UNRAVELING THE MEANING AND MEASUREMENT OF ORGANIZATIONAL RESILIENCE

A thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy

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Declaration

I certify that except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of the thesis is the result of work which has been carried out since the official commencement date of the approved research program; any editorial work, paid or unpaid, carried out by a third party is acknowledged; and, ethics procedures and guidelines have been followed.

Xun Yang
28th February 2019
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Time flies! I have been in Australia for already four years! I still remember the first time that I arrived at the building 80 of RMIT, meeting with my supervisors and being so excited about the new beginning of my life.

It is a great experience being a Ph.D. candidate and a researcher in RMIT. At my first year, I was enthusiastic and positive to everything, though at the same time struggling with the topic of my thesis. At year 2, I adapted the normal state and started the life of reading, writing, meeting with supervisors, and make amendments. Then, thankfully, I achieved great accomplishments in ways of thinking and writing philosophy in academic papers in year 3. Finally, I am able to finish and submit my thesis before the due date this year.

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# Table of Contents

Declaration ........................................................................................................................................... i
Acknowledgements ........................................................................................................................... ii
Table of Contents ............................................................................................................................ iv
List of Tables ...................................................................................................................................... viii
List of Figures ..................................................................................................................................... ix
List of Appendices ............................................................................................................................ x
Abstract ............................................................................................................................................... xi
Chapter 1 Introduction ....................................................................................................................... 1
Overview ............................................................................................................................................. 1

Chapter 2 Literature Review ............................................................................................................... 10
Overview .......................................................................................................................................... 10
Quantitative Studies of Organizational Resilience ........................................................................ 14
Qualitative and Mix-Method Studies on Organizational Resilience .................................................. 21
Conclusion .......................................................................................................................................... 30

Chapter 3 Theoretical Background ................................................................................................... 32
Overview .......................................................................................................................................... 32
Conceptual Frameworks of Organizational Resilience .................................................................... 32
- Mechanisms ................................................................................................................................. 33
- Levels ........................................................................................................................................... 40
- Antecedents ................................................................................................................................. 40
- Outcomes ..................................................................................................................................... 41
The 3-Component Resilience Capacity Framework ......................................................................... 42
The Dynamic Capabilities Theory .................................................................................................... 45
Conclusion .......................................................................................................................................... 48

Chapter 4 Study 1 ............................................................................................................................... 50
Mapping of Definitions of Organizational Resilience ...................................................................... 50
Overview ............................................................................................................................................ 50
Study 1.1 Definitions of Organizational Resilience: 1988-2016 ....................................................... 51
  - Introduction ............................................................................................................................... 51
  - Methodology ............................................................................................................................ 52
    * Literature search and inclusion criteria ................................................................................. 52
    * Data collection ...................................................................................................................... 53
    * Data analysis ......................................................................................................................... 53
<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Organizational Resilience</td>
<td></td>
</tr>
<tr>
<td>1.1 Introduction</td>
<td></td>
</tr>
<tr>
<td>1.2 Methodology</td>
<td></td>
</tr>
<tr>
<td>1.3 Results and Discussion</td>
<td></td>
</tr>
<tr>
<td>1.4 Summary of Findings and Development of a Unifying Definition</td>
<td></td>
</tr>
<tr>
<td>1.5 Paradigm of Organizational Resilience</td>
<td></td>
</tr>
<tr>
<td>2. An Exploratory Investigation on the Importance and Time Sensitivity</td>
<td></td>
</tr>
<tr>
<td>2.1 Overview</td>
<td></td>
</tr>
<tr>
<td>2.2 Methodology</td>
<td></td>
</tr>
<tr>
<td>2.3 Results and Discussion</td>
<td></td>
</tr>
<tr>
<td>2.4 Summary of Findings and Implications for Future Research</td>
<td></td>
</tr>
<tr>
<td>3. Effects of Adversity Phases on Organizational Resilience Abilities</td>
<td></td>
</tr>
<tr>
<td>3.1 Overview</td>
<td></td>
</tr>
<tr>
<td>3.2 Main Study: Online Survey</td>
<td></td>
</tr>
<tr>
<td>3.3 Results and Discussion</td>
<td></td>
</tr>
<tr>
<td>3.4 Summary of Findings and Development of a Unifying Definition</td>
<td></td>
</tr>
<tr>
<td>3.5 Paradigm of Organizational Resilience</td>
<td></td>
</tr>
</tbody>
</table>

Chapter 6 Study 3: An Exploratory Investigation on the Importance and Time Sensitivity of Organizational Resilience Capabilities

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1 Introduction</td>
<td>100</td>
</tr>
<tr>
<td>6.2 Methodology</td>
<td></td>
</tr>
<tr>
<td>6.3 Preliminary results</td>
<td>103</td>
</tr>
<tr>
<td>6.4 Main study: Online survey</td>
<td></td>
</tr>
<tr>
<td>6.5 Participants and procedures</td>
<td></td>
</tr>
<tr>
<td>6.6 The 11-component resilience questionnaire (T11CRQ)</td>
<td></td>
</tr>
<tr>
<td>6.7 Results</td>
<td></td>
</tr>
<tr>
<td>6.7.1 Part 1: Sample Characteristics</td>
<td>107</td>
</tr>
<tr>
<td>6.7.2 Part 2: Measurement Assessment</td>
<td></td>
</tr>
<tr>
<td>6.7.3 Reliability of the T11CRQ</td>
<td>110</td>
</tr>
<tr>
<td>6.7.4 Convergent and discriminant construct validity</td>
<td>111</td>
</tr>
<tr>
<td>6.7.5 Part 3: Thematic Analysis of Open-Ended Questions</td>
<td>112</td>
</tr>
<tr>
<td>6.7.6 Text-mining results of the most memorable adversity</td>
<td>112</td>
</tr>
<tr>
<td>6.7.7 Text-mining results of the actions firms took to deal with the most memorable adversity</td>
<td>114</td>
</tr>
<tr>
<td>6.7.8 Part 4: Effects of adversity phases on organizational resilience capabilities</td>
<td>116</td>
</tr>
<tr>
<td>6.8 Discussion</td>
<td>117</td>
</tr>
</tbody>
</table>

Chapter 7 Conclusion

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1 Overview</td>
<td>121</td>
</tr>
<tr>
<td>7.2 Summary of Findings and Development of a Unifying Definition</td>
<td></td>
</tr>
<tr>
<td>7.3 Paradigm of Organizational Resilience</td>
<td>122</td>
</tr>
</tbody>
</table>
Research Streams Based on Definitions.................................................................122
Research Streams Based on Measures .................................................................123
Development of a Unifying Definition and Paradigm of Organizational Resilience...124
Contributions and Implications.............................................................................130
  Contribution to the Dynamic Capabilities Theory .............................................130
  Contribution to a Theory of Organizational Resilience .......................................132
  Contribution to the Research and Measurement of Organizational Resilience......136
  Contribution to the Practice of Organizational Resilience ....................................137
Limitations and Future Directions .......................................................................138
Conclusion ..............................................................................................................139
References.............................................................................................................141
Appendices...........................................................................................................157
List of Tables

Table 1.1: The research design

Table 2.1: Literature reviews on resilience in the business and management domain

Table 2.2: Quantitative studies on organizational resilience

Table 2.3: Qualitative and/or mix studies on organizational resilience

Table 3.1: Conceptual frameworks of organizational resilience

Table 3.2: Situating organizational resilience within the dynamic capabilities theory

Table 4.1: Themes, respective concepts, and exemplars of definitions subsumed in a theme

Table 5.1: Themes, respective concepts, and exemplar of items subsumed in a theme

Table 6.1: Items and the respective origination of each capability

Table 6.2: The 11-component resilience questionnaire (T11CRQ)

Table 6.3: Correlation matrix for capabilities across the three periods of adversity

Table 6.4: Reliability and validity of measures for the cognitive, behavioral, and contextual components of organizational resilience across the three periods of adversity

Table 6.5: Fornell and Larcker criterion and HTMT criterion for discriminant validity

Table 6.6: Cross-factor loadings of each latent variable

Table 6.7: Themes, respective concepts, and exemplar subsumed in a theme

Table 6.8: Themes, respective concepts, and exemplar subsumed in a theme

Table 6.9: Repeated measures ANOVA with a Greenhouse-Geisser correction for the effects of time on the 11 resilience capabilities

Table 6.10: Post hoc analyses on the eight resilience capabilities
List of Figures

Figure 3.1: The 3-component resilience framework ...............................................................43
Figure 4.1: Theme map of organizational resilience definitions ........................................55
Figure 4.2: All article map (1988-2007) ........................................................................67
Figure 4.3: All article map (2008-2012) ........................................................................68
Figure 4.4: All article map (2013-2016) ........................................................................69
Figure 4.5: Conceptual articles map (1988-2016) .............................................................73
Figure 4.6: Qualitative articles map (1988-2016) ..............................................................74
Figure 4.7: Quantitative articles map (1988-2016) ............................................................75
Figure 5.1: Theme map of organizational resilience measures ........................................86
Figure 5.2: All article map (1988-2007) ........................................................................95
Figure 5.3: All article map (2008-2012) ........................................................................96
Figure 5.4: All article map (2013-2016) ........................................................................97
Figure 6.1: Organizational resilience as a second-order construct for the period of during adversity .........................................................................................................................110
Figure 6.2: The single most memorable adversity that SMEs face .....................................113
Figure 6.3: Actions taken by SMEs taken to deal with the most memorable adversity ........114
List of Appendices

Appendix 6.1: Participant information and consent form............................................157
Appendix 6.2: Organizational resilience as a second-order construct for the period of pre-adversity..................................................................................................................159
Appendix 6.3: Organizational resilience as a second-order construct for the period of post-adversity..................................................................................................................160
Abstract

Over the previous three decades, organizational resilience capability has become increasingly important for enterprises in today’s continuously changing environment (Erol, Sauser, & Mansour, 2010; Vogus & Sutcliffe, 2007). Technological breakthroughs and interconnected globalization has made enterprises vulnerable to unexpected and even minimal changes that precipitate or nudge profound outcomes (Weick & Sutcliffe, 2011).

Resilience capability is regarded as a unique property crucial for business survival and prosperity, particularly during turbulent times and in high velocity environments (Lengnick-Hall & Beck, 2009; Pettit, Fiksel, & Croxton, 2010; Sheffi, 2005a). Resilience capability enables enterprises to anticipate and understand current conditions, to allocate its people and resources flexibly (Erol et al., 2010), to change and adapt in an efficient and timely manner (Hamel & Valikangas, 2003; Sullivan-Taylor & Branicki, 2011), and to self-renew over time (Reinmoeller & Van Baardwijk, 2005).

However, despite the theoretical and empirical progress made to date, scholarship has been constrained by a lack of theoretical foundation, construct clarity, and operational inconsistency. The present thesis aims to address these major shortcomings by integrating three paradigms: The 3-component resilience capacity framework (Lengnick-Hall & Beck, 2005), the dynamic capabilities framework (Teece, 2007), and new thinking on micro foundations. This integration enables the formulation of a proposed model that combines the cognitive, behavioral, and micro-foundational components underlying organizational resilience.

This thesis adopts a systematic and novel approach to evaluating what scholars have written via a comprehensive and technical examination of the literature (articles published between 1988 and 2016 across ten computerized databases). Major articles were systematically reviewed using a machine-based text analysis, Leximancer, revealing which themes pervade
the field of scholarship based on what is written. In utilizing this approach, the current thesis focuses on concepts and themes that emerge from the text without allowing reading of articles to influence what was derived conceptually (thus reducing bias), as might be the case in narrative reviews. This approach is one that permits the text to reveal itself via the relationships found among the words themselves.

The present thesis is structured as follows. First, Chapter 2 reviews and integrates scholarly papers categorized along methodological lines (quantitative versus qualitative) in order to gain a comprehensive appreciation of the construct of organizational resilience in the business and management area. Chapter 3 introduces and discusses theories that underpin this thesis: The 3-component resilience capacity framework, the dynamic capabilities theory, and the major conceptual frameworks involving the levels (especially micro-foundational), mechanisms, antecedents, and outcomes of organizational resilience.

Chapter 4 involves a series of content analyses of definitions of organizational resilience obtained from a systematic search during the period 1988-2016. The aim of this investigation is to unravel the theoretical meaning of organizational resilience, and more specifically, to discern the stability and reliability of essential components of this construct. This Chapter consists of three interrelated studies. Study 1.1 is an in-depth content analysis of all definitions of organizational resilience, deconstructing definitions to identify prominent components. Study 1.2 examines the conceptual evolution of organizational resilience clustered across three periods: 1988-2007, 2008-2012, and 2013-2016 to determine whether the prominence of those components from Study 1.1 vary in tandem with the change of periods. Study 1.3 explores whether the prominence of components from Study 1.1 change according to theoretical and methodological orientation, be it, conceptual, quantitative, and qualitative.
Briefly, Study 1 reveals that organizational resilience involves three principal cognitive capabilities: anticipating, sensing, and situation awareness, and four behavioral capabilities: adaptability, flexibility, agility, and innovation. The cognitive component provides a foundation for organizational behavior. The behavioral component enables a firm to respond effectively and successfully to unexpected events. The prominence of these components varies in tandem with the period of time and with the different types of orientation, be it: conceptual, qualitative, and quantitative.

Chapters 5 (Study 2) concerns a series of content analyses of the measures of organizational resilience obtained from a systematic search during the period 1988-2016. The aim is to explore the operational meaning of organizational resilience and to determine the reliability of essential components of this construct. This Chapter contains two interrelated studies. Study 2.1 textually analyzes all measures of organizational resilience during the period 1988-2016, decomposing measures to pinpoint dominant components. Study 2.2 examines the operational evolution of organizational resilience clustered across three periods: 1988-2007, 2008-2012, and 2013-2016 to ascertain whether the prominence of those components from Study 2.1 vary in tandem with the change of periods. Overall, findings reveal that organizational resilience comprises micro-foundational capabilities including entrepreneurial leadership, decision-making, and social capital with access to information and knowledge. The prominence of these capabilities does not vary in tandem with the time period.

Chapter 6 (Study 3) took findings of the textual analyses of organizational resilience (Studies 1 & 2) to entrepreneurs of SMEs. Study 3 conducted an exploratory investigation on the importance and time sensitivity of the capabilities of organizational resilience. Findings indicate that the three cognitive (e.g., situation awareness, sensing, anticipating), four behavioral (e.g., adaptability, flexibility, agility, innovation), and four micro-foundational (e.g., leadership, decision-making, social capital, information and knowledge) capabilities are
regarded as important by entrepreneurs, irrespective of adversity phases. Moreover, the most memorable crises are related to micro-foundational factors: stakeholders, clients, key staff, and firm partners. However, the during-adversity phase, compared to the pre- and post-adversity phases, is considered critical by entrepreneurs.

This thesis concludes with a unifying definition that can bring coherence and clarity for future research. By linking the theoretical understanding, operational meaning, and contextual contingencies (extreme negative environmental conditions, time), organizational resilience is defined as a time-sensitive and second-order construct that incorporates a pattern of higher-order organizational dynamic capabilities and micro-foundations, which altogether enable firms to anticipate and sense current conditions, to allocate people and resources flexibly, and to change and adapt in an innovative and timely manner, in order to address extreme negative events.

Within the context of this definition, this thesis elaborates upon and dissects the texture of organizational resilience into its components, capabilities, and levels. Organizational resilience embodies three components (i.e., cognitive, behavioral, and micro-foundational). The cognitive and behavioral components incorporate higher-order dynamic capabilities at the organization-level, whereas the micro-foundations emphasize the individual-level. Capabilities are expressed differently at different time phases (e.g., before, during, & post an event) of extreme negative conditions.

The corollary of formulating of an integrative definition of organizational resilience will promote theoretical discourse and empirical investigations concerning the nature, constituents, enablers, and outcomes of organizational resilience, helping to bridge the current disconnect between theoretical development and operationalization of this construct, and ultimately contribute to our understanding of organizational survival and sustainable competitive advantage.
Chapter 1 Introduction

Overview

This chapter begins with a statement of business environments and theoretical developments embedded within the organizational resilience area. Next, the rationale, structure, and research objectives and questions for undertaking research into organizational resilience are outlined. Chapter 1 concludes with a summary of the contributions of this thesis.

In recent years, the global economy has experienced unprecedented levels of turbulence and disruption that have altered the dynamics of competition. As a result, no company, irrespective of industry, size, and age is immune to these forces. Given the increased velocity and levels of disruption in technologies, economies, and markets, answering the question concerning how organizations survive and gain a sustainable competitive advantage in highly dynamic and volatile environments is particularly relevant today.

Over the previous three decades, the emergence of a number of theories (Barney, 1991; Tosi & Slocum, 1984) has informed such questions. One such perspective, the dynamic capabilities framework explains how firms sustain their competitive advantages in rapidly changing environments by developing and sustaining “an ability to integrate, build, and reconfigure internal and external organizational assets and competences” (Teece et al., 1997, p. 516). Despite its prominence and applicability, Eisenhardt and Martin (2000), amongst others, have questioned the power of this framework to explain firm behavior in high-velocity environments.
In this light, this thesis argues that organizational resilience has a critical role to play in addressing this shortfall. Resilience capability is regarded as a unique property crucial for business survival and prosperity, particularly during turbulent times and in high-velocity environments (Lengnick-Hall & Beck, 2009; Pettit et al., 2010; Sheffi, 2005a). Resilience capability enables enterprises to anticipate and understand current conditions, to allocate its people and resources flexibly (Erol et al., 2010), to change and adapt in an efficient and timely manner (Hamel & Valikangas, 2003; Sullivan-Taylor & Branicki, 2011), and to self-renew over time (Reinmoeller & Van Baardwijk, 2005).

However, despite the theoretical and empirical progress made to date, the development and application of the organizational resilience construct have been hindered by three interrelated issues: the dearth of theoretical foundation, definitional inconsistency, and a glaring operational muddle.

First, six reviews of organizational resilience (Table 2.1, p.12) have been identified from the business and management literature including supply chain management (Kamalahmadi & Parast, 2016), strategic and operational management (Annarelli & Nonino, 2016; Linnenluecke, 2017), crisis management (Williams, Gruber, Sutcliffe, Shepherd, & Zhao, 2017), occupational psychology (Kossek & Perrigino, 2016), and entrepreneurship (Korber & McNaughton, 2018). Extant reviews suggest that organizational resilience is in a formative phase (Annarelli & Nonino, 2016) concentrating on understanding and uncovering the different streams of research (Kamalahmadi & Parast, 2016; Linnenluecke, 2017) and integrating scholarly conversations (Korber & McNaughton, 2018). These reviews highlight two prominent problems. One is that organizational resilience is conceptualized imprecisely and differently within studies (Annarelli & Nonino, 2016; Korber & McNaughton, 2018; Linnenluecke, 2017). The other involves a lack of robust, reliable, and valid measure (Kamalahmadi & Parast, 2016; Linnenluecke, 2017).
Second, existing frameworks have identified antecedents to the development of organizational resilience (Pal, Torstensson, & Mattila, 2014), key components comprising this construct (de Oliveira Teixeira & Werther, 2013), and the processes by which this capacity can be cultivated (Kantur & İşeri-Say, 2012). Notwithstanding, a review of existing research reveals that these frameworks have relied extensively on desktop research and thus lack empirical validation. As Linnenluecke (2017) observes, theories of organizational resilience have varied dramatically over the years. High-reliability organizing (Sutcliffe, 2011) has emerged as the dominant theory prior to 9/11. Post 9/11, however, attention shifted to coping mechanisms and response strategies under conditions of extreme environmental uncertainty and disruption.

Third, the lack of a solid theoretical foundation has led to definitional inconsistencies in the literature on organizational resilience. In fact, emergent definitions fail to identify the nature and texture of this construct, raising questions as to whether organizational resilience is a capability (Annarelli & Nonino, 2016; Kamalahmadi & Parast, 2016), a property (Burnard & Bhamra, 2011; Lengnick-Hall & Beck, 2005), a function (McManus et al., 2008), a process (Williams et al., 2017) or even an amalgam of these components. This ambiguity is reflected in the plethora of definitions used to describe the characteristics typifying organizational resilience. Though some definitions emphasize an ability to adapt (Madni & Jackson, 2009) and to gain access to flexible resources (Acquaah, Amoako-Gyampah, & Jayaram, 2011), others focus on rapid and effective responses to crises (Pettit et al., 2013). Further, as in the case of innovation-related research, most definitions exhibit a high degree of tautology and fail to distinguish among components (Oh & Teo, 2006), antecedents (Mafabi, Munene, & Ntayi, 2012), and consequences (Dewald & Bowen, 2010).

Finally, the lack of theoretical foundations and the definitional inconsistencies have contributed substantially to an operational muddle and subsequent low levels of construct validity. Few studies (Akgün & Keskin, 2014; Richtnér & Lőfsten, 2014) provide details as to theories that
underpin the development of their measures. Reported measures often take different perspectives. For example, a number of instruments tap the challenges an organization might face (Alonso, 2015; Alonso & Bressan, 2015) or the dynamic capabilities necessary for reconfiguring and re-enhancing resources (Birkie, 2016). As a consequence, aligning and embedding identified measures of organizational resilience with accepted theoretical frameworks is problematic.

The muddle is further reflected in a diverse range of dimensions across measures. Is resilience capability unidimensional, multi-dimensional, or an amalgam of multiple capabilities? Hitherto, this question has neither been addressed nor let alone proposed. One stream of research considers organizational resilience capabilities to be uni-dimensional (Ambulkar, Blackhurst, & Grawe, 2015; Biggs, Hall, & Stoeckl, 2012; Blatt, 2009), while other streams regard this construct to be either bi-dimensional (Oh & Teo, 2006; Sonnet, 2016) or multi-dimensional (Andrew, Arlikatti, Siebeneck, Pongponrat, & Jaikampan, 2016; Birkie, 2016). Adaptive capacity, networking, and planning are three dimensions widely utilized in empirical studies (Jones, 2015; Orchiston, Prayag, & Brown, 2016; Stephenson, 2010). Such diversity makes it difficult to untangle what is meant by and how to specifically measure different levels of organizational resilience, as well as enabling comparisons of findings across studies.

Against this backdrop, the objective of the current thesis is to address the research gap between theory, definition, and measurement through an examination of definitions and measures of organizational resilience. This exploration involves integrating the 3-component resilience capacity framework (Lengnick-Hall & Beck, 2005), the dynamic capabilities framework (Teece, 2007), with recent thinking on micro-foundations (Lippman & Rumelt, 2003a, 2003b). The present integration culminates in the development of a model that combines recent micro-foundations thinking with the cognitive and behavioral components underlying organizational resilience.
As one of few frameworks underpinned by theory, Lengnick-Hall and Beck (2005) provide the boundary conditions within which to understand the findings. This framework explains comprehensively the components of resilience capacity that enable an organization to adapt to uncertainties. In this framework, cognitive, behavioral, and contextual components indispensably and interrelatedly constitute resilience capacity. Yet, the sub-components, especially those concerning behavioral resilience (a wide range of action inventories, useful habits) are not consistent with key characteristics identified as being central in the business area such as being flexible (Erol et al., 2010; Pal, Torstensson, & Mattila, 2014) and agile (Erol et al., 2010; Tierney, 2003). Moreover, these sub-components have not been demonstrated empirically to be associated with organizational resilience. Thus, this thesis determines whether there is a match between the components and subcomponents derived from the current text-mining exercise with those proposed by Lengnick-Hall and Beck (2005, 2015).

As an outcome of the present thesis, organizational resilience is viewed as a pattern of higher-order dynamic capabilities. Dynamic capabilities theory (Teece, 2007; Teece, Pisano, & Shuen, 1997) provides explanations concerning the capabilities and micro-foundations that firms need to address the challenges associated with constantly changing environments. These dynamic capabilities involves three principal cognitive capabilities: anticipating (Ates & Bititci, 2011), sensing (Birkie, 2016), and situation awareness (McManus, 2008), four behavioral capabilities: adaptability (McManus, 2008), flexibility (Yilmaz Borekci, Rofcanin, & Gürbüz, 2015), agility (Kamalahmadi & Parast, 2016), and innovation (Oh & Teo, 2006), and four micro-foundations: leadership (Williams et al., 2017), decision-making, social capital (Sullivan-Taylor & Branicki, 2011), and information and knowledge.

In regard to the overall design, this thesis adopts a systematic and novel approach to evaluating what scholars have written via a comprehensive and technical examination of the literature (articles published between 1988 and 2016 across ten computerized databases). Major articles
were systematically reviewed using a machine-based text analytic program entitled Leximancer, revealing which themes pervade the field of scholarship based on what is written. In utilizing this approach, the current thesis identified concepts and themes that emerge from the text without allowing reading of articles to influence what was derived conceptually (thus reducing bias), as might be the case in narrative reviews. This approach is one that permits the text to reveal itself via the relationships found among the words themselves.

The present thesis is structured as follows. Chapter 2 reviews and integrates scholarly papers categorized along methodological lines (quantitative versus qualitative) in order to gain a comprehensive appreciation of the construct of organizational resilience in the business and management area. Chapter 3 introduces and discusses theories that underpin this thesis: The 3-component resilience capacity framework, the dynamic capabilities theory, and the major conceptual frameworks involving the levels (especially micro-foundational), mechanisms, antecedents, and outcomes of organizational resilience.

This thesis comprises three inter-related studies. Table 1.1 provides a overall summary of the research design for this thesis. Chapter 4 (Study 1) involves a series of content analyses of the definitions of organizational resilience obtained from a systematic search during the period 1988-2016. The aim of Study 1 is to unravel the theoretical meaning of organizational resilience, and more specifically, to discern the stability and reliability of essential components of this construct. The research questions are outlined in Table 1.1.

Extending Study 1, Chapter 5 (Study 2) concerns a series of content analyses of measures of organizational resilience obtained from a systematic search during the period 1988-2016. Study 2 aims is to explore the operational meaning of organizational resilience and to determine the reliability of essential components of this construct. Table 1.1 provides the research questions.
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<thead>
<tr>
<th>Study</th>
<th>Sub-Study</th>
<th>Design</th>
<th>Research questions</th>
</tr>
</thead>
</table>
| Study 1 Mapping of definitions of organizational resilience | Study 1.1: Definitions of organizational resilience: 1988-2016 | Qualitative | RQ1.1.1: What are the underlying components of definitions of organizational resilience?  
RQ1.1.2: To what extent are these components congruent with the 3-component resilience capacity framework proposed by Lengnick-Hall and Beck (2005)? |
| Study 1.2: Conceptual evolution of definitions of organizational resilience: 1988-2016 | Qualitative | RQ1.2.1: Have definitions of organizational resilience evolved from 1988 to 2016?  
RQ1.2.2: If so, whether the prominence of components and capabilities identified in Study 1.1 varies in tandem with the change of period? |
| Study 1.3: Analysis of definitions of organizational resilience originating from conceptual, qualitative, and quantitative papers: 1988-2016 | Qualitative | RQ1.3.1: What components and capabilities from Study 1.1 are liable to conceptual papers, and thus have been employed in the theoretical building?  
RQ1.3.2: What components and capabilities from Study 1.1 are more susceptible to measurement, and thus have been employed in empirical research? |
| Study 2 Mapping of measures of organizational resilience | Study 2.1: Measures of organizational resilience: 1988-2016 | Qualitative | RQ2.1.1: What are the underlying components of measures of organizational resilience?  
RQ2.1.2: To what extent are these components congruent with the 3-component resilience capacity framework proposed by Lengnick-Hall and Beck (2005)? |
| Study 2.2: Operational evolution of measures of organizational resilience: 1988-2016 | Qualitative | RQ2.2.1: If any, how have the measures evolved from 1988 to 2016?  
RQ2.2.2: Whether the prominence of those components and capabilities identified from Study 2.1 varies in tandem with the change of periods? |
| Study 3 An exploratory investigation on the importance and time sensitivity of organizational resilience capabilities | Quantitative | RQ3.1: Do entrepreneurs regard each of the 11 capabilities important?  
RQ3.2: If so, are different resilience capabilities viewed as being more important than others at different phases (i.e., pre- , during, post-adversity)? |
Chapter 6 (Study 3) took the findings of the textual analyses of organizational resilience (Studies 1 & 2) to entrepreneurs of SMEs. The aim of this investigation is to explore the importance and time sensitivity of the capabilities of organizational resilience. Table 1.1 addresses the research questions of Study 3.

Entrepreneurs of SMEs were chosen as the unit of analysis because this group of organizations is a significant contributor to the economy. SMEs comprise 97% of all Australian businesses, producing 1/3 of total GDP and exporting 90% of all goods including over 60% of services.

This thesis contributes substantially to the theory, research, and practice of organizational resilience and dynamic capabilities framework in three ways. First, the thesis uncovers five research streams embedded within the definitions and measures of organizational resilience. It is noteworthy that the theoretical and operational meanings of this construct have not developed in tandem. While the operational meaning remains relatively stable over time, the theoretical meaning is dynamic and varies with regard to time and the orientation of the manuscript, be it theoretical, quantitative, or qualitative. Second, findings demonstrate how organizational resilience capabilities are at the forefront of dealing with volatile environments, drawing attention to the central role of contextual contingencies, particularly the phases of adversity.

Finally, this thesis develops an integrative definition and model, arguing organizational resilience is a time-sensitive second-order construct. This construct comprises a pattern of higher-order dynamic capabilities involving cognitive, behavioral, and micro-foundational components that enable firms to anticipate and sense current conditions, to allocate people and resources flexibly, and to change and adapt in an innovative, agile, and timely manner to address extreme negative events. Viewing organizational resilience as comprising higher-order dynamic capabilities is beneficial in both ways. On the one hand, the dynamic capabilities
theory provides explanations concerning the multi-level and multi-dimension nature of organizational resilience involving internal organizational and micro-foundational elements. On the other hand, it extends the environmental boundary conditions and explanatory power of the dynamic capability framework to turbulent and consummate negative events (i.e., adversities, crises).

The following chapter reviews pertinent quantitative and qualitative studies related to the construct of organizational resilience.
Chapter 2 Literature Review

Overview

Chapter 2 integrates scholarly papers categorized along methodological lines (quantitative versus qualitative) in order to gain a comprehensive appreciation of the construct of organizational resilience in the business and management area. This chapter begins with a discussion of the origin of organizational resilience from other disciplines, followed by a review of the literature on organizational resilience espoused by quantitative and qualitative investigations, and concludes with a discussion of the central issues associated with this construct and ways in which this thesis addressed these issues.

 Principally, the construct of organizational resilience is derived from two distinct but compatible sources: materials strength principles in engineering and the dynamics of complex ecosystems (Erol et al., 2010). Different definitions of resilience predominate across different disciplines, such as psychology (Connor & Davidson, 2003; Windle, 2011), material science (Callaway, Newman, Strogatz, & Watts, 2000), computer networks (Trivedi, Kim, & Ghosh, 2009), ecology (Walker, Holling, Carpenter, & Kinzig, 2004), and engineering (Woods, 2015). In ecology, definitions focus on survival and refer to an ability of a system to absorb and respond to disturbance (Holling, 1973). In psychology, resilience relates to an individual’s ability to cope with stress and catastrophe in a positive manner (Windle, 2011). In the field of material science, resilience refers to a material’s physical properties to bounce back to a normal state following deformation (Callaway et al., 2000). Most definitions outline two key factors: the occurrence of a negative event such as disturbance, stress, or deformation; and the positive reaction and adaptation.
Six reviews of organizational resilience (Table 2.1, p. 12) have been identified from the business and management literature including supply chain management (Kamalahmadi & Parast, 2016), strategic and operational management (Annarelli & Nonino, 2016; Linnenluecke, 2017), crisis management (Williams et al., 2017), occupational psychology (Kossek & Perrigino, 2016), and entrepreneurship (Korber & McNaughton, 2018). Extant reviews suggest that organizational resilience is in a formative phase (Annarelli & Nonino, 2016) concentrating on understanding and uncovering the different streams of research (Kamalahmadi & Parast, 2016; Linnenluecke, 2017) and integrating scholarly conversations (Korber & McNaughton, 2018). These reviews highlight two prominent problems. One is that organizational resilience is conceptualized imprecisely and differently within studies (Annarelli & Nonino, 2016; Korber & McNaughton, 2018; Linnenluecke, 2017). The other involves a lack of robust, reliable, and valid measure (Kamalahmadi & Parast, 2016; Linnenluecke, 2017).

However, the current six reviews on organizational resilience do not fully address the problems embedded within the construct of organizational resilience, such as dearth of theory underpinning conceptualizations, and the definitional and operational inconsistencies. Thus, further systematic reviews could help to address these issues. Accordingly, the aims of Chapter 2 are to undertake a comprehensive literature review of organizational resilience. Scholarly papers categorized along methodological lines: quantitative versus qualitative investigations were reviewed and contrasted. This demarcation of papers was undertaken to identify the different streams of research, highlight different foci of interest, and review similarities and asymmetry in emphasis.
<table>
<thead>
<tr>
<th>Authors</th>
<th>Summary</th>
<th>Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Korber and McNaughton (2018)</td>
<td>• Identify six scholarly conversations at the intersection of resilience and entrepreneurship: 1. Resilience as a trait or a characteristic of entrepreneurial firms or individuals 2. Resilience as a trigger for entrepreneurial intentions, 3. Entrepreneurial behavior as enhancing organizational resilience 4. Entrepreneurial firms fostering macro-levels (regions, communities, economies) resilience 5. Resilience in the context of entrepreneurial failure 6. Resilience as a process of recovery and transformation • Conclude that resilience is imprecisely defined • Suggest that future research should take a more holistic approach to explore entrepreneurship and resilience from a multi-level and longitudinal perspective.</td>
<td>Review of entrepreneurship and resilience</td>
</tr>
<tr>
<td>Williams et al. (2017)</td>
<td>• Identify three stages of resilience development and enactment process 1. Pre-adversity resource endowments: financial, cognitive, behavioral, emotion-regulation and relational capability 2. Pre-adversity organizing: preparing and restoring 3. Responding to major disturbances: cognitive and behavioral responding, and contextual reinforcement. • Indicate the resilience feedback loop 1. Experience, feedback, and resilience 2. Interpretations of tasks and relationships • Indicate the outcomes of organizational resilience 1. Positive: perseverance, enhanced reliability to challenging events, functioning despite extreme adversity, maintenance of core activities 2. Negative: organizational misalignment, poor adaptability, inability to transform • One of the first papers that illuminate processes associated with the three time periods: pre-, during-, and post-crisis. • One of the first papers that point out the negative aspects of organizational resilience.</td>
<td>Builds on a systematic review of literature toward resilience, crisis, and adversity in mainstream management and crisis management journals.</td>
</tr>
<tr>
<td>Linnenluecke (2017)</td>
<td>• Identify five research streams, in which resilience is viewed as: 1. Organizational responses to external threats, 2. Organizational reliability, 3. Employee strengths, 4. Business model innovation and adaptability, 5. Design principles that reduce supply chain vulnerabilities and disruptions. • Highlight that resilience has been conceptualized quite differently across studies. Different research streams have developed their own definitions and theories of organizational resilience • There is a lack of research exploring conceptual similarities and differences among streams. • Identify that organizational resilience has been operationalized differently.</td>
<td>Review of influential publications on resilience in business and management research</td>
</tr>
</tbody>
</table>

Table 2.1 continues…
Annarelli and Nonino (2016)

- Identify four different directions of strategic and operational resilience:
  1. Resilient design of organizations and on the management of internal resources for resilience
  2. Resilient design and management of external resources, actions, and processes for resilience (e.g. relationships and links in supply chains, supply networks or industries)
  3. Static resilience (i.e. strategic initiatives for resilience linked to operational management of internal and external resources)
  4. Dynamic resilience (i.e. dynamic capabilities of managing disruptions and unexpected events).

Kossek and Perrigino (2016)

- Specific occupational tasks and contextual demands imply different connotations of what “resilience” means and how contexts may constrain or foster resiliency.
  1. Multiple conceptual strands related to accessing resources (trait, capacity, and processes);
  2. Positive and negative triggers that are occupationally distinguished
  3. Different resilience types (cognitive, emotional, physical) that vary in need, breadth, and importance across occupations
  4. A dynamic phenomenon that occurs within and across career stages;
  5. Both content-general and job-specific occupational tensions;

Kamalahmadi and Parast (2016)

- Identify four supply chain resilience principles:
  1. Supply chain reengineering (flexibility, redundancy)
  2. Collaboration (trust, information sharing)
  3. Agility (visibility, velocity)
  4. Supply chain risk management culture (leadership, innovation)

- Empirical and analytical studies need to explore how SMEs can enhance resilience
- There is a lack of supply chain resilience measures.
Quantitative Studies of Organizational Resilience

As shown in Table 2.2 (p. 17), a review of the literature identified that quantitative studies \(n=27\) focus on investigating the contextual contingencies \(n=17\), antecedents \(n=23\), proxy measures \(n=18\), and outcomes \(n=8\) of organizational resilience. Contextual contingencies involve demographics such as industry sector and firm size and environmental conditions. In terms of organizational demographics, Table 2.2 reveals that organizational resilience has been investigated across the a number of industry sectors \(n=21\) such as restaurant and hospitality area (Hallak, Assaker, O’Connor, & Lee, 2018), utilities (Parker & Ameen, 2018), telecommunication (Amah & Onwugalu, 2017), construction (Lafuente, Strassburger, Vaillant, & Vilajosana, 2017), and aviation (Gittell, Cameron, Lim, & Rivas, 2006). Most studies \(n=23\), however, do not specify firm size (Collier, 2018; DesJardine, Bansal, & Yang, in press; Williams & Anyanwu, 2017). Only three studies investigate small (Conz, Denicolai, & Zucchella, 2017; Dewald & Bowen, 2010) or medium-size firms (Conz et al., 2017; Richtnér & Löfsten, 2014).

For the environmental conditions, Table 2.2 indicates that organizational resilience is viewed as being most applicable during extreme negative conditions such as ecological adversities (Clément, 2017); political crises (Biggs, Hall, & Stoeckl, 2012); technological disruptions (Dewald & Bowen, 2010); the global financial crisis (Branicki, Sullivan-Taylor, & Livschitz, 2018; Conz et al., 2017); and natural disasters such as typhoons (Jung, 2017), floods (Andrew, Arlikatti, Siebeneck, Pongponrat, & Jaikampan, 2016) and earthquakes (Martinelli, Tagliazucchi, & Marchi, in press). These conditions can predispose organizations to near-death experiences that threaten their survival.

In regards to the time phase, Table 2.2 identifies that the majority \(n=15\) of empirical studies examine organizational resilience post adversity (Collier, 2018; Ingram & Glód, 2018; Prayag, Chowdhury, Spector, & Orchiston, in press). Four studies (Buyl, Boone, & Wade, in press;
Clément, 2017; Conz et al., 2017; Lafuente et al., 2017) examined intra-organizational capabilities and micro-foundations across three phases of time (i.e., pre-, during, post-adversity). For example, Buyl et al. (in press) observed positive associations between narcissistic CEO traits and resilience of banks prior to the GFC, but these traits contributed to slow recovery following the GFC. Only Dewald and Bowen (2010) investigated firm resilience during periods of environmental change and associated disruptive business model innovation.

A relatively large number of antecedents contribute to the development of organizational resilience. These antecedents include internationalization experience (Collier, 2018), sensitivity to and awareness of weak signals (Ingram & Głód, 2018), resource reconfiguration (Parker & Ameen, 2018), leadership (Teo, Lee, & Lim, 2017), and innovation (Mafabi, Munene, & Ahiauzu, 2015). Surprisingly, the majority of antecedents investigated are dissimilar to those proposed in conceptualizations (Table 3.1, p. 33) such as organizational connectivity (Erol et al., 2010) and strategic capacity (Kantur & İşeri-Say, 2012).

In terms of proxy measures, Table 2.2 identifies three different research streams. One research stream (n=7) operationalizes and tests organizational resilience based on components and capabilities advanced in conceptualizations of organizational resilience (Table 3.1, p. 33). For example, Akgün and Keskin (2014), and Richtnér and Löfsten (2014), respectively, extend the 3-component resilience capacity framework of Lengnick-Hall and Beck (2005), in which cognitive, behavioral, and contextual resilience; and structural, cognitive, relational, and emotional resources are considered to be components of organizational resilience. Another research stream (n=5) focus on subjective measures such as firm survival, continuity, and reorientation (Branicki et al., 2018); organizational adaptation (Clément, 2017); and competitiveness (Mafabi, Munene, & Ntayi, 2012). The third stream (n=3) emphasizes objective measures such as declines in performance (severity of financial loss) and recovery time (Buyl et al., in press; DesJardine et al., in press); business performance (ROA) (Lafuente
et al., 2017); and improved financial volatility, sales growth, and survival rate (Ortiz-de-Mandojana & Bansal, 2016). It is noteworthy that articles in research stream 3 are published in highly ranked journals such as the *Journal of Management*.

As well, there are three research streams associated with measurement of the outcomes of organizational resilience (Table 2.2). One stream \((n=3)\) examines the impact of resilience on objective measures of firm performance such as profitability (Akgün & Keskin, 2014; Collier, 2018; Prayag et al., in press). The second stream \((n=3)\) tests the outcomes identified in conceptualizations of resilience (Table 3.1, p. 33), including organizational creativity (Richtnér & Löfsten, 2014), organizational recovery (Wicker, Filo, Cuskelly, Doherty, & Cousens, 2013), and change resistance and adoption (Dewald & Bowen, 2010). The final stream (Hallak et al., 2018) develops its own theoretical frameworks and outcomes, investigating associations between organizational resilience and commitment to innovation, creative self-efficacy, and self-assessed performance.

In summary, quantitative investigations contribute to the field in three ways: by contextualizing organizational resilience across certain environmental conditions and adversity phases; specifying the interrelations of this construct to its antecedents and outcomes; and importantly proffering a number of questionnaires for measuring this construct. However, owing to limited theoretical development, there appear to be no valid, reliable, and well-established measures, contributing to the ambiguity surrounding the antecedents, proxy measures, and outcomes associated with organizational resilience. As a case in point, innovation has been investigated as either an antecedent (Akgün & Keskin, 2014; Williams & Anyanwu, 2017), a proxy measure (Oh & Teo, 2006), or an outcome (Hallak et al., 2018) of organizational resilience. Also, objective performance indicators have not only been utilized to measure (Buyl et al., in press; DesJardine et al., in press) but also to investigate the impact (Prayag et al., in press) of organizational resilience.
<table>
<thead>
<tr>
<th>Authors</th>
<th>Industry type &amp; Firm size</th>
<th>Environmental conditions</th>
<th>Adversity phase</th>
<th>Resilience antecedents</th>
<th>Dimensions or proxy measures of resilience</th>
<th>Resilience outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collier (2018)</td>
<td>Not specified</td>
<td>2008 GFC</td>
<td>Post</td>
<td>• Internationalization experience (diversity &amp; frequency)</td>
<td>• Magnitude of resilience (aggregate bankruptcy index)</td>
<td>Performance (e.g., profitability)</td>
</tr>
<tr>
<td>Hallak et al. (2018)</td>
<td>Restaurant &amp; hospitality industry; Size not specified</td>
<td>Not specified</td>
<td>Not specified</td>
<td>• Not examined</td>
<td>• Not specified</td>
<td>Compromise to innovation</td>
</tr>
<tr>
<td>Ingram and Gild (2018)</td>
<td>Family business; Size not specified</td>
<td>Financial crisis</td>
<td>Post</td>
<td>• Professionalization of management</td>
<td>• Not specified</td>
<td>• Creative self-efficacy</td>
</tr>
<tr>
<td>Parker and Ameen (2018)</td>
<td>Utility; Size not specified</td>
<td>Infrastructure (Electricity)</td>
<td>During &amp; post</td>
<td>• Awareness to weak signals</td>
<td>• Not specified</td>
<td>• Self-assess performance</td>
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<tr>
<td>Prayag et al. (in press)</td>
<td>Tourism; Size not specified</td>
<td>Natural disasters (earthquake)</td>
<td>Post</td>
<td>• Disruption orientation</td>
<td>• Not specified</td>
<td>Not examined</td>
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<tr>
<td>Amah and Onwughalu (2017)</td>
<td>Telecommunication; Size not specified</td>
<td>Not specified</td>
<td>Not specified</td>
<td>• Resource reconfiguration</td>
<td>• Planned resilience</td>
<td>Financial performance</td>
</tr>
<tr>
<td>Branicki et al. (2018)</td>
<td>SMEs; Type not specified</td>
<td>Not specified</td>
<td>Not specified</td>
<td>• Entrepreneurial resilience</td>
<td>• Adaptive resilience</td>
<td>Not examined</td>
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</tbody>
</table>

**Note:** time phase is either pre-, during-, post-adversity

*Table 2.2 continues...*
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<thead>
<tr>
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<th>Resilience outcomes</th>
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<tbody>
<tr>
<td>Buyl et al. (in press)</td>
<td>Bank; Size not specified</td>
<td>2008 GFC</td>
<td>Pre &amp; post</td>
<td>• CEO narcissism</td>
<td>• Drop in performance</td>
<td>Not examined</td>
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<td>• Corporate governance practices</td>
<td>• Time to recovery to pre-shock performance level</td>
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<td>• Risk-taking policies</td>
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<td>• Firm age</td>
<td>• Organizational adaptation</td>
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<td>• Regulatory environment</td>
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<td>• Decision-making</td>
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<td>• Not specified</td>
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<tr>
<td>DesJardine et al. (in press)</td>
<td>Construction; Size not specified</td>
<td>2008 GFC</td>
<td>Pre &amp; post</td>
<td>• Financial resources</td>
<td>• Business performance (ROA)</td>
<td>Not examined</td>
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<td>• Not specified</td>
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<tr>
<td>Teo et al. (2017)</td>
<td>Healthcare; Size not specified</td>
<td>2003 SARS Crisis</td>
<td>Post</td>
<td>• Leadership</td>
<td>• Not specified</td>
<td>Not examined</td>
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<td>• Relational connections</td>
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<tr>
<td>Williams and Anyanwu (2017)</td>
<td>Food &amp; beverage; Size not specified</td>
<td>Not specified</td>
<td>Not specified</td>
<td>• Product innovation</td>
<td>• Adaptability</td>
<td>Not examined</td>
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<td>• Not specified</td>
<td>• Vulnerability</td>
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<tr>
<td>Andrew et al. (2016)</td>
<td>Services; Size not specified</td>
<td>Natural disasters (flood)</td>
<td>Post</td>
<td>• Bonding and bridging</td>
<td>• Not specified</td>
<td>Not examined</td>
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<tr>
<td>Jung (2015)</td>
<td>Fire &amp; police station; Size not specified</td>
<td>Natural disasters (typhoon)</td>
<td>Pre &amp; post</td>
<td>• Inter-organizational collaboration</td>
<td>• Not specified</td>
<td>Not examined</td>
</tr>
<tr>
<td>Mafabi et al. (2012)</td>
<td>Mainly governments; Size not specified</td>
<td>Not specified</td>
<td>Not specified</td>
<td>• Innovation</td>
<td>• Organizational adaptation</td>
<td>Not examined</td>
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<td>• Knowledge management</td>
<td>• Competitiveness</td>
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<td>• Organizational value</td>
<td>• Organizational value</td>
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</table>

Note: time phase is either pre-, during-, post-adversity

Table 2.2 continues...
<table>
<thead>
<tr>
<th>Authors</th>
<th>Industry type &amp; Firm size</th>
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<th>Resilience outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ortiz-de-Mandojana and Bansal (2016)</td>
<td>Not specified</td>
<td>Not specified</td>
<td>Not specified</td>
<td>Social &amp; environmental practices</td>
<td>Improved financial volatility</td>
<td>Not examined</td>
</tr>
<tr>
<td>Borekci, Rofcanin, and Sahin (2014)</td>
<td>Service subcontractors; Size not specified</td>
<td>Not specified</td>
<td>Not specified</td>
<td>Not examined</td>
<td>Structural reliance</td>
<td>Riskiness</td>
</tr>
<tr>
<td>Richtner and Lofsten (2014)</td>
<td>High-tech; Medium size firm</td>
<td>Not specified</td>
<td>Not specified</td>
<td>Not examined</td>
<td>Structural resources</td>
<td>Organizational creativity</td>
</tr>
<tr>
<td>Williams and Shepherd (2014)</td>
<td>Not reported</td>
<td>Black Saturday natural disaster (2009 bushfires in Australia)</td>
<td>Post</td>
<td>Venture creation</td>
<td>Behavioural resilience</td>
<td>Not examined</td>
</tr>
<tr>
<td>Wicker et al. (2013)</td>
<td>Sports clubs; Size not specified</td>
<td>Natural disasters (flood, cyclone)</td>
<td>Post</td>
<td>Grant support</td>
<td>Robustness</td>
<td>Organizational recovery</td>
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<tr>
<td>Dewald and Bowen (2010)</td>
<td>Real estate brokerage; Small firms</td>
<td>Environmental changes from disruptive business model innovation</td>
<td>During</td>
<td>Managers’ risk experience &amp; urgency perception</td>
<td>Robustness</td>
<td>Change resistance &amp; adoption</td>
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Table 2.2 continues...

Note: time phase is either pre-, during-, post-adversity
<table>
<thead>
<tr>
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<th>Dimensions or proxy measures of resilience</th>
<th>Resilience outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blatt (2009)</td>
<td>High-tech IT new ventures; Size not specified</td>
<td>Not specified</td>
<td>Not specified</td>
<td>• Communal schemas                                                                     • Trust</td>
<td></td>
<td>Not examined</td>
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<tr>
<td></td>
<td>Gittell et al. (2006)</td>
<td>9/11 Terrorism</td>
<td>Post</td>
<td>• Contracting practices                                                                 • Creativity</td>
<td></td>
<td>Not examined</td>
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<td></td>
<td>Aviation industry; Size not specified</td>
<td></td>
<td></td>
<td>• Relational reserves                                                                   • Not specified</td>
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<td>• Financial reserves</td>
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<td>• Business model viability</td>
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<td>• IT capability</td>
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<td>• Managerial proactiveness</td>
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<td>• Innovativeness (Hamel &amp; Valikangas, 2003)</td>
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<td></td>
<td></td>
<td>• Agility (Volberda, 1996)</td>
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<tr>
<td>Oh and Teo (2006)</td>
<td>Retail industry; Size not specified</td>
<td>Not specified</td>
<td>Not specified</td>
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<td>Not examined</td>
</tr>
</tbody>
</table>
Qualitative and Mix-Method Studies on Organizational Resilience

As shown in Table 2.3 (p. 22), Qualitative and mix-method studies (n=27) combine the strengths of conceptual papers and quantitative studies and develop and test their own conceptual frameworks within contextual contingencies and phases of adversity. This methodological approach to the study of resilience offers a range of broad-based research findings that have contributed to theory development and the validation of empirical studies in this area.

Table 2.3 indicates that, in the context of this methodological orientation, organizational resilience has been investigated across a diverse range of industry sectors (n=15) such as energy, retail, services, and transportation. For example, Sullivan-Taylor and Wilson (2009) compared firms operating in the aviation versus leisure sectors, concluding that those in aviation sector adopt a proactive attitude towards uncertainty and give priority to threats from terrorism. While those in the leisure sector tend to be reactive and less inclined to take action.

Few investigations (n=18) specify the firm size as a key consideration (Billington, Karlsten, Mathisen, & Pettersen, 2017; Guo & Anderson, 2018; Martinelli et al., in press). Two studies (Ates & Bititci, 2011; Sullivan-Taylor & Branicki, 2011) report that SMEs are likely to muddle through and to adopt a reactive approach to change. Attention is given to the implementation of change rather than firm planning and preparedness (Ates & Bititci, 2011). Although SMEs usually lack the resources to deal with identified problems associated with turbulence and have difficulties in establishing priorities, they are likely to have a capacity to act in a timely and agile manner (Sullivan-Taylor & Branicki, 2011). By way of contrast, Coldwell (2010) observed that large resilient firms such as Google and 3M have bricolage-like cultures that enable employees to utilize available resources, to improvise, and to solve problems during a crisis.
Table 2.3: Qualitative and/or mix studies on organizational resilience

<table>
<thead>
<tr>
<th>Authors</th>
<th>Definitions &amp; theory underpinning</th>
<th>Industry type, Firm size</th>
<th>Environmental conditions &amp; time phases</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carlson (2018)</td>
<td>Not specified</td>
<td>Energy company; Pre 2010 Kalamazoo River oil spill</td>
<td>Post the 2010 Kalamazoo River oil spill</td>
<td><strong>Organizational preparedness</strong> through communication is a strategic emphasis for translating recovery processes into resilient processes. <strong>Three characteristics of preparedness</strong>&lt;br&gt;1. staff deepen and broaden their network&lt;br&gt;2. framing crisis as an opportunity&lt;br&gt;3. importance of the values and commitment of a visible leader. <strong>Three levels embedded in workplace adversities</strong>&lt;br&gt;1. individual&lt;br&gt;2. function&lt;br&gt;3. organizational <strong>Mechanisms: four patterns of response to adversities and enact OR</strong>&lt;br&gt;1. disengage &amp; bounce forward&lt;br&gt;2. persevere &amp; bounce up&lt;br&gt;3. risk &amp;bounce back&lt;br&gt;4. struggle &amp; bounce around <strong>Components/ Proxy measures</strong>&lt;br&gt;1. Social capital&lt;br&gt;2. Dynamic capabilities (reconfiguration, leveraging, sensing and interpreting, learning and knowledge integration)&lt;br&gt;3. Different types of DCs and social capital played different roles and exhibited various levels of intensity during the three phases. The only exception was the sensing and interpreting DCs, which maintained a constant relevance over time. <strong>Three components</strong> (cognitive, behavioral, contextual) are evident in firms but appear as a complex and unique blend. Organizational resilience is conditioned in three levels and their interactions.&lt;br&gt;1. Regional&lt;br&gt;2. Social&lt;br&gt;3. Economic Regional resilience is built through the contribution of the firm to the economic and social systems of the region.</td>
</tr>
<tr>
<td>Guo and Anderson (2018)</td>
<td>Theory not specified; Definition: The reintegration after adversity and explores the processes, manifestations, and levels of resilience among participants</td>
<td>Public relations; Size not specified</td>
<td>Post (recall adversities)</td>
<td></td>
</tr>
<tr>
<td>Martinelli et al. (in press)</td>
<td>Not specified</td>
<td>Retail companies; Pre-2012 Emilia earthquake</td>
<td>Post 2012 Emilia earthquake</td>
<td></td>
</tr>
<tr>
<td>Billington et al. (2017)</td>
<td>Test the 3-component resilience capacity framework (Lengnick-Hall &amp; Beck, 2005; Lengnick-Hall, Beck, &amp; Lengnick-Hall, 2011). Definition not specified</td>
<td>Not specified</td>
<td>Not specified</td>
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</table>

Note: time phase is either pre-, during-, post-adversity. OR= organizational resilience

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</thead>
<tbody>
<tr>
<td>Branicki et al. (2018)</td>
<td>Theory not specified;</td>
<td>Industry not specified;</td>
<td>Not specified</td>
<td>Two levels of OR</td>
</tr>
<tr>
<td></td>
<td>Entrepreneurial resilience is a</td>
<td>SMEs</td>
<td></td>
<td>1. Micro-foundations (entrepreneurs, employees)</td>
</tr>
<tr>
<td></td>
<td>form of emotional and cognitive</td>
<td></td>
<td></td>
<td>2. Organizational</td>
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<td></td>
<td>ability that is useful for the</td>
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<td></td>
<td>entrepreneur, particularly when</td>
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<td></td>
<td>bouncing back after failures</td>
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<td></td>
<td>connected to their entrepreneurial</td>
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<tr>
<td>Tracey, O’Sullivan, Lane,</td>
<td>Test the theory and definition</td>
<td>Service organizations;</td>
<td>Not specified</td>
<td>Seven categories of organizational-level</td>
</tr>
<tr>
<td>Guy, and Courtemanche (2017)</td>
<td>of (McManus, Seville, Vargo, &amp;</td>
<td>Size not specified</td>
<td></td>
<td>assets support OR</td>
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<tr>
<td></td>
<td>Brunsdon, 2008): situation</td>
<td></td>
<td></td>
<td>1. Awareness: asset literacy, situation</td>
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<tr>
<td></td>
<td>awareness, management of</td>
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<td>awareness, plan awareness</td>
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<td></td>
<td>keystones vulnerabilities, and</td>
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<td>2. Human resources: experience and expert,</td>
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<td></td>
<td>adaptive capacity comprise</td>
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<td>skills</td>
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<td></td>
<td>organizational resilience</td>
<td></td>
<td></td>
<td>3. Information and communication: communication</td>
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<td>system, information, links to media</td>
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<td>4. Leadership and culture: engaged workforce,</td>
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<td>learning culture, preparedness culture,</td>
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<td>transformative leadership</td>
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<td>5. Operational infrastructure: agreements/</td>
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<td>memorandum of understanding, business</td>
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<td>continuity planning, decentralization,</td>
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<td>flexibility, plans, processes, and policies,</td>
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<td>response structure</td>
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<td>6. Physical resources and financial support</td>
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<td>7. Social capital: partnership/ relationships/</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>networks, and goodwill</td>
</tr>
<tr>
<td>Deary (2015)</td>
<td>Test the four concepts, rebound,</td>
<td>One transportation</td>
<td>Pre-, during, and post- challenges</td>
<td>Environmental effects on OR</td>
</tr>
<tr>
<td></td>
<td>robustness, graceful extensibility,</td>
<td>company; size not</td>
<td>included extreme weather (Hurricane</td>
<td>1. Poor handling of the consequences of</td>
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<td></td>
<td>and sustained adaptability by</td>
<td>specified</td>
<td>Sandy) and predictable periods of high</td>
<td>disruption could have a significant impact on</td>
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<td></td>
<td>Woods (2015)</td>
<td></td>
<td>transportation demand (the Thanksgiving</td>
<td>the firm’s customers and its business base;</td>
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<td></td>
<td></td>
<td></td>
<td>holiday)</td>
<td>2. A major safety incident could affect the</td>
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<td>long-term viability of the organization.</td>
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</tbody>
</table>

**Note:** time phase is either pre-, during-, post-adversity. OR= organizational resilience

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Table 2.3 continues...
<table>
<thead>
<tr>
<th>Authors</th>
<th>Definitions &amp; theory underpinning</th>
<th>Industry type, Firm size</th>
<th>Environmental conditions &amp; time phases</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sawalha (2015)</td>
<td>Not specified</td>
<td>Insurance organizations; size not specified</td>
<td>During competition with peer companies, loss of customers, and financial losses</td>
<td><strong>Six types of organizational culture influence OR</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1. Organizational learning and learning from past experiences;</td>
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<td>2. Professional leadership;</td>
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<td>3. Adequate learning;</td>
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<td>4. People’s attitude towards risk and uncertainty;</td>
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<td>5. Opportunities of women’s participation in decision-making;</td>
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<td></td>
<td></td>
<td>6. Collaboration between organizations</td>
</tr>
<tr>
<td>Zaato and Ohemeng (2015)</td>
<td>Theory not specified</td>
<td>Public sector (water); size not specified</td>
<td>During bottlenecks (institutional, financial, and operational)</td>
<td><strong>Five ways to build OR</strong></td>
</tr>
<tr>
<td></td>
<td>Definition: The capability of an organization to anticipate key events from emerging trends, constantly adapt to change, and rapidly bounce back from disaster</td>
<td></td>
<td></td>
<td>1. Autonomy</td>
</tr>
<tr>
<td></td>
<td>Theory not specified</td>
<td></td>
<td></td>
<td>2. Effective leadership</td>
</tr>
<tr>
<td>Jaaron and Backhouse (2014)</td>
<td>Theory not specified</td>
<td>Service organizations; size not specified</td>
<td>During challenges from too many customer complaints</td>
<td>3. An effective performance management system</td>
</tr>
<tr>
<td></td>
<td>Definition: The ability of an organization to adapt to the requirements of the surrounding environment and being able to effectively develop new capabilities to absorb and manage environmental variability</td>
<td></td>
<td></td>
<td>4. Building organizational and individual abilities</td>
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<tr>
<td></td>
<td>Not specified</td>
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<td></td>
<td>5. Build organizational culture</td>
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<tr>
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<td></td>
<td></td>
<td>1. Resourcefulness: cash flow, investment finance, relational networks, and material assets</td>
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<td>2. Competitiveness: strategic and operational flexibility</td>
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<td></td>
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<td></td>
<td></td>
<td>3. Attentive leadership</td>
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</thead>
<tbody>
<tr>
<td>Ates and Bititci (2011)</td>
<td>Theory not specified Definition: the ability to anticipate key opportunities and events from emerging trends, constantly adapting and changing, rapidly bouncing back from disaster and remaining stable in a turbulent environment</td>
<td>Manufacturing SMEs</td>
<td>Not specified</td>
<td>Implementation of operational (down-to-top) and strategic (top-to-down) agility build organizational resilience</td>
</tr>
<tr>
<td>Ismail, Poolton, and Sharifi (2011)</td>
<td>Not specified</td>
<td>Manufacturing; SMEs</td>
<td>During turbulence related with customers and cost increase</td>
<td>Two stages 1. Eliminate allegiance to the status quo of leaders. 2. Make renewal an equal partner to optimization.</td>
</tr>
<tr>
<td>Demmer, Vickery, and Calantone (2011)</td>
<td>Theory not specified Definition: a company’s ability to dynamically reinvent its business model and strategies as circumstances change</td>
<td></td>
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</tbody>
</table>

Note: time phase is either pre-, during-, post-adversity. OR = organizational resilience

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<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gunasekaran, Rai, and Griffin (2011)</td>
<td>Not specified</td>
<td>SMEs</td>
<td>Not specified</td>
<td><strong>Three antecedents</strong>&lt;br&gt;1. Internal factors: Organizational structure; managerial characteristics&lt;br&gt;2. External factors: Globalisation Enabling factors:&lt;br&gt;3. Use of technology, supply chain integration; generation of capital, location &amp; marketing</td>
</tr>
<tr>
<td>Stipicevic (2011)</td>
<td>Theory not specified &lt;br&gt;Definition: The ability of an organization to demonstrate successful adaptation and reinvention of strategy in accordance with major economic, social, and environmental shifts keeping in mind the organization’s connectedness within the environment. This adaptation is proactive, not reactive in nature</td>
<td>Financial firms</td>
<td>Post 2007-2008 financial crisis</td>
<td><strong>Open-minded and reflective leadership</strong> is the main driver of strategic organizational resilience.</td>
</tr>
<tr>
<td>Sullivan-Taylor and Branicki (2011)</td>
<td>Test the four-component resilience framework (Weick &amp; Sutcliffe, 2001)</td>
<td>SMEs; industry not specified</td>
<td>Not specified</td>
<td><strong>SMEs’ characteristics of OR</strong>&lt;br&gt;1. Resourcefulness related to identifying problems, establishing priorities and mobilizing resources is a key barrier.&lt;br&gt;2. Technical systems are not the major priority for SMEs, but there is an overall emphasis on supply and infrastructure and the role of inter-organizational dependence.&lt;br&gt;3. SME managers tend to talk about muddling through and question taking action.&lt;br&gt;4. SMEs have a positive potential for timeliness and agility; rapidity in practice.</td>
</tr>
<tr>
<td>Chang, Wilkinson, Seville, and Potangaroa (2010)</td>
<td>Not specified</td>
<td>Building contractors; size not specified</td>
<td>Post Wenchuan Earthquake</td>
<td><strong>Four components of post-disaster resourcing</strong>&lt;br&gt;1. resourcing facilitator: legislation and policy;&lt;br&gt;2. resourcing implementer: construction industry;&lt;br&gt;3. resourcing platform: construction market; and&lt;br&gt;4. resourcing access: transportation system.</td>
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</table>

Note: time phase is either pre-, during-, post-adversity  
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</thead>
<tbody>
<tr>
<td>Coldwell (2010)</td>
<td>Underpinned by the 3-antecedent framework (Weick, 1993) Definition: The ability of an organization to achieve a homeostatic state following a crisis.</td>
<td>Firms like Google, 3M, British Petroleum</td>
<td>Not specified</td>
<td>Organizations with <em>bricolage cultures</em>, enabling organizational participants to improvise, using whatever resources are available, to solve the problem during crises, are resilient.</td>
</tr>
<tr>
<td>Sullivan-Taylor and Wilson (2009)</td>
<td>Test the four-component resilience framework (Weick &amp; Sutcliffe, 2001) Definition not specified</td>
<td>Aviation, leisure, and tourism industry Size not specified</td>
<td>The threat of terrorism; phase not specified</td>
<td><strong>Three industry differences in OR</strong> 1. Perceptions of uncertainty and threats from terrorism and theories of action differ in and between organizations depending upon factors such as the accuracy and completeness of information; previous experience of terrorist events and whether or not these threats were prioritized over other uncertainties. 2. Organizations in the aviation industry prioritize threats from terrorism, whilst organizations in the leisure and travel sector do not. 3. Managers in the aviation industry tend to take a proactive, organizational resilience stance towards uncertainty, whilst managers in the other organizations are more reactive, or take little action.</td>
</tr>
<tr>
<td>Crichton, Ramsay, and Kelly (2009)</td>
<td>Not specified</td>
<td>Nuclear related industry, size not specified</td>
<td>Post-crisis such as underground fire; explosion and fires; mad-cow disease; power outage, rail crash, fireworks explosion; floods</td>
<td><strong>Eight recurring themes for enhancing OR</strong> 1. emphasizing the process of emergency preparedness, 2. underestimating the reference accidents, 3. aligning the safety culture throughout emergency response systems, 4. understanding the purpose of command and control, 5. communicating with the public, 6. attending to welfare long term, 7. training responders in non-technical skills, 8. assuring capability and availability of resources. Lessons can be learned by the phase of an incident, i.e. precursors, initiation, response, recovery, and termination.</td>
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<th>Environmental conditions &amp; time phases</th>
<th>Findings</th>
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</thead>
</table>
| Cho, Mathiassen, and Robey (2007) | Theory not specified Definition: Process capabilities existing at multiple levels of analysis including individuals, groups, and organizations and geared towards the adoption of IT-based innovation | Healthcare (hospital); size not specified | Post- crises related to the IT innovation adoption | **Three levels’ involvement and interaction in OR**<br>1. initial project group<br>2. the individual hospital<br>3. the entire network.  
**Problems of OR**<br>1. While resilience facilitates swift and successful adoption, it also creates tensions that endangered further diffusion and the long-term sustainability of the IT innovation  
The organizational system creates power differentials, which increase control in an organization, which in turn increase organizational rigidity and reduce organizational flexibility and resilience |
**Key characteristics for OR**<br>1. Vision<br>2. Leadership<br>3. Collective culture<br>4. Sharing of information and/ or learning organization |
| Grove (1997)                   | Not specified                                                                                   | Not specified            | Not specified                          |                                                                          |
In terms of environmental conditions, Table 2.3 identifies that organizational resilience has been examined mostly under extreme negative natural conditions \((n=6)\) associated with oil spills (Carlson, 2018), earthquakes (Chang et al., 2010; Martinelli et al., in press), hurricanes (Chewning et al., 2012; Deary, 2015), and underground fire (Crichton et al., 2009). Four studies (Ismail et al., 2011; Jaaron & Backhouse, 2014; Sawalha, 2015; Zaato & Ohemeng, 2015) examined the impact of dramatic changes in markets, such as loss of customers, financial bottlenecks (e.g., 2008 GFC), and cost increases on firms. Sullivan-Taylor and Wilson (2009) examined the threat of terrorism.

In regards to the adversity phases, Table 2.3 reveals that most studies \((n=8)\) concentrate on post-adversity (Carlson, 2018; Chewning et al., 2012; Guo & Anderson, 2018; Pal et al., 2014). Four papers (Ismail et al., 2011; Jaaron & Backhouse, 2014; Sawalha, 2015; Zaato & Ohemeng, 2015) examined organizational resilience during extreme negative events. Only two studies (Deary, 2015; Martinelli et al., in press) investigated organizational resilience over three-time phases. While Martinelli et al. (in press) examined components of organizational resilience pre-, during, and post- the Emilia earthquake, Deary (2015) investigated the mechanisms of organizational resilience as enterprises face the challenges inherent in extreme weather conditions such as Hurricanes.

Table 2.3 suggests that studies \((n=24)\) outline a range of characteristics contributing to the development of this capability. For example, Sawalha (2015) concluded that organizational culture is associated with learning from past experiences, professional leadership qualities, holding a positive disposition towards uncertainty, and inter-organizational collaboration. Tracey et al. (2017) proposed that seven organizational-level assets support the formation of resilience: an awareness of environmental situations, human capital, information and communication, leadership and culture, operational infrastructure, physical resources, and financial support, and social capital. In contrast, Carlson (2018) identified three types of
organizational resilience preparedness processes, including deep and broad-based networks; an ability of firms to frame crises as opportunities; and leaders who are visible and committed.

In summary, qualitative and mix-method investigations have contributed to the field by testing conceptual frameworks within specific contextual contingencies. By-and-large, these studies have relied upon data derived from in-depth and semi-structured interviews to formulate notable case studies. Notwithstanding, the relative paucity of studies compared to quantitative papers, raises serious questions concerning the viability and wide-spread utility of the findings.

Conclusion

Within the context of the methodological orientations to the study of organizational resilience, this chapter has focused on pertinent empirical investigations. While quantitative and qualitative studies both specify important contextual contingencies (e.g., environmental conditions, firm size, industry type) and the adversity phase (e.g., pre-, during, post-adversity), each approach unsurprisingly adopts a unique angle. Research proposal development based on desktop studies prevails in quantitative papers. Quantitative investigations center on the nomological nets among antecedents, proxy measures, and outcomes of organizational resilience, emphasizing the relationship among organizational resilience and firm performance and other characteristics (i.e., awareness to weak signals, CEO narcissism). Qualitative studies adopt a broad-based explorative orientation, focusing on the effects of organizational characteristics (i.e, firm culture and preparedness, knowledge sharing relationship, enterprise assets) in building organizational resilience. Utilization of grounded theory and adoption of case study approaches to develop theory predominate qualitative investigations.

Perhaps a glaring issue to emerge is the observation that there is a lack of cross-fertilization of findings across methodological approaches. For example, factors identified as being relevant in qualitative studies such as organizational culture (Sawalha, 2015) are seldom explored or
considered by authors formulating conceptual papers (Table 3.1, p. 34) and quantitatively-oriented investigations (Table 2.2, p. 17). In other words, categorizing papers along methodological ground reveals that the field has been dominated by silos and developments culminating in limited integration of findings, and interchange of ideas and recommendations.

The present thesis addressed the lack of cross-fertilization issue across different methodological lines in three ways. First, Study 1 analyzed most, if not all, definitions of organizational resilience derived from conceptual, quantitative, and qualitative manuscripts, in order to gain a complete understanding of the theoretical meaning of this construct. Study 2 analyzes most, if not all, existing measures of organizational resilience to obtain an appreciation of the operational meaning of this construct. Study 3 tested the findings emanating from Studies 1 and 2.

The following Chapter explains the theories underpinning this thesis.
Chapter 3 Theoretical Background

Overview

Through an analysis of conceptual papers, the construct of organizational resilience is grounded in relations to its mechanisms, levels, antecedents, and outcomes. Chapter 3 argues that organizational resilience involves multiple components in line with the 3-component resilience capacity framework (Lengnick-Hall & Beck, 2005). This chapter concludes by establishing that organizational resilience is best viewed as a pattern of dynamic capabilities.

Conceptual Frameworks of Organizational Resilience

Organizational resilience is a latent concept that is not directly observable (Ortiz-de-Mandojana & Bansal, 2016). The process of formulating and clarifying a concept, called conceptualization, lies at the heart of theory testing and construction (Singleton Jr, Straits, & Straits, 1993). Conceptualization involves deconstructing a concept into its constituent parts (Singleton Jr et al., 1993) and outlining their interrelationships in order to interpret and show how and why a phenomenon occurs (Whetten, 1989). A sound conceptualization contributes to theory development and should address at least four elements (Whetten, 1989): factors that explain the phenomenon, the relationships among the factors that constitute the theory, and reasons why these factors are involved, and why they are interrelated.

A review of the pertinent literature on organizational resilience identified 13 conceptual frameworks. Table 3.1 summarizes each of these frameworks in terms of definitions and outlines pertinent factors linked to organizational resilience. These frameworks make a
substantive contribution towards an understanding of the mechanisms \( (n=4) \), antecedents \( (n=3) \), levels \( (n=4) \), and outcomes \( (n=2) \). The following section elaborates on these factors.

**Mechanisms**

Research has adopted different perspectives when exploring the processes/mechanisms within which organizational resilience capabilities are developed. Kahn et al. (2018) draw upon the intergroup relations view and argue that adversity can create differential strain, affecting specific parts of an organization. These authors propose that the geography of strain matters and differentiated strain disconnects organizations into two fragmented parts: adjoining and focal. The differentiated emergence of strain in focal parts of an organization triggers the movements of adjoining parts to provide or withhold resources necessary for the focal parts to adapt effectively. The responses of adjoining parts to focal part strain, within specific pathways (i.e., integration, disavowal, reclamation) determine organizational resilience. The integration pathway maintains synchronicity among adjoining and focal parts. The disavowal pathway separates adjoining parts from the local parts. The reclamation pathway enables the adjoining parts to move and help the focal parts.

The notion that the geography of strain matters challenges the widely accepted view of the organization-as-a-whole (Home & Orr, 1997), as well as the so-called traditional view that sudden events or surprises affect wide segments of organizations concurrently rather than separately (Comfort, 2007). This theory of organizational resilience as a function of intergroup relations also sheds light on the temporal aspects of resilience. Resilience is enabled when different segments or divisions of an organization converge to ensure that localized strain does not deepen and spread. This theory provides new insights from a social process perspective.
### Table 3.1: Conceptual frameworks of organizational resilience

<table>
<thead>
<tr>
<th>Author</th>
<th>Definition</th>
<th>Antecedents / components/ levels/ mechanisms</th>
<th>Summary/other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kahn et al. (2018)</td>
<td>An organization’s ability to absorb strain and preserve or improve functioning, despite the presence of adversity</td>
<td><strong>Three pathways triggered by the emergence of differentiated strain in specific parts of an organization</strong></td>
<td>• Challenge the underlying premise in existing scholarship on organizational resilience that the primary actors dealing with adversity are organizational parts—groups, teams, functions, departments, and hierarchical levels, not the organization-as-a-whole.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Integration: a process by which adjoining and focal parts are synchronized</td>
<td>• Adopts the perspective of intergroup relations among parts of organizations to enable the development of organizational resilience.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Disavowal: a process by which differentiated strain disconnect adjoining parts and focal parts.</td>
<td>• Incorporates temporal aspects into theorizing about organizational resilience: differentiated parts unfold over time.</td>
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<td></td>
<td></td>
<td>3. Reclamation: a process by which the adjoining parts move to include and help the focal part.</td>
<td>• Takes an innovation perspective towards organizational resilience. Resilient organizations not only anticipate the needs of buyers but do so by creating an innovation orientation within the firm’s culture.</td>
</tr>
<tr>
<td>de Oliveira, Teixeira and Werther (2013)</td>
<td>Continuous renewal of competitive advantages</td>
<td><strong>Four Components</strong></td>
<td>• Based on desktop research</td>
</tr>
<tr>
<td>Linnenluecke, Griffiths, and Winn (2012)</td>
<td>Organizational capacity to absorb the impact and recover from the actual occurrence of an extreme weather event</td>
<td><strong>Three types of extreme weather events</strong></td>
<td>• The first that classifies the extreme weather events in relation to organizational resilience.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Simple extreme</td>
<td>• Conceptualization not tested.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Complex extreme</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>3. Unique or singular extreme</td>
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<td></td>
<td></td>
<td><strong>Five stages of organizational adaptation and resilience</strong></td>
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<tr>
<td></td>
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<td>1. Anticipatory adaptation to the potential change to initiate the adaptation</td>
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<td></td>
<td></td>
<td>2. Exposure to perturbation from an extreme weather event.</td>
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<td></td>
<td></td>
<td>3. Recovery and restoration to the same or different level compared to the state prior to exposure to extreme weather event</td>
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<tr>
<td></td>
<td></td>
<td>4. Post-impact determination of the organization’s overall resilience</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>5. Future adaptation.</td>
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<thead>
<tr>
<th>Author</th>
<th>Definition</th>
<th>Antecedents / components/ levels/ mechanisms</th>
<th>Summary/other</th>
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<tbody>
<tr>
<td>Kantur and İşeri-Say</td>
<td>Pre-event readiness for a disruptive event, post-event response for appropriate and timely recovery, and creative renewal capacity through improvisation</td>
<td><strong>Components</strong>&lt;br&gt;1. Same with (Tierney, 2003)&lt;br&gt;<strong>Four antecedents</strong>&lt;br&gt;1. Perceptual stance: a sense of reality, positive perception, unified commitment&lt;br&gt;2. Contextual Integrity: employee involvement, compatible interaction, supportive environment&lt;br&gt;3. Strategic capacity: resource availability, employee capability, focused strategy&lt;br&gt;4. Strategic acting: creativity, flexibility, proactiveness</td>
<td>• Based on desktop research&lt;br&gt;• Pointing out components of organizational resilience are often suggested as antecedents in the literature.&lt;br&gt;• Conceptualization not tested.</td>
</tr>
<tr>
<td>Burnard and Bhamra</td>
<td>Resilience is the emergent property of organizational systems that relate to the inherent and adaptive qualities and capabilities that enable an organizations adaptive capacity during turbulent periods.</td>
<td><strong>Four phases of an organization to elicit a resilient response</strong>&lt;br&gt;1. Detection phase: An organization scans and interprets its environmental changes and make an assessment of whether an event is a threat.&lt;br&gt;2. Activation phase: An organization begins to deploy available resources that enable a later response.&lt;br&gt;3. Response phase: An organization adapts, recovers, and advances from disruptive events.&lt;br&gt;4. Organizational learning: an organization continuously develop and apply new knowledge to the operating environment</td>
<td>• Builds on desktop research&lt;br&gt;• Focuses on organizational responses during disruptive events&lt;br&gt;• Conceptualization not tested.</td>
</tr>
<tr>
<td>Erol et al. (2010)</td>
<td>A response to unexpected or unforeseen changes and disturbances, and an ability to adapt and respond to such changes.</td>
<td><strong>Four components</strong>&lt;br&gt;1. Vulnerability&lt;br&gt;2. Flexibility&lt;br&gt;3. Adaptability&lt;br&gt;4. Agility</td>
<td>• Conceptualization not tested.</td>
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<thead>
<tr>
<th>Two antecedents</th>
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<tbody>
<tr>
<td>1. Connectivity (the capability of an organization to connect systems, people, processes and information in a way that allows an enterprise to become more connected and responsive to the dynamics of its environment, stakeholders, and competitors)</td>
<td></td>
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<td></td>
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<td>2. Alignment between IT and business goals</td>
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<tr>
<td>Author</td>
<td>Definition</td>
<td>Antecedents / components/ levels/ mechanisms</td>
<td>Summary/other</td>
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<td>---------------------------------------------</td>
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</table>
• Conceptualization tested by Akgün and Keskin (2014). |
• Same as those employed by Home and Orr (1997)  
Two Levels 1. Individual: chronic stressors (situational demands, resources), individual differences 2. Organizational: extra-organizational factors (technological & market demands), chronic stressors (organizational structures & processes) | • Builds on desktop research.  
• An integrated model that explains how OR is developed in the field of the information system. |
Three phases of response 1. Information processing 2. Loosening of control 3. Utilization of slack resources & capabilities: cognitive, relational, & emotional  
Three levels 1. Individual 2. Group 3. Organizational | Table 3.1 continues... |


| Author          | Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Antecedents / components/ levels/ mechanisms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Summary/other                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tierney (2003)  | A property of physical and social systems that enables them to reduce the probability of disaster-induced loss of functionality, respond appropriately when damage and disruptions occur, and recover in a timely manner.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | **Four components**<br>1. Robustness<br>2. Redundancy<br>3. Resourcefulness<br>4. Rapidity<br>**Four levels**<br>1. Technical<br>2. Organizational<br>3. Social<br>4. Economic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | • Builds on the analysis of the emergency response following 9/11.<br>• Focuses on post-disaster response and resourcefulness.<br>• Conceptualization tested by a number of authors (Andrew et al., 2016; Jung, 2015; Wicker et al., 2013).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Mallak (1999)   | The Ability of an organization to expeditiously design and implement positive adaptive behaviors matched to the immediate situation, while enduring minimal stress                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | **Six components**<br>1. Vision<br>2. Values<br>3. Elasticity<br>4. Empowerment<br>5. Coping<br>6. Connections<br>**Two levels**<br>1. Individual<br>2. Organizational                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | • Conceptualization not tested empirically                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Home and Orr (1997) | A fundamental quality of organizations as a whole to respond productively to significant change that disrupts the expected pattern of events without engaging in an extended period of regressive behavior.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | **Seven intertwined behavioral components**<br>1. Community<br>2. Competence<br>3. Connections<br>4. Commitment<br>5. Communication<br>6. Coordination<br>7. Consideration<br>**Four outcomes**<br>1. Strategic planning<br>2. Organizational alignment<br>3. Corporate culture awareness<br>4. Organizational learning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | • A whole-system view of resilience including individuals, groups, organizations, and systems.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

*Table 3.1 continues...*
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<th>Antecedents / components/ levels/ mechanisms</th>
<th>Summary/other</th>
</tr>
</thead>
</table>
| Weick (1993) | Not specified    | **Three antecedents**                                                                                       |   • Builds on the notion of sensemaking and the analysis of the Mann Gulch fire disaster.  
   • Points out that resilience can be cultivated through anticipation of disasters and comprehensive planning. Planning methods enable organizations to create internal processes and organizational structures and thus demonstrate positive adaptive behaviors when under stress.  
   • Tested by Mallak (1998b) & Somers (2009)                                                                       |
|           |                  | 1. Improvisation and bricolage (the practice of creating order out of whatever materials were available)     |                                                                                                                                                                                                              |
|           |                  | 2. Virtual role systems (provide a work environment where the team can continue in the absence of one or more members)  |                                                                                                                                                                                                              |
|           |                  | 3. The attitude of wisdom (Confidence vs. cautiousness)                                                       |                                                                                                                                                                                                              |
In another recent conceptual papers, Williams et al. (2017) expounded upon the perspectives of crisis and crisis management (Table 2.1, p. 12). These authors integrated research streams on crisis management and resilience and offered a comprehensive theoretical model explaining the dynamically interactive processes of organizational resilience when dealing with adversity. In this context, resilience is viewed as a process by which an organization builds and uses its capability endowments to interact with adversity in a way that positively adjusts and maintains functioning prior to, during, and following a crisis.

Their model is among the first to present a comprehensive picture of the internal capability components, interrelated processes of responding, three-crisis phases, and organizational feedback loops. The capability endowments involving financial, emotional, and relational resources provide an explanation of the types of components needed prior to adversity. Anticipating, preventing, and adjusting to deal with unexpected contingencies comprise the interrelated process of responding. In terms of phases of the adversity, pre-adversity capability endowments and organizing come to the fore; during-adversity cognitive, behavioral, and contextual responses are highlighted, and feedback loops predominate the post-adversity period. Feedback loops enable an organization to gain new insights and perspectives that feed into resource endowments, and organizing and responding capabilities. Feedback is enhanced largely by organizational experience and interpretation of adversity.

Two further perspectives (Burnard & Bhamra, 2011; Linnenluecke et al., 2012) consider the role of developmental stages associated with organizational resilience. Within the context of three different extreme conditions: simple, complex, and unique extremes, Linnenluecke et al. (2012) proposed that organizational resilience encompasses five stages including anticipatory ability and future adaptation. In comparison, Burnard and Bhamra (2011) provided explanations concerning resilient responses during disruptive events. These authors identify four responses: detection, activation, response, and organizational learning. These perspectives
provide limited relevance to the present thesis and for this reason, an in-depth discussion is not provided.

**Levels**

Research highlights that organizational resilience comprises multiple planes operating at economic (Tierney, 2003), social (Tierney, 2003), organizational (Mallak, 1999; Tierney, 2003), and individual (Mallak, 1999; Riolli & Savicki, 2003) levels. The economic level concerns impact locally, regionally, and nationally. The social level considers influences on communities and societies. Most studies target the organization-level emphasizing how enterprises deal with crises and build resilience (Manfield, 2016; Vogus & Sutcliffe, 2007). For example, organizational decision-making and action-taking are based on analyses of both external (e.g., technological, markets demand) and internal (e.g., organizational structures, culture, HRM practices) factors (Riolli & Savicki, 2003).

More recently, studies targeting the individual or micro-foundational level have gained interest. Typically, these investigations focus on the entrepreneurial resilience (Branicki et al., 2018); social capital (Korber & McNaughton, 2018); occupational resilience (Kossek & Perrigino, 2016); and the personality characteristics, skills, and values of employees (Lengnick-Hall et al., 2011). As a case in point, Branicki et al. (2018) investigated how entrepreneurial factors contribute to the resilience capacity of SMEs experiencing adversity. It is to be noted that the current thesis focuses on the organizational and micro-foundational levels.

**Antecedents**

A wide spectrum of antecedents contributing to the emergence and development of organizational resilience has been identified including bricolage and attitude of wisdom (Weick, 1993); community, competence, connections, and communication (Home & Orr, 1997); and resourcefulness, strategic and operational flexibility, and attentive leadership (Pal et al., 2014).
An analysis of these antecedents suggests that uncertainty adumbrates the meaning of and distinguishing features of these elements. For example, leadership was conceptualized as an antecedent by Pal et al. (2014) but as a component by de Oliveira Teixeira and Werther (2013).

**Outcomes**

As alluded to earlier, there is a dearth of theory explaining the outcomes of organizational resilience. Resilience can be defined as an ability to respond to disruptions with minimal stress (Mallak, 1998b), without engaging in regressive behavior (Home & Orr, 1997). Resilience involves a capacity to bounce back from disruptions (Sheffi, 2005b) and return to an original state (Christopher & Peck, 2004). Disruptions can also herald opportunities. Resilience can also enable an organization to grow (Pettit, Croxton, & Fiksel, 2013), and to become strengthened and resourceful (Lengnick-Hall & Beck, 2009). Välikangas and Romme (2012) classified organizational resilience as operational and strategic. Operational resilience reflects a capacity to bounce back from disruptions. Strategic resilience represents an enterprise’s ability to turn threats into opportunities. In contrast, Boin and van Eeten (2013) coined the concept of recovery resilience, conveying an ability of firms to bounce back to their original observable normal state. Precursor resilience describes a non-observable capacity of organizations to accommodate changes gracefully.

Resilience is not an end in its own right. Rather, the possession and cultivation of resilience help to foster organizational alignment, culture awareness, organizational learning, and strategic planning, thus enabling firms to develop a whole-system response to turbulence and crises (Home & Orr, 1997). This building process ultimately contributes to organizational evolvability including recovery, adaptation, and renewal (Kantur & İşeri-Say, 2012). While recovery might help an organization to return to pre-event conditions, organizational adaptation is essential for transcending into a new state (Prayag et al., in press). Resilience is a prerequisite for minimizing negative consequences and ensuring the continuity and survival of an
organization as it renews and evolves post-event. Despite the positive outcomes associated with the possession of organizational resilience capabilities, Williams et al. (2017) outline some of the negative aspects, including the consumption of time and resources. Clearly, understanding the trade-offs associated with the allocation of resources for building resilience is vital.

In summary, conceptual frameworks contribute a unique line of inquiry into our understanding of how organizational resilience can be developed and cultivated, situating organizational resilience within its mechanisms, levels, antecedents, and outcomes. Conceptual papers tend to draw upon formulations derived from other perspectives such as risk management (Williams et al., 2017) and social intergroup relations (Kahn et al., 2018). This review of conceptual papers raises an important question: Do extant theories of organizational resilience provide sufficient explanatory power or are established management science theory or theories commensurable? As discussed in the ensuing section, the present thesis argues that the dynamic capabilities theory proffers direction.

The next section involves an introduction of the 3-component resilience capacity framework (Lengnick-Hall & Beck, 2005; Lengnick-Hall et al., 2011) on organizational resilience.

**The 3-Component Resilience Capacity Framework**

There are a plethora of characteristics typifying or distinguishing organizational resilience from other constructs. These characteristics cover a disparate range of elements such as holding situation awareness (McManus et al., 2008), having access to flexible resources (Ortiz-de-Mandojana & Bansal, 2016), being innovative (Reinmoeller & Van Baardwijk, 2005); and having an ability to detect and notice (Oh & Teo, 2006; Ortiz-de-Mandojana & Bansal, 2016). This wide array of elements has lead to ambiguity and lack of specificity.
One framework, in particular, the 3-component resilience capacity framework (Lengnick-Hall & Beck, 2005; Lengnick-Hall et al., 2011) has gained increasing attention in recent years because of its specificity, derivation from psychology and organizational science, and being one of the only frameworks to have been tested empirically (Akgün & Keskin, 2014). For these reasons, Lengnick-Hall and Beck (2005) provide the lens through which to systematically examine the components of organizational resilience.

In this framework (Figure 3.1), cognitive, behavioral, and contextual components constitute organizational resilience. Cognitive resilience enables firms to notice, interpret, and analyze changes. Organizational sensemaking and organizational identity are two elements encompassing this dimension. Sensemaking focuses on situation-specific interpretations and judgments. Organizational identity offers a prime directive for firm choices.

**Figure 3.1: The 3-component resilience framework**
Behavioral resilience describes those established behaviors and routines that enable organizations to respond to uncertainty. Learned resourcefulness, counterintuitive moves, useful habits, and behavioral preparedness comprise the behavioral resilience dimension. Learned resourcefulness accumulates established and practiced behaviors for innovative problem-solving. Counterintuitive moves indicate that resilient organizations are able to follow a dramatically different course of action from that which is the norm for the organization. Useful habits, in direct contrast to learned resourcefulness and counterintuitive action, describes repetitive, well-rehearsed routines that enable the first response to any unexpected threat. Behavioral preparedness helps bridge the gap between the divergent forces of learned resourcefulness and counterintuitive action and the convergent forces of useful habits. Behavioral preparedness focuses on planning and taking actions beforehand to ensure that a firm is able to benefit from emerging situations.

Contextual resilience associates the relational environment within which an organization behaves. Contextual resilience provides an appreciation of the relational conditions within and outside an organization, and it forms the basis of cognitive and behavioral resilience. Contextual resilience encompasses deep social capital, a broad resource network, psychological safety, and diffuse power and accountability. Deep social capital benefits resilience in four ways: facilitates firm growth in intellectual capital, eases resource exchange and cross-functional collaboration, and prepares for organizational long-term partnerships. A broad resource network indicates that resilient firms are able to utilize relationships with suppliers, customers, and strategic alliance partners to secure needed resources to support adaptive initiatives. Psychological safety describes the degree to which people perceive their work environment is conducive to taking interpersonal risks. Diffuse power and accountability imply that resilient organizations depend on self-organization, dispersed influence, individual and group accountability, and similar factors that create a “holographic” structure of an organization.
The 3-component resilience framework (Lengnick-Hall & Beck, 2005; Lengnick-Hall et al., 2011) proposes that cognitive, behavioral, and contextual components indispensably and interrelatedly constitute resilience capacity. Yet, the sub-components, especially those concerning behavioral resilience (i.e., a wide range of action inventories, useful habits) are not consistent with key characteristics identified as being central in the business area such as being flexible (Erol et al., 2010; Pal, Torstensson, & Mattila, 2014) and agile (Erol et al., 2010; Tierney, 2003). Moreover, these sub-components have not been demonstrated empirically to be associated with organizational resilience. Thus, while the 3-component resilience framework provides the boundary conditions within which to understand organizational resilience, this thesis examines and determines whether the components and subcomponents from the content analysis of definitions (Study 1) and measures (Study 2) match those proposed by Lengnick-Hall and Beck (2005), then subsequently tests those findings on a cohort of entrepreneurial founders of SMEs (Study 3).

It should be noted that three other conceptualizations (de Oliveira Teixeira & Werther, 2013; Erol et al., 2010; Tierney, 2003) were considered for the present thesis. However, it has been concluded that these conceptualizations were descriptive and failed to explain the interrelationship between factors and how they synergistically integrated with each other, leading to the formation of organizational resilience. Their limitations preclude their suitability for this thesis. The next section discusses the dynamic capabilities theory.

**The Dynamic Capabilities Theory**

Organizational resilience is best viewed as a pattern of dynamic capabilities. The dynamic capabilities theory (Teece, 2007; Teece et al., 1997) provides explanations concerning the environmental dynamism, capabilities, and micro-foundations that firms need to address the challenges associated with constantly changing environments. Table 3.2 shows the ways in
which organizational resilience can be situated hierarchically within the dynamic capabilities theory.

Environmental dynamism affects dynamic capabilities (Li & Liu, 2014; Schilke, 2014; Zhou & Li, 2010). In moderately dynamic markets, dynamic capabilities have a positive effect on firm performance and competitive advantage (Helfat & Peteraf, 2009; Peteraf, Di Stefano, & Verona, 2013). However, in high-velocity environments or during times of organizational crisis such as cash-flow events, the role of dynamic capabilities remains uncertain. While some authors (Barreto, 2010; Wu, 2010) indicate that dynamic capabilities enhance competitive advantage effectively in high volatility situations in ways that help to increase value creation (Li & Liu, 2014), others (Eisenhardt & Martin, 2000) argue that dynamic capabilities are unstable and may even collapse in the face of uncertainty. Makkonen, Pohjola, Olkkonen, and Koponen (2014) observed, however, that dynamic capabilities facilitate competitive advantage during periods of financial crises through innovative solutions rather than of themselves.

Table 3.2: Situating organizational resilience within the dynamic capabilities theory

<table>
<thead>
<tr>
<th>The dynamic capabilities theory (DCF)</th>
<th>Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental dynamism</td>
<td>Value creation (Competitive advantage) in rapidly changing environments (Teece et al., 1997)</td>
</tr>
<tr>
<td>Nature</td>
<td>Capabilities of processes &amp; routines (Lin &amp; Wu, 2014; Teece, 2007)</td>
</tr>
<tr>
<td>Components</td>
<td>Sense &amp; seize opportunities; adaptability; flexibility; and innovation; Build, modify, integrate, renew, reconfigure Resources, capabilities, &amp; competences</td>
</tr>
<tr>
<td>Microfoundations</td>
<td>The role of managers and top management team such as managerial social capital &amp; decision-making (Wilden, Devinney, &amp; Dowling, 2016)</td>
</tr>
</tbody>
</table>
As presented in Table 3.2, three layers of components are associated with the dynamic capabilities framework. Layer one consists of organizational bases such as resources (Lin & Wu, 2014; Makkonen et al., 2014; Zhou & Li, 2010), capabilities (Rindova & Taylor, 2002; Winter, 2003), and competences (Rindova & Taylor, 2002; Teece et al., 1997; Wu, 2010). Layer two involves functions such as creating, generating, and building (Griffith & Harvey, 2001; Teece et al., 1997; Zollo & Winter, 2002), adapting and modifying (Zollo & Winter, 2002), integrating (Eisenhardt & Martin, 2000; Teece et al., 1997; Wu, 2010), renewing (Wu, 2010; Zhou & Li, 2010), reconfiguring (Eisenhardt & Martin, 2000; Rindova & Taylor, 2002), upgrading (Rindova & Taylor, 2002), and extending (Winter, 2003) those resources and competences. Layer three concerns higher-order dynamic capabilities such as sensing and seizing opportunities (Barreto, 2010; Teece, 2007; Wilden, Gudergan, Nielsen, & Lings, 2013), adaptability (Hung, Yang, Lien, McLean, & Kuo, 2010), innovation (Wang & Ahmed, 2007), and flexibility (Wu, 2010).

Finally, the micro-foundations of dynamic capabilities emerge as an outcome of recent studies. Micro-foundations refer to “the distinct skills, processes, procedures, organizational structures, decision rules, and disciplines that underpin dynamic capabilities” (Felin, Foss, & Ployhart, 2015, p. 1319). Most researchers (Helfat & Martin, 2015; Helfat & Peteraf, 2015) focus on micro-foundations at the level of individual managers. Helfat and Martin (2015) reported that managerial cognition and social and human capital, as micro-foundations of dynamic managerial capabilities, affect strategic change and firm performance differentially. These investigators indicate that sensing opportunities are predicated on managerial perception and attention; problem-solving and reasoning undergird seizing opportunities. Language, communication, and social cognition form the basis of reconfiguring abilities.

Dynamic capabilities are fostered through organizational learning activities. Repetition and experimentation facilitate the evolution of dynamic capabilities (Eisenhardt & Martin, 2000).
in ways that help organizations to establish knowledge and logic when understanding complex problems (Teece et al., 1997). Experience and knowledge accumulation, and absorption (Zollo & Winter, 2002), knowledge integration and utilization, and knowledge reconfiguration and transformation are three essential learning processes (Eriksson, 2014).

As shown in Table 3.2, the present thesis supports the argument that organizational resilience is best viewed as a pattern of dynamic capabilities in three ways. First, Studies 1 to 3 of the present thesis examines the environmental conditions of organizational resilience through a series of content analyses on the definitions (Study 1) and measures (Study 2) and an investigation on SMEs. Second, the nature of organizational resilience is explored through definitions (Study 1). Components are uncovered through a content analysis of definitions (Study 1) and measures (Study 2). The micro-foundations associated with organizational resilience are identified through an examination of measures of organizational resilience (Study 2). Finally, Study 3 validates the findings of Studies 1 and 2 through an empirical examination involving entrepreneurial founders of SMEs.

It should be noted that the resource-based view of the firm (Barney, 1991), social capital theory (Coleman, 1988), resource dependency theory (Heide, 1994; Pfeffer & Salancik, 1978), and system theory (Ackoff, 1971; Katz & Kahn, 1978) were also considered for their explanatory power. Although these theories provide a different vantage point from which to view this construct, they are not the focus of the current thesis.

**Conclusion**

By reviewing dominant conceptual frameworks, Chapter 3 builds connections between organizational resilience and its antecedent and outcome variables, and offers a theoretical appreciation of its mechanisms and levels. By situating the construct of organizational resilience within the 3-component resilience capacity framework (Lengnick-Hall & Beck, 2005;
Lengnick-Hall et al., 2011), this chapter addresses an apparent lack of specificity in characteristics typing this construct and provides a framework that unifies the prominent components embedded within resilience. By arguing that organizational resilience is best viewed as a pattern of dynamic capabilities, this chapter argues that prevalent theories underpinning this construct have failed to integrate and utilize recent theoretical and research advances espoused by dynamic capabilities theory, which explicates ways in which firms survive and attain a sustainable competitive advantage during extreme negative events and associated environments.
Chapter 4 Study 1

Mapping of Definitions of Organizational Resilience

Overview

Chapter 4 involves a series of content analyses of the definitions of organizational resilience obtained from a systematic search during the period 1988-2016. The aim of this investigation is to unravel the theoretical meaning of organizational resilience, and more specifically, to discern the stability and reliability of essential components of this construct. This Chapter consists of three interrelated studies. Study 1.1 is an in-depth content analysis of all definitions of organizational resilience, deconstructing definitions to identify prominent components. Study 1.2 examines the conceptual evolution of organizational resilience clustered across three periods: 1988-2007, 2008-2012, and 2013-2016 to determine whether the prominence of those components from Study 1.1 vary in tandem with the change of periods. Study 1.3 explores whether the prominence of components from Study 1.1 change according to theoretical and methodological orientation, be it, conceptual, quantitative, and qualitative. Chapter 4 concludes with analyses of findings and implications for future research, the scholarship of which forms the basis for verification and extension of findings outlined in Study 3 (Chapter 6) by means of an online survey of entrepreneurs.
**Study 1.1 Definitions of Organizational Resilience: 1988-2016**

**Introduction**

Organizational resilience is essential for firm survival and sustainability. The meaning of a construct plays a pivotal role in construct clarity and theory building. However, emergent definitions of organizational resilience are inconsistent in their language with regards to its nature, characteristics, and relationship between key variables. First, ambiguity across definitions predominates in the nature of this construct, raising questions as to whether organizational resilience is a capacity (Hamel & Valikangas, 2003; Lee, Vargo, & Seville, 2013; Marwa & Milner, 2013; Winston, 2014), a property (Burnard & Bhamra, 2011; Lengnick-Hall & Beck, 2005), a function (McManus et al., 2008; McManus, 2008), or a quality (Mallak, 1998a).

Second, as discussed in Chapter 3, there are a plethora of characteristics typifying or distinguishing organizational resilience from other constructs. While some definitions emphasize an ability to adapt (Madni & Jackson, 2009; Mallak, 1999; McDonald, 2006; Sutcliffe, 2006; Wildavsky, 1988), others focus on rapidity and effective responses to crises (Ates & Bititci, 2011; Ortiz-de-Mandojana & Bansal, 2016; Pettit et al., 2013; Välikangas & Georges L. Romme, 2012).

Third, a definition should specify the relationship between key variables (Yaniv, 2011). While some studies (Amann & Jaussaud, 2012; Gittell et al., 2006; Lampel, Bhalla, & Jha, 2014; Ortiz-de-Mandojana & Bansal, 2016) utilize firm performance or competitive advantage as indicators of resilience in their definitions. Most investigations (Akgün & Keskin, 2014; Birkie, 2016) outline firm performance as a positive outcome of resilience. In a similar vein, a range of definitions (Ates & Bititci, 2011; Oh & Teo, 2006; Yılmaz Borekci et al., 2015) include organizational agility as a characteristic of resilience, but Lengnick-Hall et al. (2011) identify
organizational agility as a distinct concept. Furthermore, concepts like innovation have been examined either as a component (Oh & Teo, 2006), an antecedent (Mafabi et al., 2012), or a consequence (Dewald & Bowen, 2010) of organizational resilience.

Accordingly, the objective of Study 1.1 is to gain an appreciation of the definitions of organizational resilience and situate this examination within the 3-component resilience capacity framework (Lengnick-Hall & Beck, 2005). Study 1.1 first systematically reviewed all the major articles published between 1988-2016 across ten computerized databases. Then, this study extracted 59 definitions and utilized a machine-based text analysis, Leximancer, to analyze these definitions. Study 1.1 addresses two inter-related research questions:

RQ1.1.1: What are the underlying components of definitions of organizational resilience?
RQ1.1.2: To what extent are these components congruent with the 3-component resilience capacity framework proposed by Lengnick-Hall and Beck (2005)?

Methodology

Literature search and inclusion criteria

The present study concerns a systematic search of the organizational resilience literature during the period 1988-2016. A two-step approach was adopted to locate relevant studies. Step 1 involved an in-depth literature review and analysis of 10 computerized databases: SCOPUS (Elsevier), ScienceDirect (Elsevier), Proquest, Emerald Insight, Business Source Complete (EBSCO), Business Collection (Informit), PsycINFO (ProQuest), Wiley Online Library, Web of Science, and Google Scholar. The following keywords were utilized: enterprise (s)\ company(ies)\ organizational\ corporate\ firm(s) resilience, resilient organizations\ enterprises\ corporations\ firms\ companies. Step 2 entailed examining the reference lists of selected manuscripts for pertinent studies.
Studies that articulated conceptualization of organizational resilience were selected for the current content analysis. Manuscripts needed to provide, discuss, or outline definitions of organizational resilience. This process resulted in the inclusion of 139 Journal papers and Ph.D. theses, of which 64 were classified as conceptual, 31 as qualitative, and 44 as quantitative studies.

**Data collection**

In relation to these 139 manuscripts, definitions of organizational resilience were isolated on the basis of wording such as we defined organizational resilience as…, organizational resilience is the ability of…, we focus organizational resilience as…, a resilient organization is…, organizational resilience reflects/represents the ability of organizations. This selection process culminated in the identification of 59 definitions of organizational resilience and involved a text database of 4244 words.

**Data analysis**

Leximancer 4.0 (http://info.leximancer.com/) was utilized to undertake the content analyses of definitions of organizational resilience. Leximancer was selected for five considerations. First, as a text analytic tool, Leximancer automatically transforms lexical frequency and co-occurrence information from natural language to semantic themes. This content analytic process software mitigates subjectivity and avoids possible fixation as might occur in human analyses (Smith & Humphreys, 2006). An iterative process helps to discover unexpected meaningful connections through an objective analysis approach (Dann, 2010).

Second, Leximancer utilizes a quantitative method to analyze qualitative data (Tseng, Wu, Morrison, Zhang, & Chen, 2015). The program employs word frequency and co-occurrence data to show three essential units: words, concepts, and themes (Smith & Humphreys, 2006; Wu, Wall, & Pearce, 2014). Words that occur frequently are generated as concepts. Concepts
that have high co-occurrence and close proximity are circled and generate theme maps. Concepts that are more likely to be associated are circled within a particular theme. A theme map summarizes the main idea in a specific cluster and is named by the most prominent concept. The importance of themes is shown by the color and size of circles representations (Biesenthal & Wilden, 2014). The most important theme appears in red, and the next one in orange, and so on according to a color wheel. The distance between concepts in themes indicates their closeness (Leximancer Manual version 4, 2011).

Finally, Leximancer demonstrates high levels of face validity, stability, and reproducibility (Smith & Humphreys, 2006), and has been utilized in a number of research areas such as psychology (Cretchley, Rooney, & Gallois, 2010), human language (Smith & Humphreys, 2006), project management (Biesenthal & Wilden, 2014), and tourism (Tseng et al., 2015; Wu et al., 2014).

**Results**

The process of subjecting the 59 definitions of organizational resilience to a content analysis utilizing Leximancer generated 12 themes and 42 concepts (Figure 4.1). In descending order of importance, the themes and their connectivity rates (in parentheses) are *capability* (100%), *challenges* (70%), *change* (37%), *resources* (31%), *innovation* (14%), *flexibility* (9%), opportunity (8%), *awareness* (7%), *system* (7%), *performance* (4%), employees (4%), and *before* (4%). Connectivity scores identify the relative importance of a theme (i.e., a cluster of concepts) that are heat mapped (Figure 4.1). As alluded to earlier, *capability*, the most central and dominant theme is assigned the color red. In descending order of centrality, other themes are coded orange, yellow, green, blue, and purple.

Figure 4.1 reveals that while organizational resilience research covers a diverse array of topics, three core areas of research predominate. Briefly, research stream 1 comprises the themes of
capability, challenges, and change, designated in the map as Area A, indicating that resilience is a capability for dealing with challenges and change. Research stream 2 focuses on innovation and opportunities (innovation, opportunities, anticipate themes), designated in the map as Area B. Research stream 3 designated in the map as Area C, encapsulates the functions of adaptive ability, situation awareness, and vulnerabilities.

Figure 4.1: Theme map of organizational resilience definitions

The final agglomeration of themes is designated by Area D and reflects the performance implications of organizational resilience (performance theme). Unlike themes represented by Areas A, B, and C, the performance theme is ancillary to the core aspects of organizational resilience. The research streams are discussed subsequently. Table 4.1 provides a detailed summary of themes, respective concepts, and exemplars of definitions subsumed in each theme.
Table 4.1: Themes, respective concepts, and exemplars of definitions subsumed in a theme

<table>
<thead>
<tr>
<th>Area</th>
<th>Theme</th>
<th>Concepts</th>
<th>Exemplar of concept definitions subsumed under associated themes</th>
</tr>
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</table>
| A    | Capability  | - Organizational  
                  - Environment  
                  - Dynamic  
                  - Unexpected | The capacity of an organization to withstand unexpected changes and discontinuities associated with environmental risks (de Carvalho et al., 2016)  
                  The dynamic capability of individuals, groups, and organizational subsystems to develop flexible and innovative solutions in response to immediate and unexpected environmental changes (Kamalahmadi & Parast, 2016) |
|      | (100%)      |                                      |                                                                  |
|      | Challenges  | - Management  
                  - Operating  
                  - Events  
                  - External  
                  - Internal  
                  - Preparedness | Challenges include discrete errors, scandals, crises, shocks, risks, disruptions, stresses, and strain (Vogus & Sutcliffe, 2007)  
                  Organization’s capability to manage disruptions and unexpected events in advance through a strategic awareness and linked operational management of internal and external shocks (Annarelli & Nonino, 2015)  
                  The organizational preparedness to rapidly redeploy and reconfigure technical and organizational resources that enable a quick response to unpredictable operating changes (Ates & Bititci, 2011) |
|      | (70%)       |                                      |                                                                  |
|      | Change      | - Response  
                  - Agility  
                  - Sense  
                  - Proactive | The ability of an organization to proactively initiate, restore, and redesign responses in a flexible and quick way to circumstantial changes (Yilmaz Borekci et al., 2015)  
                  Sensing refers to a set of proactive practices that enable a firm to detect, develop, and learn anticipative know-how based on past experiences and prevailing circumstances (Birkie, 2016) |
|      | (37%)       |                                      |                                                                  |
| B    | Innovation  | - Business  
                  - Model | The capacity of an organization to sense and explore environmental changes and opportunities and to exploit and respond swiftly with business model and technology innovations (Oh & Teo, 2006) |
|      | (14%)       |                                      |                                                                  |
|      | Opportunities| - Technical | The ability to absorb, anticipate, and resist external events, and generate new technical and organizational solutions when faced with challenges (Gilly et al., 2014)  
                  The ability to turn threats into opportunities before it is too late (Välikangas, Georges & Romme, 2012) |
|      | (8%)        |                                      |                                                                  |
|      | Anticipate  | - Before | The ability to dynamically anticipate and adjust to threats through reinventing business models and strategies before the need becomes desperately obvious (Hamel & Valikangas, 2003) |
|      | (4%)        |                                      |                                                                  |

Note: The exemplars are generated by Leximancer that covers the concepts and meaning of a theme.

Table 4.1 continues...
<table>
<thead>
<tr>
<th>Area</th>
<th>Theme</th>
<th>Concepts</th>
<th>Exemplar of concept definitions subsumed under associated themes</th>
</tr>
</thead>
</table>
| C    | Resources (31%) | • Adaptive  
• Functions  
• Vulnerabilities  
• During  
• Survival | A function of an organization’s overall situation awareness, management of keystone vulnerabilities, and adaptive capacity in a complex, dynamic, and interconnected environment (McManus et al., 2008)  
The ability of organizations to collaborate and coordinate critical resources in minimizing operational disruptions, and to perform core functions during disasters (Andrew et al., 2016; Jung, 2015) |
|      | Awareness (7%) | • Situation | Situation awareness is a measure of an organization’s understanding and perception of its entire operating environment which includes an ability to look forward to opportunities as well as potential crises, an awareness of internal and external available resources, and the ability to identify crises and their consequences accurately (McManus et al., 2008) |
|      | Employees (4%) | • Employees | Management of keystone vulnerabilities includes tangible resources such as employees, managers, decision-makers, and subject matter experts and intangible resource. For example, relationships and communication structures between key internal and external groups (McManus et al., 2008) |
|      | Flexibility (9%) | • Decision | The structural and infrastructural decisions build flexibility in resource acquisition and deployment that reduce vulnerabilities against severe economic changes (Acquaah et al., 2011) |
| D    | Performance (4%) | • Competitive  
• Strategy | The ability to align manufacturing strategies to competitive strategy resulting in a competitive advantage and superior performance (Acquaah et al., 2011) |
|      | System (7%) | • System | The ability of organizational system to absorb, adapt, adjust, and survive at three levels—the operation (the individuals, group or team who work through the task and operational processes, with the relevant technology to produce the required result or output); the organization (which incorporates, organises, and coordinates resources to support the operations); and the industrial system (which designs and produces the technologies that make the operation possible) (McDonald, 2006) |

Note: The exemplars are generated by Leximancer that covers the concepts and meaning of a theme.
Research stream 1

Research stream 1 has gained significant attention, suggesting that organizational resilience is a dynamic capability that enables the development of flexible and innovative alternatives (Kamalahmadi & Parast, 2016) in order to respond quickly to environmental changes (Table 4.1). This research stream is reflected by the three prominent themes, capability, challenges, and change (red color). Capability consists of five concepts, organizational, environment, dynamic, unexpected, and strategic. Interpretation of the meaning of these concepts and the capability theme indicate that organizational resilience is neither a process, property, nor quality but rather an ability or a capability (de Carvalho, Ribeiro, Cirani, & Cintra, 2016; Kamalahmadi & Parast, 2016) to withstand unexpected environmental changes and risks (de Carvalho et al., 2016).

The second prominent theme, challenges, compromises six concepts, management, operating, events, external, internal, and preparedness. Challenges are regarded as those crises, shocks, risks, and disruptive disturbances that affect an organization negatively (Vogus & Sutcliffe, 2007). The six concepts clustered as a theme imply that organizational resilience involves the effective management of internal and external shocks (Annarelli & Nonino, 2016) along with an advanced level of organizational preparedness in redeploying and reconfiguring organizational and technical resources (Ates & Bititci, 2011).

The theme of change consists of four concepts, response, agility, sense, and proactive. An in-depth examination of these concepts reflects that organizational resilience involves three interrelated components: agility, sensing, and flexibility. Resilient organizations employ proactive and quick responses when facing challenges (Birkie, 2016; Yilmaz Borekci et al., 2015). An ability to sense environmental changes enables organizations to detect, develop, and learn based on past experiences (Birkie, 2016). A capacity to initiate, restore, and redesign
responses in a proactive, flexible, and swift way (Yilmaz Borekci et al., 2015) helps organizations to withstand circumstantial perturbations.

**Research stream 2**

Research stream 2 encapsulates the themes of *innovation, opportunities, and anticipate*. The subsumed concepts of these themes are interrelated and overlap (Table 4.1). *Innovation* includes two concepts: *model and business*. *Opportunities* capture the concept of *technical*. *Anticipate* incorporates the concept of *before*. This research stream denotes that organizational resilience involves innovation, an ability to respond with strategies, technologies, and business model innovations (Hamel & Valikangas, 2003; Oh & Teo, 2006), to generate new technical and innovative organizational solutions (Gilly, Kechidi, & Talbot, 2014) before the need becomes desperately obvious. Also, research stream 2 identifies resilience as an ability to dynamically sense, explore, and anticipate environmental changes and opportunities a priori in the face of challenges (Hamel & Valikangas, 2003; Oh & Teo, 2006).

**Research stream 3**

Central to research stream 3 are the notions of situation awareness, management of vulnerabilities, and adaptive capability during times of a disaster (Andrew et al., 2016; McManus et al., 2008). The concept of adaptive capacity is at the core and can be defined as the ability of an enterprise to alter its “strategy, operations, management systems, governance structure, and decision-support capabilities” to withstand perturbations and disruptions (Starr, Newfrock, & Delurey, 2003, p. 3). Adaptive capability emphasizes positive enterprise and employee behavior. Situation awareness reflects an organization’s understanding and perception of its overall operating environment and available resources (McManus et al., 2008). This characteristic enables an organization to identify opportunities, and to minimize and manage vulnerabilities and potential crises, and to deal effectively with their subsequent consequences in a timely manner (Boin & van Eeten, 2013; McManus et al., 2008).
Management of vulnerabilities concerns a capacity to collaborate and coordinate tangible resources (e.g., employees, decision-makers) and intangible assets such as partnerships, relationships, and communication structures between internal and external groups (Andrew et al., 2016; Jung, 2015; McManus et al., 2008), along with an ability to minimise operational disruptions and vulnerabilities.

**Discussion**

Study 1.1 examined how organizational resilience has been conceptualized over the previous three decades using Leximancer, a content analysis software. Findings unravel the meaning of organizational resilience, establishing the existence of three main research streams. Put simply, research stream 1 signifies that organizational resilience is a dynamic capability that enables organizations to respond quickly in face of challenges. Research stream 2 intimates that organizational resilience is an ability to anticipate and seize opportunities through innovation. Research stream 3 reveals that organizational resilience is an ability to adapt by holding a situation awareness of environmental changes and through the effective management of organizational vulnerabilities. Each research stream alludes to time sensitivity elements in the form of a priori preparedness or at-the-time responses to deal with challenges.

On the basis of the main themes and concepts identified in each research stream, findings indicate that organizational resilience includes cognitive components, which are interrelated and in combination act as “a conceptual orientation that enables an organization to notice, interpret, analyse, and formulate responses” (Lengnick-Hall & Beck, 2005: 750). However, the cognitive resilience focuses on an anticipating capability (Ates & Bititci, 2011; Hamel & Valikangas, 2003), sensing ability (Birkie, 2016; Oh & Teo, 2006), and having a situation awareness (McManus et al., 2008) to environmental changes (opportunities & threats), which incorporate organizational sensemaking but not organizational identity.
Anticipating capability involves ongoing monitoring of the environment and detecting unexpected events (Vogus & Sutcliffe, 2007), enabling an organization to predict opportunities and threats in advance, to make any necessary corrections to strategic direction, and to build capabilities for recovering from any unexpected events. While anticipating implies a pre-crisis preparedness for a crisis, sensing and situation awareness reflect a business-as-usual ability.

Sensing opportunities is “a scanning, creation, learning, and interpretive activity” (Teece, 2007, p. 1322), that enables organizations to not only recognize but also understand and discern environmental changes and marketplace opportunities. Sensing includes situation awareness, which enables an organization to perceive its entire operating environment, recognize changes, identify opportunities, and preclude core negative events (McManus et al., 2008). Sensing incorporates sensing-making, which helps firms to interpret new events and making decisions based on experiences and information (Lengnick-Hall & Beck, 2005).

Based on the main themes and concepts identified in each research stream, the present findings intimate that adaptability (McManus et al., 2008), flexibility (Yilmaz Borekci et al., 2015), agility (Kamalahmadi & Parast, 2016), and innovation (Oh & Teo, 2006; Välikangas & Romme, 2012) focus on behavioral aspects of resilience capabilities that move an organization forward. Put simply, enterprises deal with a crisis by adapting and innovating flexibly in an agile manner. These four capabilities do not align with the behavioral components: learned resourcefulness, counterintuitive moves, useful habits, and behavioral preparedness (Lengnick-Hall & Beck, 2005). Also, there is no evidence to suggest a contextual component (e.g., social capital) of organizational resilience. The following sections elaborate on the components, respectively.

Adaptability and innovation concern outcome-related adaptations. Adaptability is associated with adjustments to products, services, or technology in order to be congruent with external environments (McManus et al., 2008). Adaptability is geared towards adjusting and altering
essential structures, strategies, operations, coordination activities, and decision-making capabilities to withstand disruptions (McManus et al., 2008). However, a key consideration here is the extent to which and in what ways adaptability is a behavioral component of resilience. Lengnick-Hall and Beck (2005) regarded resilience capability as an internal factor that facilitates the process of adaptive fit. Stipicevic (2011) equated organizational resilience with adaptive capacity. Wildavsky (1988) suggested that resilience is an adaptive capability that grows over time. Findings of the current study, however, indicate that adaptability is a component of organizational resilience, emphasizing a behavioral action to deal with challenges.

Innovation reflects a creative renewal capability in the form of new business models and strategies, new products and services, new methods of distribution and marketing to respond to the unexpected (Oh & Teo, 2006). Innovation has received the most research attention and its role has been largely controversial when compared with the other three behavioral components. Innovation, as an antecedent, impacts positively on organizational resilience (Mafabi et al., 2012). Innovative companies are more likely to be resilient and able to sustain higher financial performance than their counterparts (de Carvalho et al., 2016). In contrast, as an outcome, organizational resilience influences organizational creativity positively (Richtnér & Löfsten, 2014). Resilience not only has a positive effect on product innovativeness but product innovativeness has been observed to mediate the relationship between resilience capability and firm performance (Akgün & Keskin, 2014).

The current findings address this controversy and suggest that innovation is a component of resilience. These findings are consistent with Reinmoeller and Van Baardwijk (2005) who defined resilience as “the capacity to self-renew over time through innovation” (p. 61) and Oh and Teo (2006) who proposed that innovation was an integral component of organizational resilience. Moreover, the Benchmark Resilience Tool, the Resilience HealthCheck Tool, and
the Resilience Thumbnail Tool incorporate innovation and creativity as a component of their definitions and operationalization of organizational resilience.

Flexibility focuses on inner operations. Having alternative strategies, a range of operational processes, a diversity of employees, and being able to source up-to-date information are key examples of flexibility, enabling effective adaptation (Yılmaz Börekci et al., 2015). Flexibility focuses on behavioral aspects targeted at developing a wide range of interchangeable alternatives or deploying resources in a flexible, storable, and convertible way to avert maladaptive tendencies and to cope positively with the unexpected (Gittell et al., 2006). This view is consistent with Kamalathamadi and Parast (2016) who defined flexibility as the capacity to take distinct positions to respond to uncertain conditions. Examples of this capability include having flexible production lines, supply bases, and labor arrangements.

The meaning of flexibility in the resilience literature remains ambiguous. A number of authors (Mendonça & Wallace, 2015; Woods, 2006) take an implicitly system-oriented view, defining flexibility as a system’s ability to change processes and restructure. Others (Erol et al., 2010) define resilience as an ability to adapt to changing environmental requirements. While others conflate the meaning of flexibility and agility in terms of rapid decision-making (Pal et al., 2014), Lengnick-Hall and Beck (2009) regard flexibility as a dimension of agility. Study 1.1 confirms that flexibility is a behavioral component of organizational resilience and is interrelated but different to adaptability and agility.

Nimbleness, swiftness, and timeliness of adaptation are key attributes of agility. The meaning of agility and the identified relationship of agility to resilience is also problematic. Lengnick-Hall and Beck (2009) noted that organizational resilience and strategic agility share common roots, and are both built on complementary resources, skills, and competencies. Organizational resilience facilitates the development of strategic agility. Birkie (2016) equated resilience with
agility and defined resilience as an ability to change and respond quickly. Study 1.1 highlights the timely nature of responses of organizations to unpredictable changes, the findings of which are consistent with Jamrog et al. (2006) who emphasize a decisive, as well as an endowed ability to effectively anticipate, initiate, and take advantage of the nature of unpredictable changes.

In summary, Study 1.1 demonstrate that organizational resilience involves cognitive and behavioral components. The cognitive component involves three capabilities, anticipating, sensing, and situation awareness. The behavioral component includes four capacities, adaptability, flexibility, agility, and innovation. Moreover, this construct has different meanings to different authors, and possibly over different intervening periods of time. As a construct, its meaning has remained dynamic. Thus, the following section presents Study1.2, an exploration of the conceptual evolution of the organizational resilience construct.

Introduction

It has been three decades since the promulgation of the organizational resilience construct (Wildavsky, 1988). Over this period, a number of different factors have been influential in the development of this construct. First, global business environments have changed contiguously and are increasingly uncertain. Certain events (i.e., 2008 GFC) have been triggers of research interest. Second, different disciplines have contributed to this field at different times, from ecology (Holling, 1973), psychology (Connor & Davidson, 2003; Windle, 2011), and to sociology (Kahn et al., 2018). Third, academic interest has shifted from viewing resilience in terms of reliability during the 1980s-90s to managing employee strengths and business model adaptability post 9/11 (Linnenluecke, 2017). Finally, research in the field has moved from the early conceptual work of Weick (1993), Mallak (1999), and Lengnick-Hall and Beck (2005) to more structured empirical modelling and testing (Buyl et al., in press; Lafuente et al., 2017; Parker & Ameen, 2018; Yilmaz Borekci et al., 2015).

Given that the meaning of a construct promulgated during a particular period is reflected by the zeitgeist and that change occurs in tandem with the evolution of theories and intervening events such as economic turbulence, it is argued that definitions of organizational resilience change over time. Accordingly, the motivation underlying Study 1.2 was to determine whether there have been any significant developments or changes in definitions across different periods of time, in another word, to determine the stability and reliability of those components identified from Study 1.1. The research questions addressed in Study 1.2 are:

RQ1.2.1: Have definitions of organizational resilience evolved from 1988 to 2016?
RQ1.2.2: If so, whether the prominence of components and capabilities identified in Study 1.1 varies in tandem with the change of period?
Methodology

Study 1.2 also utilized Lexmancer to conduct a content analysis. In this analysis, the 59 definitions identified in Study 1.1 were grouped across three time periods: 1988-2007 (18 definitions), 2008-2012 (21), and 2013-2016 (20). 1988 was chosen as the start point because Wildavsky (1988) provided one of, if not, the first definition of organizational resilience. 2008 was chosen as the breakpoint because 2008 heralded a surge in research on organizational resilience. 2013 evidenced another spike in publications post the GFC.

Results and Discussion

Respectively, Figures 4.2, 4.3, and 4.4 are pictorial representations of key themes emanating from the textual analysis of definitions of organizational resilience clustered across three time periods: 1988-2007, 2008-2012, and 2013-2016. When comparing the three time periods, the theme of capability is at the core (red color). In Figure 4.2 (1988-2007), which includes an analysis of a cluster of papers published between 1988-2007, capability incorporates the concepts of adaptive, dynamic, and before but is not closely linked to other themes, indicating that resilience is a dynamic and adaptive capability with a proactive perspective involving an a priori perspective.

In contrast, an appraisal of Figure 4.3 (2008-2012) reveals that capability includes the concepts of, adaptive, leadership, and culture. Capability is encircled by the themes of vulnerabilities, decision-maker, and response. Prominent concepts include flexibility, resources, and individuals. This pattern of findings indicates that increasing attention was dedicated to the role of leadership, decision-making, and individuals—that is, the micro-foundations of organizational resilience, suggesting that sound leadership enables effective decision-making and resource flexibility. Figure 4.4 shows that since 2013, capability has taken a reactive perspective involving management of the unexpected.
This finding can be attributed in part to a concentrated theoretical push within the strategic management and entrepreneurship areas. Post 2008, the development and extensive utilization of the resource-based theory (Barney, 1991; Kraaijenbrink, Spender, & Groen, 2010; Lockett, Thompson, & Morgenstern, 2009; Terziovski, 2010) and the dynamic capabilities perspective (Ambrosini & Bowman, 2009; Helfat & Peteraf, 2009; Hung et al., 2010; Teece, 2007), exploring micro-foundational mechanisms by which organizations attain sustainable firm performance and competitive advantage within rapidly changing environments has provided a solid foundation for further developments in organizational resilience research.

Close scrutiny of thematic developments over time reveals subtle shifts in the importance of and relationships between innovation and challenges, and a number of other themes.
Innovation with respect to business models and technology is dominant during 1988-2007 (red color). Challenges (green color) is less prominent. Innovation is located at a distance to challenges, indicating a weak co-occurrence. Post 2008, challenges is incorporated within the capability construct. Innovation plays a less central role (green color) but is linked with challenges through opportunities. Vulnerabilities gain prominence.

Figure 4.3: All article map (2008-2012)

In the 2013-2018 period (Figure 4.4), however, challenges gain prominence, but innovation is out-of-favor. Increasing attention is dedicated to different types of challenges such as those concerning strategic, operational, cognitive, and opportunities. This shift in emphasis is consistent with Zaato and Ohemeng (2015) who addressed four major organizational
challenges: cognitive, strategic, political, and ideological. According to these authors, cognitive challenges relate to an awareness of change and their impact on organizational environments. While strategic challenges necessitate the development and deployment of a plethora of new alternatives to outdated strategies. Political challenges require building a portfolio of breakout experiments. Ideological challenges relate to renewing organizational doctrines of optimization. The shift in emphasis to different types of challenges contribute to firms concentrating on agility: that is, quick responses to challenging events.

Figure 4.4: All article map (2013-2016)
Coevolution of themes of innovation and challenges is reflected in definitions. Reinmoeller and Van Baardwijk (2005) defined organizational resilience as a capability to self-renew over time through innovation. Notwithstanding, over time, definitional emphasis shifted to regarding this construct as a capacity to adopt new routines and processes to address threats and opportunities through business model innovations (Dewald & Bowen, 2010); and as an ability to respond quickly and effectively, recover from disruptions, and exploit opportunities affiliated with unanticipated events (Birkie, 2016).

Variations in concepts scaffolding the construct of capability along with the co-evolution of the innovation and challenges constructs across these three periods can be attributed to business environment changes and relatively frequent volatile and economic turbulent conditions. During 1988-2007, although organizational resilience research was limited, innovation across different industry sectors, particularly IT, flourished. Moreover, the business environment was relatively unstable as evidenced by an early 1990s recession, the 1997 crisis, and the 2000-02 bust of the Dot.com bubble. Organizations were forced to be proactive, and foreplanning and innovation become a necessity, as demonstrated by high tech companies such as Google and Apple.

Since the 2008 subprime mortgage crisis interest in topics pertaining to vulnerabilities and challenges can be attributed to the impact of high-velocity changing business environment on business performance and survival. Nowadays, organizations operate in continuously changing and unpredictable contexts. Minor shifts can precipitate unforeseeable consequences and expose organizations to new and different types of challenges and opportunities. The dominant effect of unexpected challenges means that organizations have to develop a capacity to change and respond quickly, as well as having an ability to counterpunch.
In summary, Study 1.2 finds that regarding of organizational resilience as a dynamic capability has remained consistent since 1988. However, the theme of challenges has gained prominence in recent times (2013-2016). Different behavioral capabilities of organizational resilience attain prominence only during specific periods, such as those concerning adaptability (1988-2012), innovation (1988-2007), flexibility (2008-2012), and agility (2013-2016). Of particular note, the 2008-2012 period saw an emphasis on micro-foundational capabilities (e.g., leadership, decision-making, individuals).

Study 1.3, which follows, explores the differential emphasis of conceptual, qualitative, and quantitative manuscripts to determine their impact on theory building and measurement of organizational resilience.
Study 1.3 Analysis of Definitions of Organizational Resilience Originating from Conceptual, Qualitative, and Quantitative Papers: 1988-2016

Introduction

As elaborated in Chapters 2 and 3, work originating from different manuscripts view organizational resilience through different prisms. Conceptual papers explore the mechanisms, components, antecedents, levels, and the interrelationships that explain this construct. Quantitative investigations center on the nomological nets encapsulating antecedents, proxy measures, and outcomes of organizational resilience associated with specific contextual contingencies such as industry sectors. Qualitative studies not only examine mechanisms, components, and antecedents of organizational resilience but also proffer broad-based conceptual insights. Given that definitions play a pivotal role in theory building, it is proposed that the differences in emphasis across these orientations is reflected by the prominence of particular components. Accordingly, the objective of Study 1.3 is to determine whether there are differences in the focus of components across these three orientations. The two research questions of Study 1.3 are,

RQ1.3.1: What components and capabilities from Study 1.1 are liable to conceptual papers, and thus have been employed in the theoretical building?
RQ1.3.2: What components and capabilities from Study 1.1 are more susceptible to measurement, and thus have been employed in empirical research?

Methodology

As in the previous two investigations, Study 1.3 utilized Lexmancer to conduct a thematic content analysis of definitions of organizational resilience, concentrating on the orientation of respective manuscripts. In this analysis, the 59 definitions utilized in Study 1.1 were partitioned into those that originated from either conceptual (n=26), qualitative (n=15), or quantitative (n=18) research.
Results and Discussion

Respectively, Figures 4.5, 4.6, and 4.7 show the concept maps for conceptual-, qualitative-, and quantitative-oriented manuscripts. Close scrutiny reveals that there is congruency across these underlying maps. Once again, it is observed that Capability is manifested at the core (red color) of all maps but incorporates the single concept, environment. This finding suggests that the context plays a central role and that resilience can be regarded as an environment-sensitive capability.

![Concept Map](image)

**Figure 4.5: Conceptual articles map (1988-2016)**

Despite the scant similarity in themes, there are significant differences across the three modes of research, intimating that a level of pervasive methodological and theoretical determinism constrains scholars’ ability to integrate concepts within the field. Based on the analysis, it
appears that conceptual papers (Figure 4.5) portray resilience as a capability to respond (response) to challenges through an awareness of and preparedness for the unexpected. Qualitative articles (Figure 4.6) focus less on capability and challenges, but more on resources, organization, and systems. The emphasis seems to have shifted from what constitutes resilience capability to how to build capability, noting that resources/systems are linked directly with organization, management, flexibility, and timely response, in order to be deployed to deal effectively with challenges. In contrast, the textual analysis of definitions emanating from quantitative articles (Figure 4.7) highlights the mediating role of challenges between capability and innovation.

Figure 4.6: Qualitative articles map (1988-2016)
One interpretation of these differences can be attributed to the field evolving quasi-independently of theory, which to a large extent has not been tested empirically. Rather, it seems that definitions across different disciplines have been contiguously reformulated and (re)combined by researchers. Definitions associated with conceptual manuscripts appear to search for the meaning and characteristics of organizational resilience. As evident in Figure 4.5, themes are mostly scattered with the majority of underlying concepts seldom overlapping along with a high degree of separation among themes. Accordingly, conceptual papers tend to propose broad-based frameworks that encapsulate the components, enablers, and operational aspects of organizational resilience. For example, Lengnick-Hall and Beck (2005) prudently deliberate on the cognitive, behavioral, and contextual components, and their interdependency.
In contrast, Kamalahmadi and Parast (2016) propose an alternative framework and expound upon seven primary principles of organizational and supply chain resilience.

Qualitative papers (Figure 4.6) proffer insights into the varying levels of analysis including financial, social, economic, system and individuals. In general, research questions in this area have concentrated on the development and underlying mechanisms associated with organizational resilience such as resource allocation, (re)integration, and processes adopted during/post a crisis. As a case in point, Pal et al. (2014) investigated how SME resourcefulness such as cash flow and relational networks through strategic and operational flexibility promoted the development of organizational resilience during economic crises encountered over the past two decades. Emmons (2013) examined how knowledge-sharing relationships and positive adaptation processes build organizational resilience.

It is not surprising that researchers adopted a systems perspective as early investigations of organizational resilience were derived mainly from two distinct but compatible sources: materials strength principles in engineering and the dynamics of complex ecosystems (Erol et al., 2010). Other disciplines such as material science (Callaway et al., 2000) and psychology (Windle, 2011) add another level of complexity to this field.

By way of contrast, themes associated with quantitative articles (Figure 4.7) show a coalescence of two tightly bunched but distinct camps. One stream concerns a capability to deal with challenges in an innovative manner in the context of leadership. The other focuses on adopting a positive orientation to manage unexpected and maladaptive events. Exploring the relationships among constructs is another feature of quantitative articles. For example, de Carvalho et al. (2016) compared innovative and non-innovative companies on levels of organizational resilience. Ortiz-de-Mandojana and Bansal (2016) investigated the influence of social and environmental practices on organizational resilience.
Differences in emphasis as evident across the three categories of manuscripts indicate that there is a disconnect between theoretical advancement and empirical pursuit. Particular definitions demand specific methodological approaches that culminate invariably in the formulation of significantly different models and outcomes.

Perhaps, a concerning aspect is that the research field is underdeveloped. As discussed in Chapter 2, there are only six review papers (Annarelli & Nonino, 2016; Kamalahmadi & Parast, 2016) in this area. Lack of a universally accepted organizational resilience scale is another factor inhibiting the development of this field. Put simply, it is easy to tell whether an organization is resilient as long it survives through a crisis and becomes increasingly resourceful. But what is organizational resilience by nature? Identifying the constituents, inner organizational routines and managerial actions that comprise and lead to resilience are challenging because crises are unexpected, fateful, and ephemeral. This challenge explains why a number of researchers equate organizational resilience to firm performance (Amann & Jaussaud, 2012; Lampel et al., 2014).

In summary, Study 1.3 reveals that organizational resilience is an environment-sensitive capability irrespective of manuscript type. However, the meaning of organizational resilience is closely associated with the orientation of the paper, be it: conceptual, qualitative, or quantitative. Conceptual papers explore organizational resilience as a capability to respond to challenges through awareness and preparedness. Qualitative documents examine multiple levels of analysis including systems, organizations, and individuals, and focus on organizational resources and flexibility has gained prominence. Quantitative manuscripts investigate the relationship among capability, innovation, and challenges. Clearly, researchers need to consider these associations when selecting and adopting a definition.
Summary of Findings and Implications for Future Research

As elaborated below, the observations from Studies 1.1 to 1.3 raise four issues for future consideration. That is, organizational resilience: is a multi-component and time-sensitive construct; a pattern of higher-order dynamic capabilities and involves contextual contingencies (e.g., extremely negative conditions).

**Issue 1: A Multi-Component Construct**

Organizational resilience involves cognitive and behavioral components. The cognitive component provides a foundation for organizational behavior. The behavioral component enable a firm to respond effectively and successfully to unexpected events. The cognitive component includes three principal capabilities: anticipating, sensing, and situation awareness, The behavioral component comprises four abilities: adaptability, flexibility, agility, and innovation. The prominence of these capabilities varies in tandem with the period of time and across different types of manuscripts, be it: conceptual, qualitative, and quantitative. Adaptability is prominent in both the content analysis of definitions for two time periods (i.e., 1988-2007, 2008-2012) and in conceptual manuscripts. Agility has gained attention in relatively recent times (2013-2016). Situation awareness receives attention in conceptual papers. Flexibility is prominent during the 2008-2012 period and in qualitative manuscripts. Of particular note, the 2008-2012 period saw an emphasis on micro-foundational components (e.g., leadership, decision-making, individuals).

These findings imply that organizational resilience is not a fixed construct but is dynamic and its meaning has changed with time and into ascertaining degree dependent on the orientation of manuscript (i.e., theoretical, methodological). The early period focuses on theoretical exploration and the adaptive aspect of resilience. The mid-development period heralds a number of qualitative manuscripts that center on using grounded theory and identifying
resource flexibility and micro-foundations in building organizational resilience. In recent times attention is heeded to agility: the fast and timely speed of organizational responses to extreme negative events (i.e., adversities, turbulence)

It should be noted that innovation gains prominence during the 1988-2007 period and in quantitative papers. 2006 heralds the first empirical investigation (Gittell et al., 2006; Oh & Teo, 2006). This result denotes that empirical investigations built on theories developed 10 years earlier. In other word, there is a 10-year time lag in the adoption and utilization of definitions of organizational resilience between empirical research and theoretical development.

**Issue 2: A Time-Sensitive Construct**

A second fundamental characteristic of organizational resilience is its time-sensitive nature. This nature is reflected in the two capabilities: anticipating and agility; and in the action and reaction to three phases (pre, during, post) of adversity. Anticipating implies an ability to predict and prepare for the unexpected before adversity. Agility intimates a capability to act and respond quickly and timely in an efficient manner. Organizational resilience involves a pattern of components and capabilities that vary according to the different types and time phases of adversities. Each capability assumes a different role and takes on a distinct level of prominence at particular phases.

**Issue 3: A Pattern of Dynamic Capabilities**

Organizational resilience involves a pattern of higher-order dynamic capabilities: sensing opportunities (Barreto, 2010; Teece, 2007; Wilden et al., 2013), adaptability (Hung et al., 2010), innovation (Wang & Ahmed, 2007), and flexibility (Wu, 2010). Teece, Peteraf, and Leih (2016) define dynamic capabilities as “the firm’s capacity to innovate, adapt to change, and create change that is favorable to customers and unfavorable to competitors” (p 18). Adaptive
capability is a firm’s ability to identify and capitalize on emerging market opportunities (Wei & Lau, 2010) while innovative capability refers to a firm’s ability to develop new products and/or markets through aligning strategic innovative orientations with innovative behaviors and processes (Wang & Ahmed, 2007). In terms of flexibility, dynamic capabilities can be disaggregated into the capacities to enhance, combine, and (re)configure organizational tangible and intangible resources (Teece, 2007), indicating in-built flexibility. Dynamic adaptive capability manifests itself through the inherent flexibility of resources endowments and application (Wang & Ahmed, 2007).

It remains unclear whether organizational agility is a dynamic capability. One research stream (Baskarada & Koronios, 2018; Teece et al., 2016) views organizational agility within the dynamic capability framework and proposes that dynamic capabilities (e.g., sensing, seizing, transforming) enable and effectuate organizational agility during intense uncertainty. Supply chain agility represents a dynamic capability enabling firms to respond to and affect the external environment (Aslam, Blome, Roscoe, & Azhar, 2018; Blome, Schoenherr, & Rexhausen, 2013). The other research stream (Mikalef & Pateli, 2017; Zahra, Sapienza, & Davidsson, 2006) indicates that dynamic capabilities act as antecedents of organizational agility. Dynamic capabilities increase organizational agility and market responsiveness (Zahra et al., 2006). IT-enabled dynamic capabilities facilitate two types of agility, market capitalizing and operational adjustment agility, which in sequence enhance competitive performance (Mikalef & Pateli, 2017).

Dynamic capabilities theory seldom discusses the role of anticipating capability and the three time-phases (before-, during, and post-adversity) of actions. Rather, this theory centers on the business-as-usual competences and capabilities. One interpretation is that organizational resilience co-exists with extreme negative events. This co-existence necessitates the holding of
time-sensitive capabilities (anticipating, agility) and the focus on the different phases of responses.

**Issue 4: Contextual Contingencies**

Organizational resilience is expressed during challenging and extreme negative conditions. The terms utilized in explaining these conditions includes but not limited to crises (McManus et al., 2008), disasters (Ates & Bititci, 2011), disruptions (Annarelli & Nonino, 2016), emergencies (Andrew et al., 2016; Jung, 2015), problems (Gilly et al., 2014), risks (de Carvalho et al., 2016), perturbations and stresses (Woods, 2006), threats (Dewald & Bowen, 2010), disturbances (Erol et al., 2010), pressures (Grove, 1997), turbulence (Marwa & Milner, 2013), shocks (Boin & van Eeten, 2013), and adverse and unexpected events (Vogus & Sutcliffe, 2007). This finding suggests that organizational resilience and extreme negative events co-exist. Organizational resilience has an essential role to play in extreme negative conditions that can predispose organizations to near-death experiences that threaten their survival.

In summary, Chapter 4 contributes, in no small way, to the definitional and paradigmatic debates in this area. It should be noted that this is the first time that definitions of organizational resilience promulgated by a diverse range of proponents have been subjected to an intensive qualitative analysis. This series of interrelated studies track the semantic evolution of organizational resilience in written literature and explores whether different methodologies have affected this evolution. Moreover, based on the findings, Chapter 4 clarifies this construct in terms of its components, nature, contextual contingencies, and underpinning theory (i.e., dynamic capabilities framework).
Chapter 5 Study 2

Mapping of Measures of Organizational Resilience

Overview

Chapters 5 concerns a series of content analyses of measures of organizational resilience obtained from a systematic search during the period 1988-2016. Study 2 aims to explore the operational meaning of organizational resilience and to determine the reliability of essential components of this construct. This Chapter contains two interrelated studies. Study 2.1 textually analyzes all measures of organizational resilience during the period 1988-2016, decomposing measures to pinpoint dominant components. Study 2.2 examines the operational evolution of organizational resilience clustered across three periods: 1988-2007, 2008-2012, and 2013-2016 to ascertain whether the prominence of those components from Study 2.1 varies in tandem with the change of periods. Overall, findings reveal that organizational resilience comprises micro-foundational components including leadership, decision-making, social capital, and information and knowledge. The prominence of these components does not vary in tandem with the time period. Chapter 5 concludes with an analysis of findings and implications for future research, the scholarship of which forms the basis for verification and extension of findings outlined in Study 3 (Chapter 6) by means of an online survey of entrepreneurs.
Study 2.1 Measures of Organizational Resilience: 1988-2016

Introduction

Conceptualizations of organizational resilience establish a basis for measurement quality. Notwithstanding, measurement of organizational resilience involves thinking about what resilience means in both an abstract and a practical sense. According to Singleton Jr et al. (1993), the measurement process of organizational resilience consists of moving from the abstract (concepts) to the concrete (measures of concepts). However, the lack of a solid theoretical foundation and the definitional inconsistency have contributed substantially to an apparent operational mess and subsequent low levels of construct validity.

Within the three-decade history of organizational resilience research, only three studies provide details as to theories that underpin the development of their measures and these theories are distinct. The three-source framework of bricolage, attitude of wisdom, and virtual role (Weick, 1993) form the basis of resilience scales of Mallak (1998b) and Somers (2009). The three-component resilience capacity (Lengnick-Hall & Beck, 2005) laid the foundation for the scales of Akgün and Keskin (2014) and Richtnér and Löfsten (2014). Grounded theory, organizational learning theory, and risk management and business continuity theory underscored the measure of McManus et al. (2008).

In addition, researchers seem to focus on different perspectives when operationalizing their components. Some authors (Alonso, 2015; Alonso & Bressan, 2015) concentrate on the challenges an organization faces. Others (Mafabi et al., 2012; Mafabi et al., 2015) emphasize the behavioral aspect of service delivery and reputation in response to demands. Still others (Birkie, 2016) focus on the dynamic capability perspective of reconfiguring and re-enhancing, the processes of which have been shown to be associated with organizational resilience. As a
consequence, aligning and embedding identified measures of organizational resilience with accepted theoretical frameworks has posed a challenge for the measurement.

Moreover, a muddle is further reflected in a diverse range of dimensions across measures. Is resilience capability unidimensional, multi-dimensional, or an amalgam of multiple capabilities? Hitherto, this question has neither been addressed nor let alone proposed. One stream of research considers organizational resilience capabilities to be uni-dimensional (Ambulkar, Blackhurst, & Grawe, 2015; Biggs et al., 2012; Blatt, 2009). While other streams regard this construct to be either bi-dimensional (Oh & Teo, 2006; Sonnet, 2016) or multi-dimensional (Alonso, 2015; Andrew et al., 2016; Somers, 2009).

Adaptive capacity, networking, and planning developed by the Resilient Organizational project are three components widely utilized in empirical studies (Jones, 2015; Orchiston, Prayag, & Brown, 2016; Stephenson, 2010). In contrast, robustness, redundancy, resourcefulness, and rapidity are four components operationalized into two distinct organizational resilience scales (Andrew et al., 2016; Jung, 2015; Wicker et al., 2013). Such diversity makes it difficult to untangle what is meant by and how to specifically measure different levels of organizational resilience, as well as enabling comparisons of findings across studies.

Finally, construct validity is essential for theory building and research development. Validation helps to determine the quality of measures and connect theory development to organizational practice. Thus, in line with Study 1, Study 2.1 focuses on measures and situated the findings within the 3-component resilience capacity framework (Lengnick-Hall & Beck, 2005). The objective of Study 2.1 is to determine whether the components from the text-mining exercise of measures of organizational resilience match those proposed by Lengnick-Hall and Beck (2005). The research questions are as follows:
RQ2.1.1: What are the underlying components of measures of organizational resilience?
RQ2.1.2: To what extent are these components congruent with the 3-component resilience capacity framework proposed by Lengnick-Hall and Beck (2005)?

Methodology

**Literature search and inclusion criteria**

The literature search keywords and procedure were the same as that adopted for Study 1.1. Studies that have utilized and reported measures of organizational resilience published between 1988-2016 were selected. This process resulted in the inclusion of 44 quantitative studies.

**Data collection.**

Of the 44 quantitative studies, only 29 (66%) reported either complete measures or a list of items of organizational resilience. Documents of these measures were saved as .csv files in preparation for Leximancer analysis. These instruments comprise 540 items founded on a text database of 8068 words.

**Data analysis.**

As the case with Study 1.1, Leximancer was utilized to content analyze measures of organizational resilience.

**Results**

Overall, the qualitative analysis generated nine themes and 33 concepts (Figure 5.1). In descending order of importance, the themes and their connectivity rates (in parentheses) are challenges (100%), capability (59.4%), information (8%), plan (6.5%), leadership (5.6%), service (5%), experience (3.4%), customers (3%), and networks (1.5%). Figure 5.1 reveals that unlike the interdependency demonstrated in the analysis of definitions, research streams in measures are, by-and-large, independent and concentrate on two core aspects: challenges and capability (red color of the theme).
Research stream 1 depicted by Area A comprises the themes of challenges, leadership, information, experience, and networks. Challenges is circled by the four themes, suggesting that developers of measures place an emphasis on assessing ways in which leaders manage challenges, make informed decision-making, and the role of people, and networks. Research stream 2, designated by Area B, characterizes the capability to amass sufficient resources, and respond in an agile manner during unexpected times to ensure the provision of services to customers. Research stream 3 is designated by Area C and reflects the role of emergency and contingency planning. Unlike themes presented in Areas A and B, planning is regarded as ancillary to the core aspects of organizational resilience. These streams are discussed in greater detail below.

![Theme map of organizational resilience measures](image)

*Figure 5.1: Theme map of organizational resilience measures*
Table 5.1: Themes, respective concepts, and exemplar of items subsumed in a theme

<table>
<thead>
<tr>
<th>Area</th>
<th>Theme</th>
<th>Concepts</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Connectivity)</td>
<td></td>
<td><strong>Employees</strong> are very clear about <strong>decision-making</strong> ability and feel empowered and <strong>supported</strong> to take action (Organizational Resilience Healthcheck, 2017)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Decision-making</strong> follows clear, transparent, and non-emotional <strong>processes</strong> (Organizational Resilience Healthcheck, 2017)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Our <strong>management</strong> think and act strategically to ensure that we are always ahead of the curve (Benchmark Resilience Tool, 2012)</td>
</tr>
<tr>
<td>A</td>
<td>Challenges (100%)</td>
<td>Organization</td>
<td>Staff have the <strong>information and knowledge</strong> they need to respond to unexpected problems (Whitman, Kachali, Roger, Vargo, &amp; Seville, 2013)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Employees</td>
<td>We get reliable <strong>information</strong> from multiple sources (Sonnet, 2016)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Decision-making</td>
<td>Staff are encouraged to move between <strong>different</strong> departments or try different roles to gain <strong>experience</strong> (Benchmark Resilience Tool, 2012)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Management</td>
<td>We use bits of past <strong>experience</strong> to come up with new ideas (Sonnet, 2016)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Support</td>
<td>We build <strong>relationships</strong> with <strong>others</strong> we might have to work with in a crisis (Benchmark Resilience Tool, 2012)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Process</td>
<td><strong>Managers are actively</strong> involved and support the <strong>recovery</strong> process through the allocation of resources (Birkie, 2016)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Leaders</strong> display decisive <strong>leadership</strong>, innovation and seek opportunity, including in times of adversity (Organizational Resilience Healthcheck, 2017)</td>
</tr>
<tr>
<td>Leadership (5.6%)</td>
<td>Recovery</td>
<td></td>
<td><strong>Managers are actively</strong> involved and support the <strong>recovery</strong> process through the allocation of resources (Birkie, 2016)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>We get reliable <strong>information</strong> from multiple sources (Sonnet, 2016)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>We use bits of past <strong>experience</strong> to come up with new ideas (Sonnet, 2016)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>We build <strong>relationships</strong> with <strong>others</strong> we might have to work with in a crisis (Benchmark Resilience Tool, 2012)</td>
</tr>
<tr>
<td>Information (8%)</td>
<td>Knowledge</td>
<td></td>
<td>We diversify more from the current <strong>product/service</strong> offer (Alonso &amp; Bressan, 2015)</td>
</tr>
<tr>
<td>Experience (3.4%)</td>
<td>Different</td>
<td></td>
<td>We have the <strong>capability</strong> to employ /mobilize <strong>sufficient</strong> backup resources to sustain operations <strong>during unexpected events</strong> (Wicker et al., 2013)</td>
</tr>
<tr>
<td>Networks (1.5%)</td>
<td>Others</td>
<td></td>
<td>We have the capability to restore services/ products <strong>quickly during unexpected events</strong> (Wicker et al., 2013)</td>
</tr>
<tr>
<td>B</td>
<td>Capability (59.4%)</td>
<td>Sufficient</td>
<td>We have the capability to employ /mobilize sufficient backup resources to sustain operations during unexpected events (Wicker et al., 2013)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Resources</td>
<td>We have the capability to restore services/ products quickly during unexpected events (Wicker et al., 2013)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>During</td>
<td>We are able to provide a quick response to the supply chain disruption (Ambulkar et al., 2015)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unexpected</td>
<td>We diversify more from the current product/service offer (Alonso &amp; Bressan, 2015)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Events</td>
<td>Organization has strong liquidity and cash flow position and can absorb the impact of modifying operations to respond to challenge or adverse event (Organizational Resilience Healthcheck, 2017)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Respond</td>
<td>Educating consumers more (e. g., connecting with them through, with information provided on our web site, thereby “connecting” consumers more to our business) (Alonso, 2015)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agility</td>
<td>We believe emergency plans must be <strong>practiced and tested</strong> to be effective (Whitman et al., 2013).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Supply</td>
<td>We diversify more from the current product/service offer (Alonso &amp; Bressan, 2015)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cash-flow</td>
<td>Organization has strong liquidity and cash flow position and can absorb the impact of modifying operations to respond to challenge or adverse event (Organizational Resilience Healthcheck, 2017)</td>
</tr>
<tr>
<td>C</td>
<td>Plan (6.5%)</td>
<td>Strategic</td>
<td>We believe emergency plans must be <strong>practiced and tested</strong> to be effective (Whitman et al., 2013).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Practiced</td>
<td>We believe emergency plans must be <strong>practiced and tested</strong> to be effective (Whitman et al., 2013).</td>
</tr>
</tbody>
</table>

Note: The exemplars are generated by Leximancer that covers the concepts and meaning of a theme.
Research Stream 1

Research stream 1 exemplifies the weighty value of leadership, decision-making, and networks of people when dealing with a crisis (Birkie, 2016; Sonnet, 2016; Stephenson, 2010; Whitman et al., 2013). Table 5.1 shows the themes, respective concepts, and exemplars of items subsumed in a theme. **Challenges**, as the most prominent theme, incorporates seven concepts: organization, employees, decision-making, management, support, processes, and actively. This theme indicates that resilient firms follow clear, transparent, and non-emotional decision-making processes. Employees are actively encouraged and feel supported when making decisions. Workplace enhancements are fostered and are key aspects of the **Leadership** theme during a crisis (Organizational Resilience HealthCheck, 2017). Active guidance and direction also play a significant role during times of adversity and the recovery process (Birkie, 2016). Active and decisive leadership helps (Birkie, 2016) to ensure that responsibilities for different elements are clearly and appropriately distributed (Whitman et al., 2013); strategical thinking and acting (Benchmark Resilience Tool, 2012); and that seeking opportunities are identified and innovative cultures are fostered (Organizational Resilience HealthCheck, 2017) during times of adversity and the recovery phase.

The themes of **information, experience, and networks** tap employees’ abilities to harness and apply information, knowledge, and experience when acting and managing unexpected challenges. Employees are encouraged to gain a breadth of experience across different departments (Benchmark Resilience Tool, 2012) and past experiences are tapped to generate new ideas (Sonnet, 2016). Value is placed on information, and the development and establishment of trusted networks involving multiple sources such as suppliers and customers (Organizational Resilience HealthCheck, 2017). Resilient enterprises acquire and refine pertinent information and knowledge (Alonso & Bressan, 2015; Sonnet, 2016) needed to respond to unexpected problems (Whitman et al., 2013).
Research Stream 2

Research stream 2 emphasizes the role of responding quickly during unexpected events (Alonso & Bressan, 2015; Ambulkar et al., 2015; Mafabi et al., 2012; Mafabi et al., 2015; Whitman et al., 2013; Wicker et al., 2013). The capability theme encapsulates eight concepts: sufficient, resources, during, unexpected, events, respond, agility, and supply, implicating that resilient organizations employ and mobilize resources, and restore services and products (Wicker et al., 2013) in a quick and timely manner during unexpected events (Ambulkar et al., 2015). The single-concept theme, service, exemplifies diversity and agility in products and services offers (Alonso & Bressan, 2015) in order to meet customer needs with minimum complaints (Mafabi et al., 2012; Mafabi et al., 2015). A strong cash flow and liquidity position help to minimize the effects of unexpected challenges (Organizational Resilience HealthCheck, 2017). Establishing close connections with consumers, clients, and suppliers are the main features of the customers theme (Alonso, 2015).

Research Stream 3

Applied strategic planning, incorporating the two concepts of strategic, and practiced, to manage disruptions is the sole focus of Research stream 3. (Organizational Resilience HealthCheck, 2017). In today’s disruptive environment, firms are required to have an appreciation of emerging threats and opportunities, and employee vulnerabilities (Organizational Resilience HealthCheck, 2017). Emergency planning needs to be practiced and tested to ensure efficiency in the event of a crisis (Whitman et al., 2013).

Discussion

Study 2.1 explores the operational meaning of organizational resilience identifying two predominate research streams. Research Stream 1 encapsulates the importance of leadership, decision-making, employees, and social capital involving internal (e.g., staff, employees) and external (e.g., customers, suppliers) network relationships. These network relationships
comprise structural (e.g., organizational) and relational (e.g., data and information) embeddedness that help firms to integrate (learn) and absorb (collaborate). Research stream 2 characterizes the capability to amass sufficient resources and respond in an agile manner during unexpected times. Access to tangible (e.g., technology resources, investment in customer service) and intangible resources (e.g., knowledge competences) are key aspects of organizational resilience.

On the basis of these main themes and concepts identified in each research stream, findings confirm that organizational resilience involves deep social capital and broad resources networks, which is consistent with contextual resilience proposed in the 3-component resilience capacity framework (Lengnick-Hall & Beck, 2005). However, the present findings highlight the prominent role played by micro-foundational components that take into account the entrepreneurial role in relation to leadership, decision-making, and social capital. The following section elaborates on these components.

**Leadership**

Leadership plays a pivotal role before, during and immediately after a disruption (Williams et al., 2017). Leadership qualities identified in Study 2.1 include opportunity seeking and innovation before onsite of a crisis, and proactiveness in problem-solving and rapid decision-making during the recovery process. A capacity to display business-as-usual behaviors such as behavioral alignment with organizational values, orientation and control, and building trust and authority are other traits. It should be noted that most of the items on leadership are derived from the Organizational Resilience Healthcheck (2017).

The constitutional role of leadership in organizational resilience has not gained much attention in the literature. Only one conceptual paper (de Oliveira Teixeira & Werther, 2013) and four qualitative studies (Grove, 1997; Sawalha, 2015; Tracey et al., 2017; Zaato & Ohemeng, 2015)
examine professional and effective leadership as a key characteristic in building organizational resilience. Recently, owing to research developments in the entrepreneurship area, studies have begun to focus on the resilience (Branicki et al., 2018) and social capital (Korber & McNaughton, 2018) of entrepreneurs as contributing factors for developing resilience capacity of SMEs experiencing adversities.

Moreover, exploration of the association between leadership and time phases of adversity is scant. As shown in Table 2.3 (Chapter 2, p. 22), three studies (Pal et al., 2014; Stipicevic, 2011; Teo et al., 2017) investigated the role of leadership, as an antecedent, in facilitating organizational resilience post adversity. For example, Stipicevic (2011) found that open-minded and reflective leadership was the main driver of strategic organizational resilience post the 2007-2008 GFC.

**Social capital and information and knowledge**

Study 2.1 confirms that measures of organizational resilience assess the key role of entrepreneurs’ social capital and their ability to build trusted networks with industry peers, suppliers, and customers. Social capital provides the context within which efficient information and knowledge harnessing and sharing, and appreciation of available resources for swift responses in uncertain conditions are possible. This finding is consistent with Lengnick-Hall and Beck (2005) extending their range of salient contextual factors and demonstrating a clear link between internal and external networks, knowledge management, and resilience capabilities.

Social capital helps the integration, absorption, gathering, and sharing of knowledge, and thus enhances organizational resilience. A large and diverse presence of external networks provides a rich source of information and helps organizations to utilize information effectively (Collins & Clark, 2003). During disruptive times, information derived from networks benefits an
organization in three ways: timing, access, and referral (Acquaah, 2007). High-quality networks not only help an organization to get information and obtain valuable opportunities in an efficient and timely manner but also affect how it acts during disruptions (Acquaah, 2011; Randall, 2012). Also, knowledge-sharing relationships help to expand employees ability to contribute to organizational performance and to build organizational resilience in the face of challenging conditions (Emmons, 2013).

The role of entrepreneurial social capital as a proxy measure/ dimension of organizational resilience has only been explored by two qualitative studies (Martinelli et al., in press; Tracey et al., 2017). Most quantitative studies (Andrew et al., 2016; Jung, 2015; Wicker et al., 2013) examine social capital as an enabler that facilitates the development of organizational resilience. For example, Andrew et al. (2016) showed that multi-sector partnerships enhance organizational resilience for disaster response. Inter-organizational relationships enable rapid implementation of decisions in SMEs (Sullivan-Taylor & Branicki, 2011) and help organizations to become resilient during natural disasters (Wicker et al., 2013). As well, close relationships with suppliers, customers, and marketing partners increase order volumes, contributing to the building of resilience capability (Freeman, 2004).

**Decision-making**

The present findings capture the critical role played by employee and entrepreneurial decision-making in building organizational resilience. Close scrutiny indicates that the items are related to making tough decision in a timely manner (Orchiston et al., 2016), and having authority to make decisions with minimal consultation during adverse conditions. Decision-making follows a clear and transparent process and is congruent with organizational values and purpose (Organizational Resilience HealthCheck, 2017). It is noteworthy, however, that the importance and relevance of decision-making to resilience has seldomly been explored. As a case in point,
Conz et al. (2017) concluded that the resilience of SMEs is fostered by entrepreneurial decision-making rather than the influence of the external environments (i.e., GFC).

In summary, Study 2.1 revealed that organizational resilience involves four micro-foundational capabilities, leadership, decision-making, social capital, and information and resources. Moreover, its operational meaning is not fixed, but is different from different authors, and probably over different periods of time. Thus, the following section presents Study 2.2, an examination of the operational evolution of the organizational resilience construct.
Study 2.2 Operational Evolution of Measures of Organizational Resilience: 1988-2016

Introduction

As reported, Study 1.2 found that, from a textual analysis of definitions, the meaning of organizational resilience changed over time. Given that measures are developed based on definitions, it is argued that the operational meaning of organizational resilience would also evolve with time. Thus, the objective of Study 2.2 is to determine whether there have been any significant developments or changes in measures across the period of 1988-2016. The research questions of Study 2.2 are,

**RQ2.2.1:** If any, how have the measures evolved from 1988 to 2016?

**RQ2.2.2:** Whether the prominence of those components and capabilities identified from Study 2.1 varies in tandem with the change of periods?

Methodology

Study 2.2 utilized Lexmancer to conduct the present content analysis. In this examination, the 29 measures obtained from Study 2.1 were grouped across the same three time periods utilized in Study 1.2: 1988-2007 (2 measures), 2008-2012 (10 measures), and 2013-2016 (17 measures).

Results and Discussion

The textual analysis of measures of organizational resilience indicates that themes identified from the period of 1988-2007 (Figure 5.2), are different to those for the 2008-2012 (Figure 5.3) and 2013-2016 (Figure 5.4) periods. In Figure 5.2, only three isolated themes: chaotic situation, teams, and goals were identified. Chaotic situation, incorporating the concepts of sense, service, and overwhelmed, is the most prominent theme (red color). This theme suggests that resilient firms avoid being overwhelmed by chaos and making sense of the situation. The other two themes, teams and goals indicate that team members in resilient organizations are goal-directed, confident, and independent when making decisions. The limited number of themes during
1988-2007 can be attributed to the fact that only two measures (Mallak, 1998b; Oh & Teo, 2006) were identified.

The periods of 2008-2012 (Figure 5.3) and 2013-2016 (Figure 5.4) see a similar configuration of themes. Capability and information and resources are at the core of these two periods (red and orange colors, respectively). Capability incorporates the concepts capability, respond, and unexpected, suggesting that resilient organizations have the capacity to respond to unexpected events. It appears that 2013-2016 expands the focus of the previous period (2008-2012) by integrating the theme entitled information and resources, which incorporates the concepts of sufficient, economic, social, and business. This amalgam intimates that resilient organization is reliant on the support of economic resources (cash-flow), social networks, and business partners.
Given that the 2007-2009 GFC changed the business environment to a highly unstable state, it is understandable that the number of measures increased and emphasis of themes changed. However, given that organizations nowadays operate in continually changing and unpredictable contexts, minor shifts can precipitate unprecedented consequences and expose organizations to new and different types of challenges. It is surprising to see that themes since 2013 have not evolved to a large extent sense since the 2008-2012 period. Three possible explanations can be posited here. One is that the essence of organizational resilience suggests that this construct involves the ability to respond quickly to the unexpected, because of the access and utilization of resources, information, and knowledge. Second, scant attention has been paid to the operationalization of organizational resilience, contributing to the
underdevelopment of measures. Third, the 2013-2016 period heralded an emphasis upon the decision-making of leaders, the contribution of employees, and collaborating with others during times of crises (green circles), indicating a change in the operational focus of organizational resilience.

In summary, the text mining exercise of measures since 1988 demonstrates cogently that the operational meaning of organizational resilience has changed but not significantly. The notion that organizational resilience is the capability to respond quickly to the unexpected and that agile responses are predicated on the basis of access to resources and information and knowledge remain consistent over time. Moreover, the theme relating to the role of leadership,
social capital, and human capital of entrepreneurs in dealing with challenging events starts to gain traction during the period 2013-2016.

**Summary of Findings and Implications for Future Research**

In relation to the operationalization of organizational resilience, two cogent considerations emerge: A focus on micro-foundational components and a relatively stable thematic focus on organizational agility.

**Issue 1: A Focus on the Micro-Foundational Component**

Recently, the micro-foundations movement receives very large attention. One research stream unpacks how organizational processes, procedures, and structures influences organizational outcomes such as performance and sustainability (Teece, 2007). The other intends to explain how individual-level factors such as entrepreneurial behaviors and personality impact organization-level elements (i.e., opportunity seizing) (Abell, Felin, & Foss, 2008; Felin & Hesterly, 2007). The findings of Study 2 revealed that organizational resilience builds largely upon the individual-level micro-foundations, including the contributions of entrepreneurs, team members, and employees in relation to leadership, social capital, human and economic resources, and knowledge integration and absorption. These micro-foundations play unique roles and are present at different levels of intensity during different phases (pre-, during, and post-adversity). Together, this micro-foundational pattern of elements facilitates resilience capabilities at the organization level.

Of particular note, the micro-foundations of organizational resilience are similar to those of dynamic capabilities. For example, managerial social and human capital, as micro-foundations of dynamic managerial capabilities, affect strategic change and firm performance differentially (Helfat & Martin, 2015). Leadership qualities such as unique way of thinking and experience
with earlier ventures facilitate the new opportunities recognition and the resources assembling for the venture (Alvarez & Busenitz, 2001).

**Issue 2: A Relatively Stable Thematic Focus on Organizational Agility**

Measures of organizational resilience involve agility, a behavioral capability that focuses on responding in a quick and timely manner to unexpected events. The prominence of agility remains stable over time, indicating that the operationalization of organizational resilience weights more value on the capability of speedy response during crises, compared to other cognitive capabilities such as situation awareness, sensing, and anticipating.

In closing, Chapter 5 examined the meaning of organizational resilience from an operational perspective. This is the first time that a cluster of measures of organizational resilience has been subjected to an intensive qualitative analysis. This series of studies also tracked the semantic evolution of the operational meaning of organizational resilience as reflected in the written literature. The findings that the operational components of organizational resilience focus on the micro-foundational components involving entrepreneurial leadership, social capital, and human and economic resources are novel.

The following chapter investigates the importance and time sensitivity of organizational resilience capabilities derived from the findings of Study 1 and Study 2.
Chapter 6 Study 3

An Exploratory Investigation on the Importance and Time Sensitivity of Organizational Resilience Capabilities

Overview

Study 3 took the findings of the textual analyses of organizational resilience (Studies 1 & 2) to 65 entrepreneurs of SMEs. The aim of Study 3 is to explore the importance and time sensitivity of the capabilities of organizational resilience. Findings indicate that the three cognitive (situation awareness, sensing, anticipating), four behavioral (adaptability, flexibility, agility, innovation), and four micro-foundational (leadership, decision-making, social capital, information and knowledge) capabilities are regarded as important by entrepreneurs, irrespective of adversity phases. Moreover, the most memorable crises are related to micro-foundational factors: stakeholders, clients, key staff, and firm partners. However, the during-adversity phase, compared to the pre- and post-adversity phases, is considered critical by entrepreneurs.

Introduction

On the basis of a series of content analyses of definitions and measures, Studies 1 and 2, respectively find that organizational resilience involves three cognitive (situation awareness, sensing, anticipating), four behavioral (adaptability, flexibility, agility, innovation), and four micro-foundational (leadership, decision-making, social capital, information and knowledge) capabilities. These studies indicate that organizational resilience involves a time element (pre-, during, post-adversity) and the importance of each component varies according to the time of adversity. Given that the 11 capabilities and their time-sensitive nature are derived from the
academic literature and reflect a practical viewpoint, it is unclear whether practitioners/entrepreneurs would regard these 11 capabilities in a similar light. Thus, Study 3 took findings of the current textual analyses to entrepreneurs with the aim of determining their view of the levels of importance and time-sensitivity of these capabilities. The research questions are as follows:

*RQ3.1: Do entrepreneurs regard each of the 11 capabilities important?*  
*RQ3.2: If so, are different resilience capabilities viewed as being more important than others at different phases (i.e., pre-, during, post-adversity)?*

**Methodology**

Building on relevant exemplars (Cardon, Gregoire, Stevens, & Patel, 2013; Mafabi et al., 2012) in the area, Study 3 followed a three-stage process to assess the importance and time-sensitivity of the 11 capabilities. First, within the context of Studies 1 and 2, Study 3 developed theoretically consistent items, which were then fine-tuned in a pilot study. Next, items were presented to entrepreneurs as part of a cross-sectional online survey.

**Item Development**

The measurement instrument was structured as a task where respondents rated the levels of importance of statements meant to characterize the items. This formulation follows common practice in applied psychology (Button, Mathieu, & Zajac, 1996) and entrepreneurship research (Cardon et al., 2013). In line with the proposed model of organizational resilience and the research aim of Study 3, one item was formulated to reflect each of the 11 capabilities. The capabilities, and their items and respective origination are listed in Table 6.1.
Table 6.1: Items and the respective origination of each capability

<table>
<thead>
<tr>
<th>Components</th>
<th>Capabilities</th>
<th>Items (references)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive</td>
<td>Situation awareness</td>
<td>Having a situational awareness of our company’s entire operating environment including staff customers, suppliers, and consultants (McManus et al., 2008).</td>
</tr>
<tr>
<td></td>
<td>Anticipating</td>
<td>Having the ability to anticipate changes and threats that challenge our company’s core earning power and survival (Ates &amp; Bititci, 2011; Vogus &amp; Sutcliffe, 2007).</td>
</tr>
<tr>
<td></td>
<td>Sensing</td>
<td>Having the ability to sense, notice, and interpret internal and external changes (Oh &amp; Teo, 2006; Teece, 2007).</td>
</tr>
<tr>
<td>Behavioral</td>
<td>Adaptability</td>
<td>Having the ability to adapt and change quickly in response to adversity (Gilly et al., 2014; Woods, 2006).</td>
</tr>
<tr>
<td></td>
<td>Flexibility</td>
<td>Having the ability to utilize and retain resources in a flexible, storable, and convertible way (Gittell et al., 2006).</td>
</tr>
<tr>
<td></td>
<td>Agility</td>
<td>Having an ability to respond quickly and in a timely and efficient way (Oh &amp; Teo, 2006).</td>
</tr>
<tr>
<td></td>
<td>Innovation</td>
<td>Having an ability to innovate and develop new products or services, new methods of distribution or marketing, tap into new markets or restructure transaction (Oh &amp; Teo, 2006; Reinmoeller &amp; Van Baardwijk, 2005).</td>
</tr>
<tr>
<td>Micro-</td>
<td>Leadership</td>
<td>Having an ability to show decisive leading roles (Benchmark Resilience Tool)</td>
</tr>
<tr>
<td>foundational</td>
<td>Decision-making</td>
<td>Having the ability to make the right and timely decisions (Organizational Resilience healthcheck)</td>
</tr>
<tr>
<td></td>
<td>Social capital</td>
<td>Having the ability to maintain trusting relationships with networks such as suppliers, customers, and government (Organizational Resilience Healthcheck).</td>
</tr>
<tr>
<td></td>
<td>Information &amp; knowledge</td>
<td>Having enough relevant information &amp; knowledge (Stephenson, 2010).</td>
</tr>
</tbody>
</table>

Pilot Study

The present pilot study was established to determine the face validity and content adequacy of items. Semi-structured interviews with academic experts (n=5) in entrepreneurship and owners/CEOs/managers of SMEs (n=10) were conducted. SME participants were obtained from the SmartCompany Database. SmartCompany is a leading online publication in Australia for free news, information and resources catering to entrepreneurs, and small-to-medium business owners and managers.
**Preliminary results**

Respondents provided feedback on item clarity (i.e., whether or not the item reflects the meaning of the capability), convenience (i.e., whether the website is user-friendly), and content (i.e., whether more sufficient information was provided or needed). Changes were incorporated into the final version that was administered to participants (See Table 6.2).

**Main study: Online survey**

The main study involved a cross-sectional online survey of entrepreneurs to determine their views on the time-sensitive nature and importance of capabilities identified from the content analyses.

**Participants and procedures**

Entrepreneurs of SMEs were chosen as the unit of analysis because this group of organizations is a significant contributor to the economy. SMEs comprise 97% of all Australian businesses, producing 1/3 of total GDP, and exporting 90% of all goods including over 60% of services. To be included in this study, firms needed to consist of less than 200 employees. Participants were derived from the databases of the BRWFast100 (2002-2011), BRW Starters (2005-2009), and Smart 50 (2014). Of the 1144 entrepreneurs, 65 responses were obtained following two rounds of reminding. However, 353 email addresses were invalid, representing an overall response rate of 7.94%, a rate relatively consistent with other surveys of entrepreneurial managers (Bartholomew & Smith, 2006). The participant information and consent form is attached in Appendix 6.1.

**The 11-component resilience questionnaire (T11CRQ)**

Building on the pilot study results, the present questionnaire included 11 items for measuring the capabilities of organizational resilience across three different time phases of pre-, during, and post-adversity. Consistent with the research objectives and putting participants in the
scenarios of facing adversity, the questionnaire also included two open-ended questions asking participants to identify the single most memorable adversity the company has experienced and the actions firms took to deal with the adversity. Given that the contextual contingencies such as firm size and age and industry sector are important factors influencing organizational resilience, these demographic questions were also incorporated in the final questionnaire (Table 6.2).

The following section reports on the findings in four parts. Part 1 reports on the sample characteristics, followed by an evaluation of the measurement properties of the T11CRQ including model fit, reliability, and construct validity (Part 2). Next (Part 3), a qualitative thematic analysis of two open questions: the single most memorable adversity the company has experienced and the actions firms took to deal with the adversity are reported. Finally, Part 4 reports on the findings of the effects of adversity phases on organizational resilience capabilities.
### Table 6.2: The 11-component resilience questionnaire (T11CRQ)

#### Part I
1. Please indicate the most memorable single adversity (crisis, risks, disruptions, unexpected events) your company has experienced.
2. Please rate how important each of the following 11 capabilities was at the time when your company faced that adversity.

<table>
<thead>
<tr>
<th>Resilience capabilities</th>
<th>Time of challenges/threats</th>
<th>1. Not at all important</th>
<th>2. Slightly important</th>
<th>3. Moderately important</th>
<th>4. Very important</th>
<th>5. Extremely important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Situation awareness: Having a situational awareness of our company’s entire operating environment including staff, customers, suppliers, and consultants.</td>
<td>Pre</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pre</td>
<td>During</td>
<td>Post</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anticipating: Having the ability to anticipate changes and threats that challenge our company’s core earning power and survival.</td>
<td>Pre</td>
<td>During</td>
<td>Post</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pre</td>
<td>During</td>
<td>Post</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensing: Having the ability to sense, notice, and interpret internal and external changes.</td>
<td>Pre</td>
<td>During</td>
<td>Post</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adaptability: Having the ability to adapt and change quickly in response to a crisis.</td>
<td>Pre</td>
<td>During</td>
<td>Post</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexibility: Having the ability to utilize and retain resources in a flexible, storable, and convertible way.</td>
<td>Pre</td>
<td>During</td>
<td>Post</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agility: Having an ability to respond quickly and in a timely and efficient way.</td>
<td>Pre</td>
<td>During</td>
<td>Post</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innovation: Having an ability to innovate and develop new products or services, new methods of distribution or marketing, tap into new markets, or restructure transaction.</td>
<td>Pre</td>
<td>During</td>
<td>Post</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership: Having an ability to show decisive leading roles.</td>
<td>Pre</td>
<td>During</td>
<td>Post</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6.2 continues…
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Decision-making: Having the ability to make the right and timely decisions.</td>
<td>Pre</td>
<td>During</td>
<td>Post</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social capital: Having the ability to maintain trusting relationships with networks such as suppliers, customers, and government.</td>
<td>Pre</td>
<td>During</td>
<td>Post</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information &amp; knowledge: Having the ability to access and utilize relevant information &amp; knowledge timely.</td>
<td>Pre</td>
<td>During</td>
<td>Post</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others (please specify)</td>
<td>Pre</td>
<td>During</td>
<td>Post</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. What measures did your company take to deal with the adversity?

Part II: Company Background
1. What is your position title in the business (e.g., founder, owner, CEO, senior manager/ executive, middle manager/ executive)?
2. In which year was your company established?
3. The number of equivalent full time (2 part time= 1 full time) employees in your company?
4. What is your industry sector?
Results

Part 1: Sample Characteristics

Organizations vary in terms of age, size, and industry sector. The majority (56.92%) of organizations were founded within 20-30 years, followed by 27.70% which had been in existence more than 30 years, 15.38% have been in operation for less than 10 years. In the case of firm size, 24.62% employ less than 20 employees; 32.31% employ 20-50 employees; and 42.48% employ more than 50 employees. In terms of industry, most organizations were in the professional, scientific & technical services sector (23.08 %) and the information media & telecommunications sector (15.38 %). This implies that a high proportion of fast growth-oriented Australian SMEs is set up to pursue technology and social media objectives. Another sizable cluster of organizations was from the manufacturing and retail trade sector (7.69 %), with a relatively equal distribution in financial and insurance services (4.61%). Those in the miscellaneous sector category included health care and social assistance, construction, rental, hiring, real estate services, public administration and safety, transport, postal, warehousing, administrative and support services, and education and training.

Part 2: Measurement Assessment

The Partial least squares (PLS) was utilized to evaluate the measurement model of the 11 capabilities of organizational resilience at each of the three adversity phases (pre-, during, and post-adversity). PLS is a confirmatory, second-generation, multivariate analytical technique (Fornell & Larcker, 1981). PLS offers three important advantages for this study over the more familiar structural covariance analytical methods: (1) The intent of this study is to explore a theory that has hitherto foreseen limited testing. PLS is a suitable method for prediction-oriented research focused on explaining endogenous constructs intended for theory building rather than theory testing. (2) PLS has higher levels of statistical power than its covariance-based counterpart (Lu, Kwan, Thomas, & Cedzynski, 2011) for small sample sizes. In PLS-
SEM analysis, the recommended minimum sample size is ten times the number of indicators of the scale with the largest number of indicators (Chin & Newsted, 1999); the present sample meets this requirement. (3) The indicators of this study are reflective.

Table 6.3 shows the mean scores, standard deviation scores, and Pearson correlation coefficients for all constructs at pre-, during-, and post-adversity. All organizational resilience capabilities scores are positively and significantly correlated for the three time periods. PLS results confirm that for each of the three time periods, during adversity (Figure 6.1), pre-adversity (Appendix 6.2), and post-adversity (Appendix 6.3), organizational resilience can be conceptualized as a second-order reflective construct comprising cognitive, behavioral, and micro-foundational first-order dimensions. Coefficients between first- and second-order constructs ranged between 0.901 and 0.947 (pre-adversity), .872 and .918 (during adversity), and .865 and .910 (post-adversity). $R^2$ value range between .748 and .904, irrespective of time phase. Model fit statistic are for SRMR = 0.11, 0.13, 0.13 for pre-, during, and post-adversity, respectively. These findings demonstrate the stability (replicability) of the model.
### Table 6.3: Correlation matrix for capabilities across the three periods of adversity

<table>
<thead>
<tr>
<th>Period of adversity</th>
<th>Resilience Component</th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-</td>
<td>1 Situation awareness</td>
<td>3.89</td>
<td>1.16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 Anticipating</td>
<td>4.03</td>
<td>1.05</td>
<td>.63**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 Sensing</td>
<td>3.95</td>
<td>1.02</td>
<td>.56**</td>
<td>.63**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 Adaptability</td>
<td>3.85</td>
<td>1.22</td>
<td>.51**</td>
<td>.63**</td>
<td>.60**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 Flexibility</td>
<td>3.77</td>
<td>1.14</td>
<td>.56**</td>
<td>.66**</td>
<td>.66**</td>
<td>.60**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 Agility</td>
<td>3.95</td>
<td>1.07</td>
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<td>.62**</td>
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</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed)
Figure 6.1: Organizational resilience as a second-order construct for the period of during adversity.

Note: values in the left arrow show the path coefficients; values in the circle show the $R^2$ value; values in the right arrow show the factors loadings.

Reliability of the T11CRQ

For the present study, measures of internal consistency reliability including Cronbach’s $\alpha$ and composite reliabilities of all latent variables at each of the periods of adversity (Table 6.4) are above the recommended level of 0.70 (Hair, Ringle, & Sarstedt, 2011). The Rho_A of each component are all higher than 0.75. These results indicate high levels of reliability for the T11CRQ resilience measure at each phase of adversity.
Table 6.4: Reliability and validity of measures for the cognitive, behavioral, and contextual components of organizational resilience across the three periods of adversity

<table>
<thead>
<tr>
<th>Periods of adversity</th>
<th>Latent constructs</th>
<th>Cronbach's Alpha</th>
<th>Rho_A</th>
<th>Composite Reliability</th>
<th>Average Variance Extracted (AVE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre</td>
<td>Cognitive</td>
<td>.82</td>
<td>.83</td>
<td>.90</td>
<td>.74</td>
</tr>
<tr>
<td></td>
<td>Behavioral</td>
<td>.87</td>
<td>.88</td>
<td>.91</td>
<td>.76</td>
</tr>
<tr>
<td></td>
<td>Micro-foundational</td>
<td>.90</td>
<td>.90</td>
<td>.93</td>
<td>.77</td>
</tr>
<tr>
<td>During</td>
<td>Cognitive</td>
<td>.75</td>
<td>.78</td>
<td>.86</td>
<td>.67</td>
</tr>
<tr>
<td></td>
<td>Behavioral</td>
<td>.79</td>
<td>.82</td>
<td>.86</td>
<td>.61</td>
</tr>
<tr>
<td></td>
<td>Micro-foundational</td>
<td>.84</td>
<td>.85</td>
<td>.90</td>
<td>.53</td>
</tr>
<tr>
<td>Post</td>
<td>Cognitive</td>
<td>.89</td>
<td>.89</td>
<td>.93</td>
<td>.82</td>
</tr>
<tr>
<td></td>
<td>Behavioral</td>
<td>.81</td>
<td>.82</td>
<td>.88</td>
<td>.64</td>
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<tr>
<td></td>
<td>Micro-foundational</td>
<td>.87</td>
<td>.88</td>
<td>.91</td>
<td>.73</td>
</tr>
</tbody>
</table>

Convergent and discriminant construct validity

To ensure convergent validity of a construct, its average variance extracted (AVE) should be superior to 0.50, indicating that the latent variable explains at least 50% of the variance of its indicators (Götz, Liehr-Gobbers, & Krafft, 2010). To assess discriminant construct validity, a latent variable should share more variance with its assigned indicators than with any other latent variables (Fornell & Larcker, 1981). The square root of the AVE for each latent variable should be considerably greater than the corresponding inter-construct Pearson zero-order correlations. As reported in Tables 6.4 and 6.5, the results support both convergent and discriminant validity of each of the components across the three time periods.

Furthermore, since these approaches can fail to reliably detect a lack of discriminant validity in common research situations, Henseler, Ringle, and Sarstedt (2015) recommended calculating the heterotrait- and monotrait-ratio of correlations (HTMT), the values of which should be below a threshold value of 0.90. However, as the cognitive, behavioral, and micro-foundational components are lower-order dimensions for the reflective higher-order construct, organizational resilience, it was expected that dimensions would not be highly discriminating. Thus, values greater than 0.9 but lower than 1.0 can be regarded as satisfactory.
Table 6.5: Fornell and Larcker criterion and HTMT criterion for discriminant validity.

<table>
<thead>
<tr>
<th>Periods of adversity</th>
<th>Latent constructs</th>
<th>Cognitive</th>
<th>Behavioral</th>
<th>Micro-foundational</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cognitive</td>
<td>.86</td>
<td>.85</td>
<td>.88</td>
</tr>
<tr>
<td></td>
<td>Behavioral</td>
<td>.80 (.94)</td>
<td>.85 (.96)</td>
<td>.88</td>
</tr>
<tr>
<td></td>
<td>Micro-foundational</td>
<td>.78 (.90)</td>
<td>.72 (.84)</td>
<td>.83</td>
</tr>
<tr>
<td>During</td>
<td>Cognitive</td>
<td>.82</td>
<td>.78</td>
<td>.83</td>
</tr>
<tr>
<td></td>
<td>Behavioral</td>
<td>.68 (.87)</td>
<td>.72 (.84)</td>
<td>.83</td>
</tr>
<tr>
<td></td>
<td>Micro-foundational</td>
<td>.71 (.89)</td>
<td>.72 (.84)</td>
<td>.83</td>
</tr>
<tr>
<td>Post</td>
<td>Cognitive</td>
<td>.91</td>
<td>.80</td>
<td>.85</td>
</tr>
<tr>
<td></td>
<td>Behavioral</td>
<td>.84 (.99)</td>
<td>.80</td>
<td>.85</td>
</tr>
<tr>
<td></td>
<td>Micro-foundational</td>
<td>.64 (.72)</td>
<td>.69 (.81)</td>
<td>.85</td>
</tr>
</tbody>
</table>

Note: Square root of AVE is shown in bold in the diagonal; all construct correlations are less than AVEs. The values in () shows the HTMT ratio.

In line with (Chin, 1998), the loading of each indicator to its corresponding latent variable was greater than all its cross-loadings (Table 6.6). Therefore, it can be concluded that each construct is unique and captures a phenomenon that other measures do not.

Table 6.6: Cross-factor loadings of each latent variable

<table>
<thead>
<tr>
<th>Resilience Capabilities</th>
<th>Pre</th>
<th>During</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cog</td>
<td>Behav</td>
<td>Micf</td>
<td>Cog</td>
</tr>
<tr>
<td>Situation awareness</td>
<td>.84</td>
<td>.59</td>
<td>.63</td>
</tr>
<tr>
<td>Anticipating</td>
<td>.88</td>
<td>.71</td>
<td>.66</td>
</tr>
<tr>
<td>Sense</td>
<td>.86</td>
<td>.75</td>
<td>.71</td>
</tr>
<tr>
<td>Adaptability</td>
<td>.68</td>
<td>.88</td>
<td>.72</td>
</tr>
<tr>
<td>Flexibility</td>
<td>.73</td>
<td>.82</td>
<td>.69</td>
</tr>
<tr>
<td>Agility</td>
<td>.74</td>
<td>.93</td>
<td>.81</td>
</tr>
<tr>
<td>Innovation</td>
<td>.56</td>
<td>.77</td>
<td>.67</td>
</tr>
<tr>
<td>Leadership</td>
<td>.68</td>
<td>.82</td>
<td>.91</td>
</tr>
<tr>
<td>Decision-making</td>
<td>.60</td>
<td>.74</td>
<td>.91</td>
</tr>
<tr>
<td>Social capital</td>
<td>.65</td>
<td>.71</td>
<td>.88</td>
</tr>
<tr>
<td>Information &amp; Knowledge</td>
<td>.79</td>
<td>.70</td>
<td>.79</td>
</tr>
</tbody>
</table>

Note. Cog=Cognitive component, Behav=Behavioral component, Micf=Micro-foundational component

Part 3: Thematic Analysis of Open-Ended Questions

Text-mining results of the most memorable adversity

Five themes and 12 concepts (Figure 6.2) were generated using Leximancer. In descending order of importance, the five themes and their connectivity rates (in parentheses) are
stakeholder (63%), GFC (7%), family conflict (2%), revenue (1%), and competition (1%). Table 6.7 shows the themes, their respective concepts, and an exemplar of items subsumed in a theme.

![Diagram](image)

**Figure 6.2: The single most memorable adversity that SMEs face**

The most prominent theme, *stakeholder*, incorporates seven concepts, *client, staff, team, partner, shareholder, and senior*. This theme indicates that the most memorable challenging events of SMEs are related to stakeholders including loss of clients, sudden resignation of key staff, breach of long-term partners, and shareholder disputes. Other memorable challenging events are associated with the 2007 GFC, revenue, and conflict among family business members.
Table 6.7: Themes, respective concepts, and exemplar subsumed in a theme

<table>
<thead>
<tr>
<th>Theme (Connectivity)</th>
<th>Concepts</th>
<th>Exemplars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stakeholder (63%)</td>
<td>Client</td>
<td>We lost our biggest client at the time, which accounted for over 50% of our revenue and profit</td>
</tr>
<tr>
<td></td>
<td>Staff</td>
<td>A spate of 6 key staff resigning in 4 weeks</td>
</tr>
<tr>
<td></td>
<td>Team</td>
<td>Multiple teams of lawyers leaving at once</td>
</tr>
<tr>
<td></td>
<td>Partner</td>
<td>A long-term senior partner of the firm was found to have breached the shareholder agreement and engaged in financial deals with clients of the firm.</td>
</tr>
<tr>
<td></td>
<td>Shareholder</td>
<td>Shareholder dispute and cash flow adversity in 2012</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>A number of the senior team exited the business within a short space of time.</td>
</tr>
<tr>
<td>GFC (7%)</td>
<td>Adversity</td>
<td>2007 GFC resulted in major shareholder entering liquidation.</td>
</tr>
<tr>
<td>Revenue (1%)</td>
<td>-</td>
<td>A sharp and unexpected downturn in sales led to cash flow and supply issues.</td>
</tr>
<tr>
<td>Competition (1%)</td>
<td>-</td>
<td>A major product was copied by a low-cost competitor</td>
</tr>
<tr>
<td>Family (conflict) (2%)</td>
<td>-</td>
<td>Bringing our family together into our business from each of our disparate businesses.</td>
</tr>
</tbody>
</table>

Note: The exemplars are generated by Leximancer that covers the concepts and meaning of a theme.

Text-mining results of the actions firms took to deal with the most memorable adversity

Three themes and 15 concepts (Figure 6.3) were generated. In descending order of importance, the themes and their connectivity rates (in parentheses) are organization culture and transformation (63%), renegotiating terms (14%), and cost reduction (3%). Table 6.8 reals the themes, respective concepts, and an item exemplar subsumed in a theme.

![Organization Culture & Transformation model](image)

![Diagram](image)

Figure 6.3: Actions taken by SMEs taken to deal with the most memorable adversity
The most prominent theme, *organization culture and transformation*, incorporates 11 concepts: *staff, team, aligned, committed, communication, clients, strategy, processes, strengths, model,* and *change*. This theme indicates that SMEs emphasize leveraging organizational culture and transformation when dealing with a challenging event. During turbulent times, resilient SMEs ensure transparency between staff and clients, foster staff commitment and alignment to the organization’s core values and goals, and ensure clear communications. Other actions taken include changing and transforming business models and organizational processes, renegotiating payment terms with 3rd parties and suppliers, and reducing all non-essential costs.

**Table 6.8: Themes, respective concepts, and exemplar subsumed in a theme**

<table>
<thead>
<tr>
<th>Theme (Connectivity)</th>
<th>Concepts</th>
<th>Exemplars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization culture &amp; transformation (63%)</td>
<td>Staff</td>
<td>Transparency of the situation with staff and the client; making clear and timely communication.</td>
</tr>
<tr>
<td></td>
<td>Team</td>
<td>Leverage company culture, closeness, and team structure to bring people together</td>
</tr>
<tr>
<td></td>
<td>Aligned &amp; Committed</td>
<td>Staff are committed and aligned to the company and vice versa</td>
</tr>
<tr>
<td></td>
<td>Communication</td>
<td>Increased communication with suppliers, increasing prices; cutting operational costs; securing lines of communication and ensuring that all involved were aware of events and the likely direction of impact.</td>
</tr>
<tr>
<td></td>
<td>Clients</td>
<td>Change of strategy to develop new products to obtain new clients and capture new markets.</td>
</tr>
<tr>
<td></td>
<td>Strategy</td>
<td>Revision of company goals and development of clear strategies on how to manage the situation</td>
</tr>
<tr>
<td></td>
<td>Processes</td>
<td>Strengthening the company’s best processes for lean and quality delivery</td>
</tr>
<tr>
<td></td>
<td>Strengths</td>
<td>Focusing on core business strengths</td>
</tr>
<tr>
<td></td>
<td>Model</td>
<td>Changing the whole business model.</td>
</tr>
<tr>
<td></td>
<td>Change</td>
<td>Change of staff recruitment and termination</td>
</tr>
<tr>
<td>Renegotiating terms (14%)</td>
<td>Terms &amp; suppliers</td>
<td>Working with suppliers to extend payment terms.</td>
</tr>
<tr>
<td></td>
<td>3rd party</td>
<td>Engaging 3rd party counsel such as seeking advice from industry peers.</td>
</tr>
<tr>
<td>Cost reductions (3%)</td>
<td></td>
<td>Stripping all non-essential costs and overheads out of the business</td>
</tr>
</tbody>
</table>

Note: The exemplars are generated by Leximancer that covers the concepts and meaning of a theme.

The subsequent sector (Part 4) explores the association between time (phases of adversity) and resilience capabilities.
Part 4: Effects of adversity phases on organizational resilience capabilities

Repeated measures ANOVA with a Greenhouse-Geisser correction revealed that eight resilience capabilities: situation awareness, adaptability, flexibility, agility, leadership, decision-making, social capital, and information and knowledge differed statistically significantly among the three adversity phases (Table 6.9).

Table 6.9: Repeated measures ANOVA with a Greenhouse-Geisser correction for the effects of time on the 11 resilience capabilities

<table>
<thead>
<tr>
<th>Resilience capabilities</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Situation awareness</td>
<td>1.75</td>
<td>7.71</td>
<td>9.70</td>
<td>.000</td>
</tr>
<tr>
<td>Anticipating</td>
<td>1.71</td>
<td>1.89</td>
<td>2.83</td>
<td>.072</td>
</tr>
<tr>
<td>Sensing</td>
<td>1.82</td>
<td>1.54</td>
<td>2.19</td>
<td>.121</td>
</tr>
<tr>
<td>Adaptability</td>
<td>1.88</td>
<td>9.45</td>
<td>11.55</td>
<td>.000</td>
</tr>
<tr>
<td>Flexibility</td>
<td>1.87</td>
<td>4.26</td>
<td>8.59</td>
<td>.000</td>
</tr>
<tr>
<td>Agility</td>
<td>1.86</td>
<td>8.87</td>
<td>14.15</td>
<td>.000</td>
</tr>
<tr>
<td>Innovation</td>
<td>1.92</td>
<td>1.13</td>
<td>1.72</td>
<td>.184</td>
</tr>
<tr>
<td>Leadership</td>
<td>1.69</td>
<td>5.76</td>
<td>15.22</td>
<td>.000</td>
</tr>
<tr>
<td>Decision-making</td>
<td>1.92</td>
<td>2.39</td>
<td>8.15</td>
<td>.001</td>
</tr>
<tr>
<td>Social capital</td>
<td>1.96</td>
<td>2.49</td>
<td>8.55</td>
<td>.000</td>
</tr>
<tr>
<td>Information &amp; knowledge</td>
<td>1.87</td>
<td>3.03</td>
<td>6.85</td>
<td>.002</td>
</tr>
</tbody>
</table>

Post hoc tests using the Bonferroni correction showed that scores at the during adversity phase for each of these eight resilience capabilities are significantly higher than those at the pre- and the post-adversity phases (Table 6.10). For comparisons between post- and pre-adversity phases, only the leadership component scores are significantly different (Table 6.10). These results imply that the phase of adversity has an impact on organizational resilience. The during-adversity phase is rated as being the most important when it comes to the expression and utilization of organizational resilience.
Table 6.10: Post hoc analyses on the eight resilience capabilities

<table>
<thead>
<tr>
<th>Resilience capabilities</th>
<th>Phases of adversity</th>
<th>Mean difference</th>
<th>Std Error</th>
<th>Sig.</th>
<th>95% Confidence interval for difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower Bound</td>
</tr>
<tr>
<td>Situation awareness</td>
<td>During-pre</td>
<td>0.63</td>
<td>0.13</td>
<td>.000</td>
<td>0.31</td>
</tr>
<tr>
<td></td>
<td>During-post</td>
<td>0.43</td>
<td>0.14</td>
<td>.007</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>Post-pre</td>
<td>0.2</td>
<td>0.17</td>
<td>.744</td>
<td>-0.22</td>
</tr>
<tr>
<td>Adaptability</td>
<td>During-pre</td>
<td>0.74</td>
<td>0.15</td>
<td>.000</td>
<td>0.38</td>
</tr>
<tr>
<td></td>
<td>During-post</td>
<td>0.39</td>
<td>0.14</td>
<td>.023</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>Post-pre</td>
<td>0.35</td>
<td>0.17</td>
<td>0.131</td>
<td>-0.07</td>
</tr>
<tr>
<td>Flexibility</td>
<td>During-pre</td>
<td>0.48</td>
<td>0.11</td>
<td>.000</td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td>During-post</td>
<td>0.35</td>
<td>0.12</td>
<td>.012</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>Post-pre</td>
<td>0.12</td>
<td>0.13</td>
<td>1.000</td>
<td>-0.2</td>
</tr>
<tr>
<td>Agility</td>
<td>During-pre</td>
<td>0.65</td>
<td>0.12</td>
<td>.000</td>
<td>0.36</td>
</tr>
<tr>
<td></td>
<td>During-post</td>
<td>0.59</td>
<td>0.14</td>
<td>.000</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>Post-pre</td>
<td>0.06</td>
<td>0.15</td>
<td>1.000</td>
<td>-0.3</td>
</tr>
<tr>
<td>Leadership</td>
<td>During-pre</td>
<td>0.54</td>
<td>0.12</td>
<td>.000</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>During-post</td>
<td>0.19</td>
<td>0.08</td>
<td>.066</td>
<td>-0.01</td>
</tr>
<tr>
<td></td>
<td>Post-pre</td>
<td>0.35</td>
<td>0.1</td>
<td>0.002</td>
<td>0.11</td>
</tr>
<tr>
<td>Decision-making</td>
<td>During-pre</td>
<td>0.37</td>
<td>0.1</td>
<td>.001</td>
<td>0.13</td>
</tr>
<tr>
<td></td>
<td>During-post</td>
<td>0.25</td>
<td>0.1</td>
<td>.037</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>Post-pre</td>
<td>0.12</td>
<td>0.08</td>
<td>.436</td>
<td>-0.08</td>
</tr>
<tr>
<td>Social capital</td>
<td>During-pre</td>
<td>0.39</td>
<td>0.1</td>
<td>.001</td>
<td>0.14</td>
</tr>
<tr>
<td></td>
<td>During-post</td>
<td>0.23</td>
<td>0.09</td>
<td>.045</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Post-pre</td>
<td>0.15</td>
<td>0.09</td>
<td>.259</td>
<td>-0.06</td>
</tr>
<tr>
<td>Information &amp; knowledge</td>
<td>During-pre</td>
<td>0.37</td>
<td>0.11</td>
<td>.005</td>
<td>0.09</td>
</tr>
<tr>
<td></td>
<td>During-post</td>
<td>0.35</td>
<td>0.1</td>
<td>.002</td>
<td>0.11</td>
</tr>
<tr>
<td></td>
<td>Post-pre</td>
<td>0.02</td>
<td>0.13</td>
<td>1.000</td>
<td>-0.29</td>
</tr>
</tbody>
</table>

Discussion

Study 3 reveals that organizational resilience is a second-order construct involving three cognitive (situation awareness, sensing, anticipating), four behavioral (adaptability, flexibility, agility, innovation), and four micro-foundational (leadership, decision-making, social capital, information and knowledge) capabilities. These capabilities are regarded as important by entrepreneurs of SMEs, irrespective of the phase of adversity. Results support the findings of the textual analyses of definitions (Study 1) and measures (Study 2) and indicate that organizational resilience consists of three components (i.e., cognitive, behavioral, micro-foundational) and 11 capabilities. While cognitive and behavioral components focus on the organizational level, the micro-foundational component emphasizes an individual level of contribution.
A number of conceptual frameworks (de Oliveira Teixeira & Werther, 2013; Erol et al., 2010; Home & Orr, 1997; Lengnick-Hall & Beck, 2003; Mallak, 1999; Tierney, 2003) have explored the various components of resilience from an organizational level. Some authors (Erol et al., 2010) focus on the behavioral component (i.e., flexibility, agility, communication). Others (de Oliveira Teixeira & Werther, 2013) discuss the micro-foundational component (e.g., leadership and followership interplay), the 3-component resilience framework (Lengnick-Hall & Beck, 2003) systematically includes the cognitive, behavioral, and contextual components. Although studies discuss the levels of organizational resilience, such as social and economic (Tierney, 2003), it appears that no authors specify the components embedded within each level.

The results of Study 3 extend the current literature in six ways. First, Conceptualizations (de Oliveira Teixeira & Werther, 2013; Erol et al., 2010) focus on the components and capabilities of organizational resilience. Empirical investigations (Collier, 2018; Ingram & Głód, 2018) emphasize the importance of extreme contexts, rather than specifying the key role of time phases of adversity. Study 3 extends the current literature, finding that the during-adversity phase is rated as being the most important period when it comes to the expression and utilization of organizational resilience capabilities. This finding is possibly the first time that the central role of phase of adversity has been demonstrated.

Second, Study 3 validated the organizational level components (i.e, cognitive, behavioral) from an entrepreneurial perspective, rather than solely based on a theoretical standpoint. The cognitive component involves sensemaking, anticipating, and have a situation awareness of the operating environment. The behavioral component includes adaptability, flexibility, agility, and innovation, which enable enterprises to adapt and innovate in an agile manner in order to deal with adversity.

Third, Study 3 combines the organizational level components (i.e., cognitive, behavioral) with the individual-level micro-foundational component of organizational resilience. Study 3
uncovers the significant role of individual-level micro-foundations including leadership, decision-making, social capital, and information and knowledge in building organizational resilience. Despite the 3-component resilience framework incorporating components such as social capital and resource networks, this framework focuses only on the organizational level.

Fourth, in line with developments of resilience research in the entrepreneurship area (Branicki et al., 2018), the integration and validation of the micro-foundational component helps to form a gestalt (Korber & McNaughton, 2018).

Fifth, as listed in Table 2.2 (p.17) and Table 2.3 (p. 22), within the context of SMEs, most studies (Ates & Bititci, 2011; Richtnér & Löfsten, 2014; Sullivan-Taylor & Branicki, 2011) do not specify the type and phase of adversity. Only three studies focus their investigations on turbulence related with customers and cost increases (Ismail et al., 2011) and the aftermath of the 2007-2009 GFC (Conz et al., 2017; Pal et al., 2014). Perhaps unsurprisingly, Study 3 identified that the most memorable crises are related to micro-foundational factors such as stakeholders, clients, key staff, and firm partners. A critical time to respond is in or during the adversity phase, compared with the pre- and post-adversity phases.

Finally, the actions taken by entrepreneurs to deal with crises involve organizational transformations with regards to firm culture, strategies, processes, and communication to enable employees to become aligned and committed to the firm. These findings are consistent with the literature purporting that organizational strategies (Conz et al., 2017; Ismail et al., 2011), structures (Gunasekaran et al., 2011), and business model innovation (Hamel & Valikangas, 2003) are salient factors that facilitate the development and maintenance of organizational resilience.
Conclusion

In summary, Study 3 contributes to our understanding of organizational resilience through an exploratory empirical study of entrepreneurs, culminating in a validation of the three components and 11 capabilities model emerging from an in-depth content analysis of definitions (Study 1) and measures (Study 2) of organizational resilience. Moreover, time (the phase of adversity) is considered to be critical by entrepreneurs.

The following chapter (Chapter 7) concludes and brings together not only the findings but also the respective implications of the three studies.
Chapter 7 Conclusion

Overview

Through a synthesis of the findings of Studies 1, 2, and 3, Chapter 7 summarizes research streams on definitions and measures of organizational resilience and develops a unifying definition and model of this construct. Specifically, propositions that purport that organizational resilience is a time-sensitive and second-order construct are articulated. This construct embodies three components (i.e., cognitive, behavioral, and micro-foundational) and a pattern of higher-order dynamic capabilities, that address extreme negative environmental conditions. Particular attention is given to the contributions and implications of this thesis to the dynamic capabilities framework, and to the theory, operationalization, and practice of organizational resilience. Finally, the limitations of this thesis and future directions are explicated.

Based on an in-depth systematic review of significant publications during the period of 1988-2016, this thesis identifies four key issues that have impacted upon and hindered the development of the organizational resilience construct, including a lack of cross-fertilization among disparate types of research (conceptual, quantitative, and qualitative studies), the absence of a robust theoretical underpinning, definitional ambiguity, and problems relating to the operationalization of this construct. In order to address these issues, the present thesis utilized Leximancer as a tool to conduct a series of content analyses and text-mining exercises with the expressed purpose to unravel the texture of organizational resilience. Definitions and measures of organizational resilience were deconstructed, then integrated within the context of dynamic capabilities theory.

By synthesizing the findings, this thesis identifies research streams embedded within the definitions and measures of organizational resilience and develops a unifying definition and
model that incorporates the components, capabilities, levels, and contextual contingencies (i.e., extreme negative environmental conditions, phases of crisis), as elaborated below.

Summary of Findings and Development of a Unifying Definition and Model of Organizational Resilience

Research Streams Based on Definitions
Three prominent research streams emerge from the content analysis of definitions. Stream 1 represents organizational resilience as a capability that enables organizations to respond quickly in the face of crises. The second intimates that organizational resilience is an ability to anticipate and seize opportunities through innovation. The third suggests that organizational resilience is an ability to adapt by holding a situation awareness to environmental changes and management of organizational vulnerabilities. Each of these streams alludes to time sensitivity elements in the form of a priori preparedness or quick at-the-time responses to deal with challenges.

Given that the field of research streams on organizational and operational management of resilience is in a seemingly developing phase (Annarelli & Nonino, 2016), it is perhaps unsurprising that different streams have developed and that unique positions with respect to definitions and theories have emerged (Linnenluecke, 2017). The current thesis addressed this issue by examining the stability and reliability of research streams among different periods of data of publication (1988-2007, 2008-2012, 2013-2016) and different types of orientation of studies (conceptual, qualitative, quantitative).

Findings indicate that the research streams vary in tandem with the period and across different types of manuscripts. The so-called early period publications (1988-2007) focus on an exploration of theoretical issues and the adaptive aspect of resilience. The mid-development period (2008-2012) heralds a number of qualitative manuscripts that center on using grounded
theory and identifying resource flexibility and micro-foundations in building organizational resilience. In recent times, however, attention is heeded to agility: the fast and timely speed of organizational responses to extreme negative events (i.e., adversity, turbulence).

In terms of the orientation of the manuscripts, conceptual papers view organizational resilience as a capability to respond to challenges through awareness and preparedness. Qualitative documents examine multiple levels of analysis including systems, organizations, and individuals. Here, a particular focus is on organizational resources and flexibility. In contrast, quantitative manuscripts concentrate on the relationships among organizational capability, innovation, and challenges.

**Corollary**

*The upshot of the content analysis of definitions has culminated in a dissection of the construct of organizational resilience into its underlying components, gleaning insights into possible generalizations for developing a robust definition of organizational resilience at the organizational level.*

**Research Streams Based on Measures**

This thesis extends the evaluation of definitions to an examination of measures of organizational resilience. Two research streams emerged from this examination. Research stream 1 encapsulates the importance of entrepreneurial leadership, decision-making, and social capital involving access to information and knowledge. Stream 2 emphasizes holding sufficient resources to enable quick responses and ensuring the provision of services and/or products to customers during unexpected events.

It appears that organizational resilience has been operationalized differently by different authors (Linnenluecke, 2017) and there is a lack of consensus on the implementation of this construct (Annarelli & Nonino, 2016). The present thesis addressed these issues by examining
the stability and reliability of research streams among different periods of data of publication (1988-2007, 2008-2012, 2013-2016). Findings, however, show that the operational meaning has endured and Research stream 2 has remained prominent over time.

**Corollary**

_The corollary of the content analysis of measures not only disaggregates the construct of organizational resilience into its underlying dimensions but also offers strong explanations of the mechanisms underpinning organizational resilience at the micro-foundational level._

**Development of a Unifying Definition and Model of Organizational Resilience**

By linking our theoretical understanding, operational meaning, and the contextual contingencies (i.e., extreme negative environmental conditions, phases of adversity), this thesis proposes a unifying definition of organizational resilience that brings coherence and clarity for future research. Accordingly, organizational resilience is defined as:

_A time-sensitive second-order construct comprising a pattern of higher-order dynamic capabilities involving cognitive, behavioral, and micro-foundational components that enable firms to anticipate and sense current conditions, to allocate people and resources flexibly, and to change and adapt in an innovative, agile, and timely manner to address extreme negative events._

Within the context of this definition, this thesis proposes a model of organizational resilience (Figure 7.1). This model encapsulates the texture of organizational resilience, dissects this construct into its components, capabilities, levels, and contextual contingencies, and proffers seven propositions. The time line at the bottom emphasizes that cognitive, behavioral, and micro-foundational components express at different levels of intensity across the three
adversity phases. The connecting lines shows the first-order interrelationship among the three components of organizational resilience.

**Figure 7.1 The Model of Organizational resilience**

Proposition 1: Organizational resilience is a time-sensitive construct.

Notably, the time-sensitive aspect of organizational resilience has not been explored in depth. Only three studies (Burnard & Bhamra, 2011; Linnenluecke et al., 2012; Williams et al., 2017) have adopted a developmental perspective and classified stages associated with this construct.
Burnard and Bhamra (2011) identified four phases of a firm to enact a resilient response, from the detection of potential turbulence, the activation in deploying available resources, responses to actual disruptive events, to the organizational learning in developing and applying new knowledge to an operational environment.

The latter two investigations adopted a time phase perspective. That is, Williams et al. (2017) proposed that the development of resilience capabilities occurs over three stages involving the pre-adversity resource endowments and organizing, during-adversity responding (i.e., cognitive, behavioral), and post-adversity organizational learning stages. According to Linnenluecke et al. (2012), resilient organizations traverse through five stages when dealing with extreme conditions. These stages involve anticipatory adaptation to potential changes, exposure and resistance to impact from extreme conditions, recovery and/or restoration to the same or different level compared to the state prior to exposure to an extreme event, post-impact determination of an organization’s overall resilience, and future adaptation.

This thesis extends the current literature by not only highlighting the relevance of adversity phases (i.e., pre, during, post) in the expression of capabilities in response to adversity but also pinpointing two time-sensitive capabilities (i.e., anticipating, agility) embedded within organizational resilience. While anticipating capability implies a priori preparedness, agility emphasizes nimbleness, speed, and timeliness.

**Corollary**

The corollary of this line of thoughts on the time sensitivity and the phase of adversity advances our understanding of when resilience capabilities are most helpful to organizations, notably, helping to highlight the role and relevance of time and timing on firm survival and the attainment of sustainable competitive advantage.
Proposition 2: Organizational resilience is a second-order construct comprising a pattern of higher-order dynamic capabilities involving cognitive, behavioral, and micro-foundational components.

Proposition 2a: The cognitive component of organizational resilience involves one time-sensitive capability, (i.e., anticipating) and two higher-order dynamic capabilities (i.e., sensing, having a situation awareness) to environmental changes.

While anticipating implies a pre-event preparedness for adversity, sensing and situation awareness reflect a business-as-usual ability. Anticipating capability involves ongoing monitoring of the environment and detecting unexpected events (Vogus & Sutcliffe, 2007), enabling an organization to predict opportunities and threats in advance. Sensing enables organizations to not only recognize but also understand and discern environmental changes and marketplace opportunities (Teece, 2007). Situation awareness helps a firm to perceive its entire operating environment, recognize changes, identify opportunities, and preclude core negative events (McManus et al., 2008). These three capabilities are interrelated and together act as conceptual orientations that help an enterprise to notice, interpret, analyze, and formulate responses (Lengnick-Hall & Beck, 2005).

Proposition 2b: The behavioral component comprises agility, a time-sensitive capability, and three higher-order dynamic capabilities: adaptability, innovation, and flexibility.

As alluded to earlier, agility incorporates the timely nature of organizational responses. Nimbleness, swiftness, and timeliness of adaptation are key attributes of agility (Oh & Teo, 2006). Adaptability and innovation concern outcome-related adaptations. Adaptability is geared towards adjusting and altering essential structures, strategies, operations, coordination activities, and decision-making capabilities to withstand disruptions (McManus et al., 2008). Innovation reflects a creative renewal capability in the form of new business models...
(Reinmoeller & Van Baardwijk, 2005) and strategies, new products and services, new methods of distribution and marketing to respond to the unexpected (Oh & Teo, 2006). Flexibility focuses on inner operations. Having alternative strategies, a range of operational processes, a diversity of employees, and being able to source up-to-date information are key examples of flexibility, enabling effective adaptation (Yilmaz Borekci et al., 2015). The four capabilities interrelatedly enable a firm to respond effectively and successfully to unexpected events.

Proposition 2c: The micro-foundational component includes four entrepreneurial capabilities: decision-making, leadership, social capital, and information and knowledge.

Leadership (Williams et al., 2017) and decision-making play a pivotal role before, during, and immediately after a disruption. Leadership qualities include opportunity seeking and innovation before the onset of a crisis, and proactiveness in problem-solving and rapid decision-making during the recovery process. Decision-making ability involves making tough decisions in a timely manner and follows clear and transparent processes (Orciston et al., 2016).

Social capital provides the context within which efficient information and knowledge harnessing and sharing, and appreciation of available resources for swift responses in uncertain conditions are possible. During disruptive times, information and knowledge obtained from a variety of sources of social capital not only help an organization to take advantage of opportunities in an efficient and timely manner (Acquaah, 2011; Randall, 2012), but also affects how an organization acts during times of disruption (Emmons, 2013).

Proposition 3: As a multilevel construct, the cognitive and behavioral components operate at the organizational level. The micro-foundational component emphasizes an individual-level of operation.
The literature on organizational resilience (de Oliveira Teixeira & Werther, 2013; Erol et al., 2010; Home & Orr, 1997; Lengnick-Hall & Beck, 2003; Mallak, 1999; Tierney, 2003) focuses predominantly on that at the organizational level. This thesis, however, integrates developments in the entrepreneurship area (Branicki et al., 2018; Korber & McNaughton, 2018), explaining the key role of the individual-level micro-foundational component, which seems to provide the basis for the organizational level cognitive and behavioral components. The cognitive elements provide a perceptive and judgemental foundation for organizational behavior. The behavioral components enable a firm to respond effectively and successfully to extreme negative events.

Proposition 4: Organizational resilience capabilities are expressed pre-, during, and post-extreme negative environmental conditions.

Organizational resilience is a context-dependent construct. Current theoretical papers focus on unraveling the internal aspects of organizational resilience such as mechanism (Kahn et al., 2018; Williams et al., 2017). However, relatively few studies (Kahn et al., 2018; Kantur & İşeri-Say, 2012) explore issues concerning organizational resilience within the context of extreme negative environmental conditions. Only Linnenluecke et al. (2012) identified three types of extreme events (e.g., simple, complex, unique) on their impact on stages of organizational adaptation and resilience.

Through a review of quantitative and qualitative studies and a series of content analyses on definitions and measures, this thesis contributes to the knowledge gap by highlighting the interplay between organizational resilience and extreme negative conditions. These conditions includes but not limited to, ecological adversities (Clément, 2017), political crises (Biggs et al., 2012), technology disruptions (Dewald & Bowen, 2010), the global financial crises (GFC) (Buyl, Boone, & Wade, 2017; Conz, Denicolai, & Zucchella, 2017; Lafuente, Strassburger,
Vaillant, & Vilajosana, 2017), and natural disasters such as typhoons (Jung, 2017), floods (Andrew et al., 2016), and earthquakes (Martinelli, Tagliazucchi, & Marchi, 2018). These conditions can predispose organizations to near-death experiences that threaten their long-term survival.

In summary, this thesis identifies the texture of the organizational resilience construct and specifies the contextual contingencies, offering a solid theoretical foundation for future research. Accordingly, contributions and implications to the dynamic capabilities framework and the theory, operationalization, and practice of organizational resilience are articulated as follows.

**Contributions and Implications**

**Contribution to the Dynamic Capabilities Theory**

Integrating organizational resilience with its focus on extreme negative conditions, extends the environmental boundary conditions and explanatory power of the dynamic capability framework to turbulent and consummate negative events (i.e., adversities, crises). In other words, going beyond notions of sustainable competitive advantage in a continuously changing environment.

Currently, the debate concerning the role of dynamic capabilities for extreme negative events (e.g., crisis, adversity, volatile environment) is fraught with controversy. Theoretically, most papers focus on unraveling the internal aspects of dynamic capabilities such as the routines (Teece, 2012), levels (Wilden, Devinney, & Dowling, 2016), micro-foundations (Helfat & Martin, 2015; Teece, 2007), and learning mechanisms (Zahra et al., 2006), rather than spanning the theory to the external business environment. It appears that authors implicitly concur that dynamic capabilities enable an organization to gain a sustainable competitive advantage during rapidly changing environments, especially in environments of rapid technological change,
irrespective of the environmental dynamism (e.g., intensity, frequency, severity). Only a few authors (Bitar & Somers, 2004; Eisenhardt & Martin, 2000; Peteraf et al., 2013) delineate environmental issues. These authors argue that high-velocity markets are a boundary condition for the dynamic capabilities framework. The outcome (e.g., performance, competitive advantage) of dynamic capabilities is predictable in moderately dynamic markets but unpredictable in high-velocity markets. In high-velocity markets, however, the internal and external challenges do not appear to be explained adequately by the dynamic capabilities theory.

As alluded to earlier, empirical investigations present three distinct streams of findings. Stream 1 highlights that extreme negative events moderate the interrelationship between dynamic capabilities and firm performance (Drnevich & Kriaucianas, 2011; Jiao, Alon, Koo, & Cui, 2013; Wilhelm, Schlömer, & Maurer, 2015; Wu, 2010). For example, Jiao et al. (2013) found that opportunity-sensing and reconfiguration capabilities impact on new venture performance at high levels of environmental dynamism. Wilhelm et al. (2015) observed that dynamic capabilities impact efficiency related firm performance under high levels of environmental dynamism. Stream 2 suggested that dynamic capabilities play no role or lead to no noticeable improvements of firm performance in volatile environments (Li & Liu, 2014; Nedzinskas, Pundzienė, Buožiūtė-Rafanavičienė, & Pilkienė, 2013; Protogerou, Caloghirou, & Lioukas, 2011). Nedzinskas et al. (2013) concluded that dynamic capabilities do not impact on financial performance in turbulence. Similarly, two other papers (Li & Liu, 2014; Protogerou et al., 2011) found that the impact of dynamic capabilities on firm performance in highly uncertain environments was negligible.

By way of contrast, stream 3 reveals that specific dynamic capabilities impact firm performance during extreme negative conditions (Girod & Whittington, 2017; Makkonen et al., 2014). Girod and Whittington (2017) found that while reconfiguration capabilities were more effective in a highly-dynamic environment than in general, reconstructing capabilities were
more effective in the general environment, compared to highly-dynamic conditions. Makkonen et al. (2014) observed that firms benefit from higher-order dynamic capabilities (i.e., regenerative, renewing) during the GFC but not from observation and evaluation capabilities.

The current thesis contributes to this debate, proposing that particular higher-order dynamic capabilities are viable contributors to firm performance in extreme negative conditions. These capabilities include organizational level sensing, having a situation awareness, adaptability, flexibility, innovation, and micro-foundational level attributes. These capabilities combine in a pattern in the context of extreme negative events. This pattern, together with the two time-sensitive capabilities, anticipating and agility, comprise the construct of organizational resilience, enabling firms to survive and even thrive in highly volatile and severe environments such as an economic crisis, natural disasters, and political turbulence.

**Contribution to a Theory of Organizational Resilience**

It appears that conceptual frameworks (Lengnick-Hall & Beck, 2005; Williams et al., 2017) concur that organizational resilience is a multi-dimension construct. As a second-order construct, organizational resilience comprises first-order dimensions. However, there is a lack of consensus concerning the number and nature of components and capabilities. Home and Orr (1997) identified seven intertwined behavioral components (e.g., community, competence, connections, commitment, communication, coordination, consideration). In contrast, Tierney (2003) proposed that this construct involves four abilities (e.g., resourcefulness, redundancy, resourcefulness, rapidity). Notwithstanding, there is a dearth of conceptual papers (Erol et al., 2010; Weick & Sutcliffe, 2001) and research (Blatt, 2009; Prayag et al., in press; Richtnér & Löfsten, 2014) that systematically incorporate both the prominent components and capabilities. This thesis, however, extends current conceptualizations by integrating the interrelationship between the first-order dimensions (i.e., three components) and the sub-dimensions (i.e., the 11 capabilities), proposing that organizational resilience encapsulates three indispensable
components, two essential levels, and 11 capabilities expressed at different phases of adversity, enabling an atomistic view of the texture of organizational resilience.

Timing is a key element and not all capabilities are expressed or utilized concurrently, and at the same level of intensity. Each capability assumes a different role and takes on a distinct level of prominence at particular phases. The multi-capability and multi-level structure of organizational resilience suggest that the pattern and intensity of expression of these capabilities differ across enterprises ensuring that some firms hold a unique competitive advantage relative to others during turbulent conditions.

The current thesis reveals that, in case of SMEs, eight resilience capabilities: situation awareness, adaptability, flexibility, agility, leadership, decision-making, social capital, and information and knowledge present as significantly higher levels of importance for the during-crisis phase than those expressed at the pre- and the post-crisis phases. One limitation here is that the focus of analysis is SMEs. Given that industry type and firm size play essential roles in organizational resilience, future research could extend these findings to other units of analysis such as large organizations and specific industry types (i.e., manufacturing, IT) to determine the generalizability of findings to other populations.

Moreover, the proposed conceptual model embeds organizational resilience capabilities within the dynamic capabilities framework. As noted earlier, it is argued that organizational resilience is best viewed as a pattern of higher-order dynamic capabilities. The dynamic capabilities theory provides explanations concerning the multi-level and multi-dimension nature of organizational resilience involving internal organizational and micro-foundational elements. However, the theory development and research on organizational resilience have not embraced the dynamic capabilities language and perspective. As indicated by Annarelli and Nonino (2016), there is a lack of research and a need for deepening our understanding of dynamic
capabilities with respect to organizational resilience. Since the promulgation of a definition of organizational resilience in the late 1980s (Wildavsky, 1988), there have been only six studies (Gittell et al., 2006; Kamalahmadi & Parast, 2016; Manfield, 2016; Manfield & Newey, 2017; Parker & Ameen, 2018; Ponomarov & Holcomb, 2009) investigating the relationship between this construct and dynamic capabilities. Not to mention, these studies hold only two distinct perspectives.

A number of authors (Gittell et al., 2006; Kamalahmadi & Parast, 2016; Manfield, 2016; Manfield & Newey, 2017) view organizational resilience as a dynamic capability. Manfield and Newey (2017) and Manfield (2016) explore organizational resilience as a portfolio of dynamic capabilities. These authors contend that organizational resilience consists of routine- and heuristics-based dynamic capabilities. The adoption of specific capabilities depends on environmental threats (e.g., familiarity, simplicity, severity, frequency) and the state an organization returns to including bouncing back, absorbing shocks, and bouncing forward. Two further studies (Gittell et al., 2006; Kamalahmadi & Parast, 2016) give a definition without detailed justifications.

In contrast, another perspective (Parker & Ameen, 2018; Ponomarov & Holcomb, 2009) suggests that organizational resilience is not a dynamic capability. Having said that, Parker and Ameen (2018) found that resource reconfiguration, as a dynamic capability, affect organizational resilience positively. Ponomarov and Holcomb (2009) reported that organizational resilience moderates the relationship between dynamically integrated capabilities and sustainable competitive advantage.

The integration of the construct of organizational resilience into the dynamic capabilities framework is congruent with current thinking (Gittell et al., 2006; Kamalahmadi & Parast, 2016; Manfield, 2016; Manfield & Newey, 2017). First, as shown in Figure 3.2 (Chapter 3, p. 134).
dynamic capabilities theory involves three layers of components. Layer 1 concerns organizational bases (i.e., resources). Layer 2 involves functional abilities (e.g., building, and modifying the resources at Layer 1). Layer 3 compromises higher-order capabilities (i.e., sensing and seizing opportunities). The proposed integration helps us to appreciate how dynamic capabilities theory situates the construct of organizational resilience. Specifically, in what ways can resilience-based dynamic capabilities (i.e., sensing, adaptability, innovation) be explained and cultivated through other lower-order dynamic capabilities such as resource mobilization and capability reformation?

Second, as proposed by Wilden et al. (2016), the house of dynamic capabilities involves three levels of analysis (e.g., individual, business unit, organizational). Sensing, seizing, and reconfiguring capabilities manifest themselves differently at different levels. For example, sensing capability is represented by individual-level sensemaking, business-level customer and supplier contacts, and organizational level identification of target market. The literature on organizational resilience (Mallak, 1999; Tierney, 2003) rarely touches upon or makes references to levels (e.g, economic, social, organizational, individual) including detailed explanations of internal actors and their interrelationships. Dynamic capabilities theory provides a lens through which to examine the levels embedded in organizational resilience.

Finally, a number of authors (Helfat & Martin, 2015; Helfat & Peteraf, 2015; Teece, 2007; Wilden et al., 2016) delineate the important role of micro-foundations in dynamic capabilities. For example, Teece (2007) explicates how entrepreneurial decision protocols, leadership, and knowledge management help to strengthen organizational sensing, seizing, and reconfiguring capabilities. However, within the organizational resilience area, the research on micro-foundations (Branicki et al., 2018; Korber & McNaughton, 2018) has been only a recent phenomenon. Moreover, there is no conceptual paper that elucidates or explains how micro-foundations help to build organizational resilience capabilities. Thus, the integration of
organizational resilience into the dynamic capabilities framework contributes to micro-foundational research.

**Contribution to the Research and Measurement of Organizational Resilience**

It has become increasingly apparent that researchers develop measures based on their perspectives and definitions. However, few, if any, empirically test or assess for consistency between definitional and operational meaning. This thesis finds that, while definitions of organizational resilience pay attention to organizational level components (i.e., cognitive, behavioral capabilities), the individual-level micro-foundational component, including entrepreneurial leadership, decision-making, social capital, and information and knowledge are key features of measures, indicating a discrepancy or misfit between definitional and operational development.

Moreover, the present thesis identifies a lag between the definitional and operational meaning of organizational resilience. In other words, conceptualizations and the development of measures have not developed in tandem. The meaning of organizational resilience is dynamic, having changed with time. The operationalization of measures, although remaining relatively stable, has not moved with the times. Given that measures are selected from quantitative studies, it is possible that the orientation of manuscripts (i.e., theoretical, methodological) has played a part in perpetuating this disconnect.

Fundamentally, conceptualizations determine the operational meaning of constructs, ultimately impacting research and practice. However, the discrepancy and lag between the operational and definitional meaning of organizational resilience imply that the measurement and research of this construct are not consistent with the theoretical developments. In order words, valid measures and empirical investigations are needed. As discussed in Chapters 2 and 5, there does not appear to be a valid and reliable measure of organizational resilience, other than the
Organizational Resilience HealthCheck (2017). and the 4-property organizational resilience framework (Tierney, 2003), both of which have been utilized widely.

The proposed model (see Figure 7.1) depicts the fundamental elements (e.g., components, capabilities, levels) typifying organizational resilience. Future research should consider utilizing these elements when defining and operationalizing this construct. Moreover, given that a number of measures have been developed involving capabilities such as sensing (Jiao et al., 2013; Wilden et al., 2013) and resource flexibility (Girod & Whittington, 2017; Kim & Boo, 2010; Makkonen et al., 2014) in the dynamic capabilities area, viewing organizational resilience as a pattern of higher-order dynamic capabilities provides empirical guidance when it comes to in operationalizing resilience.

Finally, as discussed in Chapter 2, a number of empirical investigations (Amah & Onwughalu, 2017; Hallak et al., 2018; Williams & Anyanwu, 2017) do not specify the phase and type of extreme negative events that a firm is facing. This thesis proposes that organizational resilience is a time-sensitive and context-dependent construct. Future research needs to report contextual information and time-related data in order to enhance the internal validity of their studies.

**Contribution to the Practice of Organizational Resilience**

From a practical standpoint, entrepreneurs/CEOs/owners/managers need to appreciate that in this zeitgeist there are compelling reasons for developing resilience capabilities (i.e. what they have to do) in order to remain sustainably competitive in high-velocity business environments (Hamel & Valikangas, 2003). However, the challenge here is to find ways in which to build such capacity. This thesis provides a first-aid toolkit for firms to help them to build capacities for dealing with extreme negative events. The toolkit provides a basic awareness of key capabilities including the cognitive capabilities of anticipating (Hamel & Valikangas, 2003), sensing (Birkie, 2016), and having a situation awareness (McManus et al., 2008) that enable
firms to notice, interpret, analyze, and formulate responses (Lengnick-Hall & Beck, 2005). The behavioral capabilities of adaptability (McManus et al., 2008), flexibility (Yilmaz Borekci et al., 2015), agility (Oh & Teo, 2006), and innovation (Reinmoeller & Van Baardwijk, 2005) helping organizations to adapt and innovate in a flexible and agile manner.

Entrepreneurs should bear in mind that leadership (Williams et al., 2017), decision-making (Orchiston et al., 2016), social capital (Akgün & Keskin, 2014), and access to relevant information and knowledge (Somers, 2009), are essential foundations and ensure firm viability. That is, entrepreneurial practice such as decisive and timely leadership; implementing clear and transparent processes of decision-making; ensuring trusted relationships with stakeholders, partners, and employees; and having access to important relevant information in a timely manner can make a significant difference pre-, during, and post-periods of turbulence.

Another important takeaway message for entrepreneurs is that the timing of (re)action is fundamental (Williams et al., 2017). The immediate response to the onset of an extreme negative event is especially critical and determines whether an organization is able to survive, bounce back or bounce forward from an extreme negative event (Manfield & Newey, 2017).

The following section articulates the limitations of the present thesis.

**Limitations and Future Directions**

The focus of this thesis has been on unraveling the texture of organizational resilience to the exclusion of examining the antecedents and outcomes of this construct, in regard to understanding the nomological net and its connection to other constructs. Further research could tap into this issue and answer questions such as what are the enablers that cultivate organizational resilience capabilities and how these capabilities help to improve firm performance?
Methodologically, this thesis utilized a qualitative methodology and a series of content analyses employing the Leximancer software, in order to unravel the texture of organizational resilience. “The Leximancer system is a relatively new method for transforming lexical co-occurrence information from natural language into semantic patterns in an unsupervised manner” (Smith & Humphreys, 2006) (p 262). This software enables researchers to use statistics-based algorithms to automatically analyze textual data and visually display the results in the form of concept maps and network clouds. However, the application of Leximancer involve two main limitations. One is that using Leximancer requires substantial data preparation time and a contextual knowledge of the research topic, in order to understand the findings meaningfully (Haynes et al., 2019). The other is that Leximancer does not provide information about the causal nature of the association among concepts, preventing the rich interpretation of the qualitative findings (Kuipers, Appleton, & Pridmore, 2013). There are other tools such as case studies and round table discussions, along with competing software (e.g., NVivo) that have been employed in social science research. Thus, it is incumbent on researchers to replicate the current findings.

Another limitation of the current thesis is the exploratory nature of Study 3, which involves a cross-sectional design with a relatively small sample size. Relatively small sample sizes are increasingly a feature of empirical research owing to the pressures faced by owner-managers and key personnel to participate. Obviously, issues to do with external validity and statistical power need to be considered. Another consideration would be the use of single items to represent each of the 11 capabilities. Clearly, developing and validating a large pool of items with a sizable sample are necessary.

Conclusion

In the long-term, the resilience of organizations is manifested through surviving and even thriving in extreme negative conditions (e.g., technological and market turbulence,
earthquakes). However, in the short term, organizational resilience is reflected by successful immediate (re)actions to specific extreme negative events. These events can trigger organizations to respond by utilizing and combining dynamic and time-sensitive capabilities. The challenge now remains, however, to extend the present findings and test the veracity of present conclusions and the series of interrelated propositions. Obviously, the proof of the pudding is in their testing in future research.


Appendices

Appendix 6.1: Participant information and consent form

PARTICIPANT INFORMATION FORM

Project Title: Examination of the Core Elements of Organisational Resilience

Investigators:

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Dear Participant,

You are invited to participate in a research project being conducted by RMIT University. Please read this sheet carefully and be confident that you understand its contents before deciding whether to participate. If you have any questions about the project, please ask one of the investigators.

This is an RMIT University doctoral research project being carried out by Ms Gloria (Xun) Yang from the School of Management. The project has been approved by the RMIT Human Research Ethics Committee.

The principle research question explores what are the constituent parts of resilience ability. You are invited to participate because your knowledge and experience in management of SMEs can help to canvas your opinions on items of enterprise resilience ability.

If I agree to participate, what will I be required to do?

As an owner/manager/CEO of SMEs, you will be invited to complete an online survey about organisational resilience which will take about 5 minutes.
There are no risks foreseen in participating in this project. Participation in this research project is entirely voluntary and participants are free to withdraw at any time. Information can only be disclosed: to protect you and others from harm, or when a court order is produced, or when written permission is provided by researchers.

Data will be aggregated. No person other than the researchers will have access to the data. Data (i.e. the raw information and/or images) will be kept securely at RMIT for 5 years after publication, before being destroyed. Only published Journal and conference papers, PhD thesis will remain online and aggregated.

**Security of the website**

Users should be aware that the World Wide Web is an insecure public network that gives rise to the potential risk that a user’s transactions are being viewed, intercepted or modified by third parties or that data which the user downloads may contain computer viruses or other defects.

No personal information will be collected in the survey so none will be stored as data. You have the right to withdraw from participating at any time

Please contact Professor Kosmas Smyrnios for any questions or concerns using the contact details above.

Yours Sincerely,

Xun Yang

On behalf of Professor Kosmas Smyrnios and Professor Booi Kam

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*If you have any complaints about your participation in this project, please see the complaints procedure at [Complaints with respect to participation in research at RMIT](http://www.rmit.edu.au/research/human-research-ethics)*
Appendix 6.2: Organizational resilience as a second-order construct for the period of pre-adversity.

Note: values in the left arrow show the path coefficients; values in the circle show the $R^2$ value; values in the right arrow show the factors loadings.
Appendix 6.3: Organizational resilience as a second-order construct for the period of post-adversity.

Note: values in the left arrow show the path coefficients; values in the circle show the R² value; values in the right arrow show the factors loadings.