unanticipated extra cargo. FedEx anticipates that surprises will occur every night without knowing what exactly will happen. Thus, it seeks to control the surprises by only loading the aircrafts up to 60%, thereby preventing a crisis in advance. We assume that the 60% figure is set based on experience that shows that for instance on average around 20% to 30% extra cargo needs to be moved. Further, to handle statistical outliers, an additional buffer of 10% is added. Coming up with numbers shows that we can calculate probabilities; thus, we are not talking about uncertainty but more about risk. Consequently, FedEx would enact risk avoidance rather than resilience by designing its operations according to statistical analysis. Going one step further, real resilience would occur when more than 40% unanticipated additional cargo needs to be shipped and improvised responses are needed. And what if this were to happen more often? Would FedEx increase the 40% slack to 45% or 50%, accompanied by lower efficiency?

This process of continually trying to further avoid risk is what Weick and Sutcliffe (2007, p. 72) describe (one page after the FedEx example) as follows: "[…] Systems often respond to a disturbance with new rules and new prohibitions designed to prevent the same disruption from happening in the future. This response reduces flexibility to deal with subsequent unpredictable changes. […] The resilient system [deals] with the unexpected not in the form of more elaborate defenses but in the form of more elaborate response capabilities." Thus, in accordance with the influential work of Weick and Sutcliffe (2007) as well as Vogus and Sutcliffe (2007), we see anticipation

and prevention when it takes the form of avoiding adversity via organizational *design*, not as a central part of organizational *resilience*. However, it is hard to draw a line between *preventing the escalation* of budding problems when their negative effects are only weakly noticeable and *preventing these budding problems from emerging at all*. Thus, the threshold between complete avoidance and preventing escalation can be clearly defined on a conceptual level, but remains blurry in practice and is hard to grasp empirically.

Nonetheless, we conclude that resilience ends where organizations try to already *prevent* adversities *by organizational design*. Further, we clearly contrast our understanding to that of Wildavsky (1988), because we see anticipation – in the form of *environmental scanning*, *early detection*, and *prevention of escalation* – as part of organizational resilience.

As shown in Figure 2-2, in the case of accumulated crises, prevention capabilities enable one to rapidly counteract a crisis based on early detection, thus increasing one's likelihood of recovery. Not including early detection and prevention into the organizational resilience concept would lead to the following problem: Imagine an organization that has never been in a serious crisis because it is excellent at detecting early warning signals and adapting accordingly to prevent their escalation. One would not call this organization *resilient*, although it is capable of handling crises.

From a slightly different perspective, Hamel and Välikangas (2003, p. 54) introduced the term *strategic resilience*, which is "about continuously anticipating and adjusting to deep, secular trends that can permanently impair the earning power of a core business." Although the anticipation of environmental trends in general may be subject to strategic management and not to resilience, they also emphasize anticipation. In sum, we suggest explicitly relating resilience to the detection of *crises* and the associated early warning signals as well as the subsequent prevention of escalation. Thus, we propose:

> ***P1:*** *The capabilities of environmental scanning, detecting early warning signals of an evolving crisis, and preventing its escalation early on will enhance an organization's resilience.*

2.4 **Response: Seeking sense for action**

Intuitively, rapid response is needed to stop a threatening crisis from worsening and to enable subsequent recovery. This seems especially true for sudden crises (e.g. terrorist attacks or earthquakes).

Response is understood as a bounce back to the previous or to a better state. As Vogus and Sutcliffe (2007, p. 3418) put it, "the maintenance of positive adjustment under challenging conditions such that the organization emerges from those conditions strengthened and more resourceful." However, the question is how much time is available and is needed for substantive responding in the sense of getting stronger. If organizations have time to prepare for a crisis, they may find better

responses. But even in the case of accumulated crisis, there are surprising effects, which make rapid reactions necessary.

Terrorist attacks or earthquakes are events that start and end within a short period. Even if it takes time to bounce back to a state of normalcy, the disastrous effects unfold rapidly. For instance, the disastrous effects of 9/11 unfolded almost only between 08:46 when the first aircraft crashed into the World Trade Center and 17:20 with the building's collapse. Analyzing resilience and related literature on fast-ending events shows that the core of interest are responses close to the point when adversity unfolds, because such responses are critical owing to high stress levels and pressure, which leaves less time for well-founded decisions. Suggestions concerning responding often focus on operational and sometimes tactical decisions to mitigate additional negative effects and to rapidly rebound to a state near normalcy (see for instance the analysis of film production crews by Bechky & Okhuysen, 2011).

Against this background, we propose a two-step approach. In step one, it is necessary to get the organization back to some operational modus; in step two, more reflective and substantial procedures are necessary. Whereas the first can be described as an act of swift sensemaking, the second is accompanied by sensegiving processes.

Sensemaking generally facilitates the reforming of a social structure and allows for interrelated actions among organizational members (e.g. Weick & Roberts, 1993). In case of a terrorist attack, sensemaking must take place in a few minutes or hours in order to allow the police or special units to react. Sensemaking includes

categorization and labeling of incoming information (Weick, Sutcliffe, & Obstfeld, 2005), for instance, labeling an event as a terrorist attack will lead to different operations than labeling it as an accident. The same happens in relation to strategic crises. When an organization and its members finally notice that they missed crucial opportunities in the past few years, this will dramatically influence and threaten the organization's future, and it must take care to not become paralyzed by the surprise. Through the sensemaking process, an organization's members need to analyze what went wrong, find common ground, and start working from that point on. Thus, sensemaking is crucial to build a basis for action based on assumptions, approximations, and first actions (Weick et al., 2005).

While such a shared basis for action may deliver the much desired security and stability, one can still be wrong. Thus, we assume that resilient organizations can swiftly apply sensemaking but are also aware that any presumptions can be misleading and should be continually interrogated. This capability is referred to in the organizational resilience literature as *a reluctance to simplify* (Sutcliffe & Vogus, 2003; Weick & Sutcliffe, 2015).

Thus, in step two, more reflection on the situation and on one's actions is needed. For such reflection, an additional mechanism referred to in the literature as sensegiving seems promising. Sensegiving is described as the activity of influencing others' sensemaking process via evocative language (e.g. Maitlis, 2005; Maitlis & Lawrence, 2007). It is often associated with the behaviors of leaders (e.g. Gioia & Chittipeddi, 1991). Accordingly, we conclude that reaction step two is mainly a matter

of leadership. An effort to shape a collective sensemaking process in some intended direction first requires reflection on what kind of sensemaking is takes place and whether it is viable for further action. Leaders are mainly in charge of delivering such reflections. Being confronted with a different perspective also triggers reflections on one's own sensemaking. Sensegiving creates adaptive organizational sensemaking based on updating and doubting one's own constructions (Maitlis & Sonenshein, 2010). Thus, quick fixes can be adjusted or replaced to get more substantive procedures (in a similiar vein Boin & van Eeten, 2013). This process of reflection and subsequent adjustment is depicted in Figure 2-3 through 'effort evaluation' and 'preparation'.

However, at an action level, such adjustments are a question of an organization's flexibility or agility. Some researchers connect the idea of agility to the organizational resilience concept (e.g. Lengnick-Hall & Beck, 2009). Organizational agility is commonly described as having reactive and proactive elements. The former refers to the capability of rapid reaction to changing situations, and the latter to the seizing of opportunities (e.g. Sherehiy & Karwowski, 2014). This resembles the idea of sensemaking (reactive) and sensegiving (proactive). Such organizational agility is said to be necessary especially in situations of great uncertainty (Teece, Peteraf, & Leih, 2016), which establishes the link to organizational resilience. To achieve such organizational agility, it is suggested to build slack resources and to reduce rule-bound hierarchies, which creates space for self-organization (e.g. Teece et al., 2016).

Thus, to materialize sensemaking and sensegiving in crisis situations, it is important to have enough structural autonomy and flexibility. Taken together, we propose:

> **P2:** *The capability to respond and to recover from crises depends on the quality of sensemaking and sensegiving activities, which will enhance an organization's resilience.*

2.5 Preparation and development: The dynamics of organizational resilience

Even if the original understanding of resilience refers mainly to the time during a crisis, researchers also assume that there is some preparation or prior development. In the resilience field, scholars originally included general preparation and development, rather than preparation specifically designed for particular crises (Sutcliffe & Vogus, 2003). For instance, general coordinating capabilities and socio-cognitive resources can be developed prior to a crisis or an unexpected event and will be useful in any kind of crisis that may follow (Bechky & Okhuysen, 2011). However, scholars are increasingly including the preparation of continuity plans and specific response procedures into organizational resilience, thus further broadening the concept (Burnard et al., 2018; Elliott & Macpherson, 2010). Continuity plans and specific response procedures imply that adversities are no longer unexpected in relation to their content or form; only *when* they happen remains unexpected. Although the 'unexpectedness' of adversities has been a defining feature to the resilience concept, it is now somewhat excluded by adopting the broader

understanding, that includes the preparation of continuity plans and response procedures into the concept of resilience. This can be justified as follows: first, planned response behaviors also fit the definition of resilience, since they help to handle challenging conditions and to counteract crises. Although preparing implies proactivity, it does not always have to mean to avoid the occurrence of crises (which would not form part of resilience, as discussed) but can reflect that organizations accept that crises can occur at any time. Second, as we will now show, prepared behaviors are always a good starting point for improvisation, which is part of the original conception of resilience. Thus, excluding planned behaviors from the resilience concept would be to exclude the knowledge base for improvisation and to exclude the interesting interplays between planned and improvised response behaviors.

Looking at organizational resilience from a strategic perspective leads to the question of deliberate development of organizational resilience. The aspect of continually developing capabilities, resources, and knowledge that enable organizations to better handle crises and stress without knowing exactly what, where, and when these will occur (Vogus & Sutcliffe, 2007; Wildavsky, 1988) is a particular assumption in organizational resilience research and adds another dimension compared to related disciplines. For instance, crisis management mainly describes which *specific actions* (e.g. cost cutting and asset retrenchment) should be taken *in* a crisis so as to survive and recover (Pearce II & Robbins, 1992). In contrast, the research into organizational resilience analyzes how organizations can become better

at coping with crises owing to *specific organizational capabilities* that are built *over time, thus, during but also before them*. Against this background, organizational resilience is an abstract-level concept that goes beyond specific crisis management tools.

Thus, it is at first necessary to look at the research into organizational capabilities. According to Dosi, Nelson, and Winter (2000), routines are the building blocks of organizational capabilities. Thus, the development of organizational resilience is about building up and changing routines for coping with crises. Such routines can be seen as a collective memory, with successful past actions and experiences stored for the future. Whether actions are perceived and labeled as successful depends on the *evaluation* of previous prevention, preparation, and response *efforts* (see Figure 2-3). A problem-solving procedure that was once labeled successful increases the likelihood of its reuse for similar problems. Repeated use leads to reliable patterns, establishing a routine (March, 2006; Nelson & Winter, 1982). Further, an organizational capability as an organizational routine relies on a collective pattern of interdependent actions involving multiple organizational members (Feldman & Pentland, 2003; Feldman & Rafaeli, 2002).

However, organizational routines in the context of organizational resilience can be seen in two ways. First, routines used to resolve standard problems make more cognitive resources available to handle crisis situations (Becker, 2004). Second, dealing with unexpected crises may depend on organizational routines, as we will now show. According to a more specific understanding of organizational capabilities, only

the effective solving of extraordinary problems that require complex routines (as it is true for dealing with crises) indicates an organizational capability (Dosi et al., 2000; Schreyögg & Kliesch-Eberl, 2007). However, such an understanding raises new questions about the general functioning of routines in novel situations. Looking at routines as a pattern of actions that must be followed strictly by organizational members will not always be adequate in such situations. Today, a more dynamic understanding of organizational routines is prevalent, with routines seen also as a source of flexibility and change (Feldman & Pentland, 2003). Against the background of a more practice-based understanding, the focus is on the performing aspect of a routine and the resulting variety in the organizational members' actions. Organizational members can enact stability or flexibility depending on their perceptions of a situation (Baum & Shipilov, 2006; Danner-Schröder & Geiger, 2016; S. F. Turner & Rindova, 2012).

Both, stability and flexibility result from organizational learning processes. Adopting the seminal differentiation of two learning modes by March (1991), stability refers to exploitative learning and flexibility to explorative learning. Adapting to an uncertain environment requires both exploitative and explorative learning. Exploitation without exploration leads to the use of inappropriate patterns of action, while exploration without exploitation leads to ad hoc problem-solving without developing any organizational capability. Exploitation allows for a variance-reduction mechanism and ensures the handling of security. However, the simple transfer from patterns developed from past experiences to novel situations is usually overestimated (March,

2006). It doesn't matter whether an experience was one's own or was learned from other organizations. Theories of absorptive capacity (e.g. Cohen & Levinthal, 1990; Lane, Koka, & Pathak, 2006) emphasize this point by looking at an organization's capacity to integrate external knowledge. Such an absorptive capacity may be important to develop organizational resilience, especially before a crisis occurs. However, neither integrating external knowledge nor relying on one's own past knowledge can successfully be transferred 1:1 to new crisis situations. Rather, a learning mechanism that depends on reflective observation of external or own experiences in crisis situations is necessary to improve organizational resilience. As the social cognitive learning theory by Bandura (1977) indicates, organizational members are capable of understanding at a more abstract level the underlying principles of successful actions via second-order observations of practical experiences. Stable patterns of how to deal with crises can only be reached through reflective observation and abstraction. This dynamic and ongoing development and learning process is depicted by the feedback loop of first *evaluating previous efforts* to prevent, prepare, and respond, and second, to improving these stable patterns according to the evaluation, which also describes *preparation* for future adversities (see Figure 2-3). Thus, the development of organizational resilience foremost requires time and space to reflect on crisis experiences.

Further, organizational resilience requires the creative adoption of these patterns in the situation at hand, which forms part of the *response capabilities* - as mentioned above a positive adjustment in the face of crises requires an effective

handling of the unexpected. To master such situations, improvisation is suggested as a promising course of action (e.g. Crossan, Cunha, Vera, & Cunha, 2005; Crossan & Hurst, 2006; Weick, 1998). To avoid misunderstanding, improvisation can have good or bad outcomes, but the inherent creative and spontaneous process is necessary for having a chance to cope with crisis situations. According to Weick (1998), improvisation works without prior stimulation, but does not materialize out of thin air. It is a form of guided activity based on past patterns. This means that retrospection rather than planning ahead is significant for improvisation. Persisting in precise planning during a crisis situation will take much time to analyze what is going on – time that is usually not available (Crossan et al., 2005). Improvisation allows for spontaneous action by referring to organizational memory. The larger the organizational memory, the more resources are available for improvisation (Weick, 1998). Thus:

> **P3:** *The capability to prepare depends on the quality of a) establishing pre-defined response procedures or continuity plans and b) developing organizational improvisation skills.*

Seen this way, organizational routines as a form of an organizational memory are the starting point for improvisation. Organizational improvisation mainly relies on the creative recombination of organizational routines or their elements (Vera & Crossan, 2005). The more routines exist, the more resources for improvisation are available. Routinization is a prerequisite for improvisation. However, improvisation is a skillful action (Crossan, 1998) that comprises communication, risk-taking, and the

structuring of knowledge. The latter points to the fact that only a limited number of organizational routines can be remembered in certain situations. We suggest that the structuring of the organizational memory (i.e. the classification and prioritization of organizational routines) have a key role in the development of an organization's resilience. Paradoxically, flexible improvisational action is only possible given a stable basis. Exploitative and explorative learning processes must somehow be balanced; this is referred to as organizational ambidexterity (e.g. Andriopoulos & Lewis, 2009; Gibson & Birkinshaw, 2004). Yet balancing exploitation and exploration does not mean that both these learning processes must have the same scope. From the perspective of organizational resilience, it may depend on the organizational growth stage which learning processes should be at the forefront (in a similar vein Greiner, 1972).

Newly established firms at the start of their life may need very different capabilities to handle crises compared to older, larger, and more established firms (Sutcliffe & Vogus, 2003). For instance, in startups, the capability to routinize key processes has been found to be critical to becoming more resilient (Haase & Eberl, 2019). Since the startup context facilitates flexibility and ad hoc responses, most startups struggle with or do not aim for routinization. This can lead not only to lower improvisational power in relation to resilience, but also to internally produced, accumulated crises (Rudolph & Repenning, 2002). In contrast, established organizations most likely have routinized their key processes and often have

difficulties when routines are interrupted or must be recombined (Chen & Hambrick, 1995; Latham, 2009).

In sum, startups need to preserve their flexibility and to become better at routinization and exploitative learning, while established firms need to keep up their critical routines while being flexible and explorative enough to employ spontaneous and creative improvisations. Thus, both must emphasize different learning process types if they are to become more resilient. Considering which learning process types are necessary resembles the idea of deutero learning (Argyris & Schön, 1996). Thus, the improvement of organizational resilience requires one to reflect on the underlying learning processes. The questions how we learn and how we should learn become crucial. Taken together, we consider organizational resilience as a dynamic construct that is developed through different action types in different organizational stages.

> **P4:** *The development of organizational resilience should switch between stability-enhancing and flexibility-enhancing learning processes depending on different organizational stages.*

2.6 The Interplays between different resilience capabilities

At the analytical level, we identified three defining resilience capabilities for organizational resilience: *preparation*, *prevention*, and *response* capabilities. Further, these three are preceded by *scanning* and *detecting* capabilities and are followed by *effort evaluation* capabilities, which are inherent in the core resilience capabilities prevention, response, and preparation (see Figure 2-3). *Inherent* means that these

pre- and succeeded capabilities are essential parts of preventing, responding, and preparing. For instance, without adequately scanning the environment and detecting emerging problems or sudden crises, no prevention, response, or preparing would be possible. Although we see them as inherent to the three key capabilities, we decided to display them separately. In this way, we want to ensure completeness and to appreciate their importance, which is in line with the literature (Boin & van Eeten, 2013; Burnard et al., 2018; Darkow, 2019; Vogus & Sutcliffe, 2007). Since there is no confusion regarding these inherent capabilities in the literature, we did not address them in detail in separate chapters.

We started our paper by pointing to confusions in the organizational resilience concept. Some authors see this confusion as a result of too many aspects being integrated into the concept. For instance, Klein et al. (2003, p. 42) stated that, "[r]ather than […] providing an explanation of an observable, measurable system attribute, resilience has become an umbrella concept for a range of system attributes that are deemed desirable. This leads to considerable confusion."

In response to this criticism, we argue that categorizing organizational resilience as an umbrella construct not only bears challenges but is also beneficial. The biggest advantage of a broad understanding is that it allows one to analyze several interdependencies among different organizational capability types, as mentioned above. Crises are characterized by many contradictions and therefore require a broad range of aspects and capabilities. Taking together the research fields addressed in this paper shows how many attributes may influence an organization's

resilience. As shown, organizational resilience is linked to leadership, organizational structure, culture, the capability to routinize, collective mental models, and surveillance techniques. However, it is misleading to focus on different capabilities separately. The important thing in enhancing an organizational resilience may be an efficient interplay between different capabilities and other factors that are thought to influence resilience. Having all these factors clustered and linked to the overall goal of successfully handling challenging conditions may help one to find out which factors are more or less important for becoming resilient to crisis situations.

Regarding the interplays between the abovementioned capabilities, one can ask how organizations switch between proactively preparing and preventing as well as reactively responding. According to the literature, the pre-adversity and post-adversity phases are distinct (see Figure 2-3). The boundary between them is set according to the advancement and severity of the crisis. The pre-adversity phase refers to the time before a full-blown crisis; thus, preventing the escalation of early problems is still part of the proactive pre-adversity phase (Boin & van Eeten, 2013; Williams et al., 2017). In the post-adversity phase, resilience describes a reaction to a major disturbance and calls for a rapid response and a return to a status of good organizational functioning (Boin & van Eeten, 2013; Williams et al., 2017). Notably, post-adversity does not refer to the phase in which the company has already survived and recovered from the crisis; rather, it starts when a major disturbance has manifested (Williams et al., 2017). Thus, both phases – and, accordingly, the different capabilities – seem to require different organizational qualities. Future research could

analyze how these requirements may differ in detail, how they can be integrated into an organization, and what managers must be aware of when switching between the phases.

The developmental aspect of organizational resilience also comes into play. First, the question arises which knowledge should be transferred from one capability to the other. Second, one must consider how knowledge is transferred. If prevention, preparation, and response capabilities are attached to different organizational units, specific exchange forums may be a first step. However, detection and recovery capabilities may not be clearly located in the organization, but may be decentral and diffused. The transfer process becomes a challenging task, requiring the broad spreading of knowledge.

Taken together, we propose more attention to the interplay between different capabilities in order to enhance organizational resilience. Thus:

P5: Managers must consider the interplay between all resilience capabilities so as to enhance an organization's resilience.

2.7 **Conclusion**

In our conceptual paper, we suggest that organizational resilience should a) comprise prevention, response, and preparation capabilities, b) consider sensemaking and sensegiving, c) integrate learning processes, enhancing stability, and learning processes, enhancing flexibility, and d) consider the interplay between different capabilities. Despite criticisms of it, in our view, organizational resilience is

worth further examination; however, it is an abstract capability. Thus, the idea of finding the right solution from of an organization's stock is misleading. Asking for specific tools or recipes is not advisable. Compared to related disciplines such as crisis management, the construct adds a general capability that to some extent allows organizations to be better prepared to cope with crises. Thus, findings from the resilience research can complement findings from crisis or risk management.

3 Resilience influencing factors - a grounded literature review of empirical resilience research (Article 2)

Abstract: Organizational resilience research is increasingly spreading thematically, resulting in conceptualization difficulties. Further, studies on organizational resilience often limit the concept to a few individual influencing factors, resulting in a loss of the big picture. Motivated by these issues, using grounded theory, we have extracted all factors from empirical resilience studies that, according to the various authors, are supposed to influence resilience. For this purpose, we have examined 39 exclusively empirical articles on organizational resilience.

Our analysis reveals the following seven aggregated domains: Relations, human resources, formal management and governance, organizational culture, leadership, information and communication systems, and firms' characteristics. Each influences resilience in a complex way. To better illustrate our findings, we provide exemplary in vivo codes and detailed explanations for each. We also discuss how these factors interrelate, to derive implications for future research.

3.1 **Introduction**

The growing interest among academics on how to handle organizational adversity is noticeable in the increasing number of publications on resilience in business and management journals (Linnenluecke, 2017). Resilience is the adequate handling of challenging conditions in order to secure "the maintenance of positive adjustment" (Vogus & Sutcliffe, 2007, p. 3418) and an organization's functioning refers to organizations that are better able to cope with and to prepare for adversities and to prevent their escalation in order to survive. Indeed, some firms are able to thrive, despite adversity, while others perish (Gittell et al., 2006).

However, the research, while clearly contributing toward understanding the concept of organizational resilience[1], has only shown a fragment of the whole picture. Much about the development of resilience remains to be identified (Vogus & Sutcliffe, 2007). We still do not completely know the exact composition of resilience (Boin & van Eeten, 2013). Some even argue that resilience is "[…] a subject none of us will ever understand fully" (Coutu, 2002, p. 46). Two reasons come to mind why knowledge on resilience is both dispersed and limited. First, owing to the concept's comprehensiveness and the complex interactions between factors (van der Vegt et al., 2015), scholars most often examined only one or a few of its components within a single study. Since the resilience construct gained popularity in organizational research over the past few years, researchers are increasingly linking their research

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[1] Hereinafter abbreviated as *resilience*.

areas to resilience (Linnenluecke, 2017). Thus, owing to the concept's complex and diffuse nature (Alexander, 2013), one can hardly keep track of the multitude of factors that seem to facilitate an organization's resilience. This also explains why resilience is increasingly being referred to as an "umbrella concept" (Darkow, 2019; Duchek, 2019; Hirsch & Levin, 1999; Klein et al., 2003), defined as "a broad concept or idea used loosely to encompass and account for a set of diverse phenomena" (Hirsch & Levin, 1999, p. 200). Second, the knowledge generated by scholarly inquiry is often limited to conceptual approaches (Linnenluecke, 2017; van der Vegt et al., 2015; Vogus & Sutcliffe, 2007) and, in the few existing empirical studies on resilience, there is a "[…] dire need of […] empirical rigor […]" (Hällgren, Rouleau, & de Rond, 2018, p. 112). From a quantitative perspective, this lack of empirical rigor can be attributed to difficulties in operationalizing and measuring the resilience concept (Glantz & Sloboda, 1999), and from a qualitative perspective, the problem that crises and their management can usually only be investigated retrospectively rather than in real time, since their occurrence is often characterized by surprise, suddenness, and difficulties gaining access (Buchanan & Hällgren, 2018). Thus, it is "[…] unlikely that researchers can capture firsthand information […] in the midst of crisis […]" (James, Wooten, & Dushek, 2011, p. 481).

However, in our view, it is both crucial and possible to shed more light on resilience as a whole by seeking to identify its underlying and empirically proven influencing factors that make one firm more resilient than another. For this purpose, we conducted a systematic literature review by using methods borrowed from

grounded theory (Glaser & Strauss, 1967; Strauss & Corbin, 1990; Wolfswinkel, Furtmueller, & Wilderom, 2013). We analyzed 39 empirical articles on resilience in a comprehensive and computer-aided way.

3.2 **Method**

We use grounded theory (Glaser & Strauss, 1967) as our method of choice to rigorously review the literature in order to "reach a thorough and theoretically relevant analysis" of the empirical resilience-related research (Wolfswinkel et al., 2013, p. 46).

We used the Social Science Citation Index, a database on the Clarivate Analytics Web of Science[tm] platform, to identify articles. We conducted a Boolean search in June 2018 using the search terms "organi?ation*" AND "resilien*". Both the question mark as well as the asterisk represent wildcards. We included these wildcards to search for variations of our search terms such as "organization," "organizational," "resilience," "resiliency," or "resilient". We purposely focused on these general terms because we did not want to dismiss any articles owing to our restrictions. We searched for the terms in each article's title, abstract, and keywords, resulting in an initial set of 2,314 articles. We then narrowed our search by filtering for articles relating to the areas of "business" or "management," leaving us with 430 articles. Then, both authors independently screened each article's title, abstract, and keywords to see whether it should be included in the literature review for further analysis. The main selection criterion for articles in this process was a clear and empirical proven connection between the influencing factor and resilience. If it was

then still not clear whether or not an article should be included, the researcher referred to the whole text. After comparing the results of both researchers and discussing articles where the judgments differed, the number of articles reduced to 39 (see Table 3-1).

We then analyzed these articles. We used MAXQDA^{tm} to assign the codes, which contributed to greater comprehensibility and traceability (Wolfswinkel et al., 2013). We organized the coding process along the following steps:

First, both researchers independently conducted open coding, looking for passages that contained an empirically proven influence on and clear reference to resilience. In step two, which still belongs to open coding, we extensively compared the generated concepts so that similar concepts could be grouped into categories (Strauss & Corbin, 1990). In step three of the analysis (axial coding), we searched for differences and connections between the previously generated categories so as to reduce the previously very high number of categories to a manageable number (Gioia, Corley, & Hamilton, 2012) by combining categories into clusters and delimiting them from one another at the theoretical level (Dacin, Munir, & Tracey, 2010).

Our literature search resulted in 39 articles for further analysis. These were distributed between 2006 and 2018 (see Figure 3-1). Two aspects are notable. First, we did not specify a period from which a paper should originate. It is therefore surprising that the earliest publication dates back to only 2006 (Gittell et al., 2006).

Table 3-1: Articles included in the review

Number	Author(s)	Title
1.	Adini et al. (2017)	Striving to be resilient: What concepts, approaches and practices should be incorporated in resilience management guidelines?
2.	Ahn, Mortara, and Minshall (2018)	Dynamic capabilities and economic crises: has openness enhanced a firm's performance in an economic downturn?
3.	Barton, Sutcliffe, Vogus, and DeWitt (2015)	Performing Under Uncertainty: Contextualized Engagement in Wildland Firefighting
4.	Burnard, Bhamra, and Tsinopoulos (2018)	Building Organizational Resilience: Four Configurations
5.	Carmeli and Markman (2011)	Capture, Governance, And Resilience: Strategy Implications from the History of Rome
6.	Chewning, Lai, and Doerfel (2012)	Organizational Resilience and Using Information and Communication Technologies to Rebuild Communication Structures
7.	Davison (2014)	Selected leadership demographics as predictors of continuity planning
8.	Edson (2012)	A Complex Adaptive Systems View of Resilience in a Project Team
9.	Elliott and Macpherson (2010)	Policy and Practice: Recursive Learning From Crisis
10.	Fainshmidt, Nair, and Mallon (2017)	MNE performance during a crisis: An evolutionary perspective on the role of dynamic managerial capabilities and industry context
11.	Gimenez, Hernantes, Labaka, Hiltz, and Turoff (2017)	Improving the resilience of disaster management organizations through virtual communities of practice: A Delphi study
12.	Gittell (2008)	Relationships and Resilience - Care Provider Responses to Pressures From Managed Care
13.	Gittell, Cameron, Lim, and Rivas (2006)	Relationships, Layoffs, and Organizational Resilience - Airline Industry Responses to September 11
14.	Gray, Duncan, Kirkwood, and Walton (2014)	Encouraging sustainable entrepreneurship in climate-threatened communities: a Samoan case study
15.	Hales and Chakravorty (2016)	Creating high reliability organizations using mindfulness
16.	Halkos, Skouloudis, Malesios, and Evangelinos (2018)	Bouncing Back from Extreme Weather Events: Some Preliminary Findings on Resilience Barriers Facing Small and Medium-Sized Enterprises
17.	Harrison et al. (2017)	Resilience, culture change, and cancer risk reduction in a fire rescue organization: Clean gear as the new badge of honor
18.	Härtel and Latemore (2011)	Mud and tears: The human face of disaster – A case study of the Queensland floods, January 2011
19.	Herbane (2015)	Threat orientation in small and medium-sized enterprises: Understanding differences toward acute interruptions
20.	Hernantes, Rich, Lauge, Labaka, and Sarriegi (2013)	Learning before the storm: Modeling multiple stakeholder activities in support of crisis management, a practical case
21.	Hurmelinna-Laukkanen (2012)	Constituents and outcomes of absorptive capacity – appropriability regime changing the game
22.	Ignatiadis and Nandhakumar (2007)	The impact of enterprise systems on organizational resilience
23.	Kraft and Wolf (2018)	Through the Lens of Accountability: Analyzing Legitimacy in Environmental Governance
24.	Labaka, Hernantes, and Sarriegi (2016)	A holistic framework for building critical infrastructure resilience
25.	Lampel, Bhalla, and Jha (2014)	Does governance confer organisational resilience? Evidence from UK employee owned businesses
26.	Linnenluecke and Griffiths (2013)	The 2009 Victorian Bushfires: A Multilevel Perspective on Organizational Risk and Resilience
27.	Mannen, Hinton, Kuijper, and Porter (2012)	Sustainable Organizing: A Multiparadigm Perspective of Organizational Development and Permaculture Gardening
28.	Nowell, Bodkin, and Bayoumi (2017)	Redundancy as a strategy in disaster response systems: A pathway to resilience or a recipe for disaster?
29.	Offstein, Dufresne, and Childers (2012)	Reconciling Competing Tensions in Ethical Systems: Lessons From the United States Military Academy at West Point
30.	Ortiz-de-Mandojana and Bansal (2016)	The Long-Term Benefits of Organizational Resilience Through Sustainable Business Practices
31.	Powley (2009)	Reclaiming resilience and safety: Resilience activation in the critical period of crisis
32.	Richtnér and Lofsten (2014)	Managing in turbulence: how the capacity for resilience influences creativity
33.	Sahebjamnia, Torabi, and Mansouri (2015)	Integrated business continuity and disaster recovery planning: Towards organizational resilience
34.	Teo, Lee, and Lim (2017)	The relational activation of resilience model: How leadership activates resilience in an organizational crisis
35.	Tognazzo, Gubitta, and Favaron (2016)	Does slack always affect resilience? A study of quasi-medium-sized Italian firms
36.	Valero, Jung, and Andrew (2015)	Does transformational leadership build resilient public and nonprofit organizations?
37.	Wastell, McMaster, and Kawalek (2007)	The Rise of The Phoenix: Methodological Innovation as a Discourse of Renewal
38.	Wicker, Filo, and Cuskelly (2013)	Organizational Resilience of Community Sport Clubs Impacted by Natural Disasters
39.	Zagelmeyer and Heckmann (2013)	Flexibility and crisis resistance: quantitative evidence for German establishments
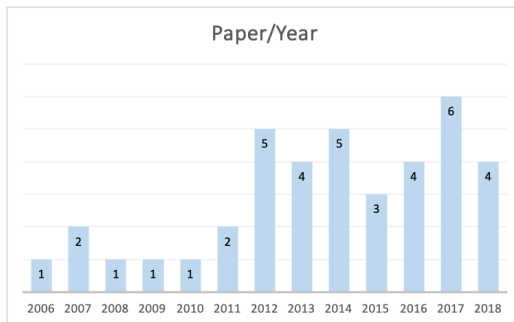
Figure 3-1: Publications across time   Figure 3-2: Research approaches
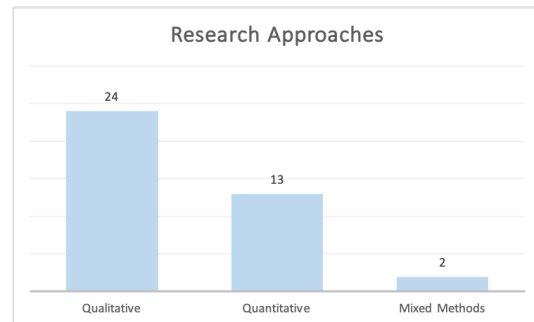
This also brings us to the second notable aspect: While the oldest article in our review dates back to 2006, the empirical resilience research has seen increased interest from 2012. From 2006 to 2011, eight articles were published, with the remaining 31 published between 2012 and 2018.

Three research approaches could be observed in the 39 articles we analyzed (see Figure 3-2): 24 used a qualitative research approach, while 13 conducted a quantitative analysis, and two used a combination of qualitative and quantitative approaches. Table 3-1 provides an overview of the articles in this literature review.
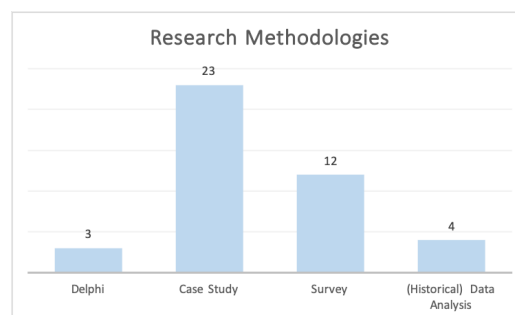
Figure 3-3: Research methodologies

Of all the articles with a qualitative research approach (24) or the partial use of a qualitative research approach (mixed methods: 2), a case study was used almost every time (Figure 3-3). Three papers used a Delphi process (Adini et al., 2017; Gimenez, Hernantes, Labaka, Hiltz, & Turoff, 2017; Labaka, Hernantes, & Sarriegi, 2016), while Labaka et al. (2016) used the Delphi process in combination with a case study and a survey. In the quantitative approaches, including mixed methods, a survey was the main chosen method. In the other cases, historical/existing data were used for statistical analysis.

3.3 **Results**

We will now categorize the factors that influence resilience into specific domains. We found 294 in vivo codes, which describe 111 distinct influencing factors, grouped into the following seven aggregated domains: relations (82), human resources (38), formal management and governance (102), organizational culture (12), leadership (23), information and communication systems (22), and firm characteristics (15).

Based on the detailed description of all the factors, we will draw some implications for future research.

3.3.1 **Resilience domain "relations"**

According to (Gittell, 2008, p. 303) "a growing body of empirical evidence supports the notion that positive relationships at work—or relational reserves—are a

prerequisite to resilience". This was also shown by our analysis, since the domain "relations" was the one with the highest number of codes (82 codes over 21 articles, as summarized in Figure 3-4). Some authors (Gray et al., 2014; Harrison et al., 2017; Härtel & Latemore, 2011) used the term *social capital* as „the stock of active connections among people, the trust, mutual understanding, and shared values and behaviors that bind members of human networks and communities" (Cohen & Prusak, 2001, p. 4) when describing what we subsume under the domain relations.

Generally, "relational resources are the relationships inside and outside an organization" (Richtnér & Lofsten, 2014, p. 140). Of the analyzed articles, 16 referred to external relational resources and eight to internal relationships (see Table 3-2), which illustrates the importance of external connections and collaboration for resilience. Concerning internal relational resources, Gittell (2008) presented the most detailed findings. According to her, effective internal relationships, called "relational work systems" (Gittell, 2008, p. 30) consist of cross-functional teamwork, good conflict resolution, rewards to contribute to shared goals, and "coordinating mechanisms like team meetings and boundary spanners." On the other hand, external resources describe

Table 3-2: Authors referring to „relations"

External relations	Adini et al. (2017)
	Ahn et al. (2018)
	Burnard et al. (2018)
	Carmeli and Markman (2011)
	Chewning, Lai, and Doerfel (2012)
	Elliott and Macpherson (2010)
	Gimenez et al. (2017)
	Gray et al. (2014)
	Halkos et al. (2018)
	Härtel and Latemore (2011)
	Hernantes et al. (2013)
	Hurmelinna-Laukkanen (2012)
	Kraft and Wolf (2018)
	Labaka et al. (2016)
	Richtnér and Lofsten (2014)
	Teo et al. (2017)
Internal relations	Ahn et al. (2018)
	Burnard et al. (2018)
	Gittell (2008)
	Gittell et al. (2006)
	Mannen et al. (2012)
	Nowell et al. (2017)
	Powley (2009)
	Richtnér and Lofsten (2014)

"how actively firms cooperate with external partners" (Ahn et al., 2018, p. 56). These external partners can be all "external stakeholder such as government" (Labaka et al., 2016, p. 25) "various industry bodies and regulators" (Burnard et al., 2018, p. 358), "clients throughout the supply chain" (Härtel & Latemore, 2011, p. 870) or "Virtual Communities of Practice" (Gimenez et al., 2017, p. 163).

While some articles (Adini et al., 2017; Gimenez et al., 2017; Gittell, 2008; Gittell et al., 2006; Kraft & Wolf, 2018; Labaka et al., 2016) regard relationships as a resource that
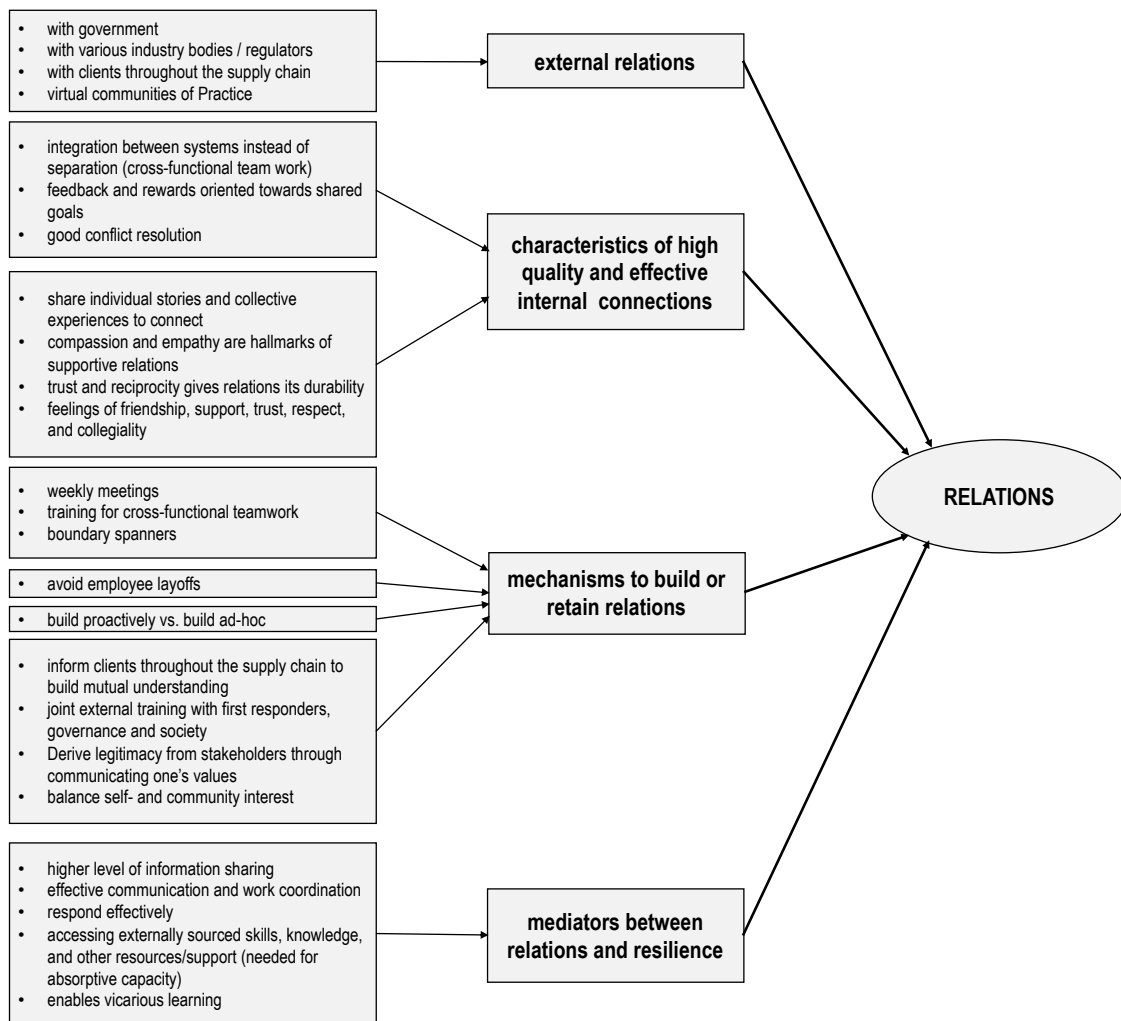
Figure 3-4: Code structure for the domain "relations"

is built proactively "prior to the occurrence of a disaster" (Gimenez et al., 2017, p. 169), others mention the ad hoc and improvised establishment of collaborative networks of participants who face the same threat (Powley, 2009; Teo et al., 2017). Concerning proactivity, some authors (Adini et al., 2017; Hernantes et al., 2013; Labaka et al., 2016) also mentioned joint trainings with "first responders, government and society" (Hernantes et al., 2013, p. 1750) in order to respond in coordinated and efficient ways. However, not only establishing relations, but also retaining them during a crisis, was highlighted by Härtel and Latemore (2011, p. 869): "unaffected parties may be unaware of the ongoing hardship experienced by others in their region"; thus, clients should be informed throughout the supply chain so as to build "mutual understanding and cooperation" (Härtel & Latemore, 2011, p. 870).

Since relationships differ, Mannen et al. (2012) cite the high-quality connection (HCQ) construct of Dutton and Heaphy (2003), according to which strong, effective relationships have "higher levels of connectivity, which is defined by the number of interactions between agents within a system and the positivity of these interactions" (Mannen et al., 2012, p. 365). Positive interactions also include compassion and empathy which, according to Powley (2009, p. 1306), are "hallmarks of close personal relationships […] that support ongoing helpfulness and reciprocity." In times of crisis, sharing individual stories and collective experiences can help us to better connect to one another and to build supportive relationships. Further, trust is a key element, since it "gives social capital its durability" (Harrison et al., 2017; Härtel & Latemore, 2011, p. 871; Mannen et al., 2012) and thus fosters relationships.

Here, leaders are key "in shaping the formation of relational connections" (Teo et al., 2017, p. 143). Mechanisms to facilitate integration "between system components" and to establish a "frequent, high-quality communication" (Gittell, 2008, p. 33) are "weekly meetings" (Chewning et al., 2012, p. 247) and "training for cross-functional teamwork, [..] use of conflict resolution [and] boundary spanners" (Gittell, 2008, p. 30). To prevent segregation, disconnection, and "competition within the system" (Mannen et al., 2012, p. 364), one can use "feedback and rewards that are oriented toward contributions to shared goals" (Gittell, 2008, p. 30). But, for external relations, it is also important to have the "ability to derive legitimacy from a set of diverse stakeholders" (Kraft & Wolf, 2018, p. 82) through the communication of a firm's values and practices (e.g. via its website), which should be compatible with the respective stakeholder values. Regarding social, cultural, and ecological values, firms must also balance "self-interest […] with community interest" (Gray et al., 2014, p. 421).

Further, layoffs should be avoided, because they can cause direct damage to relational resources (especially internally) and "such cuts can harm firms' resilience power" (Ahn et al., 2018, p. 59; Gittell et al., 2006).

When firms have developed such relational resources, they can use them in various ways to increase their resilience. The first group of codes we identified argues that positive relationships enable a higher information sharing and more effective communication in the firm and with external stakeholders (Burnard et al., 2018; Gittell, 2008; Powley, 2009), which means that "work can be effectively coordinated, thus

enabling an organization and its participants to respond effectively to external performance pressures" (Gittell, 2008, p. 30). Concerning overarching resilience capabilities – for instance coping and preparation/prevention, etc. (Duchek, 2019; Williams et al., 2017) – access to critical information and efficient coordination are crucial during a crisis, to correctly make informed decisions, which is crucial for effective responses and coping (Burnard et al., 2018; Gittell, 2008; Härtel & Latemore, 2011; Powley, 2009). Without the right information at hand, it is not possible to detect adversity early on and to prepare for or prevent its escalation.

Besides more effective coordination and task integration, "having relational resources implies having networks that can be mobilized" (Richtnér & Lofsten, 2014, p. 140). These networks "ensure close cooperation between stakeholders" (Adini et al., 2017, p. 43) and allow for accessing of externally sourced skills, knowledge, material resources, "or other kinds of support" (Ahn et al., 2018; Carmeli & Markman, 2011; Fainshmidt et al., 2017; Gray et al., 2014; Mannen et al., 2012; Richtnér & Lofsten, 2014, p. 140) so that they can save their own resources.

Based on the large number of codes for external relationships and the use of external resources, it can be concluded that during crises firms need extraordinary resources (in terms of quantity and quality), which they are often unable to raise on their own.

All these external resources (materials, knowledge, skills, experience) are critical during crises, when resources must be mobilized as swiftly as possible. Also, through the "process of listening to and learning from other[s]" (Harrison et al., 2017,

p. 176), "the experience [other organizations] gained and the lessons learned from the crisis" (Hernantes et al., 2013, p. 1750) can be used as a starting point for one's own *preparation* activities, which represents vicarious learning (Duchek, 2019).

3.3.2 Resilience domain "human resources"

Further, the attributes of an organization's human resources (38 codes identified, as summarized in Figure 3-5) can positively influence resilience. We will now list the attributes we found in the empirical articles we analyzed.

First, organizational members must have "adequate skills, knowledge, and competence (all examples for cognitive resources) […] which are used for learning and knowledge sharing in the organization" (Richtnér & Lofsten, 2014, p. 145). To properly use these resources, it is key to match "a problem-solving assignment with the person having the best competence" (Richtnér & Lofsten, 2014, p. 145). Employees' cognitive resources relating to creativity, resourcefulness, and change-readiness (Burnard et al., 2018; Gray et al., 2014; Mannen et al., 2012; Wastell et al., 2007; Wicker et al., 2013) are vital during crises in order to properly cope, which is done through "identifying problems and prioritizing tasks" (Wicker et al., 2013, p. 521) and through "improvisation [which is] using whatever is to hand" (Wastell et al., 2007, p. 251) in order to "create unconventional (and creative) responses to unexpected challenges" (Richtnér & Lofsten, 2014, p. 140).

Further, regarding skills and knowledge, Mannen et al. (2012) emphasize the importance of *diversity*. A diversified workforce also means diverse cognitive

resources (knowledge, values, etc.) and, "when properly managed diversity, […] is directly correlated with an organization's creativity" (Mannen et al., 2012, p. 365) that can then be utilized when responding to crisis. Here, *properly managed* refers to appreciating "the diverse nature of people" (Härtel & Latemore, 2011, p. 868) and "bridging multiple perspectives" (Mannen et al., 2012, p. 365), since diverse perspectives are worthless if they are not interlinked and combined to new knowledge.

Further, the role of employees' knowledge for organizational resilience becomes clear when linked to absorptive capacity, a construct we found in three
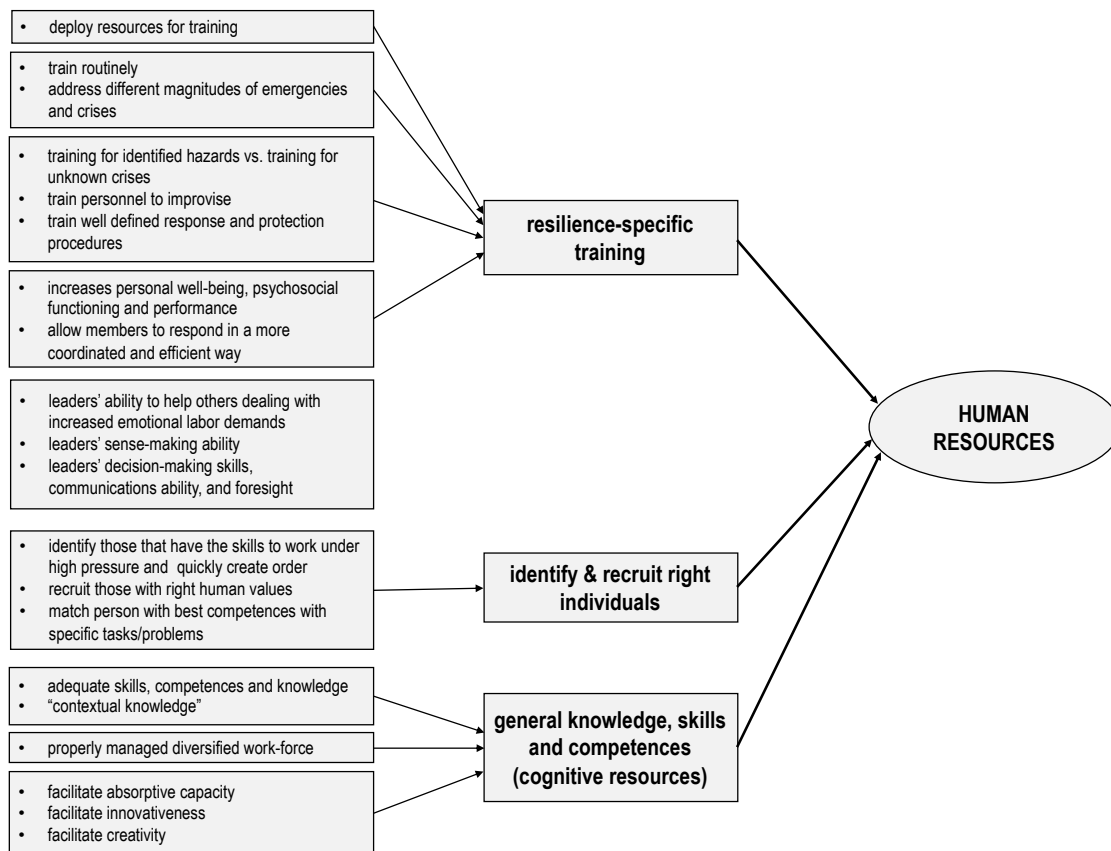

Figure 3-5: Code structure for the domain "human resources"

articles (Ahn et al., 2018; Carmeli & Markman, 2011; Hurmelinna-Laukkanen, 2012). *Absorptive capacity* has been defined as "the ability of a company to identify, capture, and exploit external knowledge" (Hurmelinna-Laukkanen, 2012, p. 1179). Thus, instead of "generating knowledge internally, firms are able to save resources while maintaining the access to the necessary knowledge" (Ahn et al., 2018, p. 60) by sourcing it externally. To recognize and understand the value of external knowledge, organizational members must have prior knowledge, also named "contextual knowledge" (Cohen & Levinthal, 1990, p. 129; Lindsay & Norman, 1977). The individually sourced external knowledge must then be integrated and discussed at the organizational level.

At this point, it becomes clear that, without employees with a broad range of knowledge, a firm will be unable to further expand its knowledge base through external sources, since employees will simply oversee the vast information and knowledge that surrounds them. Especially during crises, such information and knowledge can lead to creative responses to adversity.

Besides creative coping, Hurmelinna-Laukkanen (2012) took a proactive view on resilience, arguing that absorptive capacity can increase a firm's *innovative performance*, allowing the firm "to be able to send superior products to market, which fosters growth of the firm and its market share [and thus] contributes to the resilience of the firm" (p. 1181). Thus, firms can take a more strategic perspective on resilience, which is similar to Hamel and Välikangas (2003); Välikangas and Romme (2013), according to whom absorptive capacity is essential during the pre-crisis phase, since

it prevents firms from having a poor product portfolio, which could "impair the earning power of" (Hamel & Välikangas, 2003, p. 3) their business.

While the aforementioned knowledge, skills, and competences are more general, six articles also refer to resilience-specific training (Adini et al., 2017; Halkos et al., 2018; Härtel & Latemore, 2011; Hernantes et al., 2013; Labaka et al., 2016; Valero et al., 2015).In this regard, we found two types of resilience training: first, training of specific robust structures on how to behave in a specific crisis which includes "preparing and establishing well defined response and protection procedures" (Labaka et al., 2016, p. 30) and second, trainings "that enables personnel to improvise during the handling of situations" (Adini et al., 2017, p. 43) that were previously unknown. Regarding these two types, Labaka et al. (2016) showed that the training in critical infrastructure firms in their study only focused on "already identified hazards [and not] on the capacity to deal with unknown crises" (p. 30), which may be a tentative indication that improvisation training has been utilized less to date.

Training that seeks to improve and institutionalize predefined response procedures "will allow [workers] to respond in a more coordinated and efficient way" (Hernantes et al., 2013, p. 1750). Specifically, crisis managers are trained how "to gather data [and] detect early warning signals" (Labaka et al., 2016, p. 30). They must also "address different magnitudes of emergencies, disasters and crisis" (Adini et al., 2017, p. 43) and should include "scenario-based exercises to prepare for worst-case scenarios"(Adini et al., 2017, p. 43).

While all the previous aspects mostly refer to process knowledge, Härtel and Latemore (2011); Valero et al. (2015) point to interpersonal training, specifically how leaders should behave in relation to others and how organizational members can "help [others to] deal with the increased emotional labor demands associated with disasters" (Härtel & Latemore, 2011, p. 870). Similarly, Valero et al. (2015, p. 15) argued that leaders should be trained to "exhibit transformational skills [for instance] by focusing on the individual needs of organizational members, being strong role models, motivating members of the organization, and engaging in intellectual exchange with other members and collaborative partners." Further, leaders should "develop their sensemaking capacity […], which is the ability to understand an unexpected event, adapt to it, and make the correct decisions in a stressful situation and without complete information" (Labaka et al., 2016, p. 25) and, in order to properly enact resilience planning tasks, managers should have "a complex set of decision-making skills, communications ability, and foresight" (Davison, 2014, p. 245). We will address specific leadership behaviors that facilitates resilience in the leadership domain in some detail.

In sum, such resilience training for employees have "been shown to improve personal well-being, psychosocial functioning as well as performance outcomes" (Adini et al., 2017, p. 45), but should be done regularly (Adini et al., 2017), and enough resources should be allocated to it (Labaka et al., 2016).

Besides training, resilience managers should identify "individuals who have the skills to work under high pressure and quickly create order out of ambiguity and

chaos" (Härtel & Latemore, 2011, p. 869), which is vital for coping, and should "recruit people with the right human values" (Härtel & Latemore, 2011, p. 868), because they will care about others and will help them during crises (Härtel & Latemore, 2011; Powley, 2009).

3.3.3 Resilience domain "formal management and governance"

In this domain, we will summarize all formalized organizational structures and practices that are established by (resilience) managers. We found 102 codes for this domain (summarized in Figure 3-6), which illustrates that formality played a big part in the resilience literature we analyzed.

We grouped the codes in four categories: a) formal management of financial and physical assets, b) contingency planning, c) formalized evaluation and learning practices, and d) limitations of formal management.

Managing for resilience before and during a crisis requires considerable resources (regarding quality and quantity). Generally, these resources must be orchestrated "so as to extract more value from the firm's resource base" (Fainshmidt et al., 2017, p. 1090) and should be continuously reconfigured "in response to changes in the environment" (Ahn et al., 2018, p. 50). Specifically, managers should allocate resources to employee training (Labaka et al., 2016), for contingency planning in general (Burnard et al., 2018; Sahebjamnia et al., 2015) and "allocating resources toward overcoming the unexpected" (Burnard et al., 2018, p. 360). For this purpose,

Sahebjamnia et al. (2015, p. 272) developed "a novel resource allocation mathematical model".

Since the allocation of financial and material resources usually requires formal approval by managers, we assign it to the aggregated domain formal management and governance.

Of the analyzed articles, six (Gittell et al., 2006; Halkos et al., 2018; Labaka et al., 2016; Tognazzo et al., 2016; Wicker et al., 2013; Zagelmeyer & Heckmann, 2013)
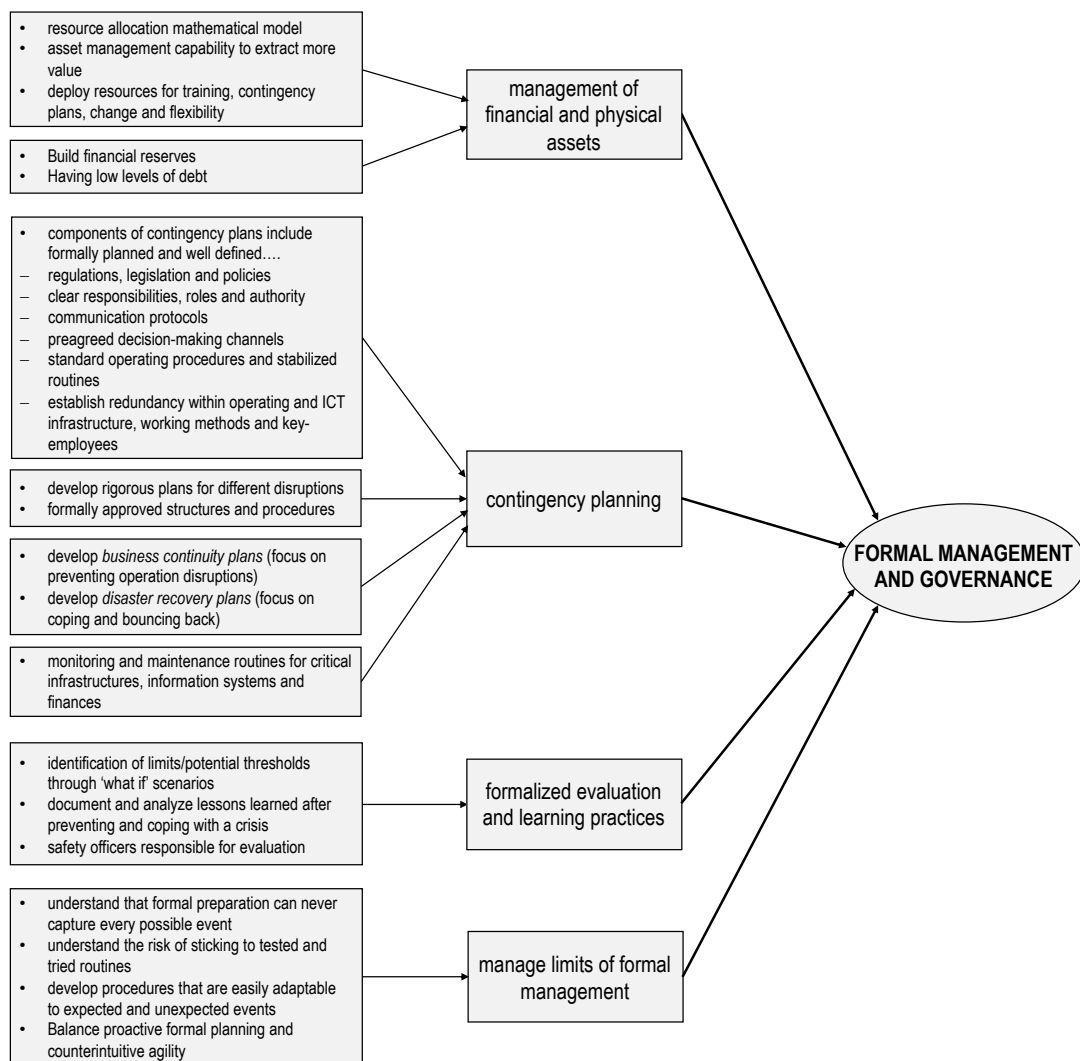
Figure 3-6: Code structure for the domain "formal management and governance"

emphasized the key role of financial reserves for resilience, stating that it "is the least frequently incorporated form of slack in an organization's structures, processes, and routines, but it […] provides managers the most [flexibility] in diverting resources to alternative uses" (Tognazzo et al., 2016, p. 784). Financial reserves can be used to "cover repairs and replacements" (Labaka et al., 2016, p. 25) "purchase equipment or machinery, erect new buildings, hire talented people, invest in R&D" (Tognazzo et al., 2016, p. 774) and "minimize layoffs in the face of crisis" (Gittell et al., 2006, p. 324), allowing for the absorption of negative impacts.

Further, not only slack resources but also "larger equity-to-debt ratios [are important, because they] provide more opportunity to acquire additional discretionary funds […] than smaller ratios do" (Gittell et al., 2006; Tognazzo et al., 2016, p. 784).

In addition to the field of formal asset management, as discussed, contingency planning is a key resilience management task that "focus[es] on the development of rigorous plans for different disruptions" (Burnard et al., 2018, p. 357), shaping formally approved structure and procedures (we identified 47 codes).

Contingency plans can generally be subdivided into business continuity plans (with a focus on preventing operational disruptions) and disaster recovery plans (with a focus on coping and bouncing back) (Sahebjamnia et al., 2015).[2]

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[2] We adopted the classification of Sahebjamnia et al. (2015), knowing that different views exist, e.g. disaster recovery as part of business continuity (see Davison, 2014).

Components that apply to both types are formally planned and well defined…

- regulations, legislation, and policies (Adini et al., 2017; Elliott & Macpherson, 2010; Hernantes et al., 2013; Labaka et al., 2016)

- clear responsibilities, roles and authority inside and outside a firm (Elliott & Macpherson, 2010; Hernantes et al., 2013)

- "effective communication protocols" (Härtel & Latemore, 2011, p. 871)

- "preagreed decision-making channels" (Burnard et al., 2018, p. 359)

- standard operating procedures and stabilized routines (Adini et al., 2017; Elliott & Macpherson, 2010)

All these planning outcomes are "designed to formulate linkages between relevant actors and to build robust structures" (Adini et al., 2017, p. 45), so that firms are well prepared to prevent emerging problems or to mitigate and cope with disasters with disasters (Sahebjamnia et al., 2015).

A specific and particularly relevant design principle for business continuity planning is redundancy. Regarding redundancy, we found 21 codes. It can be seen "as a design feature of organizational systems" (Nowell et al., 2017, p. 124) that leads to the "ability to still execute a task or function if the primary unit fails or falters" (Nowell et al., 2017, p. 123). The article by Nowell et al. (2017) specifically addressed this topic, differentiating four strategies on how redundancy can be designed: backup, cross-functionality, duplication, and cross-checking (p. 125). We found that,

especially for the following aspects, managers try to provide them in a redundant form: "Working methods" (Adini et al., 2017, p. 43), technological operating infrastructures (Adini et al., 2017; Hernantes et al., 2013), information and communication systems (Chewning et al., 2012; Nowell et al., 2017), and human resources such as single key employees (Wicker et al., 2013).

Managing redundancies also includes clarifying procedures so as to swiftly deploy backup resources (Nowell et al., 2017), because merely having redundant resources is useless when they cannot be rapidly activated.

Besides advantages, there are also downsides to redundancy: When employees act as a backup, they may be not as well prepared and educated for specific jobs as the employees who usually carry out the task. When these tasks are life-threatening (e.g. police officers or firefighters), backup employees are exposed to a much higher risk (Nowell et al., 2017). Redundancy also comes at a cost, so that "in some literature, redundancy […] is viewed as wasteful and inefficient use of resources" (Nowell et al., 2017, p. 124); thus, managers should identify and analyze where redundant resources are in fact needed. Further, formal routines for monitoring and maintenance are key for successful disaster prevention and, thus, business continuity. Here, the monitoring and maintenance of critical infrastructures (Hernantes et al., 2013; Labaka et al., 2016), information systems (Adini et al., 2017) and finances through bookkeeping routines (Edson, 2012) were highlighted.

The abovementioned plans are not static and must be regularly evaluated and revised in order to enable improvements (Adini et al., 2017; Burnard et al., 2018).

Regarding evaluation and learning, Linnenluecke and Griffiths (2013, p. 407) argued that management should go from specific and narrow learning based on past experience to the identification of limits through "application of creative 'what if' scenarios […] to explore consequences and potential thresholds associated with extremes."

Further, according to Hernantes et al. (2013, p. 1750) after successful coping or preventing, "it is necessary to document and analyze all the lessons learned in order to avoid making the same mistakes again." Other formal and "organisational learning techniques [are for instance] log-books, debriefings [and] after-action reviews" (Adini et al., 2017, p. 43).

Specific "safety officers [can be] employed at multiple levels" (Nowell et al., 2017, p. 131), so that employees become formally responsible for continually reviewing contingency plans.

Finally, we address the limits of formal management, which were also highlighted in the articles we analyzed. While contingency plans deliver stable routines and structure, firms run the "risk of suffering, if they stick only to a tested and tried routine" (Ahn et al., 2018, p. 51) and "a narrow focus on only structure may hamper the ability for an organization to be creative" (Richtnér & Lofsten, 2014, p. 145).

When there is a narrow focus on formalized and codified procedures, it may be hard to "be creative when such 'lessons learned' prove inappropriate" (Elliott & Macpherson, 2010, p. 572), because bricolage will appear "less comforting and more

ambiguous than the neat apportionment of accountability and responsibility" (Elliott & Macpherson, 2010, p. 599) and such behavior will battle to achieve legitimacy.

Another balancing problem is that some firms are "almost sure that nothing could happen with their prevention systems" (Labaka et al., 2016, p. 31) which leads to high business continuity but almost no procedures for absorption and recovery. Managers must understand that "codified learning after crisis can never capture the complexity of events to ensure that 'this never happens again'." (Elliott & Macpherson, 2010, p. 596)

To deliver at least some flexibility, Adini et al. (2017, p. 43) argued that one must develop "procedures that are easily adaptable to both expected and unexpected events (all-hazard approach) [and] flexible enough to handle different types of situations." Yet this will also make contingency planning more complex and resource-intensive.

As noted, contingency planning demands that one assign authorization to employees. Thus, higher-level managers give away control. Ignatiadis and Nandhakumar (2007, p. 42) emphasized that employees "may be given too much or too little authority […] which can respectively lead to either the users abusing the system, or them not being able to carry out all of their functions" needed to achieve high resilience.

In sum, firms need "a good balance between proactive [formal] planning and agility" (Burnard et al., 2018, p. 360) that will look different for every firm and its context.

3.3.4　Resilience domain "organizational culture"

Our section on management and governance structures referred to the rational, objective, formal and fixed aspects of resilience management. However, "how strictly and uniformly [these structures, procedures and regulations are] interpreted and taken seriously" (Alvesson, 2013, p. 5) depends on a firm's culture, since it gives these aspects their meaning. "Meaning [as an inherent part of organizational culture] need to be negotiated and processed, not rigidly applied"; thus, cultural aspects are more informal, "dynamic, situationally adaptive and co-created in dialogue" (Alvesson, 2013, p. 4).

We consider organizational culture to be "[t]he system of meanings which are shared by members of a human grouping and which define what is good and bad, right and wrong, and what are the appropriate ways for members of that group to think and behave" (Watson, 2001, p. 21), focusing on members' shared meanings and their influences on resilience cognition and behaviors.

We found 12 codes that relate an organization's culture to resilience (see Figure 3-7). Organizational culture and the values embedded in it are important "positive, constructive conceptual orientations" (Lengnick-Hall et al., 2011, p. 245) that cognitively influence organizational members, which guides their behaviors (Burnard
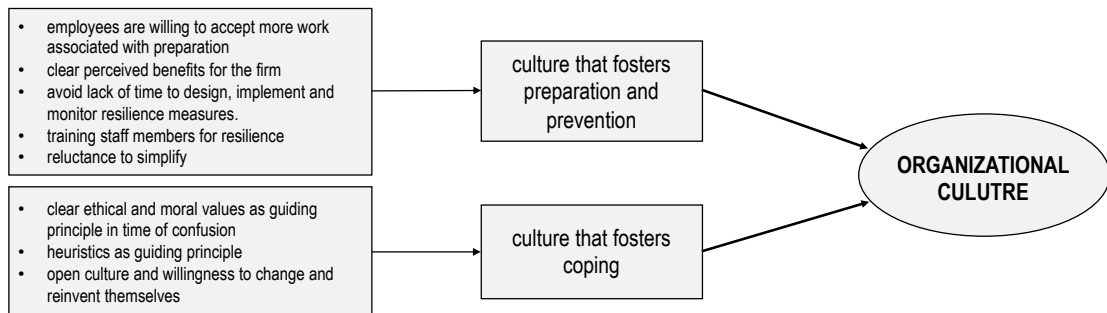
Figure 3-7: Code structure for the domain "organizational culture"

et al., 2018; Halkos et al., 2018; Offstein, Dufresne, & Childers, 2012). To facilitate preparation, an organization's culture must value the goal of becoming a more resilient organization, so that its members are willing to accept more work associated with preparing for adversity. As Halkos et al. (2018) showed, in some organizations there is a "perceived absence of clear benefits for the firm [and at the same time they perceive] resilience measures as additional, potentially bureaucratic, operational procedures [or as an] interruption of more important operational processes" (Halkos et al., 2018, p. 554). According to them, such a culture, in which resilience initiatives are perceived more as a burden than as a valuable and essential tool, can arise owing to "the lack of time to design, implement and monitor resilience measures [and] the lack of relevant training and expertise of staff members" (Halkos et al., 2018, pp. 553-554).

Further, the ways in which employees are "seeking, encouraging, and welcoming the noticing and discernment" (Barton et al., 2015, p. 76) of potential and emerging problems, in order to understand them and "to stop oversimplifying problems" (Hales & Chakravorty, 2016, p. 2877), is important if these problems are to be to prevented or prepared for. Although Barton et al. (2015) as well as Hales and

Chakravorty (2016) did not mention culture in this context, this special way of interpreting and making assumptions about potential adversity relates to organizational culture, as Weick and Sutcliffe (2015) made clear.

While the abovementioned aspects primarily focus on a firm's culture in terms of being better prepared or better able to prevent an emerging crisis, other authors emphasized culture's role during acute crises. Offstein et al. (2012) found that heuristics embedded in a firm's culture "provided ethical and moral clarity in times of confusion" (p. 631) acting as a guiding principle on how to behave during crises. Further, a culture in which feedback is accepted leads to a "capacity for learning, for trying new things, taking risks" (Mannen et al., 2012, p. 363). Similarly, an "open organizational culture where employees are willing to accept change" (Burnard et al., 2018, p. 359) and where they are determined "to reinvent themselves" (Wastell et al., 2007, p. 252) are important during crises in order to foster agile responding instead of rigidity, increasing the chance of survival.

Finally, owing to the culture construct's broadness, it has been possible to assign other codes to this category (for instance, the ways organizational members interact with one another, as mentioned in the domain relations). Since these aspects were discussed at a more individual level instead of a collective one, we did not assign them to culture.

3.3.5 Resilience domain "leadership"

Although this domain (23 codes identified, as summarized in Figure 3-8), similar to the domain formal management and governance, refers to tasks at the executive level, both perspectives can be distinguished: At this point, we refer to the influential differentiation between leadership and management by Kotter (1990). On the one hand, managers focus on stabilizing processes and routines, establishing hierarchies, rules and regulations, and conducting controls and monitoring (all this was described under the domain formal management and governance) with the aim of increasing a firm's efficiency (Kotter, 1990). In contrast, leaders formulate vision, bring people together, and motivate and inspire them, in order to foster change in the firm with the overall aim of increased effectiveness (Kotter, 1990). Thus, similar to the previous domain, organizational culture, here we refer to the more informal, emotional, and subjective aspects that executives must handle if they are to foster resilience.

First, leaders "should be committed to the resilience building process" (Labaka et al., 2016, p. 25), because it is only if they are really committed that they will be able to motive and persuade employees to behave and think in resilient ways. When leaders perceive that they have the "ability to intervene to reduce or prevent the impact of specific threats" (Herbane, 2015, p. 590), and if they have "prior discontinuity experience" (Davison, 2014, p. 250; Herbane, 2015) they will be more encouraged to build resilience.
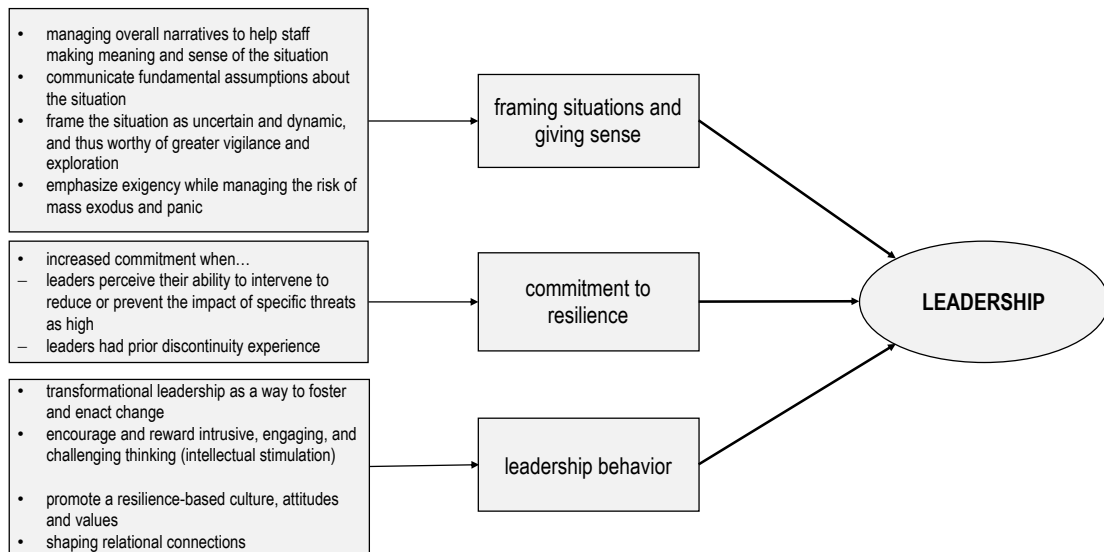
Figure 3-8: Code structure for the domain "leadership"

Second, according to the analyzed articles, specific leadership behaviors promote resilience. Two articles (Valero et al., 2015; Wastell et al., 2007) highlighted transformational leadership, stating that "leaders with transformational traits [are able to] build a resilient organization, which can better respond and adapt to a catastrophic event" (Valero et al., 2015, p. 16) because they can bring "off the required changes" (Wastell et al., 2007, p. 250). Similarly, Harrison et al. (2017, p. 176) mention "leadership […] as a way to enact change", but without referring to transformational leadership. Generally, transformational leadership describes behaviors via which a leader transforms their subordinates' beliefs, values, and attitudes so that they are motivated to perform beyond expectations (Bass, 1985, 1999). In this regard, Labaka et al. (2016, p. 25) argued that leaders "must promote a resilience-based culture, attitudes and values." Further, by saying that leadership should "encourage and reward intrusive, engaging, and challenging thinking" (Offstein et al., 2012, p. 645) as well as "seeking out diverse perspectives and encouraging people to bring up

problems or different viewpoints" (Barton et al., 2015, p. 76), these two articles describe the factor intellectual stimulation (Bass, 1990, p. 21), which is an integral part of transformational leadership, again without specific reference to this form of leadership.

Further, we found passages that can be assigned to another transformational leadership factor: individual consideration (Bass, 1990, p. 22). Härtel and Latemore (2011, p. 869) emphasize that leaders "must make it a first priority to check staff for signs of emotional exhaustion or distress" and must "understand their individual context and have flexible policies and practices" (Härtel & Latemore, 2011, p. 868).

Also, leaders can activate positive emotions [by] noticing, feeling empathy, and reaching out to staff" (Teo et al., 2017, p. 143), which are vital in times of crisis and negative emotions in order to achieve resilience.

Concerning the discussed domain relations, Teo et al. (2017, p. 143) argued that "leaders play a role in shaping the formation of relational connections formed during liminality," which they describe as "a period when routines [are] disrupted, and [that allows] members to adjust psychologically, emotionally, and socially, to activate resilience" (Teo et al., 2017, p. 136).

The last group of codes we found concerning leadership deals with leaders' ability to properly frame a crisis situation. By "actively managing overall narratives [leaders] help [their] staff [to] make meaning and sense of the situation" (Teo et al., 2017, p. 143). In addition, Barton et al. (2015, p. 76) argued that leaders

can "communicate to group members fundamental assumptions about the situation" just through the ways they behave. These assumptions will then "frame the situation as uncertain and dynamic, and thus worthy of greater vigilance and exploration" (Barton et al., 2015, p. 76). However, this task requires good communication skills, since leaders must carefully communicate selected "information to subteam leaders and general team members, [thus] taking care to emphasize exigency while managing the risk of mass exodus and panic" (Edson, 2012, p. 513).

In sum, it becomes clear that leaders' behaviors seem especially important during crises to facilitate adaptive, creative, and emotionally stable employee behaviors.

3.3.6 Resilience domain "information and communication technology (ICT)"

Similar to the previous domains leadership and culture, ICTs is also cross-sectional because it touches the areas of relations as well as formal management and governance. We first tried to assign the codes to either one or to split the underlying codes but, owing to the total number of 22 codes (summarized in Figure 3-9), we decided to make it a separate domain so as to highlight its importance for resilience management.

According to Chewning et al. (2012, p. 237), "organizations enacted a variety of resilient behaviors through adaptive ICT use, including information sharing, (re)connection, and resource acquisition." All three refer to what we described in the

relations domain: good information flow, high-quality connections, and accessing externally sourced resources.

Similarly, Elliott and Macpherson (2010, p. 590) argued that "coping […] was hampered by a lack of suitable tools to coordinate information and translate that into effective actions." Translating information into effective actions can also be improved by deeply embedding IT into the decision-making process (Elliott & Macpherson, 2010), making key information accessible (Linnenluecke & Griffiths, 2013). Further, ICT in the form of monitoring systems can help to gather information, analyze them, and use them for forecasting, which is key to prevent and prepare for emerging adversities (Elliott & Macpherson, 2010; Labaka et al., 2016). Moreover, Hales and Chakravorty (2016) specified that such information systems need to be "fast, accurate, and robust" (p. 2880).

Concerning communicating with communities, some "new technologies [and] 'nontraditional' information sources" (Linnenluecke & Griffiths, 2013, p. 407) were highlighted, for instance, "mass outreach via websites or blogs" (Chewning et al.,
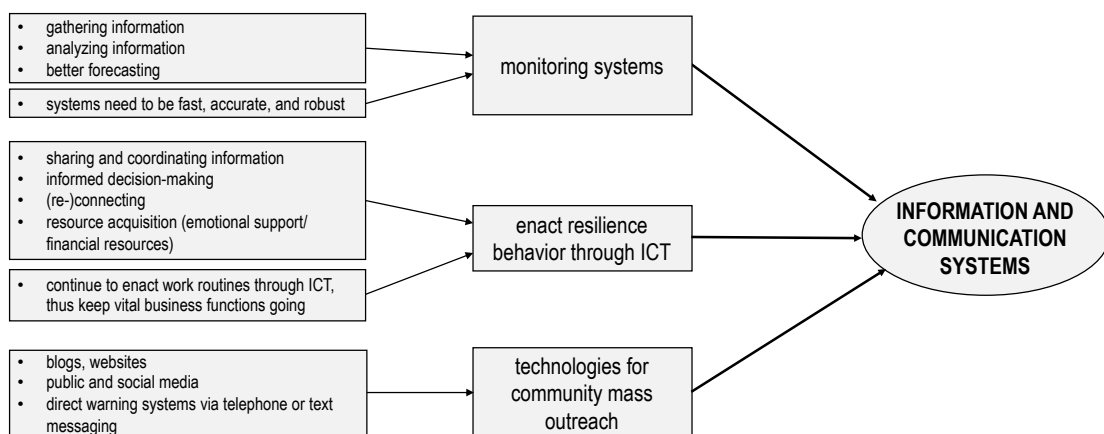

Figure 3-9: Code structure for the domain "information and communication technology"

2012, p. 247), public and social media (Hernantes et al., 2013; Linnenluecke & Griffiths, 2013) and "a more direct [..] warning system by telephone or text messaging" Elliott and Macpherson (2010, p. 590). Informing the community may not be essential for all crisis types, but all four articles analyzed crises that impacted on communities: Hurricane Katrina (Chewning et al., 2012), the Black Saturday bushfires in Victoria, Australia in 2009 (Linnenluecke & Griffiths, 2013); the 2007 floods in the UK (Elliott & Macpherson, 2010), and failures in critical infrastructures that provide "energy, water supply, transportation, sanitation and telecommunications" (Hernantes et al., 2013, p. 1742).

Finally, ICTs allow the further enactment of key "work routines across geographic space" (Chewning et al., 2012, p. 247), for instance, selling to customers holding meetings that usually take place face-to-face, which is important for resilience, because it keeps vital business functions going. In sum, Adini et al. (2017, p. 43) argued that firms should "incorporate advanced technologies into resilience management."

3.3.7 Resilience domain "firm characteristics"

In addition to all the factors outlined before, we found a small number of codes (15) that describe firm characteristics (summarized in Figure 3-10) that were statistically tested for their correlations to resilience. All the above mentioned domains describe factors a company should have or actively develop, whereas the studies on

firm characteristics give the impression that firms are doomed to live with the advantages and disadvantages of these characteristics.

Concerning firm age, Herbane (2015, p. 583) found "empirical evidence to highlight the importance of firm age rather than size as a determinant of the propensity to formalize activities to deal with acute interruptions." This is because, the longer a firm exists, the more experience it accumulates, which results "in a move away from ad hoc responses to developed incident management systems" (Herbane, 2015, p. 590). This fits Tognazzo et al. (2016, p. 785) findings that "older firms might be less able to cope with turbulent environments than younger firms are," owing to higher organizational inertia, which "impedes the firm's ability to adapt to external changes and increased competitive pressure." (Tognazzo et al., 2016, p. 785)

Regarding *firm size,* resource constraints in SMEs seem to have the most dominant negative impact on resilience (Halkos et al., 2018). Similarly, according to Wicker et al. (2013, p. 521), larger organizations "have some advantages in recovery, likely due to having access to more human […] and financial resources." SMEs' lack of resources is manifest in the "lack of [managers' and employees'] time to design, implement and monitor resilience measures [and] the lack of relevant training and expertise of staff members" (Halkos et al., 2018, pp. 553-554).
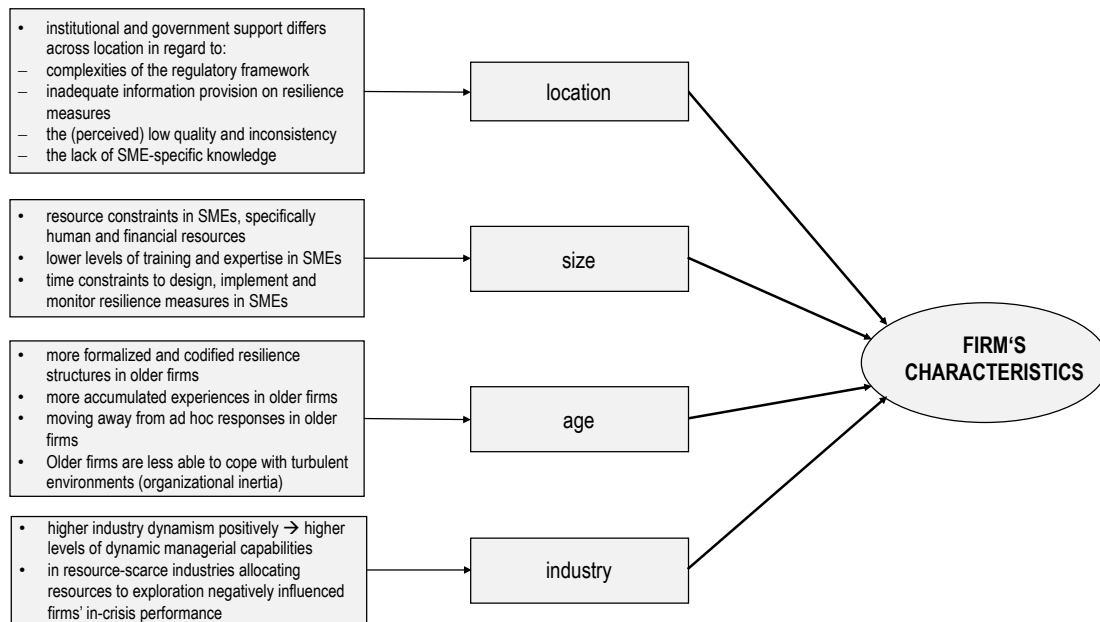
Figure 3-10: Code structure for the domain "firm characteristics"

Depending on a firm's location, the institutional and government support that firms can potentially access differs. Halkos et al. (2018) investigated the design and characteristics of such external support and how this can influence resilience enhancement in SMEs. They found that (a) "complexities of the regulatory framework," (b) "inadequate information provision by authorities on the design and implementation of such resilience measures," (c) "the (perceived) low quality and inconsistency [of resilience related governmental support]," and (d) "the lack of SME-specific knowledge" (Halkos et al., 2018, p. 554) are barriers to the enhancement of SME resilience, since they make it harder to access support.

Concerning the *industry* in which a firm is located, Fainshmidt et al. (2017) showed two things: First, industry dynamism positively correlated to dynamic managerial capabilities, because "dynamic task environments push firms to develop

capabilities needed to deal with change, but preparedness for one type of change may not necessarily generalize to other types" (Fainshmidt et al., 2017, p. 1095). Second, industry munificence (great resource availability for exploration and innovation) moderated the effect between strong dynamic asset management capabilities and firms' in-crisis performance. In industries with higher munificence, the allocation of more resources for change resulted in higher in-crisis performance but, interestingly, in resource-scarce industries, allocating resources to exploration negatively influenced firms' in-crisis performance.

Even if at first glance it seems that these factors provide little information about how to manage for high resilience levels, implicit conclusions can be drawn. Especially regarding the factors location, age, and size, it may be helpful for firms and managers to know what firms of a similar age, location, or size tend to do or what problems they usually have. By knowing these tendencies, managers can seek to avoid them.

3.4 **Discussion**

In relation to resilience as "a subject none of us will ever understand fully" (Coutu, 2002, p. 46), we conclude the following on the basis of our analysis: Scientists have contributed to unnecessarily broadening the resilience concept by increasingly analyzing more and more factors under the resilience label. Especially for those who have begun to explore the concept for the first time, the impression described by Coutu will inevitably arise, owing to the sheer number of factors that are supposed to

influence resilience. Thus, we identified, aggregated, and structured the factors that influence resilience from the existing empirical resilience research without the ambition to reduce the overall complexity and scope. We will now discuss our findings in relation to other existing similar articles and will derive some implications for future research on organizational resilience.

In the organizational resilience research literature, some review articles already exist (Bhamra, Dani, & Burnard, 2011; Darkow, 2019; Duchek, 2019; Kantur & Iseri-Say, 2012; Linnenluecke, 2017; Williams et al., 2017). All these review articles do not focus on empirical articles only; but include a mix of conceptual and empirical articles. Thus, the advantage of our articles is, that we are able to show the focal points and research gaps of empirical research in the resilience field without being mixed with conceptual articles. In the paragraph on future research, we will outline some of the research gaps we identified.

Except for Linnenluecke (2017), the other articles seek to summarize and aggregate the diverse resilience literature so as to deliver a comprehensible model or conceptualization, while we sought to collect and present the entire number of influencing factors without compromising in relation to scope. Further, Williams et al.'s (2017) review focused more on the fusion of crisis and resilience literature than explicitly highlighting and grouping the full number of all the factors that influence resilience that were examined in the empirical articles.

In contrast to these conceptual articles, Linnenluecke (2017) broadly analyzed which resilience research streams have emerged over time (e.g. responding to

external threats, employee strengths, business model adaptability, etc.). The detail level regarding the resilience influencing factors, as we present it, cannot be found in this review, since it is not the article's aim.

3.4.1 Different ways to structure influencing factors

We have presented one possible way to structure all the influencing factors we found in empirical research on resilience, which may provoke discussions. For instance, Lengnick-Hall et al. (2011) distinguished between behavioral, cognitive, and contextual capabilities and routines. In addition, sequential differentiations of resilience influencing factors according to a pre-crisis phase and a post-crisis one (Williams et al., 2017) or according to the anticipation, coping, and adaptation stages (Duchek, 2019) can be found.

Compared to these review and conceptual articles, some of the articled we analyzed that sought to develop a resilience measurement tool or catalog, have a different structure, for instance, McManus et al. (2008) presented a two-fold separation into adaptive capacity and planning, with 13 underlying indicators. We sought to illustrate how many constructs from non-resilient research fields (e.g. culture, transformational leadership, innovation) are incorporated into and linked to organizational resilience. Thus, structuring the articles into cognitive, behavior, emotional, and other resources – similar to Williams et al. (2017) and Lengnick-Hall et al. (2011) – would not have been promising.

3.4.2 Resilience and its umbrella character

Compared to the abovementioned review articles, ours is deliberately overwhelming concerning its scope and level of detail, so as to illustrate the questionable tendency that the resilience literature is developing. The vast amount of research into resilience complicates the development of a uniform understanding of the construct (Linnenluecke, 2017). Duchek (2019) as well as Klein et al. (2003) speak of resilience as an umbrella construct that is defined as "a broad concept or idea used loosely to encompass and account for a set of diverse phenomena" (Hirsch & Levin, 1999, p. 200). Indeed, previous research into resilience has shown a broad understanding of the term, which is reflected in multiple definitions and components of resilience. Our work clearly underlines this umbrella character; especially the vast number of approaches, capabilities, and resources we outlined represent the "diverse phenomena" (Hirsch & Levin, 1999, p. 200) and thus make resilience the umbrella construct it has become. No matter whether it is organizational culture (Harrison et al., 2017), leadership behavior (Valero et al., 2015) or innovation (Wastell et al., 2007), to name a few, the resilience research uses multiple concepts and tries to bring them all together in one concept. This conceptual breadth made our qualitative evaluation more complex than expected. Instead of a clear conceptual framework, a multitude of different concepts awaited us. Concepts that were already considered extensively in their own research streams are now combined within resilience research, creating a seemingly all-encompassing meta-concept. As an example of these complex interactions, Gittell et al. (2006) found that layoffs relate negatively to

resilience (i.e. recovery after crisis). However, these layoffs correlate with the lack of financial reserves and the lack of a viable business model. However, the existence of a viable business model again depends on the existence and maintenance of relational reserves in a firm.

We have shown only a small part of the entire resilience research, yet it has already sought to combine multiple concepts into a complex whole, which in the end influences resilience. The challenge in resilience research, which we also addressed, is to take all these variables that influence resilience and bring them together in an overall resilience construct (Hirsch & Levin, 1999). However, this attempt of 'bringing together' poses several difficulties resulting from the broad conceptualization of the resilience construct. In this article, we accept the umbrella character of resilience while clearly acknowledging its weaknesses. Our evaluation showed that resilience research must be careful not to be too scattered in order to retain the concept's usefulness. As Hirsch and Levin (1999, p. 210) put it "[…] when a scholarly idea becomes dangerously close to meaning all things to all people, that idea's validity cannot be maintained indefinitely […]".

3.4.3 Focusing on close rather than distant influencing factors

Thus, the question arises how to address the weaknesses of resilience's umbrella character and how the resilience research can use this as an advantage? When looking at the overall number of factors we identified, it became clear that they encompass *input variables*, *output variables*, *mediators*, or *moderators*. Under all

these factors, some are directly linked to the overarching resilience capabilities (preparation/prevention and responding), while other factors are distant input factors that are connected to resilience capabilities via one or more mediators. For instance, we found that a diversified workforce is important for resilience. At first glance, it is not so clear how this factor influences resilience, but we found creativity, resourcefulness, and innovativeness to be key mediators. Thus, when managed and integrated properly, a diversified workforce can increase a firm's creativity and innovative performance. The latter factors are more closely linked to resilience cognition and behaviors, namely creative coping by finding "unconventional (and creative) responses to unexpected challenges" (Richtnér & Lofsten, 2014, p. 140). Another example is transformational leadership (Valero et al., 2015; Wastell et al., 2007). A transformational leader does not directly increase a firm's resilience, but this leadership style is known to promote the willingness to change, creativity as well as adaptability in firms (Valero et al., 2015; Wastell et al., 2007), similar mediators to those mentioned before. A third example that clearly illustrates the problem of linking too distant practices to resilience refers to the study by Ortiz-de-Mandojana and Bansal (2016) who argued that social and environmental practices increase organizational resilience. They linked these "distant" practices to resilience based on the following logic: Social and environmental practices are found to significantly reduce financial volatility. Based on the assumption that firms with low financial volatility are good at anticipating hazards, it is concluded that social and environmental practices facilitate preparation and prevention capabilities and therefore resilience.

In contrast, by analyzing factors that directly facilitate the resilience capabilities, the resilience research could maintain its meaning as a unique research area instead of becoming an undefined or ill-defined and all-encompassing research field. Throughout the articles, we found that some factors were frequently used to link distant factors (for instance, diverse workforce, transformational leadership, and social and environmental practices) to the overarching resilience capabilities; these factors include high information-sharing, effective coordination (including formal regulations, routines, and plans), change readiness, sensemaking capabilities, diverse thinking and reflection, creativity, and learning capabilities. Since there is already a vast number of studies on how to establish high information-sharing, effective coordination, adaptive capacity, creativity, and so on, we can use this knowledge for managing resilience in firms, instead of examining questions such as "how to establish creativity" again under the label of organizational resilience. Instead, the resilience research could take on a meta-character and could analyze how all these closely linked factors interact in a crisis and whether they are compatible with one another or whether they compete. We will address these potential competing demands in the following sections.

3.4.4 Resilience manager vs. Resilience leader

Within resilience management, the influencing factors we found placed several demands on the firm that seem somewhat competing. For instance, we found factors that aim at stabilization (specifically in the domain formal management and governance) and others that aim at change (specifically the domains culture,

| **Resilience managers** that focus on …		**Resilience leaders** that focus on ..
– stability		– change
– formality	⟷	– informality
– planned and codified responses		– improvisation and ad-hoc response
– adherence to regulations		– creativity
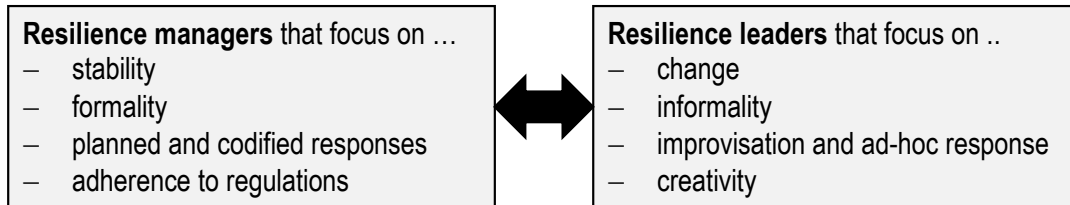
Figure 3-11: Resilience manager vs. resilience leader

leadership, and human resources). Further, the influencing factors differ concerning formality and informality as well as planned and codified responses vs. improvised and ad hoc ones. To create the most resilient firm possible, it seems that a firm must be able to successfully combine these factors. In this regard, we refer to the distinction between management and leadership of Kotter (1990). In our view, it will take resilience managers and resilient leaders (see Figure 3-11) within an organization to combine stability with change and formality with informality as well as to foster adherence to regulations yet enhance creativity when needed.

If a firm focuses too much on improvisation, informality, and change, the scale would be out of balance, resulting in a firm that cannot foresee any danger and is restricted to reacting (Burnard et al., 2018); on the other hand, if a firm focuses too much on anticipating, preventing dangers, adherence to regulations, and stability, it may unable to cope with sudden crises (Burnard et al., 2018).

3.5 Future research

Our literature review led us to make several recommendations for future research. First, does a firm need to incorporate every one of the resilience influencing

factors we uncovered in order to become resilient, or are specific influencing factors more important than others? Firms likely do not need to have all these factors but should rather make a selection that fits its needs. For instance, a startup may be unable to ensure sufficient financial slack to withstand unexpected adversity for long periods owing to its age and size, but its flexibility may enable faster responses compared to large firms (Gunasekaran et al., 2011; Pal et al., 2014; Sullivan-Taylor & Branicki, 2011). Thus, it is possible that certain influencing factors can be substituted with others without the firm completely losing its resilience. Research into the substitutability of influencing factors therefore seems very promising from both a theoretical and a practical perspective.

Second, there is a shortage of empirical research using quantitative methods to investigate the influencing factors and their effects on resilience. Most of the current research on resilience has been conducted using a qualitative or conceptual approach. The main problem with quantitative research is that of operationalizing the influencing factors as well as the concept of resilience (Glantz & Sloboda, 1999). Future research must find ways to measure these concepts in order to increase the explanatory power of the resilience concept. Mixed-method research offers a potential yet surprisingly rarely used opportunity to make this possible. Qualitative case studies could be used to inductively develop a theory that can then be deductively tested using quantitative instruments such as surveys (Johnson & Onwuegbuzie, 2004). We trust that our literature review will guide future research in

this quest to develop measures that account for the proposed differentiation between the influencing factors and resilience.

Third, looking at the resilience domains that resulted from our review, it became clear that many research topics from existing general management research can be applied to resilience research. If a research question on factors that influence resilience is formulated based on an apparent research gap, scholars must search for existing studies, especially within resilience-independent literature. A problematization strategy for formulating a research question (Alvesson & Sandberg, 2011) could therefore be promising in resilience research, by problematizing why existing studies and their findings cannot be applied to the context of managing unexpected events and therefore require context-specific investigations.

3.6 **Conclusion**

Using grounded theory as an approach to examine empirical resilience research allowed us to carry out a comprehensible and transparent literature review for building theory. We were able to identify seven categories that influence a firm's resilience: (1) relations, (2) human resources, (3) formal management and governance, (4) organizational culture, (5) leadership, (6) information and communication systems, and (7) firm characteristics. Based on the number of codes we found, formal management (102 codes) followed by internal and external relations (82 codes) are by far the most important categories among the articles we analyzed. Our results highlight the

complex and diffuse nature of the resilience concept, emphasizing its umbrella

character

4 The challenges of routinizing for building resilient startups (Article 3)

Abstract: While large and established organizations can rely on well-embedded routines, startups need to first create and maintain them. We refer to this as routinizing. Yet, scholars have not addressed the challenges of routinizing in young firms and how this relates to their resilience. Routinizing essential-for-survival processes can increase a startup's pre-adversity resilience, which is an organization's capability to anticipate, prevent, and mitigate potential adversity prior to its escalation to secure an organization's existence and prosperity. Based on our qualitative cross-case analysis, we identify startup specific context factors that inhibit routinizing. Moreover, we show that a high perceived routine value is crucial to successfully routinize, and present ways to increase a routine's perceived value in startups, namely via artifacts and incentives.

5 It's not what it seems to be: organizational resilience and competing demands (Article 4)

Abstract: To manage adversity in the best possible way, firms seek to become resilient. To achieve these needed high resilience levels, the research into organizational resilience has agreed on the necessity for firms to be able to both plan and improvise if they are to become truly resilient. Yet, despite recommendations on how to best become resilient, organizations tend to focus on one or the other, instead of focusing on both simultaneously, thereby lowering their behavioral response repertoire and their resilience potential. Guided by this gap between scientific advice and de facto organizational behaviors, we conceptually investigate why the decision-makers in firms unconsciously reduce their firms' resilience by focusing on either planning or improvising.

Our work is guided by the assumption that decision-makers view planning and improvising as competing demands because of their biased cognition. We consult the literature on competing demands in order to examine what kinds of competing demands, if any, planning and improvising may represent. We conclude that these two key components of resilience constitute a duality. Dualities, when not recognized as such, can decrease rather than increase an organization's resilience owing to wrong conclusions drawn by organizational actors on how to deal with crises. Thus, the greatest challenge for those responsible for a firm's resilience is that decision-

makers recognize that the relationship between planning and improvising is not contradictory at all – it just *seems* to be.

Keywords: resilience, crisis, adversity, duality, planning, improvisation, cognition, perception, conceptual analysis

5.1 Introdcution

In past years, scholars have tried to explain how organization can best become resilient, i.e. how they prepare and respond to adversity in order to avoid, mitigate or even inverse the negative effects of it (Boin & van Eeten, 2013; Duchek, 2019; Gover & Duxbury, 2018; Meyer, 1982; Pal et al., 2014; Rerup, 2001; Sutcliffe & Vogus, 2003; Weick, 1993; Wildavsky, 1988). Adversity in this sense does not solely mean a sudden low-probability crisis event itself (Pearson & Clair, 1998), but also the accumulation of strain thus resulting in a full-blown crisis (Roux-Dufort, 2007, 2009; Rudolph & Repenning, 2002; B. A. Turner, 1976; Vogus & Sutcliffe, 2007; Weick, 1990). In this regard, a large number of publications presented a variety of characteristics, resources and capabilities of organizations that are necessary for the emergence and maintenance of resilience. Examples include innovation and innovative behavior in general (Morais-Storz, Stoud Platou, & Berild Norheim, 2018), financial slack (Bourgeois III, 1981; Meyer, 1982), social and environmental practices (DesJardine, Bansal, & Yang, 2019; Ortiz-de-Mandojana & Bansal, 2016), relational practices (Gittell et al., 2006), routines (Haase & Eberl, 2019), sensemaking (Weick, 1993), and inter-organizational networks (Pal et al., 2014).

Nowadays, resilience is mainly approached from a process-based perspective, i.e. researchers focus on distinct phases that are constructed around a crisis-event (Duchek, 2019; Madni & Jackson, 2009; Williams et al., 2017). The phase before a crisis arises is characterized by preparation and, if possible, complete avoidance of its occurrence (Annarelli & Nonino, 2016; Bundy, Pfarrer, Short, & Coombs, 2016; Hollnagel & Woods, 2006). The phase during and after a crisis, on the other hand, is characterized by reacting and coping in relation to a stimulus (Bundy et al., 2016; Wildavsky, 1988) and can either be based on the usage of previously planned or improvised and thus spontaneously developed situation specific responses (Lengnick-Hall et al., 2011; Weick & Sutcliffe, 2015).

However, while these two kinds of responses and their underlying demands on the organization clearly differ from each other, previous resilience research confirms that organizations that strive for the highest overall resilience should combine planning and improvisation towards a unified whole (Boin et al., 2010; Boin & van Eeten, 2013; Burnard et al., 2018; Williams et al., 2017). But yet, previous research also confirms that despite having several response options to choose from, organizations tend to focus on one or the other. Depending on several factors like industry context, pace of environmental change or resource availability, organizations confronted with adversity either focus on rigid, well-known patterns of behavior (D'Aunno & Sutton, 1992; Greve, 2010; Herbane, 2015; Labaka et al., 2016; Roux-Dufort & Vidaillet, 2003; Staw, Sandelands, & Dutton, 1981), flexible (Fainshmidt et al., 2017; Haase & Eberl, 2019), or no response at all (Kraatz & Zajac, 2001). Thus, there

is a gap between scientific advice to combine planning and improvisation in order to become truly resilient and practical implementation by decision-makers that focus one either one of them.

This is our point of departure. While the subgroup of organizations that does not show any response at all is somewhat special due to their high levels of resources to "weather the storm" (Meyer, 1982, p. 518), we are particularly interested in why these other organizations actively decide on either falling back on using pre-existing procedures and plans (i.e. rigid responses (D'Aunno & Sutton, 1992)) or acting on the spot using improvisation (i.e. flexible responses (Hadida, Tarvainen, & Rose, 2015; Weick & Sutcliffe, 2015)) to counteract adversity instead of using both simultaneously like resilience research suggests to do (Rerup, 2001). To conceptually investigate this guiding question, we start from the following assumption: Organizations, or rather the decision-makers within them, view plans and improvisation as being competing demands (Gaim, Wåhlin, Pina e Cunha, & Clegg, 2018). Consequently, plans and improvisation are perceived as being not compatible with each other and, if pursued simultaneously, they rather decrease than increase an organizations chances of survival. In order to investigate these counterintuitive behaviors, we want to examine what kind of competing demand, if any, improvisation and planning might represent. In doing so, we hope to find out why decisions-makers neglect latest scientific findings on resilience and to give advice on how to overcome the problems associated with implementing both simultaneously.

5.2 **Organizational resilience – a definition**

Research related to organizational resilience has been very popular in recent years (Boin & van Eeten, 2013; Linnenluecke, 2017). At the same time, the conceptualization of resilience across research streams often differs from one another (Alexander, 2013; Linnenluecke, 2017; Williams et al., 2017). Linnenluecke (2017), for example, identified five different conceptualizations of organizational resilience: (1) Resilience as an organizations response to external threats, (2) resilience as reliability, (3) resilience as the management of employee strengths, (4) resilience as the adaptability of business models, and (5) resilience as supply chain design. In addition, she mentioned the activation of resilience as a new and thus sixth direction towards which research is moving. Despite this manifold conceptualization of organizational resilience, research most often refers to a crisis or adversity in general (Williams et al., 2017). Resilience is thus understood as a reaction to a severe event that has already occurred (Lengnick-Hall et al., 2011; Meyer, 1982; van der Vegt et al., 2015). Defined by Wildavsky (1988, p. 77) as "the capacity to cope with unanticipated dangers after they have become manifest, learning to bounce back" , resilience in this sense is about successfully improvising and responding in the face of a crisis (Rerup, 2001). A second perspective on organizational resilience is largely accepted among researchers: Resilience as the continuous management of stress and ongoing risks (Vogus & Sutcliffe, 2007). This view on resilience does not only include the coping with severe events that have already occurred, but also the recognition, planning for, and prevention of accumulating strain (Vogus & Sutcliffe, 2007; Williams et al., 2017).

Organizational resilience is therefore not just survival in the face of a crisis, but rather constant adaptation in the face of adversity (Somers, 2009).

Taken together, resilience is – in its essence – about dealing with "challenging conditions" (Vogus & Sutcliffe, 2007). Challenging conditions include the accumulation of strain as well as distinct crisis events. Recently this comprehensive view of resilience was defined by Williams et al. (2017, p. 742) as "the process by which an actor (i.e., individual, organization, or community) builds and uses its capability endowments to interact with the environment in a way that positively adjusts and maintains functioning prior to, during, and following adversity". According to Williams et al. (2017), three phases are particularly relevant when considering crises and resilience: the phase before the actual crisis, the ongoing phase of immediate crisis, and the phase after the actual crisis, which in turn represents a new phase before the next crisis (Bundy et al., 2016; Darkow, 2019; Duchek, 2019). We follow this comprehensive process-based view of organizational resilience. However, since the phase following a crisis is characterized by learning, which in turn flows into the preparatory phase before the next crisis, this phase can only be distinguished from the other two phases to a limited extent. Accordingly, we would argue in favor of distinguishing two distinct phases instead of three: the phase before a crisis and the phase after the occurrence of a crisis (Boin & van Eeten, 2013; Hale & Heijer, 2007).

During these phases, organizational resilience scholars agree upon the importance of two particular components of resilience which are summarized by (Weick & Sutcliffe, 2015, p. 108) as "[…] an extensive action repertoire and skills at

improvising". These two components of resilient behavior, plans and improvisation, and their importance towards the creation of resilient organizations are often addressed within the resilience literature. Rerup (2001), for example, analyzes the Apollo 13 incident where a cryogenic tank explodes during the mission, resulting in a loss of breathable oxygen for the astronauts. He concludes that all of the astronaut's lives could be saved through anticipatory preparation (plans) as well as improvisational skills. In the same vein, Burnard et al. (2018) conclude that an organization needs both, proactive planning as well as improvisational skills which they call "agile adaptation" in order to be truly resilient (Burnard et al., 2018, p. 355).

We will adopt this view of resilience as a combination of planning and improvising and continue by further elaborating the two concepts.

5.2.1 Planning

The phase prior to the onset of a crisis is characterized in particular by the fact that it prepares the ground for counteracting the unexpected (Weick & Sutcliffe, 2015). At the same time and in parallel with preparatory measures, a potential crisis should at best already be avoided or managed preventively. The literature that deals with pre-crisis prevention and preparation mainly speaks of anticipation (Hale & Heijer, 2007; Hamel & Välikangas, 2003; Rerup, 2001; Välikangas & Romme, 2013). Boin and van Eeten (2013) refer to this as "precursor resilience". They define this type of resilience as the "ability to accommodate change without catastrophic failure, or a capacity to absorb shocks gracefully" (Boin & van Eeten, 2013, p. 431; Foster, 1993).

In particular, this type of resilience is often associated with High Reliability Organizations (Vaughan, 1990). Nuclear power plants, space shuttles or airspace surveillance, as examples of High Reliability Organizations, cannot afford to let mistakes arise. These types of organizations have in common that they operate in an unforgiving environment. A thoughtless action could have undreamt-of consequences for humans and nature (Rochlin, 1996). That is why this type of organization must be designed for high reliability (Weick, Sutcliffe, & Obstfeld, 1999). But also, in completely different contexts, such as startups, anticipation, prevention, and mitigation of potential adversity is an essential part of ensuring organizational survival. Startups, for example, on the one hand cannot afford to let crises arise in the first place, because they may not have the financial slack to withstand them, but on the other hand, due to limited resources they cannot prepare for every single crisis that may occur (Demmer et al., 2011; Haase & Eberl, 2019; Manfield & Newey, 2018).

One word used in the literature in relation to this anticipatory resilience is proactivity (Burnard et al., 2018). Proactivity is defined as "acting in anticipation of future problems, needs, or changes" (Mish, 2011, p. 989). (Boin et al., 2010), for example, speak of proactively adapting to disturbances while Somers (2009, p. 13) mentions the "planned steps" that are needed for an organization to thrive "in the face of adversity", thus resulting in an organization that adapts to its complex environment . Burnard et al. (2018, p. 355) use the term proactivity to express that an organization is "preparing […] for as many eventualities as possible". However, proactivity and therefore planned behavior is not only exercised before a crisis. Much more, behaviors

are prepared and trained to be utilized at a later point in time, namely during crises. The following example shall illustrate the necessity of a planned response during crisis: After the attacks on the World Trade Center in 1993, Morgan Stanley established a preparatory program to protect the workforce in the event of another attack. This program, previously established in peaceful times, allowed Morgan Stanley's workforce to survive the unforeseen attack of 2001 largely unscathed (Coutu, 2002), showing in particular the value of previously established routines and preparation, which the organization used during times of crisis (Christianson et al., 2009).

5.2.2 Improvising

Not all kinds of adversity can be solved with well elaborated plans and it might even be that some kinds of crisis make it impossible to create a plan beforehand and act accordingly (Rerup, 2001). On the one hand, there is still the possibility that problems accumulate because they are simply overlooked or not considered important enough (Billings, Milburn, & Schaalman, 1980; Marcus & Nichols, 1999). An example of this would be the Challenger disaster of 1986, in which seven astronauts lost their lives due to technical errors that were known but not resolved prior to the incidence (Vaughan, 1990). On the other hand, there is always the danger that a crisis will either occur unexpectedly for the organization and/or that the actual emergence of the crisis lies outside the organization's influence (Weick, 1993). Examples include the terrorist attacks of 9/11, the global financial crisis of the late 2000s, or the contamination of Tylenol capsules with cyanide, which resulted in the death of eight

people and a loss of approximately $500 million for Johnson & Johnson (Mitroff, Pauchant, & Shrivastava, 1988). In the case that a crisis can no longer be averted or an organization is simply surprised by its emergence and thus no plans are at hand, organizations must manage the crises spontaneously in order to at least ensure the survival of the organization (Lengnick-Hall et al., 2011; van der Vegt et al., 2015; Wildavsky, 1988). Such an understanding of organizational resilience as coping in the face of immediate danger is based on the ad hoc management of crises that is commonly referred to as improvisation (Hadida et al., 2015; Rerup, 2001). Improvisation, in its essence, "[…] deals with the unforeseen […]" (Weick, 1998, p. 544) and can be defined as "[…] the degree to which composition and execution converge in time" (Moorman & Miner, 1998, p. 698)[3]. The definition made by Moorman and Miner (1998) uses the word "composition" which implies that improvisation goes along with at least some level of innovatively combined and novel behavior. Otherwise it would just be a repetition of pre-learned routines and responses. In this sense, organizational researchers often refer to Jazz as a metaphor for explaining improvisation (see for example the special issue of Organization Science dedicated in particular towards Jazz improvisation (Meyer et al., 1998)). In the context of his performance, the jazz musician must react immediately to unfolding moments. He works, so to speak, with unpredictable musical moments. Musical phrases emerge and disappear on the basis of improvisation (Weick, 1998). Thus, the process of how

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[3] For a detailed overview on improvisation definitions across disciplines see Moorman and Miner (1998).

a Jazz ensemble interacts with each in order to create something novel is somewhat close to how actors within organizations interact with each other. Therefore it is used as a representative example within a multitude of fields of management (Hadida et al., 2015).

In regard to resilience, Rerup (2001), refers to the interaction of the jazz ensemble when he analyzes the improvisational endeavors of the Apollo 13 crew while facing a life-threatening crisis. He explains that the crew, similar to a Jazz ensemble, acted "without having full understanding" of the situation and the solution they strived for (Rerup, 2001, p. 12). In that particular situation, the crew was trying to combine existing knowledge while simultaneously creating new combinations of said knowledge leading to an improvised solution that saved their life's. Similarly, Weick (1993) highlights how the leader of a team of firefighters survives a life-threatening wildland fire by creating novel solutions on the spot while most of his teammates died because they were overwhelmed by the situation.

5.3 **Competing demands and resilience**

Competing demands are inevitably part of organizational life (Ashcraft & Trethewey, 2004; Clegg, da Cunha, & e Cunha, 2002; Quinn & Cameron, 1988). Due to the ever-increasing complexity of organizational processes in combination with technological change and an environment that is becoming more global, fast paced and competitive, competing demands increasingly come to light (Lewis, 2000; Smith & Lewis, 2011). Generally speaking, competing demands arise when the changing

environment and the thus resulting demands are set against the limited resources of

companies (Gaim et al., 2018). This could also be one of the reasons why planning

and improvising might be regarded as a competing demand by organizational actors.

Organizations can only focus so much on one or the other due to their limited

resources, such as finances or time. Therefore, they might have to decide whether to

pursue only one instead of both components of resilient behavior. Looking at the

literature on competing demands, it is noticeable that a wealth of different concepts

and definitions exist (Gaim et al., 2018). Quinn and Cameron (1988) as well as

Westenholz (1993), for example, differentiate between paradox, dilemma, irony,

inconsistency, dialectic, ambivalence and conflict. Achtenhagen and Melin (2003) in

turn focus on four different types of competing demands, namely paradox, trade-offs,

dilemmas and duality while Putnam, Fairhurst, and Banghart (2016) distinguish

Table 5-1: Definitions, examples and existing work on competing demands

Concept	Definition	Example	Existing work
Paradox	*"contradictory yet interrelated elements that exist simultaneously and persist over time"* (Smith & Lewis, 2011, p. 386)	The mutual organizational pursuit of exploration and exploitation (Ambidexterity) (Smith & Lewis, 2011)	(Lewis, 2000; Poole & van de Ven, 1989; Quinn & Cameron, 1988; Schad et al., 2016; Smith & Lewis, 2011; Smith & Tracey, 2016)
Duality	*"The twofold nature of an object of study without separation; they are seemingly opposite but are interdependent and complementary"* (Gaim et al., 2018, p. 5)	The dualistic tension between individualistic and pragmatic individuals within an organization (Ashforth & Reingen, 2014)	(Ashforth & Reingen, 2014; Farjoun, 2010; Gaim et al., 2018; Graetz & Smith, 2008; Jackson, 1999; Janssens & Steyaert, 1999)
Dilemma	*"[…] an either- or situation"* (Westenholz, 1993, p. 41)	The decision between centralized or decentralized purchasing (Achtenhagen & Melin, 2003)	(Achtenhagen & Melin, 2003; Quinn & Cameron, 1988)
Trade-off	*„A gradual exchange between two demands where more of one means less of the other"* (Gaim et al., 2018, p. 5)	Work/life balance (Caproni, 1997)	(Achtenhagen & Melin, 2003; Gaim et al., 2018)

between tension, dualism, duality, contradiction, dialectic and paradox. In their general comparative overview of competing demands in organizations, Gaim et al. (2018) consider dilemmas, trade-offs, dialectics, duality and paradox. We follow the selection made by Achtenhagen and Melin (2003), since we believe that it combines the competing demands most commonly found in literature (see Table 5-1 for an overview of the chosen concepts, their related definitions and examples of each). Thus, we consider paradox, dilemma, duality as well as trade-offs for our further argumentation about whether planning and improvising might represent one of these competing demands.

5.3.1 Are planning and improvising competing demands?

So far, we have considered organizational resilience and competing demands separately. Within this section we will now try to link organizational resilience based on planning and improvising and competing demands with each other. Therefore, by comparing the characteristics of planning and improvising we will examine whether these two components of resilience constitute competing demands towards an organization.

In order to be able to do so, we refer to Gaim et al. (2018) who identified seven core components of competing demands of which each of them, depending on the specific demand considered, is either present or absent: 1) The existence of a dyad; 2) contradiction; 3) compatibility; 4) interrelatedness; 5) complementarity; 6) simultaneity; 7) push-pull relationship. Depending on which of these components are

present or absent, it is possible to determine what kind of competing demand, if any, planning and improvising constitute (see Table 5-2).

Table 5-2: Conceptualization of competing demands. Own illustration based on Gaim et al. (2018)

	Existence of dyad	Contradiction	Compatibility	Inter-relatedness	Comple-mentarity	Simultaneity	Push-pull
Dilemmas	✓	x	x	x	x	x	x
Trade-offs	✓	✓	✓	x	x	x	✓
Dualities	✓	x	✓	✓	✓	✓	✓ / x
Paradoxes	✓	✓	✓	✓	✓	✓	✓

5.3.2 Existence of a dyad

A dyad exists, when there is a choice between two demands, that constitute a potential contradiction. In this paragraph we focus on the two-fold and thus dyadic character of decision-making problems and will address the aspect "contradiction" in the subsequent paragraph (Gaim et al., 2018). Simultaneous exploring and exploiting (March, 1991) or the decision between stability and change (Leana & Barry, 2000) are examples of such dyadic choices. When it comes to planning and improvising, the decision that has to be made lies between either focusing on planning beforehand and using the prepared responses that are readily available to the organization or rely on improvised responses that are created in the midst of adversity.

As we have already mentioned earlier, organizational decision-makers tend to focus on either one of the two possibilities to counteract adversity. This implies that those individuals who decide upon the actual behavior of an organization view both, planning as well as improvisation, as potential solutions towards adversity. It is

important to note that no evaluation is yet made as to whether the two demands are contradictory, interrelated etc. or not. Improvisation as well as planning can both be successful ways of dealing with adversity and can therefore represent resilient organizational behavior. The mere decision between these two strategies is sufficient to determine the existence of a dyadic relationship.

Proposition 1: There is a dyadic choice between planning and improvisation.

5.3.3 Contradiction.

Being contradictory means that managing competing demands requires different organizational processes (Schmitt, Probst, & Tushman, 2010). In its essence, contradictory demands are oppositional to each other, therefore it seems irrational and illogical to engage in both competing demands to their full extent at the same time (Gaim et al., 2018). Dilemmas, for example, do not contradict each other.[4] The elements of a dilemma are in an either/or relationship, within which they fight for full attention at one point in time. They both have advantages and disadvantages and it is up to the actors to decide which element they pursue (Smith & Lewis, 2011). The elements of a Trade-off on the other hand do contradict each other. Since one means less of the other, an organization will never be able to fulfill both to their full extent

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[4] The relationship between the elements of a dilemma is simplified here. If a longer time horizon is considered, dilemmas can develop into paradoxes because the tensions between the two might reoccur more than once. Finally, they would become contradictory to each other Smith and Lewis (2011).

(Achtenhagen & Melin, 2003). Finally, dualities are described by Gaim et al. (2018, p. 9) as "not necessarily" contradictory . Farjoun (2010) as well as Smith and Lewis (2011) who describe dualities as being contradictory might not agree with this assumption made by Gaim et al. (2018). Dualities, so their reasoning, are very similar to paradoxes. The only fundamental difference between the two is how the competing demand is ultimately dealt with within the organization (Farjoun, 2010). In this sense, Smith and Lewis (2011, p. 387) explain duality using the Taoist yin yang symbol and describe it as "opposites that exist within a unified whole". Thus, the internal boundary between yin and yang describes the contradiction between the demands, while the external boundary (i.e. the circle) describes the synergies between the demands.

When it comes to planning and improvising, both components of resilience appear as being contradictory to each other. This is due in particular to the fact that improvisation and plans seem to be mutually exclusive. Both kinds of behavior represent oppositional approaches on how to deal with a crisis. Organizations can either use pre-defined responses, i.e. fall back on plans and prepared routines, or react spontaneously on the basis of improvisation. Therefore, one might be tempted to say that the demands on the organization underlying these behaviors differ fundamentally (Schmitt et al., 2010). This might also be the reason why actors, as soon as they find themselves in unknown situations, often fall back on already known patterns of behavior (Weick, 1998), thus increasing standardization, conservatism and rigidity during times of crisis (Cameron, Kim, & Whetten, 1987). Such behavior may be due to the fact that the organizational actors try to reduce the uncertainty

associated with the crisis through standardized responses (Roux-Dufort & Vidaillet, 2003; Staw et al., 1981).

However, the literature on organizational improvisation shows us that the simultaneous pursuit of planning and improvisation is not as irrational as decision-makers might believe. In order to successfully improvise in the midst of adversity, rigorous planning and preparation are necessary (Meyer, 1998). Improvisation therefore never happens out of the unexpected, but instead "[…] involves reworking precomposed material and designs in relation to unanticipated ideas […]" (Berliner, 1994, p. 241). The relationship between planning and improvisation is not just one way, but instead can successful improvisation lead to the creation of new plans and routines that can be used in later periods (Christianson et al., 2009).

Therefore, we argue that the contradiction between planning and improvising is only seemingly present. Seemingly present in this context means that the actors within the respective organizations perceive the two elements as contradictory, however, in fact they are not. As with the Taoist yin yang symbol, the two elements appear to be opposed to each other. Those who only pay attention to the apparent distinction between black and white or between yin and yang will regard the two elements as opposites. Those who, however, pay attention to the interplay of the two elements to form a large whole will notice that it is less the contradiction between the elements than the symbiosis that determines the relationship between these elements. This also distinguishes our interpretation of the Yin Yang symbol from that of Smith and Lewis (2011). While Smith and Lewis (2011) regard the two individual

elements as contradictory, we view them as **seemingly** contradictory, as their opposites seem to dissolve with regard to the big picture.

We will later discuss in greater detail what the seeming contradiction between the two components of resilience implies for practitioners and future resilience research.

*Proposition 2: Planned and improvised responses represent **seemingly** contradictory demands, i.e. decision-makers view them as being contradictory while in fact they are not.*

5.3.4 Compatibility.

Competing demands that are compatible with each other can exist side by side at the same time and might even operate together (Gaim et al., 2018). Competing demands framed as a dilemma, for example, stand in an exclusive either/or relationship to each other. This means that either one or the other demand can exist at a time. A simultaneous and compatible coexistence of both demands is thus excluded (Achtenhagen & Melin, 2003; Westenholz, 1993). Framing competing demands as trade-offs on the other hand, renders them as compatible with each other, i.e. a coexistence between the demands is possible (Gaim et al., 2018).

When it comes to planning and improvising, both the competing demands are compatible with each other, i.e. they can operate together. Weick (1993, p. 639), for example, states that routine action can help facilitate improvisation or, as he puts it

"Bricoleurs remain creative under pressure, precisely because they **routinely** [emphasis added] act in chaotic conditions" . Burnard et al. (2018) take a similar view in their paper. Improvisation is called agile adaptation by Burnard et al. (2018). In combination with proactivity (planning), according to the authors, organizations achieve the highest possible level of resilience. These two examples show that planned and ad hoc responses can coexist side by side, are compatible with each other, and even, as we describe in more detail below, can reinforce each other.

Proposition 3: Planned and improvised responses are compatible with each other.

5.3.5 Interrelatedness

Competing demands, which are interrelated, are in a bidirectional relationship with each other (Clegg et al., 2002), while having the potential for synergies (Gaim et al., 2018). As mentioned before, Farjoun (2010) describes such an interrelated relationship with stability and change as duality. Both elements influence each other in such a way that one supports the other. The same can be said about the relationship between planned and improvised responses. For example, the establishment of routines and crisis management plans can lead to improvisation, thus promoting ad hoc response to a crisis (Feldman & Pentland, 2003). Improvisation occurs as soon as existing plans and resources are applied to the unknown situation (Clegg et al., 2002). As already mentioned, Weick (1998) cites the example of a jazz musician that uses his prior knowledge in order to react towards new unfolding

musical moments, thus reflecting the synergistic relationship between planning in terms of preemptively created knowledge and improvisation. The situation is similar with organizations and their resilience. The use of elaborated plans (known melodic phrases within Weick's example) during a crisis leads to the possibility of deviating from these plans with the help of improvisation based on already existing knowledge and resources (Rerup, 2001).

The other way around, the influence of ad hoc responses on planning happens in the long term. In their analysis of the Baltimore & Ohio Railroad Museum, Christianson et al. (2009, p. 850) describe "learning through rare events". By this, the authors mean that in the course of the crisis new routines are discovered and embedded while at the same time existing routines are further strengthened, improved or suspended. These so-called response repertoires are not nearly as unique as the crisis itself and can therefore continue to be used in subsequent periods.

Both examples show, that planning, and improvising are mutually interrelated as they are mutually reinforcing each other. Planning as well as improvisation both need the other in order to be applied to their fullest potential.

Proposition 4: Planned and improvised responses are mutually interrelated.

5.3.6 Complementarity

Competing demands are complementary if each individual demand is necessary on its own, but not sufficient for the ultimate well-being of an organization

(Ashforth & Reingen, 2014). Put differently, the demands reinforce each other (Gaim et al., 2018). Demands that are complementary with each other are therefore inherent features of an organization. In this sense, they are not substitutable, i.e. more of one demand cannot substitute the lack of the other demand (Gibson & Birkinshaw, 2004). Trade-offs are therefore not complementary with each other. If competing demands are conceptualized as trade-offs, then one of the most striking features is that the substitution between the demands is possible (Achtenhagen & Melin, 2003). However, paradoxes, for example, are in a both/and relationship with each other. It is believed that the best possible result for the organization can only be achieved if the competing demands can be embraced simultaneously (Lewis & Smith, 2014). When it comes to resilient coping in the face of adversity, organizational scholars have found out that both planning as well as improvising, are of paramount importance (Burnard et al., 2018; Gittell et al., 2006; Meyer, 1982; Rerup, 2001; Williams et al., 2017). If one of the two components do not exist, an organization may still be able to deal with crises, but it will be highly vulnerable. In other words, both components complement each other to the extent that planning can compensate for the weaknesses of improvisation and vice versa, so that an organization becomes less vulnerable. The weaknesses of planning are among others high costs and the overall time-consumption for the detailed preparation of response procedures, protocols etc. (Nowell et al., 2017) as well as the fact that planned responses are often highly situation specific. This means that preparation is based on certain assumptions about potential crises, which, however, do not reflect their full complexity (Elliott & Macpherson, 2010). This specificity can result in rigid behaviors (Adini et al., 2017;

Ahn et al., 2018). Improvisation compensates these two weaknesses because implementing improvisation comes at a lower cost and is less demanding in (human-) resources (Hadida et al., 2015). In addition, responding in a flexible manner to a new situation forms the core of improvisation and thus complements rigid planning (Sonenshein, 2016).

On the other hand, the weaknesses of improvisation are among others that up to the actual occurrence of the crisis there is uncertainty whether the actors will actually find a solution that fits the needs of the respective situation they are faced with (Elliott & Macpherson, 2010). Furthermore, they might have the urge of doing things for the sake of doing things, i.e. individuals come up with solutions just for the sake of having something to go by (comparably to the behavior of most of the man during the Mann Gulch Disaster analyzed by Weick (1993)). Thus, due to time pressure under which decisions have to be made, potentially severe consequences of improvised actions cannot be fully taken into account.

At this point, planned responses provide the actors with a sense of certainty (Elliott & Macpherson, 2010), allows them to coordinate their actions at an early stage with a clear head, enables them to think through the consequences of alternate behaviors in detail and establish robust and formally approved procedures (Adini et al., 2017; Elliott & Macpherson, 2010). Consequently, planned and improvised responses are not substitutable but highly complementary. Only the combinations of both responses during crisis is what makes an organization highly resilient (Burnard et al., 2018).

Proposition 5: Planned and improvised responses are complementary.

5.3.7 Simultaneity

In regard to competing demands, simultaneity means that the oppositional elements can be present to their full strength at the same time. Ultimately, the success of an organization depends on its ability to simultaneously meet the competing demands (Gaim et al., 2018). The elements of a trade-off, for example, are never present to their full strength at the same time, thus simultaneity does not exist. (Gaim et al., 2018). Competing demands, however, which represent a paradox or a duality, occur simultaneously. Organizational ambidexterity, defined as the ability of an organization to simultaneously pursue exploitation and exploration (O'Reilly & Tushman, 2013), constitutes a paradox for example (Lewis & Smith, 2014). Nevertheless, the question arises as to how organizations can pursue these demands, which are irrationally related to each other (Lewis, 2000). As described above, organizations cannot completely resolve this paradox. Rather, the structural, contextual or sequential pursuit of exploitation and exploration offers an opportunity to deal with the competing demands (O'Reilly & Tushman, 2013).

In terms of planning and improvising, both competing demands and their oppositional tendencies can be present simultaneously. Organizations that want to be fully resilient must be able to simultaneously react on the basis of planned and improvised behavior (Burnard et al., 2018; Rerup, 2001). The possibility of such a simultaneous pursuit of both components of resilient behavior shows, once again, the

example of a jazz ensemble. The musicians are able to use their pre-existing and vast

musical knowledge in order to play around a known musical phrase. However, they

are able to depart from that piece of music at every point in time and improvise. That

improvisation does not have to be completely novel in regard to the original piece but

can instead make a clear reference towards it, thus further reflecting their

simultaneous character (Moorman & Miner, 1998).

> *Proposition 6: Planned and improvised responses can be apparent at the same*
>
> *time.*

5.3.8 Push-pull

Competing demands that draw the organization in opposite directions are in a

push-pull relationship. This is particularly the case with elements that are

contradictory to each other, since no final decision can be made for one of the

elements (Gaim et al., 2018; Schad, Lewis, Raisch, & Smith, 2016). The demands

constituting a Trade-off, for example, always pull the organization in different

directions. The organization therefore has to balance how much attention is given to

each demand respectively (Gaim et al., 2018). The elements of a paradox are also

characterized by a push-pull relationship to each other. The irrationality between the

elements makes it difficult for the organization to decide between the elements or to

pursue both in parallel (Schad et al., 2016). The elements of a dilemma have no push-

pull relationship to each other. The organization is faced with the choice between two

alternatives and usually decides once for one of the two instead of being in a constant tug-of-war. (Achtenhagen & Melin, 2003; Gaim et al., 2018).

When it comes to planning and improvising, there is no such one-time decision for either element. Organizations should rather act according to the situation they are faced with (Staw et al., 1981). This means that, depending on the situation, relapsing to planned responses might be more promising than, for example, an improvised ad hoc response, or vice versa. In some situations, a combination of planned and ad hoc responses may even be necessary to demonstrate resilient behavior (Rerup, 2001). However, since the best possible response in a crisis situation is not known beforehand, organizations see themselves between planned and ad hoc responses in a tug-of-war situation. This tug-of-war is especially apparent with regard to organizational decision-makers. Constantly balancing organizational behavior and responses towards the ever-changing environment they see themselves in somewhat forces them to make a decision in favor of either one of the components of resilience.

Proposition 7: Planned and improvised responses are often perceived by decision-makers as being in a push-pull relationship.

5.3.9 Disclosing the competing demand

Table 5-3 summarizes the propositions from the previous section and sets them in conjunction with the competing demands and their respective components shown in Table 5-1. Based on the propositions developed so far, we suggest that planning and improvising represent a duality.

Table 5-3: Classification of planning/improvisation

	Existence of dyad	Contradiction	Compatibility	Inter-relatedness	Comple-mentarity	Simultaneity	Push-pull
Dilemmas	✓	x	x	x	x	x	x
Trade-offs	✓	✓	✓	x	x	x	✓
Dualities	✓	x	✓	✓	✓	✓	✓ / x
Paradoxes	✓	✓	✓	✓	✓	✓	✓
Planning / Improvising	✓	x	✓	✓	✓	✓	✓

We will now discuss the implications of this outcome.

5.4 **Discussion**

Our work is a first attempt to recognize to what extent components of organizational resilience work in relation to each other. Three possibilities are conceivable: First, individual components of organizational resilience may easily be integrated into an overall construct of organizational resilience where components do not influence each other. Second, individual components may be competing, i.e. component X has a positive effect on organizational resilience in isolation, but in combination with component Y the positive effect is diminished or reversed. Third, organizational members perceive the components as competing with each other but in fact they are not. Instead they are compatible and complementary.

Understanding these interrelations is highly relevant from a practical point of view. If decision-makers incorrectly assume that certain components of organizational resilience are in harmony with each other, or if it is wrongly assumed that they compete with each other, this can lead to wrong managerial decisions that ultimately

reduce an organization's resilience. Depending on how organizations perceive and value planning and improvising, different managerial approaches to achieve organizational resilience are chosen. Take, for example, an organization that purely focuses on planning and planned responses, such an organization is prepared for a multitude of eventualities and can deal with a crisis based on these proven responses (Burnard et al., 2018). This preventative and preparatory focus corresponds on the one hand to the understanding of the so-called strategic resilience and on the other hand to high reliability organizations. Strategic resilience refers to a long-term adaptation to a changing environment and the development of related mechanisms *before* organizations need to recover (Hamel & Välikangas, 2003; Välikangas & Romme, 2013). Preparational effort to achieve strategic resilience focus primarily on a) building slack resources that ensure innovative performance during crisis, b) developing mindful engagement within the organization and c) establishing "generative doubt" about the strategic orientation (Välikangas & Romme, 2013, p. 49). Besides strategic resilience, researchers often refer to high reliability organizations when talking about extensive prepartion (Bourrier, 1996; Rochlin, 1996; Weick et al., 1999). These types of organizations cannot tolerate any mistakes at all because of their unforgivable consequences to life, nature and the organization itself. Thus, they establish detailed monitoring procedures and continuity plans (Bourrier, 1996).

On the other hand, an organization might successfully focus on improvisation and improvised responses in order to overcome adversity. In his analysis of the Mann Gulch fire, Weick (1993) describes how the leader of the group improvised an 'escape

fire' that could have saved the lives of the men trapped inside the flames. However, letting go of the structure of their organization was not a feasible solution to most of the team members, thus resulting them in refusing the command of their leader. The result, as we know by now, was that team leader survived because of the improvised escape fire while most of the other fire fighters died.

Focusing on either planning or improvisation might be problematic in regard to the overall resilience. Take for example a high reliability organization that does not take improvised behavior into consideration but instead solely relies on preparation efforts. Such an organization could be overwhelmed by a crisis which has not been considered before. The organization does not know how to respond in that situation because any response prepared does not fit to the situation faced with.

In this sense we also contradict the distinction of Boin and van Eeten (2013) and their division into precursor and recovery resilience. Such a subdivision would imply that equally high levels of resilience can be achieved if an organization excelled in only one of the two areas. For us, resilience is a holistic construct, so that it is necessary to pursue both high levels of planning and improvising in parallel (Herbane, 2015) in order to be a truly resilient organization. In this regard, our analysis has shown that the mutual pursuit of planning and improvising is possible and necessary.

However, the duality of planning and improvising can be a problem for organizational actors. Especially the second element within our analysis, namely *contradiction,* is important, because in the context of dualities there is no actual contradiction, but the elements which represent the competing demand are only

seemingly contradictory (Gaim et al., 2018). While both, improvising and planning, appear to be fundamentally different and thus contradictory to each other, in fact they are not. On the one hand, resourcefulness, creativity and bricolage are representative for improvisation and comparable to *centrifugal forces* which "make ideas, knowledge and information available for creative action" (Lengnick-Hall et al., 2011, p. 246). On the other hand routines, habits and specific plans represent planning and are comparable to *centripetal forces*, which "direct inputs and processes towards actionable solutions" (Lengnick-Hall et al., 2011, p. 246). On closer examination it becomes clear that just in combination these two forces can help to establish organizational resilience (Lengnick-Hall et al., 2011). Moreover, they are complementary to each other: Planning, as previous research on organizational improvisation has already shown, is necessary for adequate improvisation, because actors use and combine previously planned activities as building blogs for improvised actions (Weick, 1998). Vice versa in the long-run, improvisation is often a starting point for improved planning (Christianson et al., 2009).

The greatest challenge for those responsible for an organization's resilience is therefore that decision-makers recognize that the relationship between the two is not contradictory at all, but it just seems to be.

However, since organizations are interpretative systems (Daft & Weick, 1984), decision-making in this regard is highly contingent upon managerial sensemaking and cognition (Nadkarni & Barr, 2008; Weick, 1993). Lengnick-Hall and Beck (2005, p. 750) speak in this sense of cognitive resilience and describe it as an "conceptual

orientation that enables an organization to notice, interpret, analyze, and formulate responses in ways that go beyond simply surviving an ordeal". The decision-makers of an organization that are responsible for choosing the right action are dependent on the environment and the respective meaning they give to it. This meaning does not represent the real environment an organization finds itself in, but rather is a "cognitive representation" of the former and is specific to each and every decision-maker him- or herself (Nadkarni & Barr, 2008, p. 1397). Interpretation thus guides the underlying response and explains in the same breath why organizations which face an identical threat react differently (Milliken, 1990). Therefore, resulting from these different cognitive structures and the interpretations that come along with them, different strategic actions follow, i.e. different decision-maker rather focus on one (planning) or the other (improvisation).

As an example for such an either-or focus on planning and improvisation, Labaka et al. (2016, p. 31), write that "most of the crisis management activities and systems in both [critical infrastructures they analyzed] were focused on preventing the triggering event and the escalation of incidents. They have few systems and procedures for the absorption and recovery periods. The reason for this was that they were almost sure that nothing could happen with their prevention systems". To be sure, that nothing can harm the well-prepared system, finally limits the focus on improvisation and in turn leads to an underdeveloped improvisation capability.

Taken together, it is necessary for actors to develop a certain awareness in the organizational context, that planning and improvising shall be pursued

simultaneously. Here we refer to the term "*resilience-focused*" used by Burnard et al. (2018, p. 359). Actors who are resilience-focused are conscious of the need to develop anticipatory plans and train staff early on. At the same time, a resilience focused awareness during acute crisis allows decision-makers to recognize that only relying on planned responses is not a pre-requisite for success. It rather makes them vulnerable and it is important to recognize that a combination of both kinds of responses might promise the best results and acting accordingly is necessary to be as resilient as possible. Actors who are resilience-focused thus know about the necessity of planning as well as reacting spontaneously. They plan and act on the basis of proactivity (Nowell et al., 2017) and at the same time they know about the necessity of a quick change to spontaneous reactions and solutions if the situation requires it (Adini et al., 2017).

5.5 Implications for future resilience research

Previous research has highlighted a number of different areas and aspects that, seen in isolation, contribute to the emergence of organizational resilience. In this regard, scholars are increasingly referring to organizational resilience as an "umbrella construct" (Duchek, 2019; Klein et al., 2003) that incorporates many different areas of research such as organizational culture (Harrison et al., 2017), innovation (Morais-Storz et al., 2018), leadership (-style) (Davison, 2014) or organizational practices/routines (Gittell, 2008).

However, an isolated consideration of the respective areas of organizational resilience inevitably leads to the fact that possible interactions between the areas are overlooked or simply not considered at all. Such an analysis of possible interactions is, however, necessary in order to open up the entire umbrella construct of organizational resilience.

First, a question worth examination could therefore be which areas of organizational resilience interact with each and are these interdependencies resilience enhancing, reducing, or seemingly reducing? Future research could hereby rely on the extensive literature about competing demands. Just because we came to the conclusion that planning and improvising constitute a duality does not necessarily mean that other components of resilience do not interact in such a way that they represent a paradox, trade-off, dilemma or something completely different. Our analysis offers a first attempt to analyze the interplay of two omnipresent components of resilience. Such an aggregated consideration of the components of organizational resilience offers the possibility to understand the complex resilience construct more precisely. Especially practitioners could gain a lot in the long term from such a comprehensive analysis of organizational resilience. If research examines these interactions more closely, more comprehensive recommendations can be given to build highly resilient organizations.

Second, how does a decision-maker become "resilience-focused" and how does it differ from related concepts such as cognitive resilience (Lengnick-Hall & Beck, 2005; Lengnick-Hall et al., 2011) or sensemaking (Weick, 1993). As far as our

analysis goes, we can conclude that decision-maker have to be aware of the benefits of pursuing planning and improvisation simultaneously in order to become truly resilient. Future research could examine whether and how decision-makers can be best trained to be "resilience-focused". Furthermore, future research has to create clarity about the different terms. Is being resilience-focused the same as sensemaking or having high levels of cognitive resilience?

Third, another promising area for future research could be the actual timing when switching between planning and improvising. When should organizations concentrate on planning and when should they concentrate on improvisation? Is there even a clear boundary between these two kinds of behavior or are they rather happening simultaneously throughout the resilience phases. Future research could therefore examine to what extent organizations can train improvisation skills during phases of planning and preparation. Is training for improvisation different from planning specific pre-defined response procedures?

5.6 **Conclusion**

Research so far has shown us that in order to become truly resilient, organizations must combine planning and improvising. However, organizations follow these recommendations only to a limited extent. Instead of trying to pursue both kinds of behavior they most often focus on one or the other in order to overcome adversity. This difference in recommendations given and the actual behavior of organizations shown led us to conceptually investigate why this gap exists.

We started from the assumption that organizational decision-makers view planning and improvising as being competing demands that, similar to centrifugal and centripetal forces, push and pull organizations towards different directions. By comparing different characteristics of planning and improvising we were able to pinpoint the two components of resilience as being a duality. Dualities are special in comparison to other kinds of competing demands (i.e. paradox, trade-off, dilemma) because actors view the elements as being contradictory to each other while in fact they are not contradictory at all. The seeming but non existing contradiction between planning and improvising has then guided our discussion.

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