2014

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THE ROLE OF RESILIENCE IN INDIVIDUAL INNOVATION

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2014

This dissertation is presented in fulfilment of the requirements for the award of Doctor of Philosophy

USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

ABSTRACT

The Role of Resilience in Individual Innovation

Organisations in today's changing environment face significant challenges, requiring continual innovation. A critical factor in their response may be employees' resilience, the ability to apply high levels of effort and persistence while initiating, promoting and applying new ideas. However, despite growing evidence of the value of many positive psychological characteristics in organisational behaviour, the role of resilience in individual innovation has received little attention in the literature.

This thesis describes two studies of this issue. First, current perspectives and definitions of resilience were reviewed, revealing a need for an improved definition, a re-examination of its dimensions and a new measure. A new construct based in the positive psychology framework is proposed. Unlike previous studies viewing resilience as recovery from adversity, in the present view adversity is an opportunity for employees to grow as a person. This distinction between 'survival' and 'growth' perspectives can be traced back to humanistic psychology. A measure of this new construct was developed, building on existing measures, and tested on 167 managers from large organisations in Indonesia. Exploratory factor analysis revealed two dimensions to the new construct: developmental persistency, a combination of perseverance and commitment to growth, and positive emotion.

Study 2 validated the results of Study 1 and assessed the causal model linking resilience to innovative behaviour using 241 managers from companies and industries comparable to Study 1. Confirmatory factor analysis using two-step structural equation modelling showed two primary findings. First, construct validity was demonstrated by the factor analysis results and by correlations with related constructs. The correlation between developmental persistency and positive emotion was moderate, and the reliability of each construct was reasonably acceptable. Second, factor analysis confirmed that Janssen's (2000) measure of innovative behaviour is better treated as multidimensional – comprising idea generation, idea promotion and idea implementation rather than unidimensional.

Finally, the causal relationships between the dimensions of resilience and the dimensions of innovative behaviour were positive, as hypothesised. Four paths had moderately large and statistically significant coefficients: from developmental persistency to idea implementation and idea promotion, and from positive emotion to

idea promotion and idea generation. Two paths had low and insignificant coefficients: from developmental persistency to idea generation and from positive emotion to idea implementation.

In light of these findings, suggestions for future research are presented and theoretical and practical implications, including interventions to increase employees' resilience, are explored.

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Signed ………………………

Muhammad Taufiq Amir

Date: March, 2014

ACKNOWLEDGEMENTS

DEDICATION

I dedicate this dissertation to my wife, Anita Yulianti; my lovely daughters, Jasmin and Andrea; and my amazing twin sons, Ihsan and Gibran. I always believe that this truly challenging yet incredibly rewarding experience has not only been *"my journey",* but, *"our journey".* These five special persons have made their own sacrifices as they supported me in their own special ways. I can truly say that I would never have accomplished this project without them. They have provided me with wholehearted love and unconditional support, from which I drew my energy and motivation to keep moving throughout this journey. Simply to say—these were all the best reasons for me to be *resilient* in achieving this PhD.

PUBLICATION FROM THIS THESIS

Amir, M. T., & Standen, P. (2011). *Employee resilience in organisations: Development of a new scale*. Paper presented at the 26th Australian New Zealand Academy of Management Conference.

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CHAPTER ONE – INTRODUCTION

1.1. STUDY BACKGROUND

Innovation is increasingly considered as an important means for large companies facing challenges to survive competition and maintain and grow their business. Challenges such as competition are becoming increasingly intense as companies face threats not only from existing competitors but, perhaps more significantly, from new and smaller competitors that are more agile and aggressive. Small companies can offer lower prices, quicker service, and faster product designs or business process improvements (Thornberry, 2003). Internally, the challenges are equally demanding. Large companies are pushed to minimise hierarchy, to improve relations between staff, and to use the latest technology (Thompson, 2004). Innovation seems to be the inevitable solution if large companies want to survive, maintain their business and keep growing despite the challenges.

However, large and established companies have several inherent barriers to innovation. Numerous cases show that the more established and bigger an organisation, the more likely it is to be lethargic and bureaucratic (Holt, Rutherford, & Clohessy, 2007; Thornberry, 2003). Due to rigid structures and systems, employees rarely show the same level of initiative or response to competition as in smaller firms. They are slow in presenting new ideas and strategies, which puts at risk the firm's competitive position (Srivasta & Lee, 2004). For example, Srivasta and Lee (2004) found that in markets for personal computers, telecommunications and beer, an organisation that is slow in launching products quickly loses its market share. Kuratko (2007) and Covin and Slevin (2002) suggest that established corporations face these challenges by becoming more entrepreneurial and innovative.

The notion that innovation will make corporations more adaptive and responsive to challenges has led researchers to conduct studies conceptualising and managing organisational innovation. Such studies demonstrate significant advantages for greater innovation in established organisations (Andrew, Sirkin, Haanes, & Michael, 2007; Drucker, 1985). Researchers have also examined different categories of innovation strategy (Christensen, 2003; Govindrajan & Trimble, 2005; Henderson & Clark, 1990), the measurement of effective innovation (Aiman-Smith, 2005; Andrew et al., 2007; Jane, 2006; Muller, Valikangas, & Merlyn, 2005; Tang, 1999), and the effect of organisational environmental factors such as top management support and sufficient

work discretion on innovation (Amabile, 1988; Hornsby, Kuratko, & Zahra, 2002; Morris, Kuratko, & Covin, 2008).

While the concept of innovation can be applied at the organisational level, its foundation lies at the *individual level* of the employee (Kuratko, 2007). Research on individuals typically describes innovation as a multiple-stage process of generating new ideas, gaining support for them and applying them in the workplace (Scott & Bruce, 1994). Studies have examined cognitive or behavioural aspects (Axtell, Holman, Unsworth, Wall, Waterson & Harrington, 2000; Mumford, 2000) personal attributes, leadership style and self-leadership as influences on innovative behaviour (Carmeli, Meitar, & Weisberg, 2006; Henderson & Clark, 1990). Other studies concentrate on the motivation to become innovative (Amabile, 1988; C. M. Ford, 1996; West & Farr, 1990) or how job characteristics affect individual innovativeness (George & Zhou, 2002; Janssen, 2000, 2005). Although in general these studies show the importance of innovative behaviour, together they suggest it is a complex set of demanding behaviours (e.g., Janssen, 2000; Janssen, 2004).

Individual innovation requires a high level of effort and especially hardiness from employees (Janssen, 2000, 2004). Initiating, promoting and applying new ideas leads to many complexities in a large organisation. For instance, innovative employees need to persuade others who often do not understand or who need reassurance about new ideas. The potential for superiors' or colleagues' negative evaluations and the pressures to conform to majority views often challenge the ability of innovative employees to maintain their efforts. The pressure is even greater when distributive and procedural fairness in the reward system are low (Janssen, 2004). Additionally, new ideas and their implementation often call for significant changes to organisations (Kanter, 1983). Such changes can be demanding, making people feel insecure, uncertain and ultimately causing them to revert to their original behaviours. All these problems require innovative employees to show hardiness or *resilience* and organisations to cultivate such resilience if new ideas are to succeed.

This study will explore how employees' resilience—the capacity to persevere with their work under adversity or to bounce back after set-backs while growing as a person—contributes to their innovative behaviour. The thesis is that the resilience plays a significant role in fostering innovative behaviour and turning it into organisational success. Previous studies of individual-level innovation have tended to focus on personality, cognitive ability, job characteristics and motivation (Anderson, De Drea, &

Nijstad, 2004). While studies of motivation to innovate have covered dimensions like intrinsic motivation, self-determination or personal initiative, resilience has been largely neglected (Amabile & Kramer, 2011).

Where previous studies of individuals' ability to cope with difficult situations have relied on concepts like stress (i.e. Latack, 1986), coping (i.e Lazarus, 1993) or burn out (i.e. Schaufeli, Bakker, & Rhenen, 2009), this study uses the concept of resilience from Positive Organisational Scholarship (POS) and Positive Organisational Behaviour (POB) domains. POS and POB are based on positive psychology and focus on people's capacity for psychological strength (Cameron, Dutton & Quinn, 2003; Luthans, 2002a) and substantial positive impact on performance (Luthans & Youssef, 2007). Although several studies in POS and POB relate resilience to entrepreneurship (Der Foo, Uy, & Baron, 2009; Jensen, 2003; Jensen & Luthans, 2006), it appears none specifically focus on resilience as a contributor to innovative behaviour in large, established firms. This study offers a new perspective in which innovation is linked to the POS or POB concept of resilience, transcending the criticism of innovation research as being 'routinised' and too focused on replication-extension (N. Anderson, De Drea, & Nijstad, 2004).

Resilience is a relatively new concept in organisational behaviour and studies of it are rare. It appears that only one measurement scale has so far been specifically developed for work settings (Luthans, Avolio, Avey, & Norman, 2007), although others have been developed in child or personal development contexts. Furthermore, the POS and POB perspective of resilience as a capacity that can be enhanced rather than a fixed trait is worth considering. Therefore, the present study aims to develop a new measurement scale for resilience suited to large, established organisations, based on the POS and POB view.

1.2 RESEARCH PROBLEM

Large established corporations need employees who behave innovatively, which appears to require these employees to be resilient. The research problem of this thesis is: *How does resilience contribute to employees' innovative behaviour?* More specific research questions are listed below.

1.3 RESEARCH QUESTIONS

- What is the underlying structure of the concept of resilience as applied to employees in large, established organisations?

- What is the relationship between resilience and innovative behaviour of employees?
- How are the dimensions of resilience related to the dimensions of innovative behaviour?

1.4 THE PURPOSE OF THE STUDY

The research questions identify the purposes of this study as:

- to develop a construct of resilience relevant to the work of individuals in established and large organisations,
- to develop a new scale for measuring resilience in this context,
- to explain the relationship between resilience and innovative behaviour of employees in established and large organisations and
- to explain how the dimensions of resilience relate to the dimensions of innovative behaviour of employees.

1.5 THE BENEFITS OF THE STUDY

There were both practical and theoretical reasons for conducting this study.

1.5.1 THEORETICAL BENEFITS

- To contribute to management science, particularly to the field of organisational behaviour, by providing a new concept of employee resilience and an accompanying theory linking resilience to individual innovation within the POS and POB domains.
- To contribute to future research in organisational behaviour by developing a new measure of resilience and validating an existing measure of innovative behaviour.

1.5.2 PRACTICAL BENEFITS

- To provide insight and a foundation for employees wishing to develop their innovative capacity by becoming more resilient.
- To improve understanding of how managerial practices at the organisational level can develop innovativeness in employees by increasing their resilience.

1.6 STUDY OUTLINE

This study comprises six chapters. Chapter 2 is divided into two main parts. The first evaluates conceptualisations and measures of resilience in the organisational context, especially studies undertaken in the POS or POB domains. A gap is identified and a new concept of resilience with new dimensions is put forward. The second part identifies the challenges of innovative behaviour and suggests potential roles for the proposed dimensions of resilience. It focuses on theories of the individual innovation process where each stage has its own difficulties.

Chapter 3 describes the general methodology employed in Study 1 and Study 2. The research strategy and the research context, including the industry sector and organisational level of managers, are discussed. The survey design, participants, measures and data analysis strategies are also presented here. Limitations concerning self-report measures and cross-cultural measurement are identified.

Chapter 4 describes Study 1 in which a new measure of resilience is developed and validated on a sample of managers. It describes specific details of the methodology, steps in developing the new measure and the results, and discusses implications for the new measure of resilience.

Chapter 5 describes Study 2, which aims to confirm the structure of the new measure of resilience and the existing measure of innovative behaviour, and to examine relationships between these constructs and between their dimensions using a second sample of managers. Specific details of the methodology, steps in confirming the two measures, and the results are presented.

Chapter 6 discusses and summarises the important findings of both studies and focuses on interpreting the link between resilience and innovative behaviour in relation to studies of these and other related concepts. It also describes limitations of the study and suggests future research directions and practical implications for managers, employees and management development personnel.

1.7 SUMMARY

The relationship between resilience and innovative behaviour has not yet been rigorously investigated with empirical research. This study provides a first step towards a theory of the important link between these concepts in employees of large established organisations. A new measure of resilience is developed as existing measures were designed for other contexts, and do not incorporate developments in POS and POB

theories of organisational behaviour. A new model of the relationship between resilience and innovative behaviour is expected to provide a sound basis for interventions to help managers, employees and management developers improve these important capabilities.

CHAPTER TWO - LITERATURE REVIEW

2.1 OVERVIEW

This review examines the concepts of resilience and innovative behaviour and the evidence suggesting a link between them. Psychological studies of resilience have conceptualised it as either a stable trait or, more recently, a developable capacity. The latter perspective has brought resilience into focus in organisational studies through the Positive Organisational Scholarship (POS) and Positive Organisational Behaviour (POB) movements. This perspective is explained, and important studies reviewed. The three constructs most commonly used in organisational studies, two from general psychology and one from POB, are then reviewed.

However, all current concepts and constructs were found to have a fundamental flaw in focussing only on recovery from adversity. Earlier studies identified resilience with facing adversity with the intention to growth rather than merely survive. This distinction is examined and hypothesised to be a critical dimension for the concept, suggesting a new construct is needed. The review of previous constructs identified several other common elements that are combined to propose a construct with four possible dimensions. This construct is used to develop a new measure in Chapter 4, and then to test the hypothesised link with innovative behaviour in Chapter 5.

Next the review examines concepts of innovative behaviour. These tend to focus on stages of the innovation process. A commonly used model identifies three stages: idea generation, idea promotion and idea implementation. Finally, studies of the challenges facing innovators in each of these stages are used to propose links to the dimensions proposed for the new construct of resilience. These are tested in Chapter 5.

2.2 UNDERSTANDING RESILIENCE: INDIVIDUAL DIFFERENCE VARIABLE, STABLE TRAIT OR DEVELOPABLE CAPACITY

In general terms, most recent researchers in psychology describe resilience as synonymous with patience, perseverance, survival, recovery or exceptionally high tolerance (Youssef, 2004). This 'recovery' perspective is typically applied to an individual's capability for survival or adaptation after a traumatic experience (Yu & Zhang, 2007).

Early studies of resilience described an individual difference variable related to adaptability and coping. This perspective stems from Block and Block's (1980) definition of 'ego-resilience' as the dynamic capacity of individuals to modify their characteristic level of ego-control in response to a changing and demanding environment. Block and Kremen (1996, p. 351) describe "ego-resilience" as enabling individuals to modulate their internal psychological systems to avoid the maladaptive extremes of over-control and under-control of impulses. Ego-resilience was conceived as a continuum between these poles, with highly resilient individuals exerting appropriate and dynamic self-regulation while less resilient individuals rigidly under or over self-regulate. Having an adaptively flexible ego, a resilient person is mentally healthy: zestful about life, experiencing a sense of cohesion and self-esteem, affectively aware and responsive, and having enduring interpersonal relations. Thus, for Block and colleagues resilience was more than recovery from specific trauma, an underlying approach to life based on flexibly joining in with whatever one experiences.

Some of Block and Block's characteristics are reflected in more recent studies, although these tend to describe more specific and fixed personality characteristics. For example, Wagnild and Young (1993) describe resilience as a stable personality 'trait' moderating the negative effects of stress and promoting adaptation. Luthar, Cichetti and Becker (2000) describe resilient people as high in extraversion and emotional stability.

Recently, researchers have switched attention to *developing* resilience, and explored individuals' capacity to build and expand it (Masten, 2001), typically in response to adversity. For some authors resilience is *only* developed through substantial adversity (e.g., Luthar, Cichetti, & Becker 2000). Masten and Reed (2002, p. 75) describe it as "characterised by patterns of positive adaptation in the context of significant adversity and risk".

In this 'developable' view, resilience is not a trait found only in some people but a quality that can be developed in anyone. Masten (2001) considers that resilience forms part of the psychological makeup of all persons as a result of the basic human need for attachment to others, including parents, caregivers or romantic partners. Through seeking the support of others a person becomes resilient, where socially isolated persons do not. For Bonanno (2004, p. 20) individuals have multiple pathways for improving resilience, such as cognitive processes for developing hardiness or self-enhancement and emotion-focused strategies of repressive coping or increasing positive emotion.

However, while the latter authors view resilience as developable, they do not explicitly describe the internal motivational drive identified by Block and Block. In a meta-review, G. E. Richardson (2002) suggests facing adversity may improve a person's motivation to enhance his or her psychological 'strength'. This has some similarity to Block and Block's view of a motivational drive to adapt one's ego-structures to changing circumstances, and is further discussed in 2.5.

Masten and Reed's (2002) model has become popular amongst researchers because it explains how resilience can be developed. They suggest resilience is increased when individuals develop 'assets' that function as protective factors, and when they avoid or minimise risks (Masten & Reed, 2002). Assets are resources individuals can use in responding to strain, such as cognitive abilities, self-regulation capabilities or emotional stability. Assets increase adaptation under conditions of adversity or risk. Risk refers to events that bring undesirable outcomes such as destructive or dysfunctional experiences.

In summary the psychological literature presents several broad conceptions of resilience. While Block and Block's original concept identified an evolutionary motivation to adapt to a changing environment that could itself fluctuate over a person's life span, subsequent authors saw it more as a stable personality trait. Recent developments in positive psychology have turned the emphasis to developing resilience. Where Block and Block saw resilience operating in everyday life, the later studies have focused more on response to adverse events. These different broad perspectives are evaluated in 2.5, after considering the role of resilience in organisational studies (below) and more detailed analysis of the constructs used in empirical studies in psychology and organisational research (2.4).

2.3 RESILIENCE IN ORGANISATIONAL STUDIES

In organisational research authors tend to see resilience as a necessary response to an increasingly complex and dynamic organisational environment that causes workplaces to become demanding, unfriendly, stressful or highly competitive (Youssef, 2004). Resilience is becoming an important topic in many areas of organisational research, a trend accelerated by the POS and POB branches of positive psychology.

2.3.1 RESILIENCE IN ORGANISATIONAL RESEARCH

Organisational researchers have studied resilience in diverse contexts. Some use it to describe *organisational system* performance free from routine or novel disasters (Rudolph & Repenning, 2002). Waterman and Collard (1994, p. 88) examine resilience in *employees' careers*, describing a career-resilient workforce as "a group of employees who not only are dedicated to the idea of continuous learning but also stand ready to reinvent themselves to keep pace with change, take responsibility for their own career management and are committed to the company's success". A third use involves *'moral resilience'* in leadership studies. May, Chan, Hodges, & Avolio (2003, p. 334) describe morally resilient leaders as "adaptive but assertive individuals who follow their own principles and moral values, even when faced with pressures from peers". These concepts take different perspectives on resilience to both the general psychological studies reviewed above and the POS/POB view below, and are not considered further here.

2.3.2 *RESILIENCE IN POS AND POB STUDIES*

The most prominent models of resilience in current organisational studies come from Positive Organisational Scholarship (POS) or Positive Organisational Behaviour (POB) frameworks. The latter grew from the positive psychology movement founded by Martin Seligman and colleagues as a science of "positive subjective experience" (Seligman & Csikszentmihalyi, 2000). Positive psychologists suggest psychology focus away from wrong, weak or bad pathologies and towards identifying and nurturing what is right, strong and good in humans. Seligman (2002) proposed "three pillars" of positive psychology: subjective experience, positive individual characteristics (strength and virtue), and positive institution and community. Positive psychology has grown rapidly, with many conferences, research projects and courses (Gable & Haidt, 2005).

Positive psychology's organisational branches (POS and POB) are major strands of the movement (Nelson & Cooper, 2007), focused on strength-based (rather than deficit-based) development of subjective wellbeing, optimism, hope, vitality, flow, happiness, compassion, positive emotion, joy, gratitude, serenity, perseverance, courage and similar variables in organisational contexts (Fredrickson, 2003; Seligman, 2002, 2003). They aim to improve organisations by identifying human strengths, developing *resilience*, restoration and vitality, and cultivating extraordinary qualities in individuals (Nelson & Cooper, 2007, p. 3). POS and POB studies have examined the development

of resilience and its effects on employee performance outcomes (Cameron, Dutton, & Quinn, 2003b; Luthans, Youssef, & Avolio, 2007).

POS focuses on phenomena and variables representing "positive deviance" from standard managerial practice (Cameron, Dutton, Quinn, 2003) that contribute to thriving, flourishing, virtuousness or resilience. POB similarly seeks to avoid negative variables and build on human strengths or positive psychological capacities (Luthans, 2002b; Wright, 2003). Luthans (2002a) calls for constructs and measures aimed at improving these capacities, which must be state-like or *developable* unlike the fixed, trait-like personality, attitudinal and motivational variables of traditional OB. Luthans and colleagues coined the term "Psychological Capital" or "PsyCap" (Luthans & Youssef, 2004) to describe a broad concept including resilience along with self-efficacy or confidence, hope and optimism.

The emphasis on resilience as a developable quality makes POS and POB studies highly relevant to this thesis, although the specific assumptions of positive psychology are not important to the construct developed below or the empirical evidence reported.

2.3.3 STUDIES OF RESILIENCE AT ORGANISATIONAL AND INDIVIDUAL LEVEL

POS and POB studies have examined resilience at both organisational and individual levels. For example, Masten and Reed's (2002) concepts of individual assets and risk have been applied to the *organisational* level. 'Assets' here refers to resources contributing to a *unit's* capacity to solve problems, such as knowledge, skill, trust, heedfulness, positive emotion and commitment (Youssef, 2004). Managing individual assets is predicted to build the organisation's resilience, minimizing its dysfunctions and exposure to risk. While organisations traditionally attempt to anticipate adverse events such as downsizing, re-engineering or restructuring (Youssef, 2004) these cannot be fully avoided. A resilient organisation is better placed than a merely anticipative one (Sutcliffe & Christianson, 2011; Weick & Sutcliffe, 2007). Managers build organisational resilience by making the organisation more adaptable, capable of responding to unexpected challenges by with its latent cognitive, emotional, relational or structural resources (Sutcliffe & Christianson, 2011).

At the *individual* level, POS and POB studies tend to view resilience as a dynamic developmental process rather than a fixed personality trait. Sutcliffe and Vogus (2003, p. 96) see it as an individual's ability to absorb strain and preserve or improve functioning during adversities, such as a leadership crisis, major change, production

pressures or external demands by stakeholders. Caza and Milton (2011, p. 896) define resilience in the work context as a developmental trajectory that results in professional growth as individuals increase their competence in the face of workplace adversity. Reivich and Shatte (2003) characterise resilience broadly as the capacity to overcome challenges while reaching out to pursue new capabilities, experiences, relationships and meanings in life. Sutcliffe and Vogus's concept is, like most in psychology and OB, recovery based, while Caza and Milton and Reivich and Shatte include an element of growth. The significance of this distinction is further explored in 2.5

So far researchers have not provided systematic empirical evidence on how resilience can be developed in organisations or its effects, although some preliminary observations have been presented (Luthans, 2002b; Luthans, Youssef, et al., 2007). For example, Luthans, Avey, Avolio, Norman, & Combs (2006) used experimental interventions to develop resilience in groups of students and managers by teaching participants to remain realistic, retain control, and sort through options for taking action when facing adversity. Resilience (and other PsyCap constructs) were significantly increased in experimental groups from pre-test to post-test while a control group showed no increase.

This finding suggests resilience can be developed through better handling the *regular challenges* of working life rather than requiring significant adversity as many psychologists believe (e.g. Masten & Reed, 2002; Yu & Zhang, 2007). Appropriately facing such daily challenges is predicted to build internal and external resources for future challenges, rather than merely helping recover from present ones (G. E. Richardson, 2002). However, the relative effects of major adversity and daily challenges have not yet been not systematically studied. This study therefore includes both in the construct outlined below.

Developing individual resilience is now a major theme in POS and POB as it is in general psychological studies (e.g., Bonanno, 2004; Masten & Reed, 2002). However, so far there has been little exploration of *how* individuals develop it. Two general perspectives are evident in the literature, one focused on recovery from specific events, usually strongly adverse ones (e.g., Sutcliffe & Vogus, 2003, p. 96) and the other on a broader process of growth in an individual's adaptation to life circumstances (B. B. Caza & Milton, 2011). These perspectives are more explicitly contrasted in 2.5. The next section reviews the major constructs of resilience used in recent organisational and psychological studies. All three are derived from general psychology studies of

resilience where, as in the organisational studies above, a recovery-growth distinction is implied but has not so far directly examined.

2.4 CONSTRUCTS OF RESILIENCE IN ORGANISATIONAL AND PSYCHOLOGICAL STUDIES

Organisational research on resilience employs several specific constructs and analysis of the underlying dimensions and measures sheds light on their focus and differences. A systematic search of publications in the last 12 years using "resilience" as a keyword identified fifteen. These used two constructs: Ego-Resilience as measured by the ER-89 scale (J. Block & Kremen, 1996, p. 167) and the Resilience dimension of Luthans and colleagues' Psychological Capital (PsyCap; Luthans, Avolio, Avey & Norman, 2007). The PsyCap scale primarily uses items from Wagnild and Young's (1993) Resilience Scale (WYRS) developed for general psychological use.

2.4.1 EGO-RESILIENCE (ER-89)

Block and Block's (1980) construct focuses on the capacity "to effectively modulate and monitor an ever-changing complex of desires and reality constraints" (J. Block & Kremen, 1996, p. 359), as described in 2.1. Resilient individuals have ego-functioning structures that adapt flexibly to environmental changes, including but not focused on adverse ones. Such structures fluctuate over time but form "a generalized, characterological quality" of an individual rather than being highly specific to events (J. Block & Kremen, 1996, p. 351). Sample items from ER-89 are: "I quickly get over and recover from being startled" and "I enjoy dealing with new and unusual situations".

As noted earlier, Block and Block's construct reflects a general concept of mental health as adaptive flexibility. ER-89 therefore measures a broad range of variables such as curiosity, generosity, emotional fluidity, physical energy and social skills. Klohnen (1996) factor analysed these and found four underlying factors: *confident optimism*, *productive activity*, *insight and warmth,* and *skilled expressiveness*. He concludes that despite although suggesting a slightly different emphasis to Block and Kremen's original construct his data primarily confirm its validity.

ER-89 has good internal reliability (J. Block & Kremen, 1996; Fredrickson, Tugade, Waugh, & Larkin, 2003; Tugade & Fredrickson, 2004; Waaktaar & Torgersen, 2010) and evidence of validity in convergent relationship with other domains of adaptive personality functioning such as ego-control and impulse expression (Klohnen, 1996). It has been used to measure resilience in five organisational studies, most

conducted by Luthans and colleagues who reconceptualise Block and Block's trait concept of resilience to the developable perspective used in POB studies. For example, Larson and Luthans (2006) found resilience related to job satisfaction and organisational commitment in production workers and Luthans, Avolio, Walumbwa and Li (2005) found resilience correlated highly with organisational performance in a study of Chinese workers.

2.4.2 WAGNILD AND YOUNG'S RESILIENCE SCALE (WYRS)

Wagnild and Young define resilience as a positive personality characteristic underlying adaptation (Wagnild & Young, 1990; 1993, p. 167). Their emphasis on adaptation is compatible with growth although it does not explicitly mention this. From a review of psychological studies and a qualitative study of older women they suggest five dimensions:

- *Equanimity,* a balanced perspective of one's life and experiences, the ability to consider a broader perspective and to "sit loose" and take what comes;
- *Perseverance,* persistence despite adversity or discouragement, a willingness to continue the struggle of one's life purpose and to remain involved, to practice self-discipline;
- *Self-Reliance,* believing in one's inherent capabilities, the ability to depend on oneself and to recognise personal strengths but also one's limitations;
- *Meaningfulness,* the belief that life has a purpose and one's contributions have value and;
- *Existentiality,* a feeling of freedom and a sense of uniqueness as a human being.

However exploratory factor analysis suggested these dimensions may comprise only two distinct factors, *Personal Competence* and *Acceptance of Self and Life* (Wagnild & Young, 1993) although this issue requires further research.

The WYRS has good internal reliability (Ahern, Kiehl, Sole, & Byers, 2006; Wagnild, 2009; Wagnild & Young, 1993), and evidence of its validity includes relationships to measures of adaptation such as morale, life satisfaction, depression and physical health (Ahern et al., 2006; Wagnild, 2009).

2.4.3 RESILIENCE SUBSCALE OF PSYCAP

Resilience forms part of Luthans' (2002a) construct of Psychological Capital, along with self-efficacy, hope and optimism. Resilience is defined as "the positive psychological capacity to rebound, to 'bounce-back' from adversity, uncertainty, conflict, failure or even positive change, progress and increased responsibility" (Luthans, 2002a, p. 702). Luthans adapted items from the WYRS dimensions of perseverance and self-reliance to the work context by adding "at work" or "job" to items.

This subscale has moderate to good reliability (Luthans, Avolio, Avey, & Norman, 2007; Luthans, Youssef, & Rawski, 2011) and its validity is suggested by positive relationships with the other dimensions of PsyCap and with job performance and satisfaction (Luthans, Avolio, et al., 2007).

2.4.4 RESILIENCE CONSTRUCTS IN GENERAL PSYCHOLOGY

Psychological researchers have produced a large number of scales for measuring resilience. Many are designed with specific research contexts in mind, for example adult vs child/adolescent developmental studies, or clinical use. Relatively few have received widespread construct validation, and the theoretical base and relevance to a specific domain of many is unclear. For example, Ahern et al. (2006) reviewed thirty-two resilience measures potentially relevant to studies of adolescence, but considered only six in detail and recommended one of these on the basis of it theoretical base and the breadth of evidence for its psychometric properties. Well known measures for adults include Connor and Davidson's Resilience Scale (CD-RISC; (Connor & Davidson, 2003) and Friborg and colleagues' Resilience Scale for Adults (RSA; (Friborg, Hjemdal, Rosenvinge, & Martinussen, 2003)).

While there is not room here to review the very broad set of constructs developed by psychologists, those behind CD-RISC and RSA will be briefly introduced as well-known examples. Connor and Davidson's construct was proposed in the context of measuring ability to cope with stress coping ability in both the general population and clinical settings. It has five dimensions:

- Personal competence, high standards, and tenacity
- Trust in one's instincts, tolerance of negative affect, and strengthening effects of stress
- Positive acceptance of change and secure relationships

- Control and
- Spiritual influence.

Friborg and colleagues' RSA was designed to measure the presence of protective resources in adults, primarily for clinical use. It has five dimensions:

- Personal competence
- Social competence
- Family coherence
- Social support and
- Personal structure.

These two examples illustrated the broad range of theoretical perspectives in the field of resilience studies. Conner and Davidson's notions of viewing stress as strengthening, and positive acceptance of change are relevant to the new construct proposed below. Personal and social competence, social support, and trust in one's instincts are also compatible with it. Consequently both these scales, along with those of Watkins and Marsick (2003) and Blatt (2009) were examined when developing items for the new scale proposed below. However, there is not room to more fully investigate the wide range of psychological constructs here. The role of growth in a number of these is considered in 2.5, although some are general theoretical studies that do not specifically identify a construct of resilience.

2.4.5 SUMMARY

The three constructs currently used in organisational studies are summarised in Table 2.1, which shows each has a different emphasis. Block and Block's construct describes adaptation of the individual as a whole to changing circumstances, by upwardly or downwardly regulating impulse expression. In the next section the growth-focused nature of this construct is more fully explained. Wagnild and Young's construct describes adaptation of the whole person to the negative effect of stress, and PsyCap Resilience similarly addresses recovery from specific adverse events. The latter are therefore recovery-based rather than growth-based definitions of resilience, emphasising adaptation to or recovery from specific, mostly negative, events. The former describes a broader psychological capacity to grow by facing change in general, whether in terms of specific events, positive or negative, or through general learning and improvement. This significance of this difference is explored in the next section.

Table 2.1 Summary of resilience constructs used in organisational studies

	Ego-Resilience Block & Kremen (1996)	Resilience Wagnild & Young (1993)	PsyCap Resilience Luthans, Avolio et al. (2007)
Focus	Capacity of the individual to effectively *adapt* to an ever-changing complexity of *desires and reality constraints*	Positive personality characteristic that enhances individual *adaptation*	Positive psychological capacity to *rebound or bounce back* from *adversity*, conflict or stressful events
Measure	Ego-Resilience (ER-89)	Wagnild & Young Resilence Scale (WYRS)	PsyCap Resilience
Dimensions	Adaptability (curiosity, generosity and social skills appear as bases for item generation).	For item generation: 1. Equanimity 2. Perseverance 3. Self-reliance 4. Meaningfulness 5. Existentiality From factor analysis: 1. Personal competence 2. Acceptance of self	Unidimensional

2.5 RECONCEPTUALISING RESILIENCE

The review above has identified much overlap in the qualities attributed to a resilient person by different authors but also the existence of different underlying views on the nature of resilience. One is a general perspective of resilience as the mentally healthy adaptation of a flexible self to changing circumstances in a way that causes the individual to grow holistically while the other describes a more specific capacity to recover from specific, typically adverse, events. This section argues for a new construct of resilience predicated holistically on growth rather than specifically focused on recovery from adverse events.

Block and Block's (1980) original construct emphasised upward or downward regulation of "impulse" (affect) expression, a general quality considered to fluctuate over a person's life. Later authors describe resilience more specifically as a personality trait (e.g., Wagnild & Young, 1993) or developable capacity (e.g., Bonanno, 2004; Luthans, Avolio, et al., 2007) underpinning recovery from adverse events. While the latter sometimes refer to adaptation (B. B. Caza & Milton, 2011; Coutu, 2002), this tends to refer to specific capacities related to the current adversity, such as professional

competences in organisational studies, rather than growth of the individual's flexibility as a self, that is as an agent actively influencing his or her future.

Most definitions presently used in both organisational studies and general psychology fall into the recovery category, with some important theoretical consequences. In recovery perspective resilience is most useful in negative events, which provide the need for recovery. In Block and Block's evolutionary adaptation perspective resilience helps the individual meet changes whether positive or negative: no separate theoretical mechanism is needed for the former. As Block emphasises, healthy individuals follow a "reality principle" (J. Block & Kremen, 1996, p. 350) in regulating their impulses in response to 'positive' or 'negative' events. They do not merely cope with negative situations but actively construct their self in response to a constantly changing environment. This may include finding good in 'negative' events (e.g., the dark cloud's 'silver lining') and bad in 'positive' ones (e.g., the short-term relief of avoiding long-term challenges). Their self changes as they learn to delay gratification, reject unpleasant circumstances, modulate aggression, be cautious in new circumstances, enjoy "playful sentient experiencing", experiment with new behaviours, and modify their views of interpersonal relations to use Block and Kremen's (1996, p. 350) examples. They may become more *or less* responsive to pleasure, aggressive, cautious, playful or outgoing, and more *or less* liking of others, depending on the circumstances.

In this holistic perspective 'positive' and 'negative' elements of the environment or self are not pitted against each other. Both are essential to a flexible and changing self, a theoretically distinct alternative to overcoming adversity by learning a specific new behaviour or skill. The former describes an individual becoming more adaptable *in general*, the latter someone who gains a specific advantage and short-term recovery but is not necessarily more able to meet very different future challenges or to generally master a continually changing environment. The growth perspective may be seen as a higher-order view of adaptation.

Block and Block's construct was developed during the era of humanistic psychology and shares a number of its central premises. Their underlying view of mental health does not reflect adaptation to a specific context – "a niche in which to abide and perhaps hide" (Block & Kremen, 1996, p.350) – or a lack of symptoms, as do many theories (see Jahoda 1958), but a positive drive or 'metamotivation' to become more agile as a person, not only to avoid immediate threats but to ensure future fit with

an unpredictable environment. Growth in this evolutionary sense was the *central* human motivation according to psychologists such as Maslow (1970) and Rogers (1975) a "self-actualising" person or Rogers' concept of a "fully functioning person". Block and Block's construct has much in common with these broad concepts.

However, recent concepts and constructs of resilience do not reflect this notion of long-term growth of the self as a response to an unpredictable environment. This narrowing of the concept restricts its application to circumstances based on adverse events, ironically given the modern focus on 'positive' capabilities. A reconceptualisation is needed to return focus to the broader application of the concept in which an individual grows as a person rather than just recovering from adversity.

As an example of the practical consequence of this distinction in an organisation, a rigid person may adapt well to the need for cost-cutting in difficult economic times but fail when required to creatively change the business to grow in a favourable economy. Or, he or she may adapt well to changes within the confines of an organisation but lack the personal flexibility to adapt to changes outside work that may eventually reduce work functioning through stress or burnout. The person learns new but relatively superficial skills or behaviours and does not change the fundamental personality structures producing the 'aliveness' of a resilient person described by Block and Block and humanistic psychologists.

As noted above in reviewing organisational uses of resilience, growth is sometimes implied in limited ways in modern studies. The next section contrasts these with the broader concept proposed here. Following this, the theoretical question of whether resilience is context-sensitive is raised (2.5.2). This is important in both defining resilience and creating a new measure (since dimensions or items from general scales may not be useable in the organisational context). Finally, dimensions for a new growth-oriented construct are proposed after reviewing existing constructs and measures (2.5.3).

2.5.1 PERSONAL GROWTH IN CURRENT STUDIES OF RESILIENCE AND RELATED CONCEPTS

Personal growth is mentioned in many modern psychological and organisational studies of resilience, but generally without explicitly giving it the fundamental motivational role described above. Examples of these studies are reviewed below, along

with related psychological concepts having a growth aspect. Many are conceptual studies that do explicitly define a construct of resilience.

Growth in current psychological and organisational studies of resilience

Growth is most evident in *general psychological studies* in a consistent view of resilient individuals as those who face adversity (and for some authors positive stressors or events) with the intention to grow as persons. For example Masten and colleagues' studies of human development over the lifespan (Masten, 2007; Masten & Reed, 2002). Masten & Wright (2010) suggest individuals *adapt* to their social environment. They highlights the central role of personal agency in developing competence, both a person's *intention* to self-develop and his or her competence in self-development, since "competence begets competence". For Masten and Wright, competence is primarily developed in adverse situations. Whether individuals succeed or fail in handling these, through self-reflection and other activities *resilient* individuals intentionally develop their competence for facing future events (Masten & Wright, 2010). This competence is resilience, which in effect leads an individual to grow as a person as Block and Block suggest (2.2).

G. E. Richardson (2002) similarly implies a growth perspective in suggesting adverse events allow individuals to explore and refine their values and life goals. His concept of "resilient integration" involves becoming more resilient through personal growth that expands a person's capacity to face future setbacks. Spreitzer et al.'s (2012) research on 'thriving' also shows individuals intentionally face difficulties for the purpose of learning something new.

The centrality of growth is further suggested by Bonanno (2004), who describes resilience as not minimally coping with or neutralising adversities but facing them proactively as opportunities to gain knowledge or experience and find greater meaning in life. Dealing with adversity in early life experience makes individuals more resilient and hence proactively responsive to subsequent challenges.

This is also evident in Reivich and Shatte's (2003, p. 28) concept of resilience as reaching out to others or to new possibilities during adversity, eagerly anticipating rather than reluctantly seeking them. Again, a person's motivation to grow is central. Reivich and Shatte suggest this leads to three important skills for facing future adversity: assessing risks, knowing one's self well and finding meaning in adverse events (Reivich & Shatte, 2003). Resilient individuals continually build these skills

whether or not each adversity has a positive outcome. Resilience is viewed as proactively enriching one's life by through aiming to become psychologically stronger and more confident over time.

In *studies of the work domain*, Sutcliffe and Vogus' (2003) concept of resilience has a growth perspective. Individuals who successfully adapt to environmental changes continually refine, deepen or strengthen their capabilities. Following Masten and Reed (2002), Sutcliffe and Vogus suggest that experiencing success motivates individuals to develop themselves in order to better deal with future adverse events. In effect, such individuals seek to increase their sense of self-efficacy, which helps a person grow to better face future challenges. Similarly, Luthar et al (2000) found resilient individuals made active choices to develop themselves when facing adversity in work.

Growth is also part of Blatt's (2009) view of resilient individuals facing adversity at work as an opportunity to become more resourceful and grow through developing relationships and relationship skills. Blatt uses Vogus and Sutcliffe's (2007) concept of a "safety culture", a culture they found in hospitals where individuals learned through social relationships with others. Vogus and Sutcliffe draw on research on social support and caring relationships (e.g Wilson, Centerbar, Kermer, & Gilbert, 2005) to predict that resilient individuals will become more committed to learning and growth, and consequently better recover from errors and learn to avoid them in the future.

Finally, Caza and Milton (2011, p. 896) adopt a growth based view of resileince but limit growth to the work domain. They describe resilience at work as a "developmental trajectory" of *professional* growth resulting from experiencing adversity at work, separating resilience at work from personal resilience following Tusaie and Dyer's (2004) view that resilience varies across life contexts. For these authors working life or careers expose employees to adversities different from those faced by unemployed people. However, this view does not address a person's motivation *for* professional growth. As noted below, developing specific capabilities such as work competences in response to adversity only helps face *similar* adversities. Most authors consider resilience a more general capacity that could, for example, help a person bring life skills into work adversity, or vice versa.

While personal growth is intrisic to resilience in many general psychological and organisational studies, it is not so far recognised as a dimension in existing constructs. Most of the studies cited above are largely compatible with the holistic perspective of

personal growth mentioned earlier. In this growth is theoretically important because it differentiates individuals who are 'resilient' in being able to survive specific adversities from those who are resilient because they face adversity *generally* with the active intention to develop personal competence and hence over time develop a more integrated set of capabilities, a more 'rounded' self.

The definitions of resilience used in organisational studies have so far not emphasised the personal growth perspective, concentrating instead on more specific work-related qualities. Current constructs and measures developed in general psychology also do not explicitly incorporate a growth dimension. While growth is implied in holistic general psychological constructs such as that of Block and Block (1980), the lack of a growth dimension in current organisational constructs means they can not differentiate resilience that produces recovery from resilience that leads to growth. The new construct proposed below addresses this issue.

Growth is an important concept in many psychological perspectives on variables or constructs other than resilience, including the humanistic view outlined earlier. The next section notes several contemporary examples. However, since recent authors have not examined its theoretical basis, many questions about the concept of growth arise from the role given it in most current psychological and organisational studies.

Despite such questions, the studies reviewed here and in 2.2 suggest that growth, conceived holistically as a proactive attitude towards facing adversity with the intention to become a better-adapted and integrated person, is a fundamental element of resilience as a general psychological attribute.

Growth in studies of related psychological concepts

Two currently well-known concepts of general mental functioning give growth an important role. Bandura's theory of human agency, particularly his notion of "emergent interactive agency" (Bandura, 1989, p. 1176), is consistent with many aspects of the concept identified above. Bandura suggests agency involves *actively* facing adversity or challenges with an attitude of growing as a person. When individuals contribute to their own motivation and action by taking control of personal growth, self-knowledge and self-understanding, they increase their capacity to face adversity (Bandura, 1989, 2001).

In Ryff and Singer's (2003) concept of *psychological wellbeing*, resilient people intentionally nurturing this capacity by *deliberately* facing difficulties, through which

they develop enhanced self-reliance, self-efficacy, self-awareness, self-disclosure, relationships and empathy.

Growth also features in a number of less well-known psychological concepts. For example, in Maitlis' concept of Post-Traumatic Growth (PTG) adverse life events lead to tranformative positive change in resilient individuals (Maitlis, 2011). Although post-traumatic research often emphasises recovery following trauma, some individuals experience growth that increases their resilience (Calhoun & Tedeschi, 2006). For example, they may perceive they have greater potential than previously thought, or have the capacity to face challenges with calmness. Growth can come from many sources: a greater appreciation of life and new priorities; warmer, more intimate relationships with others; a greater sense of personal strength; recognition of new possibilities for life; and spiritual development, for example. Such individuals develop personal 'strength' from PTG, focussing on new possibilities for their lives rather than the limitations imposed by the trauma.

A second example is Spreitzer and Sutcliffe's (2007) research on thriving in the workplace. They define thriving using two components, vitality or being energised by the work, and learning or growth from the work. The latter can include general growth as a person rather than just development of new skills or knowledge.

Again, while these constructs give growth an explicit role they do not examine it as a separate concept or construct. Looking at the role of growth in studies of resilience or other concepts indentifies a number of questions about its theoretical status that become relevant in making it explicit in psychological concepts.

Questions about growth raised by recent studies

Although growth is discussed in the studies above, a theoretical framework for it has not yet been presented. While this goes beyond the scope of this thesis, some important questions are raised by this review. First, does a person seek growth consciously or unconsciously? Humanistic psychologists saw it in both domains, as an unconscious 'organismic' force or motivation that becomes more conscious in mature adults. Current studies focus more on a *conscious* attitude to grow or develop, such as the intention to grow through facing adversity proactively underlying Masten and Wright's (2010) "positive developmental attitude". A consciously proactive approach is found in many of the studies listed above.

Although the present holistic construct is expected to have an unconscious component, it is difficult to study this in organisational contexts and the focus here is therefore on the conscious desire to grow. Resilience is seen in terms of a proactive rather than reactive attitude: resilient individuals see difficulties as challenges or opportunities to strengthen and improve themselves (G. E. Richardson, 2002; Sutcliffe & Vogus, 2003) by growing and increasing their capabilities (Maitlis, 2011; Reivich & Shatte, 2003). Spreitzer et al. (2012) found thriving individuals intentionally face adversity in order to learn something new about themselves, and are resourceful and determined. Similarly Blatt (2009) identifies a "commitment to resilience" in her Resilience scale. Based on these views, growth is described below in terms of a *commitment to* growth.

A second question is whether growth is focussed on the individual or on meeting social norms. Masten and Wright (2010) relate resilience to the development of "competence", defined as effective functioning according to social norms or standards of behaviour expected in a social context. People are motivated to be resilient in order to be seen as competent, well-functioning individuals (Masten, 2007; Masten & Reed, 2002). This is quite different to the internal biological motivation humanistic psychologists saw in all living organisms, or Block and Block's 'evolutionary' motivation to adapt to a changing world. Humanistic psychologists saw social norms as generally opposed to internal motivations: a resilient person's goal is to realise more of his or her inner potentials, while social norms emphasise conformity rather than individuation. Growth therefore involves resolving a fundamental conflict between self and others in favour of the self. Block and Block's emphasis on regulating 'impulses' similarly raises the issue of how individuals achieve a healthy balance between impulses and social expectations.

A third question is whether resilience is a dynamic quality, varying over time or context as a person faces different psychological and social challenges. Block and Block describe resilience as changing over a life-time, and other authors suggest individuals can be resilient in facing one risk-factor but not others, or show certain adaptive outcomes but not others (Rutter, 2007). Yu and Zhang (2007) observe that the subjective realities of adversity differ according to individuals' physical and social contexts. Resilience may therefore be influenced by such contexts. Pooley and Cohen (2010) developed a similarly dynamic concept from case studies showing individuals'

resilience changed in response to contextual factors that increased or decreased their internal resources (Pooley & Cohen, 2010).

A fourth question is whether resilience is developed only through adversity, or also in positive situations. As noted above, Block and Block's (1980) holistic concept involved adaptation to the environment in all circumstances, whether perceived as beneficial, neutral or adverse. More recent studies, especially those following positive psychology values, emphasise the role of adversity. While the present study builds on Block and Block's concept, in the competitive and pressurised modern work environment resilience is usually studied as a response to adversity. Its links to innovation are therefore described below as a function of its value in coping with problems rather than responding to neutral or positive events. Future research should, however, consider its role in helping individuals to grow through facing non-negative events in a healthy, realistic and self-advantageous manner.

How resilience is conceptualised or operationalised in relation to these issues can affect researchers' questions and conclusions. For example, in the holistic concept, context-sensitivity is lower since adversity in one context increases overall personal flexibility. However, as Block and Block suggest, flexibility can still increase or decrease according to life context. Future research on the temporal and contextual dynamics of resilience is therefore needed. A more systematic theoretical approach to growth would assist such studies.

Summary: Resilience as personal growth

While growth in a person's resources, competence, self-efficacy or specific abilities has been related to resilience by previous authors, growth itself has not been systematically theorised. Although many assumptions about the nature of growth can be questioned, multiple lines of evidence - including humanistic theories, Block and Block's studies of ego-resilience, and many more recent general psychological and organisational studies - suggest it is fundamental to resilience. A growth dimension explicitly differentiates resilience, as implicitly conceived in many of the studies above, from mere recovery from adversity or adaptation through learning very specific skills.

A holistic concept of growth therefore appears to offer a theoretically sound basis for a construct relevant to studies of resilience and innovation. Resilience is expected to develop as a person grows his or her general competence and self-efficacy through adapting to a changing environment, particularly an adverse environment. Accordingly,

resilience is defined here as *an individual's capacity to respond to adversity and challenge in ways that strengthen and develop him or herself to become a better person.*

2.5.2 RESILIENCE IN WORK

Whether resilience varies over time or in response to different psychological or social contexts was raised in 2.5. If resilience is highly dynamic then constructs may be suited to one context but not another. The holistic concept described above is not considered highly context-specific, although this should be empirically verified. However, in social science constructs are usually considered valid for a specific context. Differing concepts and measures of resilience are found in different fields of study. For example, resilience is widely studied in child development studies and increasingly in clinical psychology, areas of literature not reviewed above.

The organisational focus of this study does not require that the construct defined below represents a distinct form of resilience applying only in a workplace. Resilience is seen as a general psychological property applied here to this context, and future research should confirm its relevance to other contexts. The scale developed below draws on organisational behaviour studies that have adapted items from previous general psychology studies to the work context but their generalizability to other contexts is not assumed.

2.6 OTHER DIMENSIONS OF RESILIENCE

While growth is hypothesised to be central to a holistic concept of resilience, a review of previous constructs and related studies suggests several other dimensions potentially relevant to this construct. First, *perseverance* is mentioned in many definitions of resilience and appears in most of the constructs reviewed in 2.4. Second, *positive emotion* is a powerful concept related to mental health and organisational outcomes in many recent psychological studies. Finally, *meaning-making* is used in Wagnild and Young's construct and has theoretical connections to resilience not addressed by the other three concepts. The case for considering each of these concepts as important dimensions of resilience is presented below.

2.6.1 PERSEVERANCE

Perseverance describes the quality of not giving up when facing difficulties. Perseverance is a dimension of Wagnild and Young's construct (see 2.4.2) and an element in Luthan's PsyCap-resilience measure. The construct underlying Connor and Davidson's CD-RISC includes perseverance in the form of *tenacity,* a strong sense of adherence to pursuing goals amid challenges. Perseverance is therefore likely to be important to resilience.

Perseverance implies self-reliance, a belief that by keeping going one's goals will eventually be reached and one's interests benefited. Perseverance involves beliefs, thoughts, attitudes and behavioural persistence. Perseverant individuals tend to endure in the face of adversity for two reasons: their *perceived control over adversity* and their *perceived responsibility for the outcome of adversity* (Markman, Baron, & Balkin, 2005). Their strong belief in their ability to overcome challenges leads them to exert a high level of effort and endurance in the face of setbacks and failures, and to continually look for solutions. A desire to take personal responsibility and increase control over one's circumstances is consistent with the notion of resilience as facing adversity with the intention to grow. Perseverance is defined here as *willingness to face adversity with continual struggle and self-discipline.*

2.6.2 POSITIVE EMOTION

In general, positive emotion arises from experiencing desirable outcomes. It includes joy, happiness, elation or pleasure, courage, hope, love and interest (Lucas, Diener, & Larsen, 2003). Positive emotion has emerged as an important variable in POS and POB studies, and is considered a "basic building block" of resilience by Ong, Bergerman and Chow (2010, p.81). It has a critical role in explaining why some individuals survive or thrive difficult situations where others do not (Fredrickson, 2001, 2003; Fredrickson & Joiner, 2002). Lazarus and Folkman (1984) suggest that in intensely stressful conditions positive emotions provide an important psychological break, helping to maintain coping efforts and rebuild important resources lessened by stress.

In a diary survey of employees, Xanthopoulou, Bakker, Demerouti and Schaufeli (2012) found positive feedback from managers lead employees to immediately feel enthusiastic and content, and later in the day caused them to feel greater self-efficacy, self-esteem and optimism. In the latter outcomes, positive emotion caused employees to

more strongly believe they could respond to challenges such as adverse events. Xanthopoulou, et al. also found positive emotion improved employees' perceptions of their work environment, increasing their perceptions of autonomy and a psychological climate of cooperation and warmth. In turn this lead to a more positive view of their personal mastery which then triggered more positive emotions.

Other studies provide theoretical and empirical support linking positive emotion to a wide variety of work-related outcomes, including flexibility in thinking, problem solving and innovating (Isen, 2002), adaptive coping (Lazarus, 1993) and wellbeing (Fredrickson & Joiner, 2002; Liu, Wang, & Lü, 2013).

Positive emotion has been linked to resilience by a number of authors. According to Ong et al. (2010), positive emotion interrupts the ongoing experience of stress, bringing the individual back to a more pleasant mental state. In the longer term positive emotion stops a person habituating to stressors by creating a more balanced emotionality and hence wellbeing.

Positive emotion was not explicit singled out as a part of Block and Kremen's (1996) construct of resilience. However, Block and Kremen saw it as a characteristic of ego-resilience, and two items in their scale refer to it.

Other studies emphasise the role of positive emotion in responding to adversity. Positive emotion helps individuals broaden the scope of their cognition and attention by becoming more creative, framing problems or difficulties from a wider perspective, or generating better solutions without panic or stress (Fredrickson, 2001; Fredrickson & Branigan, 2005; Luthans, Youssef & Rawski, 2011). Baron (2008) observed these effects in a study of entrepreneurs interpreting situations and making decisions. Where others see a threat or danger, an entrepreneur with positive emotion perceives a manageable situation and maintains a realistic view of it. Greater creativity, problem-solving skills and recall of mental "shortcuts" or past knowledge were also observed (Baron & Ensley, 2006; Baron & Ward, 2004). Positive emotion is therefore expected to be an important element of resilience, bringing calmness, creativity and quick decision-making to a difficult situation. Combining these perspectives, positive emotion is defined here as *maintaining a positive outlook when facing adversity.*

2.6.3 MEANING MAKING

In *meaning making* employees *actively* seek to understand the nature and value of work in their lives through continuous sense-making. Meaning is likely to be important in resilience studies as it describes a fundamental human motivation (Frankl, 1992) that predicts physical health or adjustment to disease (Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000) and wellbeing (Helgeson, Reynolds, & Tomich, 2006). Individuals who find life meaningful are more optimistic and experience greater self-esteem and less depression or anxiety (Steger, Frazier, Oishi, & Kaler, 2006). The holistic concept of resilience outlined above is also expected to predict physical health and psychological wellbeing outcomes.

Studies of meaning in the workplace address both meaning in life (Steger, Frazier, Oishi, & Kaler, 2006) and the meaning of work (Steger et al., 2006; Wrzesniewski, 2003; Wrzesniewski, Dutton, & Debebe, 2003). *Meaning in life* describes individuals' motivation to find personal meaning, to understand the nature of their life, and to feel that life is significant, important, worthwhile and purposeful (Frankl, 1992). This kind of meaning is present in Wagnild and Young's construct under the label *meaningfulness.*

Meaning at work involves the idea that employees find the content or practice of their work valuable to others or themselves and are consequently energised to perform well (Wrzesniewski, 2003). Employees actively create meaning in their work by attempting to improve its content or social context (Wrzesniewski, 2003). In van den Heuevel, Demereouti, Schreurs, Bakker and Schaufeli's (2009, p.509) model of meaning making, conscious value-based reflection is used to integrate challenging or ambiguous work situations into a framework of personal meaning. Of particular relevance here is van den Heuvel, Demerouti, Bakker and Schaufeli's (2013) view that meaning making has a crucial role in protecting an innovator's self-esteem and motivation when facing uncertainty or ambiguity in the innovation process.

Because of both its central role in health maintenance and its specific advantages in faccing difficulties in work, meaning making is hypothesised as a dimension of resilience.

However, meaning making here describes an active, conscious process rather than the automatic processes of sense-making or finding meaning described in other studies of resilience (Connor & Davidson, 2003; Wagnild & Young, 1993). In *active*

meaning-making individuals consciously reflect on ambiguous or challenging events to revise their personal meanings, values and goals, helping them face setbacks with a growth focus. Instead of giving up they see difficulties as a personal calling in which they are deeply involved and which are consequently in some sense enjoyable (Wagnild & Young, 1993; Wrzesniewski, 2003). Following van den Heuvel et al. (2009) and Wrzesniewski (2003) meaning making is therefore defined in this study as *actively reflecting on and affirming personal values when facing problems.*

2.6.4 SUMMARY

A holistic construct of resilience based on commitment to growth was proposed in 2.5, and this section has provided arguments for three other potential dimensions. Perseverance is often included in definitions of resilience and is a dimension in several previous constructs. Positive emotion is known to have a strong influence on physical and mental health and to help individuals face the specific stresses of adverse events, two outcomes also attributed to resilience. Positive emotion is also linked to resilience in previous studies. Finally, meaning making is another fundamental contributor to physical and mental health that has been linked to resilience in previous studies.

2.7 INNOVATIVE BEHAVIOUR: ITS CHALLENGES AND DIFFICULTIES

The primary research question of this thesis concerns the effect of resilience on employees' innovativeness. The concept of individual innovation has been widely studied in psychology and organisational studies where it is recognised as one of the most significant means to creating value in an organisation. However, practising innovation is a demanding process. This section reviews different perspectives on innovation, focusing on a widely recognised three-stage model. The concept of individual innovation is described first, followed by discussion of the stages of innovative behaviour and the events or acts in each stage. The potential challenges to individual innovation are then analysed. Resilience is hypothesised to help face these challenges in a number of ways.

2.7.1 THE CONCEPT OF INDIVIDUAL INNOVATION

Individual innovation has a significant role in the effectiveness of organisational innovation (Janssen, 2004; Kanter, 1988b; West & Farr, 1990), one that varies with the degree of innovation. In simple incremental organisational innovation, individuals

primarily generate, adjust and apply new ideas (Axtell et al., 2000; West & Farr, 1990), although, depending on their position in an organisation, this may involve others. In complex and radical innovation, on the other hand, success depends on group and organisation-level innovation (Drazin, Glynn, & Kazanjian, 1999) as the sharing of ideas becomes more important than individuals working alone, even though individuals still have an important role (Farr & Ford, 1990).

The concept of individual innovation developed from the more general concept of *organisational* innovation. Zaltman, Duncan & Holbek (1973, p. 10) define organisational innovation as "…any idea, practice, or material artefact perceived to be new by the relevant unit of adoption". Kanter (1983, p. 20) saw innovation as "...the process of bringing any new problem-solving idea into use… Innovation is generation, acceptance, and implementation of new ideas, process, product or services". Combining key themes from several studies, McFadzean and colleagues (2005, p. 351) defined organisational innovation as a process that provides added value and a degree of novelty to the organisation, its suppliers, and customers through the development of new procedures, solutions, products and services as well as new methods of commercialisation.

Studies following these definitions have taken several approaches to explaining individuals' roles in organisational innovation and the factors that improve it. King's (1990) widely accepted model identifies trait and situational *facilitators and inhibitors*. Studies have identified a number of traits and individual or organisational facilitators underlying innovation, including high tolerance of ambiguity and the propensity to take risks (King, 1990), recognising problems and having the knowledge and skills to solve them (Axtell et al., 2000), discretion (Amabile, 1988), positive affect (Isen, 2002), leadership (Carmeli et al., 2006; de Jong & den Hartog, 2007; Mumford, 2000) and organisational structure (Kanter, 1988b).

While these traits and facilitators help to understand individual innovation, this study takes a process approach in describing individual actions in accomplishing innovation at work. This "stage" model is widely recognised as comprehensive perspective of the innovation process.

2.7.2 THE STAGES OF INNOVATIVE BEHAVIOUR

The process of individual innovation can be divided into two main stages, initiation and implementation (Axtell et al., 2000), and most studies involve variations

on these. West and Farr (1990, p. 16) define "innovative work behaviour" as the intentional creation, introduction and application of new ideas within a work role, group or organisation, to benefit the role performance of the group or the organisation. This broad definition is used in the present study. West and Farr's definition emphasises that while innovation is based on individual decisions and aspirations, in an organisation people have to synchronise these with the organisation's goals. Studies of various types and sizes of organisation have adopted stage models (Carmeli et al., 2006; Janssen, 2000, 2004; Scott & Bruce, 1994). Scott and Bruce (1994) and Kanter (1988b) describe the process of individual innovation in three stages: *idea generation*, *idea promotion* and *idea implementation*, encompassing a broad set of behaviours relating to creating ideas, finding support and applying ideas. The next section details these stages.

2.7.3 ACTIONS AND EVENTS UNDERLYING INNOVATIVE BEHAVIOUR

Idea generation behaviour arises when individuals face problems, incongruities, or discontinuities in their daily work (Janssen, Vliert, & West, 2004; Scott & Bruce, 1994). Creativity is often a response to such adversities (Amabile, 1988; Kanter, 1988b): deliberately exploring opportunities is one way to produce new ideas (Kanter, 1988b). Kleysen and Street (2001) view idea generation as comprising three main activities: opportunity exploration, generativity and formative investigation.

Innovators are more effective than others in finding and using information about opportunities because they perceive them differently (Kleysen & Street, 2001), using intentional effort to imagine and find possibilities (Bern, 2008). For example, they may examine the environment for emerging trends or competitors' moves (Kanter, 1983). Through such actions they avoid stagnation and progress themselves and their organisation (Kleysen & Street, 2001). However, as new ideas can be vague, innovators need to evaluate or experiment to discover which ideas are attractive enough to promote to others (Hamel, 2007; Kleysen & Street, 2001).

The *promotion of ideas* involves convincing others. Kleysen and Street (2001, p. 285) and recently de Jong and den Hartog (2010, p. 24) use the term "championing" to emphasise its significance in mobilising resources through persuading, influencing, pushing and negotiating. In the innovation process, it is sometimes impractical to introduce innovative ideas without political support to overcome others' resistance to change (Pinchot, 1985). Innovative individuals therefore need people to act as backers and sponsors when building legitimacy and support inside or outside the organisation

(Kanter, 1983, 1988b). While this may be challenging, such links to power are critical to successful promotion. The more complex the new ideas, the more promotional competency and support are required (Damanpour & Scheider, 2008; Henderson & Clark, 1990).

The *implementation* stage involves an attempt to apply new ideas across the organisation (Kanter, 1988b), and may require further innovation to turn them into routine practices (Kleysen & Street, 2001). As in the promotion stage, implementation involves other people and therefore innovators need support from influential parties, such as those with relevant resources and policies (Klein, Conn, & Sorra, 1996; Sawang & Unsworth, 2011). To gain support innovators must show commitment and make others committed by stressing the benefits of innovation – something that distinguishes innovation from concepts like creativity that address only idea *generation* (de Jong & den Hartog, 2007). While creativity is important to the whole innovation process, sound *implementation* of new ideas is necessary to improved organisational performance.

2.7.4 CREATIVITY IN INNOVATION

Creativity is an integral part of innovation studies, and many authors consider innovation to be rooted in creative ideas (Amabile, 1988; C. M. Ford, 1996; George & Zhou, 2002; Mumford, 2000). While this is often taken to indicate that creativity is primarily involved in idea generation (Shalley & Zhou, 2011)*,* it is also required in the promotion and implementation stages (Basadur, 2004). In the latter, for example, creativity helps gather approval, support and resources from others (Axtell et al., 2000; C. M. Ford, 1996; Janssen, 2005). As Howell, Shea and Higgins (2005) propose, creativity helps enlist colleagues, leaders and external networks and keep them informed, interested, and enthusiastic about new ideas. Creative ways of motivating others to become involved, and explaining how new ideas meet the organisation's purpose are required (Howell et al., 2005; Shane, Venkataraman, & MacMillan, 1995). When new ideas face opponents, innovators need a creative approach to persuading organisational power centres and building coalitions between parties (Howell et al., 2005).

2.7.5 CHALLENGES IN INDIVIDUAL INNOVATION

Innovation is a demanding process requiring individuals to adapt themselves, their work and other people (Janssen, 2004). While the degree of difficulty depends on the

type and the level of innovation (Erez & Naveh, 2004), often innovators need to modify the way they think and behave in responding to challenges in all stages of innovation (N. Anderson et al., 2004). Such challenges require an innovative individual to be resilient, as the next sections explain.

2.7.5.1 Challenges in idea generation

The main challenges and difficulties in idea generation involve innovators pushing their emotional and cognitive capabilities when searching, identifying and combining new ideas to find useful and economically valuable possibilities. The frameworks of Dyer, Gregersen and Christensen (2011), Kleysen and Street (2001) and Amabile (1988) help explain the need for questioning, observing, and networking when facing challenges.

To generate new ideas, innovators need to actively and provocatively question why things are as they are and how they might be different, rather than accepting situations or problems at face value. Confronting the status quo with "why", "why-not" and "what if" questions leads to original ideas or surprising solutions (Amabile, 1988; Dyer et al., 2011; Kleysen & Street, 2001).

These questions are often accompanied by intense observations of both familiar and novel situations. Contrary to common belief, innovators do not get their ideas in a simple "aha" moment (Dijksterhuis & Nordgren, 2006; George, 2007), but from a long process of sensing and thinking about problems, relating new information to previous knowledge, categorising and summarising information and broadening their perspective. This is a very effortful process.

To enrich their perspective innovators often need to network with other people, which take time and energy. For example, they may have to meet busy stakeholders or experts when it suits them, regardless of the inconvenience. Bern (2008) found innovators obtain more valued ideas when they access more diverse contacts, and consequently produce more unique perspectives (Amabile, 1988; Dyer et al., 2011; George, 2007).

Experimenting to validate ideas is another challenge that consumes time and energy since new ideas may not turn out as expected (Dyer et al., 2011; Govindrajan & Trimble, 2005; Hamel, 2007). Depending on their complexity, innovators can test ideas through a pilot project or purposely try something new and unrelated to current projects (Dyer et al., 2011).

All these challenges involve skills and knowledge an innovator may need to develop (Amabile, 1988; Govindrajan & Trimble, 2010), which introduces yet another challenge. Innovators have to work hard to improve their knowledge and skills, especially with more complex innovations.

2.7.5.2 Challenges in idea promotion

Challenges in idea promotion involve persuading and negotiating to gain support from co-workers or leaders (Kanter, 1988a). By "championing" (Kleysen & Street, 2001, p. 285) innovations, co-workers are influenced to endorse, accept and use them, and leaders are influenced to sponsor or approve them (Axtell et al., 2000). These activities present many difficulties.

Influencing co-workers

Changing co-workers' mindsets is often difficult, since people tend to be comfortable with familiar ideas and likely to oppose new ones (Janssen, 2004). Different ideas often involve uncertainty which may cause people to feel insecure (Amabile, 2008). Innovators must find ways to sell the uniqueness and importance of new ideas to prevent such negative responses or conflicts (Binnewies, Ohly, & Sonnentag, 2007). This in turn involves several other challenges.

First, innovators may not always understand what co-workers consider meaningful due to differences in knowledge, values, assumptions and beliefs (Grant & Berry, 2011), although this understanding is critical to the persuasion process (Mohrman, Gibson, & Mohrman, 2001). Second, once co-workers' aspirations are understood innovators need to integrate their interests with their own, even if this requires sacrifice or compromise. Third, co-workers are often critical and concerned with a new idea's drawbacks. Innovators should anticipate this by preparing effective responses and keeping co-workers enthusiastic, and relate innovations to organisational strategies to convince co-workers to look beyond minor issues (Kotter & Whitehead, 2010).

Getting support from leaders

Getting political support from leaders is important to idea promotion (de Jong & den Hartog, 2007; Janssen, 2005), but leadership and supervisory behaviour may make this difficult (Janssen, 2005). As with co-workers, leaders may present resistance and legitimacy problems. Leaders may have dislike the innovation and respond unfavourably (Janssen, 2005), perhaps due to political agendas, by withholding critical

information or resources. Lack of leader support will also reduce a new idea's acceptance to others, and may bring unnecessary bureaucratic obstacles (Morris et al., 2008). Innovators may lose faith in both their leaders and their own ideas (Clegg, Unsworth, Epitropaki, & Parker, 2002).

2.7.5.3 Challenges in idea implementation

The challenges of implementing ideas are often similar to those of promoting them, as both entail the socio-political engagement of others (Janssen, 2004; Klein & Knight, 2005). However, implementation may involve more parties and complications if innovations are embedded in organisational systems or need to be routinised in units or departments (Kleysen & Street, 2001). Here innovators may be reluctant to challenge the status quo, uncertain of their capabilities or reluctant to actively engage with the complexities of implementation (Choi & Chang, 2009). They may see implementation as risky or time consuming and become discouraged, especially when their ideas go beyond incremental change (Day, 2007) or are highly original. Scepticism about both their own capabilities and their innovation can arise.

In such circumstances innovators may be reluctant to improve their knowledge and skills (Aiman-Smith & Green, 2002; Damanpour & Scheider, 2008), instead adhering to existing tasks to avoid confronting their limitations. They may also avoid the considerable challenge of engaging top management support for policies or necessary resources such as training, communities of practice or other supports for the innovation (Edmondson, 1999; Klein & Knight, 2005). Obtaining top management champions may require developing new skills for negotiating social and political systems.

When upper management support for an innovation is lacking co-workers and unit leaders may become sceptical and passive. Managers may not present the innovation as paramount, normatively expected or valued (Choi & Chang, 2009; Klein & Knight, 2005), and may not offer incentives or sanctions relevant to the innovation (Greenhalgh, Robert, & Bate, 2008).

Implementation invariably faces a challenge in the scarcity of resources (Govindrajan & Trimble, 2010), but finding them can be complicated. Current business operations may compete with an innovation for resources, creating conflict (Shalley, 2007), especially for complex innovation that requires more integrative communication capabilities (Tepic, Kemp, Omta, & Fortuin, 2013). This may occur even after upper

management has officially allocated resources. For example, sometimes a new project needs additional staff, but managers want to keep staff in existing operations (Govindrajan & Trimble, 2010). Managers may give their attention, energy and time to existing tasks rather than a new project (Govindrajan & Trimble, 2010; Klein, Conn & Sorra, 1996). Guaranteeing resources and creating harmonious relationships with relevant managers are major challenges in implementation. Failure to handle these issues discourages staff and reduces collective confidence in the success of the innovation (Choi & Chang, 2009).

In summary, generating, promoting and implementing innovative ideas can entail a complicated series of challenges. Innovators need resilience to overcome these and succeed with their initiatives. The next section considers the how resilience can address these challenges.

2.7.6 *THE POTENTIAL ROLE OF RESILIENCE IN INNOVATIVE BEHAVIOUR*

The difficulties potentially experienced by organisational innovators suggest a strong role for resilience. This section examines studies relating the four dimensions proposed earlier – perseverance, positive emotion, commitment to growth and meaning making – to innovation or similar concepts.

2.7.6.1   The potential role of perseverance

Perseverance involves cognitive beliefs, thoughts and attitudes that cause an individual to exert extra effort to achieve a goal despite the obstacles (Markman, Baron, & Balkin, 2005). Markman et al. (2005), Nijstadt, De Drea, Rietzchel and Baas (2010), Maddi and Koshaba (2005) and other authors have provided concepts of perseverance relevant to innovators' attempts to generate, promote and implement ideas.

In generating ideas

On a cognitive level, perseverance through perceived control over adversity involves the belief that by acting one can attain certain outcomes. In generating ideas, this is consistent with what Nijstad et al. (2010) calls *cognitive persistence:* sustaining and focusing task-directed cognitive efforts. This involves hard work and systematic, effortful exploration of possibilities, helping innovators to concentrate on tasks such as evaluating new ideas. Although too much focus may limit creativity, cognitive perseverance is important to some aspects of idea generation.

Cognitive persistence is consistent with Csikszentmihalyi's (1996) concept of "flow", which describes a highly motivated state in which a person is intensely engaged, interested and curious in creative work. People in flow are fully involved in the task and committed to getting the best results for it.

On a behavioural level, perseverance helps innovators continue observation and experimentation, processes that may take time and energy (Govindrajan & Trimble, 2005, 2010). For example, in clarifying and justifying new concepts they may have to organise meetings, presentations or conferences.

In promoting and implementing ideas

Perseverance seems even more relevant to promotion and implementation of ideas, where innovators may confront resistance from co-workers and leaders and may need to change their expectations, ideas or communications (N. Anderson et al., 2004) to overcome this. Markman et al.'s (2005) concepts of *perceived control over adversity* and *responsibility for the outcomes of adverse situations* help understand the nature of persistence in these contexts. *Perceived control over adversity* is a belief that helps innovators look beyond the possibility of rejection and focus on what *can* be done with their ideas. This is similar to Maddi and Koshaba's (2005) concept of a "control attitude", whereby individuals believe it is worthwhile to keep trying to influence outcomes instead of being passive helpless. Sandberg, Hurmerinta and Zettinig (2013) found persistence a dominant characteristic of highly innovative persons, enabling them to increase effort when the potential of success of a new idea is called into questiom.

Perceived responsibility for the outcomes of adverse situations provides a different explanation for persistence in resilient individuals' belief that they have personal responsibility for their fate. Markman et al. found entrepreneurs tended to exert additional effort out of a belief that they are personally accountable for favourable life outcomes. The strong sense of responsibility mobilises them to seek greater accomplishment and to resolve difficulties rather than be weighed down by them. Normal, less-resilient individuals do not have this degree of self-belief. Similarly, Bysted (2013) found psychological empowerment of employees helped them to find meaning during challenging work.

2.7.6.2   The potential role of positive emotion

The potential role of positive emotion in innovative behaviour is suggested by studies of affect or mood in organisations, including the influence of emotion or feeling

on creativity (Eisenberg & James, 2005; George & Zhou, 2002) and response to organisational changes (Matheny & Smollan, 2005). Most of these focus on positive emotion during innovation or changes. How positive emotion helps employees initiate, promote and implement new ideas has rarely been studied, although some clues are found in studies of related concepts.

In generating ideas

Positive emotion can improve idea generation by stimulating relevant cognitive capabilities in the three stages of innovation (Ashkanasy & Ashton-James, 2007). For example, in Fredrickson's well-known "broaden-and-build" theory, positive emotions increase attention and cognition, and guide actions (Fredrickson, 1998; Fredrickson & Branigan, 2005). This may help individuals find unique or novel questions and decide who to work with, for example. This is consistent with Isen's (2002) neurological studies showing positive emotion increases dopamine in the brain, which in turn increases cognitive performance by helping people be more flexible, inclusive, creative and open. Therefore, positive emotion is expected to broaden a person's cognitive outlook and help them integrate diverse information. Optimism, appreciation and interest are important emotions in this broadening.

In Fredrickson's build stage, positive emotion has an adaptive role, helping individuals maintain effort and adapt when facing challenges such as creating new ideas. Optimism, for example, helps innovators persevere until they obtain a good outcome (Ashkanasy, 2002).

In promoting and implementing ideas

Studies such as Liu and Perrewe's (2005) model of "emotion's function", Dutton, Ashford, O'Neill, Hayes and Wierba's (1995) model of "selling issue", and Forgas' (1995, 1998) model of "the mood effect" and "affect infusion", can be adopted to the implementation and promotion of ideas. Four predictions follow.

Positive emotion enables innovators to provide the best information and approach to delivering it. As agents of change, innovators must develop confidence in their ideas before promoting them to others. Confidence and optimism help them communicate efficiently and persuasively, gaining respect for having clear and relevant ideas (Liu & Perrewe, 2005). In Dutton et al.'s (1995) "selling issue" model positive emotion helps individuals assess a situation and identify the best time and strategy to present ideas.

Positive emotion produces optimism and confidence in innovators. Positive emotion biases individuals toward perceiving their situation more favourably (Ashford

& Dutton, 1993). Optimism and confidence help innovators avoid treating rejection or failure as threats or dangers. They are therefore more convincing and face co-workers or leaders encouraged to seek open and supportive responses.

Positive emotion increases innovators' willingness to take risks. Positive emotions such as optimism, confidence and hope give innovators a feeling of control in the face of difficulties. Without this, promotion and implementation can seem risky if innovators' credibility, career prospects or relationships with colleagues are tied to success of the innovation. These emotions help innovators feel credible and optimistic that their ideas will improve their image in the eyes of colleagues and leaders (J. E. Dutton et al., 1995).

Positive emotion facilitates negotiation in the innovation process. Positive emotion helps in negotiating aspects of the innovation process. Negotiation can be a complex process producing tension, anger and conflict. Forgas (1995) suggests a good mood increases negotiators' creativity, problem solving, optimism, flexibility and helpfulness, and reduces the possibility of anger in negotiations. Forgas (1999) found experimental evidence that positive mood improves strategies and outcomes in different types of negotiations. For example, it helps people use a cooperative rather than a competitive approach, emphasising common interest.

When innovators fail and feel negative

Besides making people feel good, positive emotion helps manage negative emotion when difficulties get in the way of innovation efforts. Broadening people's thought-and-action repertoires, it reduces negative emotions, stops "fight or flight" responses and reduces psychological arousal. Frederickson (2009, p. 67) called this "the undoing effect", suggesting positive emotions reduce the physiological "damage" to the cardiovascular system caused by negative emotions. Other research shows that positive emotions decrease specific negative emotions such as anger, fear, anxiety or sadness. (Fredrickson & Levenson, 1998). When innovators face rejections in promoting and implementing ideas positive emotions can increase their resilience.

2.7.6.3   The potential role of meaning making

As suggested above (2.6.4), meaning making involves active reflection on ones' values and goals during difficult events (van den Heuvel et al., 2009) and therefore helps innovators adapt and endure difficult situations. The adjustment function of meaning making may help innovators handle challenges such as frustration when ideas

are rejected by co-workers or leaders, or when implementation is a lengthy process. Creating meaning out of difficult situation helps innovators persevere by investing their efforts with even more energy and strength.

One way of making meaning is to regard one's job as a personal calling (Wrzesniewski, 2003). Resilient innovators actively shape their perspective of their work to highlight its meaning and significance to their life. They do not see tasks merely as part of their job description or career development (Wrzesniewski, 2003), but rather something beneficial to others. They feel their work contributes to their organisation, not as a discrete task but as an integral part of others' and the organisation's success (Wrzesniewski, 2003).

Reflection on personal meanings, values and goals plays a substantial role in meaning making (van den Heuvel et al., 2009) and may therefore help face challenges during innovation. Reflection helps innovators find consistency between their personal values and organisational innovation, empowering and encouraging them to face challenges by concentrating on positively helping their organisation instead of focusing on difficulties. Bysted (2013) suggests that recognising the relevancy and importance of employees' work provide psychological empowerment that helps create meaning when facing challenges.

Personal values also increase meaning when innovators take responsibility for their goals. This cognitive strategy helps focus on goals through self-observation and self-reward or self-punishment (Spreitzer & Sutcliffe, 2007), giving innovators the strength to overcome frustrations in idea promotion or implementation. POS scholars have called for theories of the motivation for extraordinary rather than ordinary achievement (Cameron, Dutton, & Quinn, 2003a). Building personal strength through finding meaning for work during adverse situations may be an important part of the motivation of "positive deviants", employees who dramatically exceed common or expected performance (Spreitzer & Sonenshein, 2004).

Job-crafting theory (Wrzesniewski & Dutton, 2001) shows how individuals create a new meaning for their work by altering task or relational boundaries, physically or cognitively. For example, an information technology (IT) staff member can alter the view of his or her role from a "trouble shooter" of IT problems to a "facilitator" who also helps employees develop practical skills in IT. In the same way, innovators can alter the number, scope or type of tasks (Berg, Wrzesniewski, & Dutton, 2010;

Wrzesniewski & Dutton, 2001) to spend more time promoting their innovation to co-workers and leaders, or creating new relationships with internal or external parties.

Making meaning by altering tasks helps innovators proactively redefine promotion and implementation strategies to move beyond their official roles, customising their job to individual needs and preferences (Berg et al., 2010). Lyons (2008) found this strategy conducted by marketing professionals when, for example, they visit clients on site, or expand demo material. Innovators can similarly innovate their jobs. Janssen et al. (2004) highlight the value of modifying one's task or its context to assist innovating. This may be a useful direction for POS or POB studies of innovation.

2.7.6.4   The potential role of commitment to growth

Commitment to growth captures the idea of resilience as adaptation through self-development, a concept likely to have an important role in innovation.

Studies in POS and POB recognise that individuals develop strengths by consciously facing challenges as opportunities to learn and become a better adapted person (Blatt, 2009; Sutcliffe & Vogus, 2003, p. 297). This learning occurs when individuals proactively respond to challenges in order to experience increased competency or growth rather than stagnate or continue with the 'status quo' (Reivich & Shatte, 2003). Individuals facing difficulties in innovation can develop themselves by consciously seeing these as a chance to learn and grow, building resources such as knowledge, capabilities and confidence (Blatt, 2009; G. E. Richardson, 2002). Avey, Luthans, Hannah, Sweetman and Peterson (2012) found the interest and enjoyment gained from learning decreased stress by helping individuals to find ways to tackle challenges.

Commitment to growth may facilitate innovation in many ways. During idea generation, the challenges to one's time and energy may be seen as an opportunity to develop oneself rather than as drawbacks.

During idea promotion, innovators can reduce the burden of persuading co-workers and leaders of their ideas by framing promotion as a new experience that will enrich them. Likewise, they may see rejections or conflict with co-workers and leaders as opportunities to create new and more effective approaches.

In the implementation stage, commitment to growth is likely to motivate individuals to find the time and energy to deal with unplanned contingencies or the unexpected negative reactions from others.

POS studies identify "thriving" as a state in which growth is important. In one concept, thriving has two components, vitality and a sense of learning (Spreitzer, Sutcliffe, Dutton, Sonenshein, & Grant, 2005). A sense of learning helps individuals engage with tasks that offer achievement, learning or growth, such as idea generation activities (Spreitzer & Sutcliffe, 2007). For example, Caza and Milton (2011, p. 897) found resilient nurses expected to grow by viewing adverse events in their professional practice as opportunities to gain knowledge, including knowledge of medical practices but also knowledge of their own responses to pressure. Similarly, another study found service workers had an intention to develop collaboration skills to improve their innovation and ability to face adversity (Spreitzer, Porath, & Gibson, 2012).

In idea generation thriving would involve learning new, more creative ways of working. In promotion and implementation stages, learning would involve gaining confidence in selling ideas for organisational advancement, gaining respect from co-workers or leaders and learning to face scepticism or resistance (Carmeli & Spreitzer, 2009).

While commitment to growth and the learning dimension of thriving are overlapping concepts, they are not the same. The sense of learning underlying thriving does not necessarily involve learning from adverse events through a commitment to persevering with difficulties because this will ultimately lead to growth. Commitment to growth is related to other concepts of learning in the innovation literature such as building expertise (Amabile, 1988), but goes beyond them in making *self-improvement* the outcome of learning rather than merely new organisation products or process, or specific work-related skills.

The relationships between resilience and innovative behaviour described above are summarised in 2.2 (below).

Table 2.2 Predicted relationships between resilience and innovative behaviour

	Dimension of resilience	Predicted role in idea generation	Predicted role in idea promotion or implementation
1	**Perseverance**	- Sustains and focuses task-directed cognitive effort in searching for ideas - Maintains effort in observation and experimenting with ideas	- Helps survive rejection and other obstacles - Promotes attentiveness - Increases energy - Increases perceived self-control in facing challenges - Promotes greater perception of responsibility in finding and managing resources in difficult situations
2	**Positive emotion**	- Stimulates cognitive capabilities for finding new ideas - Maintains effort to pursue new ideas	- Facilitates information retrieval and approach in presenting ideas - Optimism and confidence in persuading others - Increases willingness to take risk - Facilitates negotiation process - Reduces the effect of negative emotion
3	**Meaning making**	- Focuses personal goals when validating new ideas	- Overcomes frustration of rejection or prolonged process - Empowers and encourages focus on goals - Maintains effort
4	**Commitment to growth**	- Encourages searching for new process ideas	- Reduces sense of burden in persuading and negotiating - Facilitates engagement in order to handle adverse situations - Improves endurance when facing hurdles

2.8 CONCLUSION AND RESEARCH FRAMEWORK

Previous studies of either resilience or individual innovation have little to say about their interconnection. Studies of resilience in psychology and organisational behaviour cover a variety of frameworks, definitions, measures and research contexts. Studies of resilience as a developable capacity have tended to use the constructs behind two measures, ER-89 (J. Block & Kremen, 1996) and WYRS (Wagnild & Young, 1993), although recently POB researchers have developed a resilience subscale in PsyCap (Luthans, Avolio, et al., 2007). However this review has shown that the constructs underlying all three scales overlook the critical growth dimension of resilience, and that the scales do not fully considered prior instruments. Further, existing studies do not particularly address the context of large, established organisations, which often have a strong need to innovate to remain competitive in a fast-changing market but also face particular difficulties in innovating due to their size.

Prior studies and theoretical considerations suggest four possible dimensions for a new construct of resilience that addresses these limitations. Study 1 (Chapter 4) will examine the dimensional structure of this construct and provide initial evidence of its reliability and validity.

Studies of innovative behaviour at the individual level tend to focus on its antecedents but resilience has not yet been investigated even though it appears to be an important and theoretically promising concept. The causal link between resilience and individual innovation is the main focus of this study. The literature identifies a number of significant challenges facing innovators at each stage, requiring them to persevere and overcome obstacles through self-management, obtaining resources and building relationships with stakeholders. These challenges suggest an important role for resilience in innovation.

Several constructs of innovative behaviour are found in the literature, and all tend to focus on its component stages. The three-stage model of Scott and Bruce (1994) has been widely adopted and will be used in this study. This review has related the four proposed dimensions of resilience to these three stages by showing how resilience could help innovators face the challenges involved in each. Study 2 (Chapter 5) seeks to confirm the structure of resilience identified in Study 1 and to provide empirical confirmation of these relationships. This would benefit organisations by providing scientific evidence that developing resilience can help increasingly stressed employees face the challenges of innovation (Luthans, 2012).

CHAPTER THREE - RESEARCH DESIGN

3.1 INTRODUCTION

This chapter presents the research design, which covers the research strategy, context and method. The strategy section identifies the research paradigm and its limitations, and the research questions concerning the construct of resilience and its link to innovative behaviour. Two aspects for consideration arise in this section—the industry sectors where the participants work, and participants' hierarchical level in their organisations. Next, the research methods used and the research framework that guides these methods are discussed. The sample characteristics, data collection process and statistical analyses are then introduced. More detailed explanations are provided in Chapter 4 (Study 1) and Chapter 5 (Study 2).

3.2 RESEARCH STRATEGY

A research strategy involves selecting a methodology to address the research questions based on the researchers' assumptions about ontology and epistemology (Grunow, 1995; Ticehurst & Veal, 1999). The scientific or positivist paradigm assumes reality exists independently of researchers, who can observe and describe it objectively (Ticehurst & Veal, 1999). The reality of psychological phenomena such as resilience and innovative behaviour cannot be observed directly but a researcher attempts to approximate it through reliable and valid measures developed from theoretically sound constructs.

Although both constructs in this study have been previously studied, the Literature Review identified a need for a new construct of resilience that addresses the role of learning and growth and is suited to large established organisations. This construct is hypothesised to have four dimensions: perseverance, positive emotion, meaning making and commitment to growth. A construct of innovative behaviour suited to the present purpose was presented by Scott and Bruce (1994) and Janssen (2000). It has three dimensions: idea generation, idea promotion and idea implementation. Although the relationship between these two constructs has not yet been studied directly, the theories and empirical studies surveyed in the Literature Review suggest a number of connections between their dimensions.

Limitation of the positivist approach are recognised and addressed where possible. First the findings may depend to some extent on the research context, including the socio-cultural context of the organisation and the nature of the employees' tasks. Second, predictions about the links between resilience and innovative behaviour are probabilistic and cannot be considered universally or definitively true (Lee, 1991). Third, a positivist approach cannot eliminate respondents' subjectivity (Kim, 2003), which brings the potential for measurement error when, for example, respondents interpret definitions differently.

This research involves two studies with different aims (Figure 3.1). Study 1 develops and tests a new scale for measuring resilience, while Study 2 aims to validate the results of Study 1 and test a causal model of the relationship between resilience and innovative behaviour.

The specific research questions are:

1. What dimensions explain the concept of resilience in the context of large, established organisations? (Study 1 and Study 2)

2a. What is the relationship between the constructs of resilience and innovative behaviour in employees? (Study 2)

2b. How do the dimensions of resilience influence the dimensions of innovative behaviour? (Study 2)
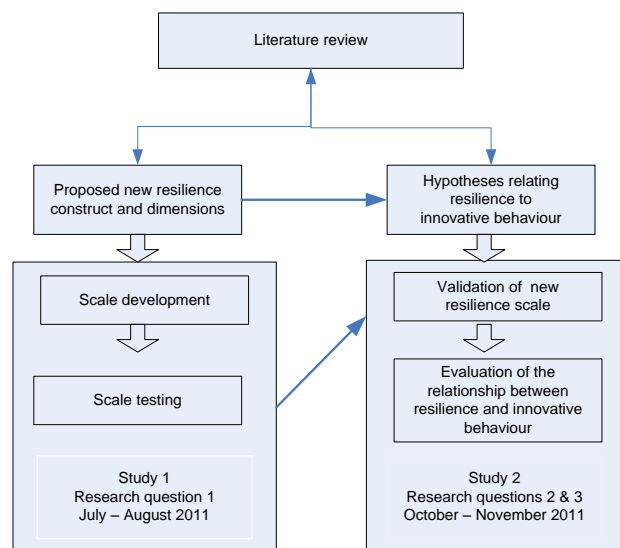
Figure 3.1 Research process

3.3 RESEARCH CONTEXT

Context has an important role in organisational research because conditions such as time, place or contextual events can affect research methods (Johns, 2006; Rousseau & Fried, 2001). Different contexts may require different hypotheses, participants and

measures. The context also influences the recommendations for practice that can be drawn from a study. The industry sector and size of sample organisations and the hierarchical level and job category of participants are contextual factors relevant to the two studies here, and are briefly outlined below.

3.3.1 INDUSTRY SECTOR AND SIZE OF SAMPLE COMPANIES

3.3.1.1 Industry sector: High growth sectors and private companies

The criteria used for choosing industry sectors were relatively high competition and high growth rate, since such industries are assumed to require employees to demonstrate both resilience and innovative behaviour. Agribusiness, telecommunications, media, construction, property and mining sectors were identified as particularly fast-growing industries suitable for the sample. A brief description of these is presented in Table 3.1.

The sample was restricted to private sector companies since public services or state-owned companies have lower growth rates and characteristics such as political direction and bureaucracy may reduce their need for innovation. Private sector employees are more likely to face demands for growth and competition and are therefore more likely to require high performance to keep their job. In this environment both innovation and resilience become important attributes for employees.

3.3.1.2 Large established companies

Large established companies have characteristics that influence employee's mood and behaviour in contexts requiring resilience or innovation. These include institutional structure, resources, practices and systems (Choi & Chang, 2009). Entrenched systems and procedures, for example, may cause employees to become less flexible (Morris et al., 2008; Thornberry, 2006), creating a climate that discourages innovative ideas. A large organisation has a complex decision-making processes that can compromise response to business opportunities or delay the implementation of new ideas. Consequently, encouraging innovation may be especially challenging for large established organisations.

Table 3.1 Brief description of industry sectors selected

Industry	Notes on competition and growth
Agribusiness	The two samples were drawn from companies involved in the palm plantation industry, which had the highest growth in Indonesia's agribusiness sector in recent years. Production increased 1.8–2.1 times between 2000 and 2010 ("Statistical Yearbook," 2011).
Telecommunications	The telecommunications sector has experienced great growth in Indonesia. Users of mobile phones almost doubled from 93.3 million in 2007 to 163.7 million in 2009 ("Statistical Yearbook," 2011). Competition between providers is high. Companies in mobile communication services were used in this study.
Media	The media sector is one of the fastest growing in Indonesia (Nugroho, Putri, & Laksmi, 2012). Recent growth has been remarkable, with the share price in the capital market increasing ten times in the last five years (Hadi & Iwan, 2011).
Construction	The construction industry has good prospects for development, especially for infrastructure, industrial and commercial construction. In 2004 infrastructure, industrial and commercial construction industries had compound annual growth rates of 9.44%, 13.3% and 12.9% respectively. Their CAGRs were anticipated to reach as high as 15.1% in 2014 ("The future of construction in Indonesia," 2010).
Property	Indonesia's property industry growth is one of the highest in the Asia-Pacific region. The yearly growth in 2011 in Jakarta was 14%, higher than any other Asia-Pacific capital city (Sitorus, 2011).
Mining	The mining industry is expected to expand and develop rapidly in coming years. Research consultant firm Research and Markets predict an average growth rate of 10.9% from 2010 to 2015 ("Mining industry in Indonesia," 2012). Indonesia is one of the world's top three thermal coal producers and ranks third in copper exports.

3.3.2 HIERARCHICAL LEVEL OF MANAGERS

The hierarchical level of managers in an organisation's structure is an important contextual element in a study of resilience and innovation. Hierarchical level affects an employee's job requirements and in particular their need for creativity. Unsworth et al. (2005) found job-required creativity substantially increased an employee's creativity compared to other factors such as job design. The present study assumes job complexity and hence the requirement for creativity increases with hierarchical level. At senior

management levels the complexity of the work of subordinates may require considerable creativity.

The term "manager" can cover a wide variety of work responsibilities. For reasons of sampling convenience, this study used a broad definition of a manager as an employee with at least two subordinates. The sample selection process made it unlikely senior managers were involved. Therefore, this study provides a mid-level perspective on resilience and innovation. Future research should investigate the relationship between these constructs in both high-level managers and non-managerial employees.

3.4 RESEARCH METHOD

3.4.1 SURVEY AND SAMPLING

Both studies used a paper-based survey, and an additional online survey was included in Study 2. The survey is recognised as a major quantitative method in managerial and behavioural science (Baruch & Holtom, 2008). However, since it does not allow manipulation of variables, researchers should be aware of its limitation in interpreting potentially causal relationships in results.

The population for this study comprises mid-level managers in large established organisation in the high growth industries listed in Table 3.1 in Jakarta, Indonesia. Ideally a random sample of such managers and organisations would be taken, but no suitable sampling frame exists and anonymous mail questionnaires are both impractical and unlikely to achieve a high response rate in Indonesia. Like those in other countries, Indonesian managers are usually busy people who do not readily return phone calls or respond to anonymous surveys appearing irrelevant to their interests (Baruch & Holtom, 2008).

Consequently, a modified random sampling approach was used in which the researcher and research assistant contacted companies in target industries and enlisted contact persons in management positions who could deliver questionnaires to other staff and provide an anonymous mailbox for their return. The researcher or research assistant then collected the mailboxes from the site. This process has elements of purposive, convenience and snowball sampling. Similar approaches are common in management research due to the difficulty of obtaining fully random samples. Any departures from full randomness of the sample present a limitation in this type of research. Details of the survey process, including the role of the contact persons, are given in 4.2.2, and 5.3.2.

A common practice in organisational behaviour research is to control for a variety of individual and work context attributes found to bias the relationship between dependent and independent variables in previous studies.

Study 1 and Study 2 use age, gender, industry and job category, control variables commonly used in research on innovative behaviour (e.g., Choi & Chang, 2009; Erez & Naveh, 2004; Landry, Amara, & Becheick, 2008). The following section reviews these variables, with the exception of industry which was discussed in 3.3.1.

Age

Age exerts a strong influence on work attitudes and behaviour (King, 1990) and has been used to predict employee attributes such as job involvement (Janssen, 2004) and job characteristics (Erez & Naveh, 2004; Janssen, 2000) that influence innovative behaviour. Age has a positive relationship to employees' reactions to innovation (Choi, Sung, Lee, & Cho, 2010) and to the component of creativity (Binnewies, Ohly, & Niessen, 2008).

Gender

The role of gender in innovation has been widely studied. Much evidence suggests men have a higher level of innovation than women. For example (Whittington & Smith-Doerr, 2005) find female scientists tend to produce less commercial work than male scientists, and studies of creative workers describe men as more resourceful (Erez & Naveh, 2004) and more interested in new technology related to innovation (Lu, Yaob, & Sheng Yua, 2005). While the interpretation of these findings may relate to differences in employees' training or career paths, or to cultural values regarding men and women in the organisation, gender differences are commonly measured in innovation research.

Job category

Job category is a control variable for both theoretical and empirical reasons. Certain job types are expected to have greater requirement for innovative initiatives. People in marketing departments, for instance, may have more need for innovation than those working in routine areas such as human resources. Marketing employees are often required to create new ideas from data concerning customer satisfaction or strategies of competitors (Landry et al., 2008).

This study uses five job categories: marketing, operations or productions, human resources, finance, and others.

Participants were managers in target companies in Jakarta, Indonesia. A total of 178 completed the paper questionnaire in Study 1, and 253 completed either the paper or electronic questionnaire in the Study 2. The number of companies for each industry and their estimated workforce size are shown in Table 3.2. The online survey was not targeted to specific companies but sought potential respondents at the same level and from the same industries as the paper survey. The respondents came from a total of 27 organisations.

Table 3.2 Sample companies and their estimated workforce

		Study 1		Study 2	
	Industry	Number of companies	Number of employees	Number of companies	Number of employees
1	Mining	2	3,700	1*	1,500
2	Property	2	1,400	3*	7,000
3	Telecommunications	1	1,800	2*	2,100
4	Agribusiness	1	900	1*	900
5	Media	2	1,500	2	950
6	Infrastructure	4	1,250	2	1,550

(*One or two were also involved in Study 1)

More detailed information about the participants in each study is presented in 4.2.1 (Study 1) and in 5.3.1 (Study 2).

3.4.4 DATA COLLECTION

A research assistant delivered and collected questionnaires for the paper-based survey. To gain access the researcher and research assistant identified a contact person, in the first instance the human resources or general affairs manager. The questionnaires

were distributed and collected by arrangement with this person. The researcher discussed relevant aspects with the contact person and the research assistant then followed up with the questionnaire distribution and collection process.

Several means were employed to increase response rates using Dillman's (2000) design method. An introductory letter and a follow-up reminder were used, and an attractively printed two page "positive organisational and innovation resources list", compiled from publicly available resources was offered as an incentive to motivate cooperation through the social norm of reciprocity (Bednar & Westphal, 2007). A deadline was communicated for collecting completed questionnaires. As a further incentive, a summary of the findings was promised to all participants. To assure confidentiality, participants completed the questionnaire anonymously and a collection box was supplied in each organisation. The research assistant collected the completed questionnaires and returned them to the researcher.

The online questionnaire used Qualtrics software. The researcher identified several mailing list groups with members who were potential participants. The online questionnaire was presented in a similar format to the paper-based version. Participants were given an internet link to download the resource list incentive and those interested in obtaining a summary of the findings were requested to provide their email address. Respondents were assured that this email address would only be used for sending the summary.

3.4.5 MEASURES

A new scale was developed for this study based on a review of previous measures of resilience (see Chapter 4). Convergent validity was assessed using measures of *Proactive Coping* (Greenglass & Schwarzer, 1998), *Active Coping* (Carver, Scheier, & Weintraub, 1989), *Self-Esteem* (C. G. Richardson, Ratner, & Zumbo, 2009), and *Psychological Vulnerability* (Sinclair & Wallston, 1999) as detailed in 4.2.4 and 5.3.3.

Janssen's (2000) nine-item scale was chosen to measure innovative behaviour for several reasons. First, Janssen drew his scale from two important studies on innovative behaviour, Kanter (1988b) and Scott and Bruce (1994). Scott and Bruce's six-item scale was subjected to validation procedures, but Janssen's revision seems more complete and relevant to a broad range of organisations. For example, Scott and Bruce's item "generate creative ideas" is elaborated as "creating new ideas for improvement" in Janssen's scale. Second, Janssen's scale has three dimensions, idea generation, idea

promotion and idea realisation, that more broadly cover the innovation process (Kleysen & Street, 2001). Third, Janssen's scale has good psychometric properties, including intercorrelations between the three dimensions varying from 0.76 (between idea generation and idea realisation) to .85 (between idea generation and idea promotion) and a Cronbach's alpha of .95 (Janssen, 2000).

Finally, descriptive measures of gender, age, industry and department and other control variables were obtained in both studies.

3.4.6 DATA ANALYSIS

In both studies demographic and control variables were analysed with descriptive statistics. Test for the normality of questionnaire scales were conducted before using Exploratory Factor Analysis (EFA) in Study 1 and Confirmatory Factor Analysis (CFA) in Study 2. Correlation analysis and reliability analysis were used to verify the factor structure and internal consistency of the scales. Study 2 employed Structural Equation Modelling (SEM) and regression analysis to examine the causal relationships between resilience and innovative behaviour at the construct and dimension levels.

EFA (Field, 2009; Souhr, 2006), as implemented in PASW18, was used to examine the underlying structure of resilience. Preliminary steps included data screening, assumption testing and examination of sampling adequacy (Field, 2009). Initial factor extractions are based on eigenvalues, proportion of variance explained and the scree test. A number of interpretability criteria were used (Field, 2009; Souhr, 2006).

CFA using SEM with AMOS 18 (Blunch, 2008) was used to confirm the factor structure of resilience and test the significance of EFA model, and then to evaluate the relationship between resilience and innovative behaviour.

The SEM procedure involved multiple stages: *model specification and identification*, *parameter estimation*, *evaluation of model fitness* and, if applicable, *model re-specification* (Blunch, 2008; Hair, Anderson, Tatham, & Black, 1998). In analysing the structural model the two-step approach recommended by Anderson and Gerbing (1988) was followed. The measurement model is assessed and then the structural model is evaluated, allowing the researcher to identify any misspecification in the measurement model before confirming the structural model. This effectively avoids incorrect interpretation of which model causes any specification errors.

3.4.7 ISSUES IN MEASUREMENT USING SELF-REPORTS

Studies 1 and 2 used self-report measures of resilience, innovative behaviour and other constructs used to assess validity. Self-report measures are the major data collection methods in organisational behaviour research (Janssen, 2000; Luthans, Avolio, Walumbwa, & Li, 2005; Luthans & Ibrayeva, 2006), but are known to be limited by potential common method variance problems. Method variance is caused by specific features of the measurement method, such as social desirability, expectancy and set effects in questionnaires, which lower the validity of inferences about the relationships studied (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Therefore, authors often suggest measures based on multiple sources and, preferably, multiple methods (Clark & Watson, 1995; Podsakoff et al., 2003). However, this approach increases the difficulties of distributing questionnaire with limited time and budget. Conway and Lance (2010) argue that common method variance is less problematic than often suggested, and that self-reporting is not inferior to other more objective methods such as rating by supervisors. Following Shalley, Gilson, & Blum (2009), they argue that in certain applications, including studies of creativity, employees are more aware of subtle influences relevant to their job than others would be.

To minimise the negative aspects of self-reports, several common practices were used (Podsakoff et al., 2003). An information letter was provided, and participants' anonymity was maximised. Each section of the questionnaire was separated, with a brief introduction to shift participants' focus in a new direction and disconnect them from previous items.

3.4.8 CROSS-CULTURAL ISSUES IN MEASUREMENT

Cross-cultural issues have to be managed in research involving cultures with different languages. Language contains assumptions about how people think and act that may impact on how they interpret questionnaires (Sireci, Yang, Harter, & Ehrlich, 2006). An translation process that considers linguistic and psychological issues is needed to obtain high quality instruments that convey similar meaning to the original (Sireci et al., 2006).

To minimise the risk of culture bias, guidance from McGorry (2000) and Sireci et al. (2006) on using foreign language psychometric tests was followed. The questionnaires and information letters were translated from English into Bahasa

Indonesian by a certified translator. The translator not only aimed for literal translation, but also considered the context of a manager in a business organisation. Back-translation into English by a second certified translator was then conducted for comparison with the original. Discrepancies in terminology were analysed and reconciled. No evidence of significant discrepancy was found, although several items were slightly revised by the researcher. For example, the word "valuable" in the item "I actively focus on activities and events that I find personally valuable" has a different meaning in Bahasa Indonesia, as normally people interpret it as "bernilai" (precious). However, the translator chose the word "bermakna" (meaningful) as more suitable. Another example is the phrase "important organisational members" in item "Making important organisational members enthusiastic for innovative ideas". This phrase is considered too formal and may be interpreted as referring only to "top management". Therefore, it was revised to "employee" or "karyawan" in Indonesian.

CHAPTER FOUR – STUDY 1
DEVELOPMENT OF A NEW MEASURE OF RESILIENCE

4.1 INTRODUCTION

This chapter presents the process for developing the new resilience scale proposed in Chapter 2. Organisational studies, particularly in the domains of Positive Organisational Behaviour (POB) and Positive Organisational Scholarship (POS), have conceptualised individual resilience in different ways but all describe it as an important capacity for employees facing difficulties in work. Recent studies propose that resilience can be developed, and that people who have this capacity may grow from facing adversities. However, it appears that no studies have specifically conceptualised growth as a primary dimension of resilience.

In Chapter 2, a new definition of resilience was proposed: *an individual's capacity to respond to adversities at work in ways that strengthen and develop him or her as a better person.* Four salient dimensions relevant to measuring employee resilience in a large organisation were suggested: *Perseverance*, *Commitment to Growth, Positive Emotion* and *Meaning Making*. This construct is expected to more accurately capture the character of a resilient employee and may therefore help researchers and practitioners improve employees' innovativeness.

This chapter reports an empirical study into the dimensional structure of the new resilience construct, using Exploratory Factor Analysis (EFA), reliability analysis and correlations with other scales to establish its construct validity. The new scale is expected to measure resilience in large organisations better than existing scales, and is used to examine the link between resilience and individual innovation in Chapter 5.

4.2 METHOD

This study used procedures suggested by DeVellis (2003), Hinkin (1995, 1998), and Netemeyer, Bearden, & Sharma (2003, p. 238), as well as precedents set in other studies of new measurement scales in organisational contexts (Sinclair & Wallston, 2004; Tian, Bearden, & Hunter, 2001; Tracey & Tews, 2005).

Hinkin (1995, 1998) describes six steps in developing a sound measurement scale: (1) generating items and establishing content validity; (2) questionnaire administration; (3) initial item reduction; (4) confirmatory factor analysis; (5) convergent/discriminant

validity; and (6) item replication with an independent sample. These steps are described below in 4.2.3 - 4.2.6.

4.2.1 PARTICIPANTS

Participants were employees at the managerial level in 12 large organisations in Jakarta, Indonesia. A total of 275 questionnaires were distributed and 178 were returned, making a response rate of 64%. Of these, 11 contained invalid data and 167 were retained for analysis. These sample sizes are considered adequate for factor analysis (Field, 2009; MacCallum, Widaman, Zhang, & Hong, 1999). Table 4.1 shows the characteristics of these 167 participants.

Table 4.1 Characteristics of participants in Study 1

Variable	Categories	Percentage of Participants (n=167)
Gender	Male	70.1
	Female	29.9
Age	<30	12.0
	30–40	58.0
	41–50	29.0
	>50	0.6
Industry	Mining	21.6
	Property	17.4
	Telecommunication	6.0
	Agribusiness	4.8
	Media	16.2
	Infrastructure	34.1
Department	Marketing	22.2
	Finance	14.4
	Operations or Production	25.7
	Human Resources	12.0
	Other	25.7

EFA (see 4.2.6.2) was the main analytic method. Hinkin (1998) and McCallum, Widaman, Zhang, & Hong (1999) recommend a minimum sample of 150 for EFA. Hinkin (1998) recommends an item-to-response ratio between 1:4 and 1:10 for statistical reasons. The present ratio was judged acceptable at 1:6 (27 items: 167 respondents) following Costello and Osborne's (2005) recommendation. Following a survey in which they found that 63.2% of studies used a ratio less than 1:6, Costello and Osborne note that the adequacy of this ratio is also partly determined by the nature of

the data: the "stronger" the data, the smaller the sample size that can be accepted. In FA this can be assessed with communalities, with .40 to .70 considered acceptable in social sciences (Costello & Osborne 2005). As the new Resilience scale had an average communality of 0.50 (Table 4.3) the 1:6 ratio can be considered acceptable.

4.2.2 PROCEDURE

The questionnaires were administered over five weeks from July to August 2011. A research assistant helped identify a contact person in each target organisation, then provided information about the survey to that person by email or telephone. Of the 12 organisations contacted, seven responded to the invitation and a second letter was sent detailing the purpose and process of the study and how the organisation would benefit from participating. The research assistant then checked with contact persons that at least 10 employees from the organisation met the criteria for respondents and, on confirmation, delivered the questionnaires to the contact person for distribution to or collection by potential participants.

All participants were informed that contribution was voluntary. An incentive in the form of a resource list of readings on Positive Organisational Behaviour concepts and practices was distributed, and a summary of the findings was offered. The research assistant provided a box for completed questionnaires for each organisation's reception desk. Each contact person was given a reminder call each week for five weeks. Finally, the research assistant collected the questionnaires from the contact person.

The response rate of 64.7 % is high for a questionnaire survey (Baruch & Holtom, 2008). This may be due to the care put into developing a short and comprehensible questionnaire, and the role of the research assistant and contact persons in facilitating responses.

4.2.3 ITEM GENERATION

4.2.3.1 Approach

There are at least two approaches to generating items in the first stage of scale development (Hinkin, 1998). One is the inductive approach or "classification from below". This is appropriate when the conceptual basis for a construct does not indicate what dimensions and items should be created. The second approach is deductive, and assumes a theoretical foundation sufficient to generate an initial set of items. This

requires an understanding of the phenomenon to be studied and a comprehensive review of literature. An advantage of the deductive approach is that it helps to ensure the content validity of the final scale (Hinkin, 1998). Additionally, when a construct is adequately defined, its items or indicators more likely encapsulate the domain of interest.

Since the concept of resilience has previously been studied in several domains the deductive approach was used. Relevant construct definitions and measurements from prior studies were exploited in generating an item pool.

4.2.3.2 Domain specification

Domain specification involves clarifying the construct to be measured (DeVellis, 2003). In the field of organisational behaviour, constructs such as resilience describe elusive phenomena that cannot be observed directly and their boundaries must be specified clearly so that the substance of the scale does not unintentionally measure different constructs. Drawing on diverse studies from several domains resilience is here defined as an *individual's capacity to respond to adversity at work in ways that strengthen and develop him or herself as a better person*. The Literature Review above identified four potential dimensions: *Perseverance, Positive Emotion, Meaning Making* and *Commitment to Growth.*

The definition and dimensions used in this study focus on growth as a critical element missing in previous studies. Items relevant to the hypothesised dimensions were adopted from previous scales intended for a wide range of uses, mostly outside workplaces and adapted to work settings. This exploration of a wide range of questionnaires also suggested a need to refine the wording of some items.

An initial pool of 38 items was generated by adapting items from six published measures of related constructs: CD-RISC (Connor & Davidson, 2003), the Brief Resilience Scale (Smith et al., 2008), the Resilience Scale for Adults (RSA) Friborg, Hjemdal, Rosenvinge, & Martinussen (2003), Wagnild & Young's Resilience Scale (WYRS) (Wagnild, 2009; Wagnild & Young, 1993), Blatt's Resilience Scale (Blatt, 2009), Heuvel's Meaning Making Scale (van den Heuvel et al., 2009) and Marsick and Watkins' Learning Organisation Scale (Marsick & Watkins, 2003). Some items were modified for the present context, and new items based on studies reviewed in Chapter Two were also included. Table 4.2 (below) presents a brief description of the items and their sources, and the full pool of items can be seen in Appendix A.

To guard against narrowing of the construct and over-reliance on the initial definition, additional and possibly redundant items were added to capture a variety of different angles, as recommended by DeVellis (2003). Items were then screened to eliminate redundant words and double-barrelled, ambiguous or leading statements, and to keep the language simple and familiar. Content validity is discussed in 4.2.6.4.

Table 4.2 Dimensions of resilience used in previous studies

Dimensions of resilience	Description	Number of items	Source of items
Perseverance	Willingness to face adversity with continual struggle and self-discipline	13	Connor & Davidson (2003), Smith et, al. (2008), Wagnild & Young (1993), Friborg et al. (2003)
Positive emotions	Maintaining a positive outlook, when facing adversity	7	Connor & Davidson (2003), Wagnild & Young (1993) and new items based on the literature
Meaning making	Actively reflecting on and affirming personal values when facing problems	8	Connor & Davidson (2003), van den Heuvel (2009).
Commitment to growth	Growing and becoming a stronger person in trying times	10	Blatt (2009), Marsick & Watkins (2003)

Four-point Likert-type response scales were initially used, but analysis of the first half of the sample results showed low variance, and a five-point scale was substituted for the remaining questionnaires. The initial four-point responses were mathematically converted to a five-point scale by multiplying by 5/4. The five-point scale follows Floyd and Widaman's (1995) suggestion to improve the effectiveness of factor analysis through creating enough variance to detect the underlying structure of a construct. To ensure this change did not alter the pattern of results, a t-test was used to compare the 89 four-point responses with the initial ones. No items showed a significant difference (two tailed $p > .05$), justifying the pooling of all respondents' data for further analysis.

Three well-known measures were included to assess the construct validity of the new scales (Hinkin, 1998; Netemeyer et al., 2003): *proactive coping*, *self-esteem* and *psychological vulnerability*.

4.2.4.1 Proactive coping measure

Proactive coping is a subscale of Greenglass and Scwarzer's Proactive Coping Inventory (1998). Proactive coping is described as a forward-looking coping strategy that "integrates the processes of personal quality of life management with those of self-regulatory goal attainment" (Greenglass, 2002, p. 2). Studies of stress were used as the groundwork for this scale (Lazarus, 1993; Lazarus & Folkman, 1984).

The proactive coping subscale has 14 items, with three reverse scored. It uses four-point responses: 1 "Not all true"; 2 "Barely true"; 3 "Somewhat true"; and 4 "Completely true". The instruction is: "The following statements deal with reactions you may have to various situations. Indicate how true each of these statements is depending on how you feel about the situation. Do this by checking the most appropriate box".

This measure has been used in a variety of samples, including Canadian employed adults, university students and nurses, and German teachers. The Cronbach's alphas in these studies were generally between α=.80 and .85.

This scale was chosen because it focuses on improving quality of life and incorporates elements of positive psychology. It also concentrates on future orientation, challenging goals and personal growth (Greenglass, 2002), variables highly relevant to the construct of resilience proposed here. Proactive coping is expected to correlate positively with resilience.

4.2.4.2 Self-esteem measure

Rosenberg's self-esteem scale (Reynolds, 1982) is a widely used measure of global self-esteem, characterising a person's overall evaluation of his or her worthiness as a human being. Recent studies suggest this six-item scale measures two correlated dimensions, self-competence and self-liking (e.g C. G. Richardson et al., 2009). It uses a five-point Likert scale: 1 "Strongly disagree"; 2 "Disagree"; 3 "Have no opinion"; 4 "Agree"; and 5 "Strongly agree". The instruction is: "Choose the attitude which best illustrates the way you are".

Rosenberg's self-esteem scale was used to assess the validity of the new construct because it is often found to correlate with positive constructs such as happiness (C. G. Richardson et al., 2009). For example, in a recent study of the relationship between self-esteem and happiness, self-esteem directly predicted happiness and mediated the effects of extraversion and neuroticism on it (Cheng & Furnham, 2003). Lyubomirsky, Tkach, & DiMatteo (2006) also found strong support for a relationship between happiness and self-esteem. On the other hand, self-esteem often correlates negatively with negative constructs such as anxiety, negative affect or emotional distress. For instance, Dutton and Brown (1997) found that people with high global self-esteem had less emotional distress after failure than individuals with low global self-esteem.

In tests with different samples and models, Rosenberg's self-esteem scale has been found to be relatively stable, having Cronbach's alphas between .77 and .84 (C. G. Richardson et al., 2009).

4.2.4.3 Psychological vulnerability measure

The Psychological Vulnerability Scale (PVS) is a six-item measure of cognitions that promote harmful reactions to stress. Psychological vulnerability is defined as a pattern of cognitive beliefs reflecting dependence on achievement or external sources of affirmation for one's sense of self-worth (Sinclair & Wallston, 1999, p. 120). Therefore, this scale is designed to identify individuals with cognitive patterns that make them more vulnerable to stress. This maladaptive cognitive reaction is assumed to affect individual coping behaviour as well as psychological and physical well-being. Sinclair and Wallston (1999) argue that the PVS is valuable in interventions aimed at modifying detrimental cognitive beliefs.

Several studies served as the foundation for the PVS, including Robin's (1995) study of self-orientation and perfectionism using the Personality Style Inventory Scale. Where an individual has excessive anxiety about activities, the fear of failure in important activities can be a devastating drive that leads to depression. Studies of dependency and interpersonal sensitivity also underpin the PVS scale, including Schill and Sharp's (1995) study of self-defeating behaviour in socially independent individuals.

The PVC has possible responses varying from 1 "Does not describe me at all", to 5 "Describes me very well". Responses 2, 3 and 4 are not labelled. In a study of three independent samples its Chronbach's alpha reliability ranged from .71 to .86 and test-

retest correlations were .83, .79 and .81 (Sinclair & Wallston, 1999). These results suggest PVS is internally consistent and stable over time.

4.2.5 QUESTIONNAIRE STRUCTURE

The final questionnaire included an information letter and a four page questionnaire (Appendix B). The information letter outlined the purpose of the study, emphasised that participation was voluntary and confidential, and gave a brief explanation of the potential benefits of the research.

The questionnaire had six parts. Part A involved demographic questions about gender, age, industry and participants' department. Part B contained 27 items measuring resilience, with the instructions: "These statements describe how people react to different situations at work. Please indicate how much they apply to you by ticking the appropriate box". A five-point scale was used: 1 "Does not apply at all to me"; 2 "Does not apply to me"; 3 "Applies somewhat to me"; 4 "Applies to me"; and 5 "Applies very strongly to me". As noted in 4.2.3.2, a four-point version was used for the first 89 respondents. This had responses: 1 "Does not apply at all to me"; 2 "Applies slightly to me"; 3 "Applies somewhat to me"; and 4 "Applies very strongly to me".

Parts C, D and E contained the Proactive Coping, Self-Esteem and Psychological Vulnerability measures. Part F measured an important control variable, Social Desirability, using the short version of the Marlowe-Crowne scale from Reynolds (1982). This version is considered more valid and reliable than the original long version (Loo & Thorpe, 2000) and has a Cronbach's alpha of .85 (Reynolds, 1982).

4.2.6 DATA ANALYSIS STRATEGY

The normality of relevant variables was tested before conducting exploratory factor analysis, reliability tests and bivariate correlation analyses (Connor & Davidson, 2003; Tian et al., 2001; Vogus & Sutcliffe, 2007; Watson & Clark, 1988). EFA was used to reduce the number of items and examine the underlying structure of the resilience construct. Reliability analysis was then used to evaluate the internal consistency of each subscale. Finally, bivariate correlations with control variables were obtained to test the construct validity.

4.2.6.1 Normality of variables

Factor analysis and correlations assume variables are normally distributed. Consequently, skewness and kurtosis were assessed for each variable and the whole scale (multivariate). The critical value for normality at the .01 probability level is z=+/-2.58 (Hair et al., 1998, p. 73).

4.2.6.2 Exploratory factor analysis

Exploratory Factor Analysis (EFA) is widely used in developing and refining measures in organisational research (Conway & Huffcutt, 2003). EFA enables the researcher to develop a parsimonious scale with construct validity (Hinkin, 1998). Anderson and Gerbing (1988) recommend EFA for construction of a new construct. In this study, EFA was used to reduce and identify the dimensions of the latent construct of resilience.

Several choices are required in using EFA: (a) the factor extraction model to be used; (b) the method for rotating factors; and (c) the number of factors to be retained (Conway & Huffcutt, 2003). These choices were made with guidance from the literature (Costello & Osborne, 2005; Fabrigar, Wegener, MacCallum, & Strahan, 1999; Field, 2009).

Data extraction

Principle Axis Factoring (PAF) was used for data extraction. This assumes the correlation between variables is due to the existence of one or more unobservable latent variables (or common factors) exerting causal influence on these variables. Hinkin (1998) argues that PAF is preferred over Principal Component Analysis (PCA) because the latter mixes common, specific and random error. Fabrigar, Wegener, MacCallum and Strahan (1999) argue that PAF is more relevant than PCA if the aim of the analysis is to identify latent constructs underlying the measured variables, since it recognises the random error. Costello and Osborne (2005) suggest that when the research variables are related PAF is preferable to as it provides more interpretable results based on correlations between variables.

Rotation

Orthogonal or oblique factor rotations are commonly used to find an interpretable solution in factor analysis. Orthogonal rotations restrict correlations between factors,

while oblique rotation allows factors to be correlated (Fabrigar et al., 1999). The theoretical and empirical basis for expecting subscales of resilience to be correlated was argued in 2.5, and oblique rotation was therefore used in Study 1.

Choosing a model

The number of factors to be retained in a model is usually assessed by the eigenvalues (or Kaiser values). An item with an eigenvalue of less than one is not considered meaningful since it indicates a factor explains insufficient variation (Field, 2009). A second commonly used method is Cattell's scree test, which examines a plot of the eigenvalues for a sharp descent followed by a curve (Field, 2009). Only factors depicted prior to this "elbow" are retained. Third, communality, the proportion of variance in a variable explained by each factor is usually also used. A communality of 60% or higher is considered acceptable (Field, 2009). However, as suggested by Fabrigar et al. (1999) and Hinkin (1998), the appropriate number of factors is not determined solely by statistical concerns but also involves subjective judgement.

The significance of factor loadings was assessed by Tabachnick and Fidell's (2007) criteria, where a factor loading less than .32 is poor, .45 fair or reasonable, .55 good, .63 very good, and .71 and above excellent. This guideline was used in interpreting factor solutions and convergent validity tests. Items below .3 were deleted if this did not compromise the meaning of the scale.

Two other guidelines for factor solutions were used (Hair et al., 1998; Netemeyer et al., 2003; Tabachnick & Fidell, 2007). First, items that cross-loaded on two or more factors should be deleted. Second, factors with only one or two items should be re-examined because these may not be unique factors.

The results suggested a hypothetical model of resilience that was subsequently tested with Confirmatory Factor Analysis (CFA) on new data in Study 2. CFA is recommended by Anderson and Gerbing (1988, 1991), and is often used following EFA in studies involving scale development (Hornsby et al., 2002; Tian et al., 2001; Vogus & Sutcliffe, 2007).

4.2.6.3 Reliability analysis

Reliability describes the internal consistency or homogeneity of a scale, or its consistency over time (DeVellis, 2003). Items with a strong relationship to their latent variable should also have a sound relationship with each other. Cronbach's alpha, which incorporates the average inter-item correlations, the corrected item-to-item correlation,

and the item variances, is commonly used to measure internal consistency (Hair et al., 1998; Netemeyer et al., 2003). A coefficient of .7 in exploratory measures suggests strong item covariance and implies that the sampling domain has been captured adequately (Hinkin, 1998). Because alpha can increase with the number of items, .7 serves as minimum value. Hair et al. (1998) suggest corrected item-to-total correlations should be >.5 and an item having inter-item correlations of <.3 should be eliminated to ensure items belong to the hypothesised dimension. The internal consistency assessment of the new scale is reported in 4.3.3.

4.2.6.4 Validity analysis

Validity concerns whether measurement items accurately reflect the construct they are intended to measure (Hair et al., 1998). Three common types of validity (2003) are used here: content validity, criterion-related validity and construct validity.

Content validity

Content validity concerns the extent to which a specific set of items reflects the content domain of a construct (DeVellis, 2003, p. 49) for a particular assessment purpose (Haynes, Richard, & Kubany, 1995). Methods for assessing content validity include asking respondents to rate their agreement with definitions, and evaluating face validity, the extent to which the items appear to measure the construct of interest (J. C. Anderson & Gerbing, 1991). These are usually considered insufficient indicators of content validity (Nunnally, 1994), and in this study an expert panel review was therefore used to assess content validity (Davis, 1992; DeVellis, 2003; Hardesty & Bearden, 2004; Haynes et al., 1995).

The expert panel was asked to assess the proposed items using the definition of resilience provided above. Five researchers with expertise in resilience were asked "How relevant do you think each item is to resilience at work in business organisations?" and "Do you think the item is clear and concise?" Responses were collected on scales anchored with 1 "not relevant at all" and 5 "highly relevant" or 1 "not at all clear and concise" and 5 "clear and concise". The experts were also asked to provide verbal comments and suggest new items. Most responses were in categories 3, 4 and 5 on both relevance and conciseness. Six items (3%) had a score of 2, and none scored 1.

As a result, nine items were deleted and twenty-seven were retained. The final scale was then translated into Indonesian and back-translated into English. No

significant difference was detected and only minor revision was made to the final Indonesian version.

Construct validity

Construct validity is in part addressed by EFA and internal consistency measures, but also requires correlating new construct measures with existing theoretically-related constructs (convergent validity) or theoretically unrelated constructs (discriminant validity) (Hinkin, 1998; Netemeyer et al., 2003).

Resilience was hypothesised to be positively correlated with *proactive coping* (Greenglass, 2002) and *self-esteem* (C. G. Richardson et al., 2009) and negatively correlated with *psychological vulnerability* (Sinclair & Wallston, 1999). Construct validity was further assessed with Confirmatory Factor Analysis (CFA) using a different sample, as described in Chapter 5. These procedures are suggested by Hair et al. (1998), Hinkin (1998) and Netemeyer et al. (2003) and are commonly used in similar studies of scale development (e.g., Tian et al., 2001; Tracey & Tews, 2005).

4.3 RESULTS

4.3.1 CONTROL VARIABLES

As a preliminary, the control variables of gender, age and hierarchical level were tested with an independent-samples t-test. This showed no difference in mean resilience scores between males (M=114.2, SD=12.5) and females (M=113.9, SD=11.5), with t(165)=.152 and p=.87. Similarly, one-way analyses of variance showed no statistically significant differences in resilience according to age (F(3,163)=1.35, p=.25), industry (F(5,161)=1.6, p =.16) or hierarchical level (F(4,232)=1.56, p=.18).

4.3.2 DATA SCREENING AND NORMALITY TEST

The data were first screened for univariate outliers. Two were detected and deleted, resulting in a final sample of 167. The ratio of cases to variables was over 6, meeting Hinkin's (1998) criteria.

Univariate normality test showed only two items violating normality (grow2, z skewness=4.2, and mean5, z skewness=3.5) and these were retained for further analysis since Floyd and Widaman (1995, p. 289) consider EFA to be relatively robust against violations of normality. A multivariate normality test showed resilience to be normally distributed with skewness z=0.15 and kurtosis z=2.22, both below the critical value of 2.58.

Analysis of multivariate normality for other measures included showed results well within the acceptable range of ± 2.58 for self-esteem (skewness=0.31, kurtosis=1.25) and proactive coping (skewness=1.56, kurtosis=0.78), validating the use of Pearson's correlations. Psychological vulnerability had a skewness of 4.68 and a kurtosis of 2.48 and consequently the nonparametric Kendall's Tau-b measure of correlation was used.

4.3.3 EXPLORATORY FACTOR ANALYSIS

The twenty-seven items were subjected to Principle Axis Factoring (PAF) using PASW Statistics 18. The first run was to evaluate the factorability. A correlation matrix showed more than 50% of the correlations were greater than .3 and none were higher than .8 (see Appendix C). The Kaiser-Meyer-Olkin measure of sampling adequacy was .85, above the recommended value of .6. Similarly, Bartlett's test of sphericity reached statistical significance ($p<.05$). Both results indicate sufficient factorability and no multicollinearity, in line with the anti-image matrix which had no correlation below .5 (Field, 2009).

Consistent with these indications, the communalities were all above .3 which is considered acceptable. Finally, only 28% of non-residuals had absolute values greater than .05, suggesting a relatively good model (Field, 2009). Given these general indicators, EFA was considered suitable for this data.

EFA was run reiteratively until the seventh run showed a clean factor structure. Oblimin rotation showed all items in the analysis had primary loadings over .5. Examination of the scree plot suggested a clear break after the third factor as Figure 4.1 shows, and these three factors were retained for further analysis. This decision is consistent with Costello and Osborne's (2005) view that eigenvalues and Cattell's scree test offer the best test of how many factors to retain. While it produced 3 factors, only 2 were as useable using the criteria in 4.2.6.2.

A total of nine items were eliminated for failing to meet the minimum criteria of a primary factor loading of .4 or above and no cross-loading on two or more factors.

Scree Plot
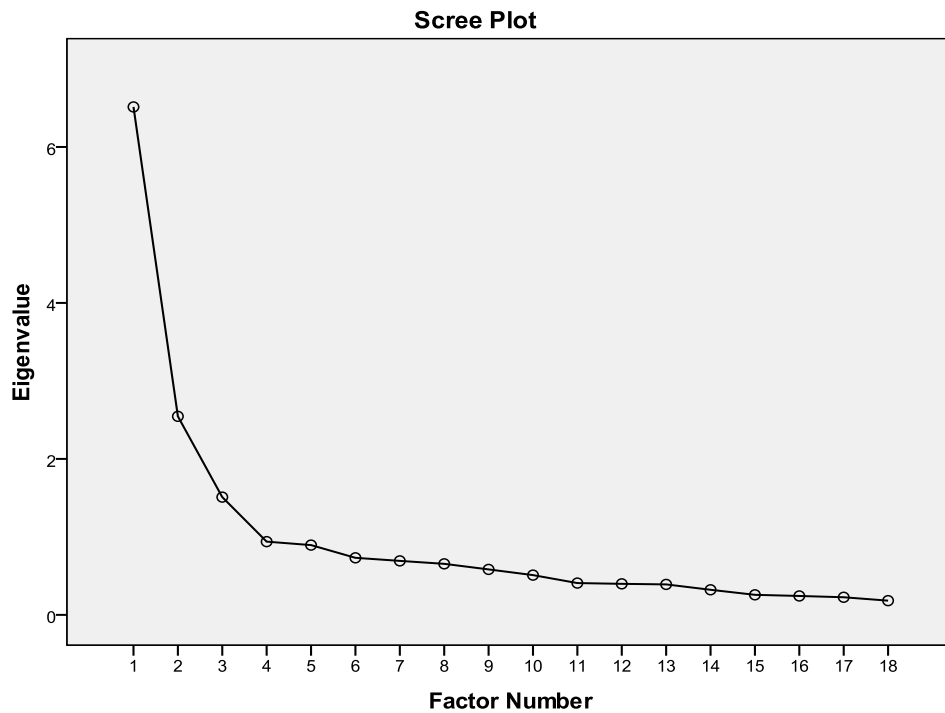
Figure 4.1 Cattell's scree test in final run of EFA

In the end a simple factor structure was only achieved by deleting all items of the Meaning Making scale. This is discussed further below in 4.4.3. Three factors with eigenvalues exceeding one were left, accounting for 36.2%, 14.1% and 8.4% of the total variance explained of 58%. Although several guidelines suggest 60% as a minimum (Field, 2009), this result is considered close enough. Appendix D shows the total variance explained in the final analysis. Model fit was assessed as reasonable, since the absolute residual value of 26% was well within the acceptable range of 0-50% (Field, 2009).

The pattern matrix for the final solution is shown in Table 4.3 (below). Factor 1 contains items from two original scales, Perseverance (six items) and Commitment to Growth (four items). Factor 2 presented as a clear factor with all items signifying Positive Emotion dimension items (six items). Factor 3 had only two items, less than Costello and Osborne's (2005) recommendation of a minimum of three, and cannot be considered unique (Netemeyer et al., 2003, Tabachnick & Fidell, 2007). These two items were accordingly removed.

The final scale consisted of 16 items, 10 describing Factor 1 and six describing Factor 2 (see Appendix E).

The combination of Perseverance and Commitment to Growth items in Factor 1 suggested reconceptualising Factor 1 as "Developmental Persistency" in the face of hardship. As the Literature Review (2.5) identified, resilience is best characterised in terms of maintaining effort amid difficulties and strengthening one's capacity to deal with life. When individuals dedicate their physical and psychological resources to analysing setbacks and trying to address them while pursuing their goals, they extend their capability as a person. Previous constructs have tended to focus on recovering from or persevering in the face of adversity, overlooking the role of growth underlying this new dimension.

The correlation between Developmental Persistency and Positive Emotion was moderate (.405), supporting the predicted correlation between these dimensions and justifying the oblique rotation method. On a theoretical level, this moderate relationship suggests people with high levels of positive emotions such as hope and self-efficacy might be more optimistic when facing difficulties, and hence more resilient.

In summary, the EFA showed two distinct factors underlying employees' responses to this measure of resilience.

4.3.4 RELIABILITY ANALYSIS

Reliability was satisfactory for both the overall resilience scale (alpha=.88) and its two dimensions (.87 for Developmental Persistency and .86 for Positive Emotion). Removing any items from these three scales lowered the alpha, and item-to-total correlations were above .5 for each factor. Finally, both factors had inter-item correlations above .3. These results suggest the new scale has satisfactory internal consistency.

Item-to-total correlations showed no item with a correlation of <.5 on either factor. Both factors had inter-item correlations of >.3. These results support the Cronbach's alpha evidence suggesting the proposed resilience scale coincides with its conceptual definition.

Table 4.3 EFA pattern matrix

VARIABLES	FACTORS			COMMUNALITY
	1	2	3	
Per4 (I don't give up when things look helpless)	**.834**	-.126	.-181	.545
Per3 (I tend to bounce back after illness or hardship)	**.731**	.061	.067	.536
Per5 (I tend to recover quickly from stressful events	**.669**	-.031	-.044	.410
Per7 (I am not easily discouraged by failure)	**.668**	.077	.089	.554
Grow2 (I think about my mistakes and learn from them	**.666**	-.046	-.025	.414
Per2 (I can deal for whatever comes)	**.648**	.095	.182	.619
Per1 (I am able to adapt to change)	**.606**	.043	.084	.440
Grow5 (I Actively look for ways to overcome the challenges I encounter)	**.577**	.080	.260	.579
Grow1 (I see difficulties as challenges and opportunities to learn)	**.554**	.053	.055	.363
Grow4 (I can grow in positive ways by dealing with difficult situations)	**.541**	.056	.155	.418
Pos5 (I am usually optimistic and hopeful)	-.031	**.790**	.077	.639
Pos6 (I am enthusiastic when facing problems rather than avoiding them)	.066	**.789**	.011	.674
Pos4 (I am usually confident in doing whatever I choose)	.028	**.787**	-.053	.596
Pos3 (I am interested in facing and solving problems)	.006	**.711**	.109	.483
Pos7 (I can see the humorous side of a problem)	.028	**.687**	-.022	.444
Pos2 (I can get through difficult times at work because I've experienced difficulty before)	.082	**.623**	.082	.473
Grow3 (I think how I could have prevented unforeseen problems when they occur)	0.35	.051	**.660**	.440
Grow7 (I often seek feedback on my work from others)	.146	.078	**.571**	.453

	Factor 1	Factor 2	Factor 3	
Factor 1	1			
Factor 2	**.405**	1		
Factor 3	**.242**	**.415**	1	

4.3.5 *CONSTRUCT VALIDITY*

The correlations between Resilience, Developmental Persistency, Positive Emotion, Proactive Coping, Self-Esteem, and Psychological Vulnerability all met theoretical predictions (Table 4.4).

As predicted, Resilience was positively correlated with Proactive Coping (*r*=.67, *p*<.01) and Self-Esteem (*r*=.74, *p*<.01), and negatively correlated with Psychological

Vulnerability (r=-.64, p<.01). According to Tabachnick and Fidell's (2007) guidelines these are reasonable correlations.

Table 4.4 Correlations between resilience and measures of construct validity

	Construct	Mean	SD	1	2	3	4	5	6
1	Resilience	67.62	7.53	(.88)					
2	Developmental persistency	42.71	5.12	.88	(.87)				
3	Positive emotion	24.80	3.92	.78	.41	(.86)			
4	Proactive coping	43.74	4.53	.67	.60	.51	(.81)		
5	Self-esteem	21.73	2.03	.74	.59	.67	.59	(.83)	
6	Psychological vulnerability	9.22	2.61	-.64*	-.56*	-.47*	-.45*	-.47*	(.82)

Note: n=167. Reliabilities of the measures are shown in parentheses on the matrix diagonal. For all correlations p<.01 (two-tailed). *Kendall's-tau, p<.01.

A composite score for the Marlow and Crowne's Social Desirability (MCSD) scale was calculated, showing M=6 and SD=1.08. Since this variable violated the assumption of normal distribution in being skewed, Kendall's Tau was used to correlate it with Resilience, showing r=-.13 (p>.05). Therefore, it appears respondents were not influenced by the tendency to show themselves in a favourable manner.

4.4. DISCUSSION

Previous organisational studies have used measures reflecting recovery from adversity but not a person's attitude to adversity as an opportunity for growth, a critical theoretical element especially from the POS and POB view (Sutcliffe & Vogus, 2003). Items from a wide range of previous studies, along with some new ones, were used to measure four dimensions of resilience: commitment to growth, perseverance, positive emotion and meaning making. The results suggest resilience comprises only two dimensions: developmental persistency, a combination of commitment to growth and perseverance, and positive emotion. The former is consistent with the prediction of a central growth orientation, suggesting an effortful or persistent attempt to not merely recover but to thrive in the face of setbacks. The latter suggests resilience has a fundamental emotional quality, similar to hope or optimism but more general, and does not just involve cognitive efforts to overcome adversity, such as strategising or goal-setting. How this structure improves on previous constructs of resilience is now discussed.

4.4.1 RESILIENCE THROUGH DEVELOPMENTAL PERSISTENCY

Developmental persistency is a philosophy of facing adversity with the intention to grow. Minimising or avoiding difficulties, blaming one's lot on "fate" or others, or merely aiming for self-preservation are essentially negative goals that don't necessarily improve one's capacity for living in an uncertain world. While POS and POB consider resilience valuable in facing difficulties, so far they stop short of embracing them as opportunities to grow as a person, unlike their humanistic predecessors who saw growth as a central human motivation (e.g., Maslow, 1970; Rogers, 1975). For example, Luthans et al. (2006) suggest resilience can be developed by *risk-focused* and *process-focused* strategies. *Risk focused* strategies emphasise management rather than avoidance of risk factors arising in adverse events. Managing risk involves a positive perspective of risk as a challenge or developmental opportunity. A *process-focus* involves one's psychological inventory of self-regulatory and self-awareness capabilities for managing difficulties. Both strategies help the individual bounce back in the short term (Luthans, Youssef, et al., 2007), but do not address long-term development – thriving rather than surviving.

Developmental persistency reflects Maddy and Khosabha's (2005) notion of taking a positive attitude towards challenges, for example looking to what one can learn from adverse situations helps retain motivation. From the present perspective it also helps one further discover one's capabilities and purpose in life.

Recently Luthans et al. (2011) have come close to implying a role for growth in intentionally facing challenges and obstacles by incorporating Mueller and Dweck's (1998) construct of *mastery orientation*. Mastery orientation characterises behavioural patterns of seeking challenges and persistence in the face of obstacles (Mueller & Dweck, 1998). The positive psychological capacities in Luthan's PsyCap construct, which includes a resilience dimension, are hypothesised to include a mastery orientation giving individuals additional motivation when facing challenges. However, where Luthans et al. (2011) focus on learning goals related to the specific problems involved, developmental persistency has a broader focus on growth of the person as a whole: a higher-level process of integrating one's capabilities and enlarging one's sense of self.

4.4.2 RESILIENCE THROUGH POSITIVE EMOTION

Positive emotion is implied by some elements of previous constructs of resilience. For example the *equanimity* scale of the WYRS involves accepting difficulties without

excessive regret (Wagnild & Young, 1993). Klohnen (1996) found resilience, as measured by Block and Kremen's Ego-Resilience scale (1996), correlated with a measure of positive emotionality encompassing behavioural and temperamental characteristics conducive to joy, excitement and vigour. However, prior studies have not given positive emotion the centrality suggested by the present results.

The resilience construct identifies a role for positive emotion in long-term growth or self-development. For example, Frederickson's (2003) "build and broaden" theory predicts positive emotion offers several benefits in adverse situations: broadening one's outlook, helping to understand one's challenges and summoning inner resources including growth-related skills. Positive emotion helps recall previous positive experiences as resources for survival and long-term learning, and reduces negative emotion and its long-term health consequences. Finally, positive emotion helps individuals gain self-control and confidence. It therefore offers not only a short-term, reactive advantage but aids developmental persistency by making inner resources more available and promoting healthy functioning.

In summary, resilience, as a mix of growth orientation and emotional positivity, helps individuals grow emotional and cognitive capabilities that increase their mastery of life. Further by facilitating each other, these two dimensions bring an interactive effect greater than the sum of their individual contributions.

4.4.3 THE MEANING MAKING DIMENSION

The Meaning Making items were all deleted in the EFA, due to low factor loadings. As well as statistical explanations or incorrect theoretical formulation, two possible item-wording explanations are worth considering. First, participants may have interpreted items as referring broadly to life rather than just work, a possibility less likely with other scales in this study due to their wording. Meaning making was not originally an organisational scale and three of its items refer to "my life", which might cause respondents to rate aspects of life not relevant to other items and scales.

Second, participants may have perceived "meaning" or "meaningful" as applying only to *significantly* adverse events, a perception which is also less likely with the wording of other scales. Luthar et al. (2000), amongst others, suggests that resilience is only invoked in significant adverse events: difficulties faced in participants' daily working life may not have been significant enough to require meaning making. Also, respondents were at middle or lower levels of management and may have less general

need for meaning making in work than those at higher levels (van den Heuvel et al., 2009; Wrzesniewski et al., 2003). On the other hand, the present results may indicate meaning making is a psychological phenomenon distinct from resilience, a possibility that should be examined by future replication studies.

4.4.4 RELATION TO OTHER CONSTRUCTS

Construct validity of the new measure is shown in positive correlations between its two dimensions and between resilience and measures of proactive coping, self-esteem and psychological vulnerability. The latter findings address calls in the POS and POB literature for new constructs that influence employees' performance and well-being. Proactive coping involves psychological resources for improving well-being, such as personal control and self-regulation capabilities (Greenglass, 2002). These are future-oriented capabilities, directed towards challenging goals and personal growth rather than merely coping with current stresses, and are therefore related to both the developmental persistency and positive emotion dimensions of resilience. This may imply resilience is related to self-esteem, as proposed in previous positive psychology studies (K. A. Dutton & Brown, 1997; Lyubomirsky et al., 2006).

The negative correlation between resilience and psychological vulnerability is consistent with other studies showing negative correlations between psychological vulnerability and measures of positive coping resources such as self-efficacy and dispositional optimism, and positive correlations with negative affect (Sinclair & Wallston, 1999). The belief set associated with developmental persistency and positive emotion is expected to reduce vulnerability in facing challenges.

4.5 LIMITATIONS

This study has a number of limitations. First, the survey data were collected through self-reports at a single point in time. This approach may lead to the potential problems of common method bias, especially since respondents are asked to consider resilience in the context of proactive coping, self-esteem and psychological vulnerability. As Podsakoff et al. (2003) warn, this potentially affects the observed correlation between variables. Second, the sample is limited to six industries, which may not appropriately represent the characteristics of large established companies in general. Further, the sample companies were in highly competitive industries and

generalization to large established companies in less competitive fields is not guaranteed. As well, the present results apply to middle managers and may not describe resilience in either more senior managers or non-managerial employees. Third, the resilience scale must be considered preliminary, particularly from the point of view of construct validity. Further replication with independent samples from other organisations and industries to check its reliability and validity should be considered. Fourth, as the study was conducted in Indonesia, its applicability to other countries and cultures is unknown without further research. Finally, translation of the questionnaire into Indonesian is a potential limitation, although back translation appears to have minimised distortion of items.

4.6 DIRECTIONS FOR FURTHER RESEARCH

4.6.1 REFINING THE NEW MEASURE

The findings of Study 1 suggest several directions for further research on the construct of resilience. One involves refining the new measure. While it appears to have sound psychometric properties, additional studies to further refine the items and dimensions, and perhaps to more comprehensively capture the domain of resilience, are recommended. This includes clarifying the distinction between major adversity and daily challenges that is often implied in the literature but rarely made explicit in theories. In particular the meaning making dimension, although failing to meet the criteria for EFA, warrants further studies since some theories support its inclusion as a dimension of resilience. For example, studies of post-traumatic growth, which has many characteristics related to resilience, show meaning making to be important (Maitlis, 2011).

4.6.2 CHECKING CONSTRUCT VALIDITY WITH OTHER POSITIVE CONSTRUCTS

Further testing of construct validity with other constructs or variables is needed. The rich body of knowledge in POS and POB presents a wide range of variables measuring distinctive individual strengths and virtues, many of which appear related to resilience and may therefore help further refine the theoretical foundations of the new construct. Qualities which can be developed by individuals or organisational interventions, and which suggest a growth rather than survival orientation, are worthy of consideration.

Luthans, Youssef et al. (2007) suggestion for further study of their psychological capital construct in cognitive, affective and social domains provides a lead. Resilience may be related to cognitive constructs such as creativity and wisdom, and affective constructs such as wellbeing, flow and humour. In the social domain, variables such as forgiveness, gratitude or spirituality may be relevant. The extent to which all such variables are developable and consistent with the present emphasis on growth should be considered. These variables have not been widely studied, compared to variables such as reinforcement, empowerment, engagement or participation (Luthans, Youssef, et al., 2007).

4.6.3 RESILIENCE AND NEGATIVE CONSTRUCTS

Research generally focuses on the positive, adaptive function of individual resilience in, for example, increasing adaptation or performance. However, its relationship with negative constructs is rarely studied. For example, relating resilience to escalation of commitment would extend the literature in a new direction. Research on escalation of commitment to a lost cause shows it is influenced both by cognition and emotion (Wong, Yik, & Kwong, 2006). Whether a highly resilient person tends to have less escalation than a person with low resilience is an interesting question arising from the growth perspective. More generally, resilient people would become more realistic over time as they develop cognitive and emotional capabilities for dealing with difficult situations. This may reduce their susceptibility to many perceptual and decision-making biases beyond escalating commitment.

4.7 PRACTICAL IMPLICATIONS

This study has implications for a large body of research that suggests ways of improving resilience. For instance, Luthans et al. (2006) offer "micro-interventions" based on building awareness of personal assets such as talents, skills and social networks. Recently, the positive psychology literature has provided several individual interventions for improving individual's positive capacities, such as the "positivity portfolio" (Fredrickson, 2009), and "happiness" (Lyubomirsky, 2007), or "engagement and thriving" (Spreitzer et al., 2012) interventions.

The present growth-focused concept of resilience can inform practitioners, managers and individuals seeking to develop resilience. Linley and Garcea's (2011)

individual strength intervention could be adopted to increase intrapersonal and interpersonal competence. Although they do not explicitly discuss resilience, their model can easily be construed to fit a growth perspective of it.

The developmental persistency dimension in particular is highly relevant to intrapersonal interventions where people learn to accurately understand themselves and minimise their dysfunctional biases. The conceptual definition, dimensional structure and measure of resilience proposed here can be used as the basis for improving employee's understanding of and skills for developing their resilience through greater self-awareness. A large body of studies in POB and POS indirectly suggest the significance of self-development program for individuals and their benefits to organisation (Boyce, Zaccaro, & Wisecarver, 2010; Spreitzer, Kizilos, & Nason, 1997; Spreitzer et al., 2012). Such interventions would help employees perceive challenges and difficulties in their work, including those involved in innovation, as an opportunity to improve their basic qualities as a person and worker. It is likely employees have much implicit knowledge of how to develop their whole self, including their resilience. Such personal-development interventions might benefit from clinically-trained psychologist's experiences in "personal growth" programs.

Using Bieswas-Diener's "strength development" approach (2011, p. 111), individuals could develop their resilience by cognitively attending to its proficiency, frequency and regulation as a personal strength and increasing awareness of its causes and consequences.

Developmental persistency as a dimension of resilience is also consistent with Dweck's (2008) "malleable self-theory". In this, belief systems organise and shape people's goals, strivings, understanding and reactions to the situation. Some people believe that their most basic qualities can be developed through effort and education, or in the case of resilience through facing adverse situations with a growth-focused mindset. Dweck distinguishes people with an "entity" mindset, who view their ability and intelligence as an unchangeable, fixed internal characteristic from those with an "incremental" or growth mindset, who believe their abilities and intelligence are malleable and can be increased through effort. This approach is very compatible with the present view of resilience.

An understanding of the growth dimension of resilience can also help interventions for developing employees' interpersonal skills. In coaching employees, managers could use the present construct and measure to facilitate dialogue about

employees' strengths. There is a widespread view that people in organisations tend to be less specific when describing their strengths than their weakness (Linley & Garcea, 2011). They tend to underestimate their strength, or be "blind" to it, because it is seen as "ordinary" rather than "extraordinary" (Bieswas-Diener, 2011, p. 113). An accurate understanding and measure of resilience would help correct this bias, and therefore simplify and facilitate coaching sessions.

4.8 CONCLUSION

This chapter has described the development and testing of a new measure of resilience incorporating dimensions from existing measures but with a new focus on a person's intention to face adversity as an opportunity to grow. Rather than merely recovering or "bouncing back", a growth motivation enables a person to become more integrated and adaptable through developing new mental resources for facing future challenges and adversities. This construct better fits the POS and POB perspective than current definitions and measures. Four dimensions were tested: perseverance, positive emotion, and meaning making were drawn from previous studies, and commitment to growth was hypothesised to address the growth factor following humanistic studies of motivation. The results provided empirical support for two of these dimensions, development persistency and positive emotion.

This factor structure appears to offer a parsimonious and methodologically sound measure of resilience with relatively high factor loadings, internal reliabilities within acceptable standards and high inter-item correlations. Construct validity was demonstrated by predicted correlations with related measures of proactive coping, self-esteem and psychological vulnerability.

Cognitive, emotional and behavioural interventions for increasing resilience have been suggested (Luthans, Avey, et al., 2006), but so far developmental persistency or growth have not been intrinsic to these. An emotionally-positive focus is also implied in previous studies of specific emotions in resilience, but so far has not been a central part of the construct. The present study suggests a new conceptualisation in which these are primary dimensions of resilience. Both are consistent with the POS and POB view of resilience as a developable quality rather than a relatively fixed 'trait'.

Prior studies suggest resilience can be developed by focusing on individuals' knowledge and adaptability (Sutcliffe & Vogus, 2003), or self-enhancement skills and attachment style (Bonanno, Field, Kovacevic, & Kaltman, 2002). However, these

mostly focus on reactions to specific adverse events rather than the broader development of a person's inner resources. The present construct extends these perspectives by emphasising that resilient people think proactively and see adversity as an opportunity to grow and become a better person. Maintaining a positive outlook is also a fundamental strategy. With this perspective, individuals can develop resilience without being distracted by the risk of failure.

Future studies should replicate the current findings and consider interventions for increasing developmental persistency and positive emotion. Such interventions can build on a number of strategies proposed for related POS or POB concepts, including developing a positive outlook, understanding one's strengths, reducing biases and changing from a fixed-entity mindset to a growth mindset. The definition, dimensions and measure of resilience developed here could be useful in such programs.

CHAPTER FIVE – STUDY 2
THE RELATIONSHIP BETWEEN RESILIENCE
AND INNOVATIVE BEHAVIOUR

5.1 INTRODUCTION

The primary research question of this thesis is how resilience affects individual innovative behaviour in large organisations. Chapter 4 described the development and testing of a new scale to measure a holistic construct of resilience focused on an individual's desire to grow out of adversity rather than merely recover from it. This construct was drawn from a review of the literature suggesting four possible dimensions. The results of Study 1 suggest combining two of these (perseverance and commitment to growth) into a new dimension of developmental persistency, and a third dimension, positive emotion forms the second dimension of the new construct. A fourth proposed dimension, meaning making, was not related to resilience. This does not change the prediction of a relationship between resilience and innovation, but suggests any effect of meaning making on innovation operates separately from that of resilience. Meaning making is therefore not further tested in this thesis.

This chapter describes a study relating resilience to individual innovation using a second sample from the same population as Study 1. Confirmatory Factor Analysis (CFA) is used to further validate the factor structure of the new resilience scale and Structural Equation Modelling (SEM) is used to analyse the relationship between the two constructs of interest. Theoretical and practical contributions of the resulting model, and its limitations and possibilities for future research, are addressed.

The clinical and organisational studies reviewed in Chapter 2 provide many advances in understanding the role of resilience in various contexts of human functioning, including the workplace. Resilience is found to be positively related to employees' performance (Luthans, Youssef, et al., 2007), positive work attitude (Larson & Luthans, 2006) and capacity to thrive despite intense setbacks (Sutcliffe & Vogus, 2003). However, its influence on innovative behaviour has not yet been studied. Research into organisational behaviour recognises the challenges of practising innovation and discusses some important influences, but has not so far considered resilience.

Links between resilience and innovative behaviour were identified in the literature review. Innovation is a challenging process requiring determination and skills for self-management, finding resources and developing relationships with stakeholders. Innovative employees need the psychological capacity to overcome difficulties and continue making progress. In the idea generation stage, for example, cognitive capabilities and strategies for working through obstacles and emerging with new and useful ideas are needed (Amabile et al., 2002; Dyer et al., 2011). An employee seeking to create new ideas may face challenges in questioning existing ideas, observing complex situations or experimenting with new ideas.

In the idea promotion stage, innovators must often try to convince sceptical co-workers or supervisors to accept ideas and support them. They have to be persistent in understanding others' interests (Grant & Berry, 2011) and building political support (de Jong & den Hartog, 2007). Similarly, in the idea implementation stage executors of new ideas may face sceptical responses and conflicts and need to create strategies for gaining support from colleagues and supervisors (Choi & Chang, 2009).

Understanding the roles of developmental persistency and positive emotion in these situations is therefore important to broadening the scope of organisational research and practice concerning innovation.

5.2 RESEARCH HYPOTHESES

Linking the construct of resilience developed in Chapter 4 with the three stage construct of innovation (Scott & Bruce, 1994; West & Farr, 1990) discussed in Section 2.7 leads to two hypotheses:

Hypothesis 1: Developmental persistency will be positively related to the three dimensions of innovative behaviour.

Hypothesis 2: Positive emotion will be positively related to the three dimensions of innovative behaviour.

Study 2 focuses on these dimension-to-dimension relationships between the two constructs (Figure 5.1).
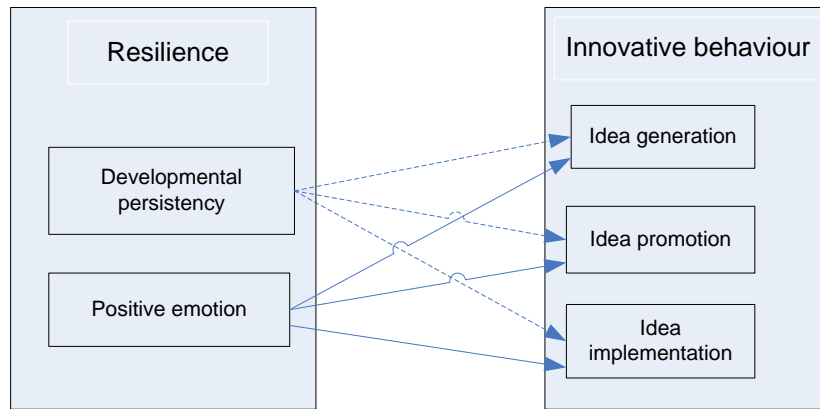
Figure 5.1 Hypothesised relationships between resilience and innovative behaviour

5.3 METHOD

5.3.1 SAMPLE AND PARTICIPANT SELECTION

The sampling method was similar to that in Study 1. A total of 345 questionnaires were distributed to 11 organisations, five of which were also involved in Study 1. In the latter organisations only employees of who had not participated in Study 1 were able to participate in Study 2. There were 226 responses—a response rate of 66%. Four of these were incomplete, leaving 222 for analysis.

An online questionnaire was also used in an attempt to increase the sample size. Four email groups used by business managers, with a total of 9100 members, were sent a link to the questionnaire using Qualtrics software. Twenty-seven responses were received but only 19 were valid. Altogether, 241 valid questionnaires were received.

Males formed 74% of the respondents. Nearly 82% of respondents were aged between 31 and 50 years old. Around a quarter worked in the property industry and the 22% were in the infrastructure sector. Respondents tended to work in production or operations (32%), or marketing (25.7%). Overall, the characteristics of this sample (Table 5.1) generally reflected the sample in Study 1 (Table 4.1). The main difference, in the industry profile, is not expected to affect the results.

Table 5.1 Characteristics of participants in Study 2

Variables	Categories	Percentage of participants (n=241)
Gender	Male	73.9
	Female	26.1
Age	<30	10.4
	30–40	62.2
	41–50	20.3
	>50	7.1
Industry	Mining	10.8
	Property	25.7
	Telecommunications	15.8
	Agribusiness	8.3
	Media	17.4
	Infrastructure	22.0
Department	Marketing	25.7
	Finance	18.3
	Operations or production	32.4
	Human resources development	9.1
	Other	14.5

5.3.2 PROCEDURE

As in Study 1, the research assistant approached a contact person in each company to arrange distribution and collection of the questionnaires. To maximise the response rate, he sent a reminder email or telephoned the contact person at two-weekly intervals. Respondents put their responses in a box provided at the reception desk. The time required to collect the questionnaires varied from two to five weeks.

The techniques used to reduce common method bias in Study 1 were also used here, along with the procedures for ensuring informed consent, anonymity and confidentiality of the data.

5.3.3 MEASURES

Resilience was measured with the scale developed in Study 1, and innovative behaviour with Janssen's (2000) scale (Appendix F). The latter has nine items measuring three stages of individual innovation: idea generation, idea promotion and idea, with three items for each stage. Although Janssen's construct is considered unidimensional, its division into three distinct stages suggests the possibility of multidimensionality and this is tested in this study. Janssen's scale uses a 7-point scale, with 1 indicating "never" and 7 indicating "always".

Two measures related to the construct validity of the resilience measure in Study 1, *self-esteem* (C. G. Richardson et al., 2009) and *psychological vulnerability* (Carver et al., 1989), were used in Study 2. A third measure was Carver's Active Coping Scale (Carver et al., 1989) which is similar to the Proactive Coping scale used in Study 1. It was used here in place of Proactive Coping to broaden the assessment of construct validity. This scale measures one dimension of the multidimensional Problem-Focused Coping Inventory (Carver et al., 1989), which also includes *planning*, *suppression of competing activities, restraint coping* and *seeking of instrumental and social support*. These dimensions are based on Lazarus and Folkman's Ways of Coping measure of thoughts or actions in facing stress (Lazarus & Folkman, 1984). Carver et al. define active coping as "the process of taking active steps to try to remove or circumvent the stressor or to ameliorate its effect" (Carver et al., 1989, p. 268), similar to Lazarus and Folkman's "problem-focused coping". Response choices are "I usually don't do this at all", "I usually do this a little bit", "I usually do this a medium amount", and "I usually do this a lot".

Carver et al. (1989) found the Active Coping Scale had an acceptable Cronbach's alpha (α=.6), and test-retest reliability showed fairly stable self-reported coping tendencies. To test construct validity Carver et al. correlated this scale with personality measures of variables such as optimism, self-esteem, hardiness and anxiety. As predicted, active coping was positively correlated with optimism, self-esteem and hardiness, and negatively correlated with trait-anxiety.

5.3.4 QUESTIONNAIRE DESIGN AND ADMINISTRATION

The paper questionnaire had four pages, including a one-page information letter, and the resource list used in Study 1 was also included as an incentive. The questionnaire was divided into six parts: (1) demographic and control measures, (2) resilience measure, (3) active coping measure, and (4–6) self-esteem, psychological vulnerability and innovative behaviour measures (Appendix F). Procedures for distributing and collecting the questionnaires were the same as in Study 1 (4.2.2).

At the end of the questionnaire respondents were offered a summary of the research as a reward, to be sent to their email address. To ensure this did not violate their anonymity, this from was detached and returned to the researcher separately from the questionnaire with the advice "Please provide your contact details. These details are

separated from the questionnaire to eliminate the identity of the respondents. Contact details are only used for the purpose of sending the report summary".

5.3.5 DATA ANALYSIS

Study 2 used a multistage approach involving normality assumption testing followed by Confirmatory Factor Analysis (CFA) using Structural Equation Modelling (SEM) with the maximum likelihood method. The CFA reassessed the factor structure of the resilience scale developed in Study 1, in line with Anderson and Gerbing's (1988) recommendation for evaluating the quality of the measurement model prior to assessing the theoretical model. The goodness-of-fit of both resilience and innovative behaviour measurement models was then evaluated. After respecifying each model, the causal relationship between resilience and innovative behaviour was assessed. This analysis also used CFA but linked resilience to innovative behaviour on the dimensions of each construct to address research questions 2 and 3. Finally, correlations between resilience and proactive coping, self-esteem and psychological vulnerability were obtained to assess construct validity.

1. Missing data analysis

Only 12 (4.7%) of the 253 responses had missing data requiring elimination. Garson suggests list-wise deletion where the number of cases to be dropped is small; the elimination of 5% of the sample is acceptable if the sample is fairly large. Two hundred and forty-one responses were used for analysis.

2. Assumption testing

SEM assumes normality, requiring the skewness and kurtosis of each variable to be evaluated (Blunch, 2008; Hair et al., 1998). For univariate normality, skewness and kurtosis values should be between 3.0 and 8.0 respectively (Kline, 1998). Multivariate normality, particularly multivariate skewness should also be tested, with 7 recommended as the maximum value (Byrne, 2010).

In this chapter, "latent variables", "latent constructs" and "factors" are used interchangeably to represent concepts. Likewise, "measured variables", "observed variables" and "indicators" all refer to objective measures.

The evaluation of the confirmatory model involved four stages (Byrne, 2010): first, specifying respective latent constructs and letting them freely covary; second,

assessing the identification status of each model; third, evaluating the fit of the model with the data; and fourth, respecifying and retesting the modified model if its initial fit is poor.

3. Model specification

This involves identifying presumed relationships among variables in a model and their connection to the latent constructs and their respective measurement variables. In an SEM measurement model latent constructs are allowed to freely covary, whereas in a causal structural relationship a causal direction between the latent constructs is hypothesised in addition to the correlation.

4. Model identification

For a model to be identified a CFA must yield an exclusive set of parameter estimates (Blunch, 2008; Byrne, 2010). Two conditions must be fulfilled: first, the number of observations must be equal to or more than that of the parameters to be estimated; and second each latent construct must be specified with a measure. The total number of parameters is the number of entries in the sample covariance matrix in lower diagonal form, calculated as $V(V+1)/2$ where V is the number of observed variables (Kline, 2011, p. 101). The difference between the number of observations and the number of parameters is the model's degrees of freedom. If there are more parameters than observations the model is under-identified, and if observations outnumber parameters the model is over-identified. A common practice for a latent construct is to fix its variance to an arbitrary choice of 1 (Blunch, 2008).

5. Model estimation and evaluation

Next, the model is estimated and the degree to which it matches the data assessed. In this study the Maximum Likelihood (ML) method of AMOS was used. The ML method calculates model parameters simultaneously to maximise the fit of the observed covariances to the hypothesised population, which in large samples should be unbiased, efficient and consistent (Kline, 2011, p. 155).

The model was assessed by its goodness-of-fit and construct validity, including convergent and discriminant validity, using standardised regression weights (factor loadings), the variance extracted, and the reliability score for the construct.

Goodness-of-fit was measured by multiple indices as suggested by Blunch (2008) and Brown (2006). This approach is considered better than depending on a single index, especially when it covers three types of goodness-of-fit: absolute fit, incremental fit and parsimonious fit (Hair et al., 1998; Kline, 2011). The fit indices suggested by Kline (1998) and Hu and Bentler (1999) were used:

- the chi-square (χ^2) test
- the Comparative Fit Index (CFI) and
- the Root Mean Square Error of Approximation (RMSEA).

In addition, since the χ^2 test is considered biased in large samples (Brown, 2006; MacCallum, Browne, & Sugawara, 1996), the χ^2 to degrees of freedom ratio (χ^2/df) is considered more realistic in SEM empirical research (Fornell & Larcker, 1981). As recommended by Byrne (2010) and Kline (1998), the cut-off criteria were $\chi^2/df < 3$, CFI > 0.9, and RMSEA < 0.6 with a p value of PCLOSE > 0.5.

The likelihood of the parameter estimates was assessed for conditions suggested by Byrne (2010). First, the sign and size of the parameter estimates were checked for consistency with expected directions. Second, the standard errors of the parameter were checked for extreme values and problems in associated parameters (Hu & Bentler, 1999, p. 40). Finally, the parameter estimates were examined for statistical significance. To achieve model parsimony, non-significant parameters were considered for deletion (Byrne, 2010). All of these conditions indicate the feasibility of the confirmatory model.

6. Model modification and respecification

The goodness-of-fit suggests whether or not the model should be modified and respecified. Byrne (2010) proposes that in modifying a model we should consider empirical knowledge and substantive theory, the various indices of fit, and parsimony. When the model was not an adequate fit, the size of the factor loadings, represented by standardised regression scores, was checked. Standardised residuals and the pattern of large Modification Indices (MIs) (Brown, 2006; Kline, 1998) were also examined. The standardised residual matrix produced by AMOS captures the discrepancy between the covariance matrix implied by the hypothesised model and the sample covariance matrix. The MI provided by AMOS reflects the expected drop in the overall χ^2 value if the parameters were to be freely estimated in a subsequent run.

Factor loadings were evaluated by Tabachnick and Fidell's (2007, p. 625) criteria. A factor loading below .32 implies a poor indicator, below .45 a fair or reasonable one, below .55 a good one and below .63 a very good one. A loading of .71 and above indicates an excellent indicator. Byrne (2010) suggests the standardised residual value should be less than 2.58. The largest MI and its respective "par change" predict the estimated change in the parameter and model fit based on analysis of covariance and regression weights. A large MI value indicates measurement error, reflecting respondent or item characteristics or an overlap in item content (Byrne, 2010). Along with these norms, the validity of each problematic item was considered to ensure its removal would not weaken the essence of the measure.

7. Construct validation: Convergent and discriminant validity and composite reliability

This study evaluated construct validity by examining the standardised loading estimates, the Average Variance Extracted (AVE) and the construct reliabilities. As recommended by Hair et al. (1998), two criteria for convergent validity are an AVE of .5 or higher and construct reliabilities of .78 or higher. Discriminant validity was checked through the subscales in each measurement model, using procedures suggested by Fornell and Larcker (1981). When the AVE values of each pair exceed the squared correlations, the variance in a latent construct's indicators is more than the variance of other constructs and this is considered evidence of discriminant validity.

8. Testing the validity of the causal structural relationship

After analysing the validity of the measurement model for resilience and innovative behaviour, a full structural equation model of the hypothesised causal relationship between the two dimensions of resilience and the three dimensions of innovative behaviour was tested. The procedures and norms used in the CFA of the measurement model were used for this.

5.4 RESULTS

5.4.1 CONTROL VARIABLES

The control variables were again checked prior to the main analyses. An independent-samples t-test showed no difference between the mean innovation scores for females (M=49.68, SD=4.2) and males (M=50.02, SD=3.3), with $t(239)=1.62$ and

the two-tailed $p=.52$. Similarly, one-way analyses of variance showed no differences in mean innovation according to age ($F(3,237)=.68$, $p=.56$), industry ($F(5,235)=0.8$, $p=.53$) or hierarchical level ($F(4,236)=1.6$, $p=.16$).

5.4.2 VALIDATING AND REFINING THE RESILIENCE MODEL

Normality assumption testing

Both univariate and multivariate normality tests showed all items to be within the acceptable range of skewness and kurtosis, except for one with a skewness of 6.2. The multivariate kurtosis was 5.8, within the criterion of <7 (Byrne, 2010). Therefore, the ML method of estimation is appropriate.

Model specification

Table 5.2 describes the variables used in the CFA of the new resilience scale.

Table 5.2 Resilience model variables

Developmental Persistency	Dimension
Grow5, Per2, Per3, Grow4, Grow1, Per4, Per5, Per1, Grow2, Per7	Items
eg5, ep2, ep3, eg4, eg1, ep4, ep5, ep1, eg2, ep7	Error terms
Positive Emotion	Dimension
Pos2, Pos3, Pos4, Pos5, Pos6, Pos7	Items
epo2, epo3, epo4, epo5, epo6, epo7	Error terms

The resilience model consisted of two latent constructs with 16 measured variables (Figure 5.2), ten describing developmental persistency and six describing positive emotion.
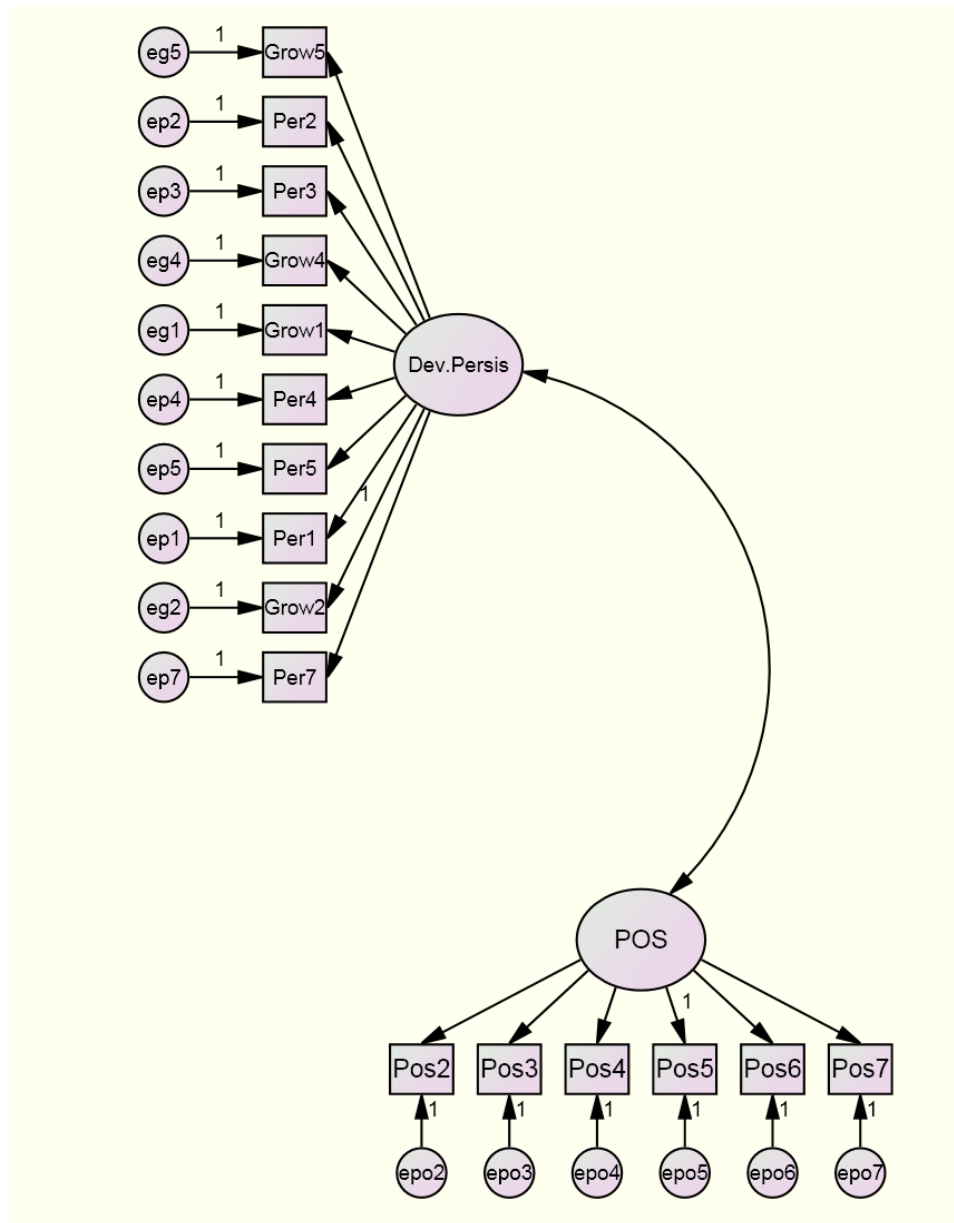
Figure 5.2 Initial model of resilience

Model identification

The AMOS results showed 136 observations available and 33 parameters to be estimated. The difference of 103 suggested an over-identified model with sufficient information for estimation. The variance of each latent construct was then limited to 1, allowing the paths from latent construct to indicators to be estimated.

Model estimation and evaluation

Appendix G summarises the overall fit for the confirmatory model. Column 2 suggests a reasonable fit. Although the χ^2 test suggested the fit of the hypothesised model was not entirely adequate ($\chi^2(103)=168.59$ $p< 0.01$), as discussed in 5.3.4 the χ^2

test is often inadequate by itself (Byrne, 2010; MacCallum et al., 1996). The χ^2 ratio of 1.64 was below 3, indicating a good fit between the observed matrix and model matrix. Furthermore, the CFI of 0.91 also indicated a moderately good fit and the RMSEA of 0.052 (PCLOSE=0.41) strengthened support for this.

Following Byrne's (2010) guidelines, the parameter sign and size were examined and found to be as expected. Furthermore there were no irrational parameter estimates, such as negative variances or correlations larger than one. Most of the items had an acceptable standard error between 0.1 and 0.4, and there were no excessively large or small values. The Critical Ratio (CR) of all parameter estimates was above 1.96, showing all factor loadings and variances to be significant.

These initial results show the model had a moderate fit to the data, reasonable parameter estimates and acceptable indicators of the latent construct. However, these indicators were improved by refining the model using the procedures recommended by Byrne (2010) as follows.

Model modification and respecification

Following Byrne's procedure the factor loadings, standardised residuals and MI indices were first inspected.

Factor loading

The standardised regression coefficients varied from .380 to .726. Eight met the "reasonable" criterion, two were between "poor" and "reasonable", two were "good", three were "very good" and one was "excellent".

Standardised residual and MI indices

The standardised residuals were all lower than the criterion of 2.58. The MI indices showed two paths with covariance and one with regression weights that should be considered. However, the covariance of paths between two error term pairs, **ep4** and **ep5** and **epo5** and **epo4,** were problematic.

In Byrne's (2010) guidelines, continuing with respecification depends on how meaningful the estimation of the targeted parameter is and the possibility of re-specification leading to an over-fitted model. After considering the content validity of items and the likelihood of compromising the quality of the measure, item **Grow5** was deleted. A small factor loading value of 3.8 suggested it did not reflect the construct, and deleting it did not appear to compromise the quality of the scale since its wording, "I actively look for ways to overcome the challenges I encounter" was relatively similar

to **Grow4,** "I can grow in positive ways by dealing with difficult situations." Both items describe a belief in facing difficult situations positively rather than avoiding them or giving in to them. However, the "I can grow" statement in item **Grow4** implies an element hypothesised as central to resilience and is therefore a better candidate than **Grow5.**

To examine the possibility of improving model fit, Byrne's (2010 p. 84) procedure for evaluating Modification Indices (MI) and Expected Parameter Change (EPC) was used. Byrne suggests that covarying error terms related to the same latent variable is an acceptable way to improve model fit provided that it has a theoretical explanation, it does not produce an over-fitted model, and the error terms in the same dimension. The error term pairs **ep4** and **ep5,** and **epo5** and **epo4,** which were in the same hypothesised dimensions, were correlated, suggesting the two elements are theoretically related (**Per4** *I don't give up when things look hopeless*, **Per5** *I tend to recover quickly from stressful events*; **Pos5** *I am usually optimistic and hopeful*, **Pos4** *I am usually confident in doing whatever I choose*). Such correlations suggest underlying factors not captured by the items. The final model is shown in Figure 5.3 (below).

As shown in column 2 of Appendix F, deleting **Grow5** and correlating **epo4** with **epo5,** and **ep4** with **ep5,** substantially improved the model goodness-of-fit to χ^2=116.61 ($\Delta\chi^2$ (ΔDF=16)=51.99, p<.01). The chi-square difference was higher than the critical value (51.99 > 26.29), the CFI increased to 0.96, the normalised chi-square decreased to 1.34 and RMSEA was lowered to 0.03 with a higher PCLOSE of 0.87. Therefore, this modified model was used in the causal structural analysis in 5.4.4.
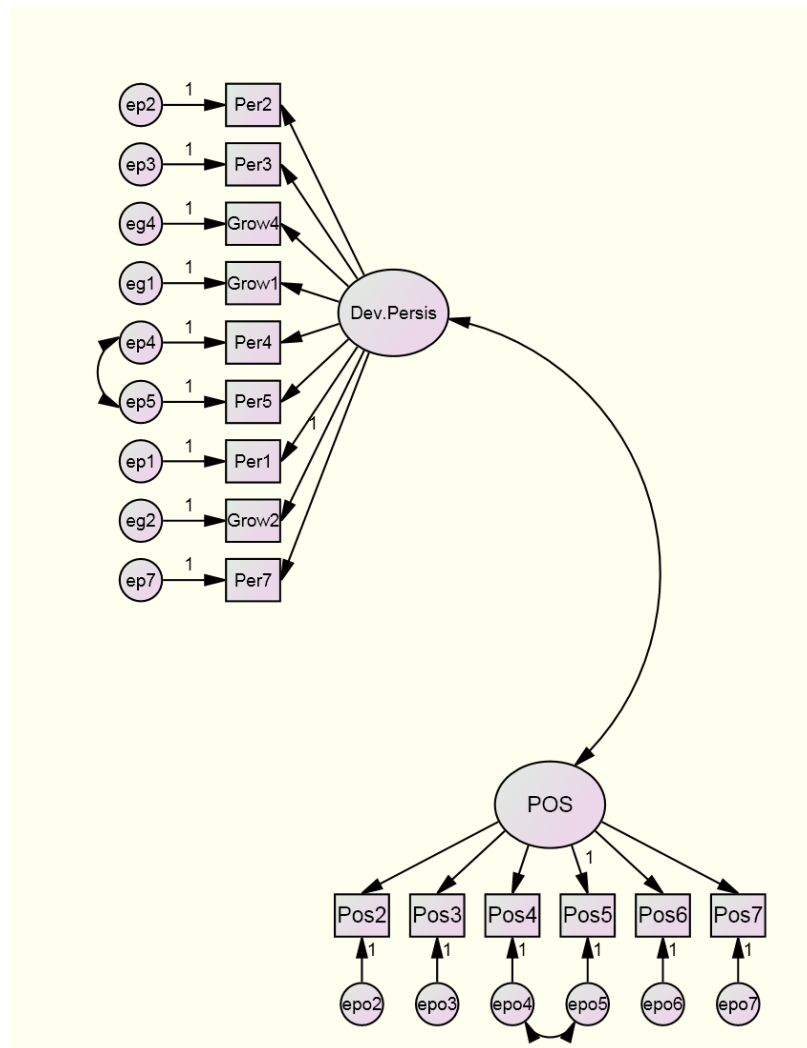
Figure 5.3 Modified model of resilience

5.4.3 CONSTRUCT VALIDITY

Construct validity was examined through the standardised factor loadings, the AVE and correlations indicating construct reliability as recommended by (Hair et al., 1998). The standardised loadings were generally acceptable: one item had a loading of "poor to reasonable", nine were "fair", three were "good" and two were "very good" or "excellent" (Tabachnick & Fidell, 2007). The factor loadings are shown in Table 5.3.

The AVE for each dimension was low, .34 for developmental persistency and .23 for positive emotion, implying weak relationships to their constructs. The evidence for convergent validity of the construct is therefore limited. However, the construct reliabilities were acceptable or close to acceptable for a new scale in relation to Hair et al.'s (1998) criterion of >.7: .81 for positive emotion and .63 for developmental persistency. Although the reliability for the developmental persistency construct is

lower than desirable, it is considered acceptable following Tharenou, Donohue and Cooper's (2007) suggestion that 0.60 is sufficient for a new measure.

Table 5.3 Factor loadings for the Resilience Scale

Item	Factor	Estimate
Pos5 <--- POS		.54
Pos4 <--- POS		.36
Pos3 <--- POS		.53
Pos2 <--- POS		.46
Pos6 <--- POS		.50
Pos7 <--- POS		.47
Grow2 <--- Dev.Persis		.44
Per1 <--- Dev.Persis		.55
Per5 <--- Dev.Persis		.53
Per4 <--- Dev.Persis		.63
Grow1 <--- Dev.Persis		.47
Grow4 <--- Dev.Persis		.47
Per3 <--- Dev.Persis		.74
Per2 <--- Dev.Persis		.64
Per7 <--- Dev.Persis		.64

Convergent validity was tested by correlations between resilience and *active coping*, *self-esteem* and *psychological vulnerability*. The results were consistent with Study 1. Resilience was positively correlated with *active coping* ($r=.61$, *p*<.01) and *self-esteem* ($r=.64$, *p*<.01), and negatively correlated with *psychological vulnerability* ($r=-.49$, *p*<.01). This and other related results are presented in Table 5.4.

Table 5.4 Descriptive statistics and correlations of construct validity measures

Variable	Mean	SD	1	2	3	4	5	6
1 Resilience	62.46	4.92	(.86)					
2 Dev. Persistency	38.39	3.54	.91	(.63)				
3 Positive emotion	23.86	2.27	.76	.43	(.81)			
4 Active coping	13.57	1.13	.61	.34	.74	(.79)		
5 Self-esteem	21.70	1.38	.64	.34	.88	.69	(.84)	
6 Psychological vulnerability	8.73	2.98	-.49[+]	-.50[+]	-.27[+]	-.25[+]	-.23[+]	(.79)

Note: n=241. Reliabilities of measures are displayed on the diagonal of the matrix (in parentheses). For all correlations *p*<.01 (two-tailed). [+]Kendall's-tau, *p*<.01.

Discriminant validity was assessed by comparing the correlation between developmental persistency and positive emotion (.43) with the square root of the AVE

of each (.58 and .47 respectively). Since the latter were slightly higher than their correlation, developmental persistency and positive emotion can be considered two different dimensions.

These results suggest the modified resilience measure has adequate construct validity, corroborating the conclusion of Study 1 that resilience consists of two dimensions, developmental persistency and positive emotion, and is best measured by the six and nine item scales developed for these dimensions. However, some aspects of the construct validity assessment suggest further testing is warranted.

5.4.4 INNOVATIVE BEHAVIOUR: COMPARING UNIDIMENSIONAL AND MULTIDIMENSIONAL MEASURES

While many studies treat innovation as a unidimensional construct, Kleysen and Street (2001) have argued that it is multidimensional as evidenced by de Jong and den Hartog's (2010) findings. Study 2 tested whether Janssen's (2000) construct should be treated as multidimensional, as a preliminary to relating it to the dimensions of resilience. This is consistent with Hair et al.'s (1998) proposal for testing relationships between first-order factors prior to testing those between higher-order factors. As a first step, CFA was used to explore the dimensionality of innovative behaviour.

Normality test

No items in the innovative behaviour scale had univariate skewness or kurtosis beyond the criteria, confirming their normality. The multivariate kurtosis test showed a CR value of 7.2, only slightly higher than the criterion, suggesting adequate normality of the scale at the multivariate level.

5.4.4.1 Unidimensional model of innovative behaviour

Items and error terms of the unidimensional innovative behaviour model are shown in Table 5.5.

Table 5.5 Unidimensional innovative behaviour model variables

Innovative behaviour	Construct
IB1, IB2, IB3, IB4, IB5, IB6, IB7, IB8, IB9	Items
e1, e2, e3, e4, e5, e6, e7, e8, e9	Error terms

Model specification

Following Janssen (2000), a model with one latent construct and nine measured variables was specified as shown in Figure 5.4.
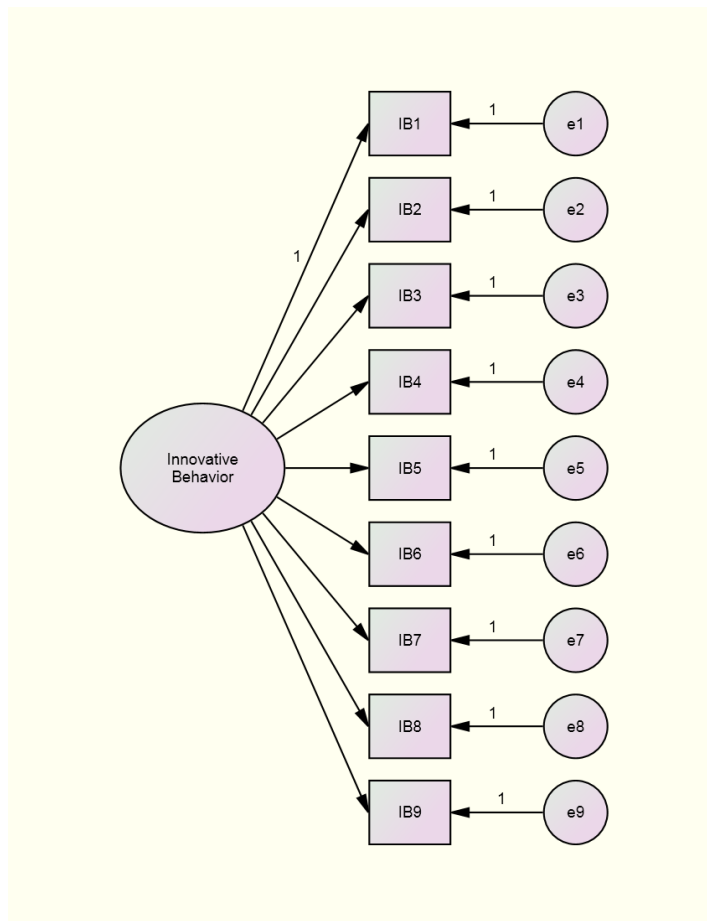
Figure 5.4 Initial unidimensional model of innovative behaviour

Model identification

A total of 45 observations were used to estimate the model, and with 27 degrees of freedom (45 minus 18) it is considered sufficiently identified. The variance of the latent construct was set to 1 and paths to its indicators were estimated.

Model estimation and evaluation

The Maximum Likelihood method was used to estimate the confirmatory model. As shown in column 4 of Appendix G, most indicators appeared outside the criteria for acceptability. The χ^2 test suggested that the observed matrix and the model-implied matrix were significantly different (χ^2 (27)=158.42, $p<0.01$). Although the χ^2 ratio of 11.23 was greatly above the recommended cut-off value of <3, implying support for the

model, the CFI of 0.49 was below the criterion of >9.00, showing a poor fit. The RMSEA value of 0.2 was higher than the criterion of <0.06, again suggesting a poor fit.

In summary, the fit indices showed the confirmatory model did not sufficiently represent the data and should be respecified.

Model modification and respecification

Three aspects of the model were examined in respecifying it: the standardised regression value (factor loading), the standardised residual values and the modification indices. The standardised regression value was left as it was because the scale was an established measure. The standardised residual values for each item were less than the cut-off value of 2.58. However, some covariances had high MI and par change values, showing misspecification associated with the pairing of error terms of items **IB7**, **IB8** and **IB9**. These three items were theoretically derived from the notion of idea application or implementation, so they should have a strong correlation with one another. **IB9** covered *evaluating the utility of innovative ideas*, **IB8** covered *introducing ideas into the work environment in a systematic way,* and **IB7** covered *transforming innovative ideas into useful applications*. However, it seems that the overlapping content was captured by the error terms as well as the items.

Given the high value of the MI, the apparent overlap of these three items, and their theoretical relationship, the model was modified to include the relevant error covariance parameters (Figure 5.5), substantially improving the model fit (Appendix G, column 5).
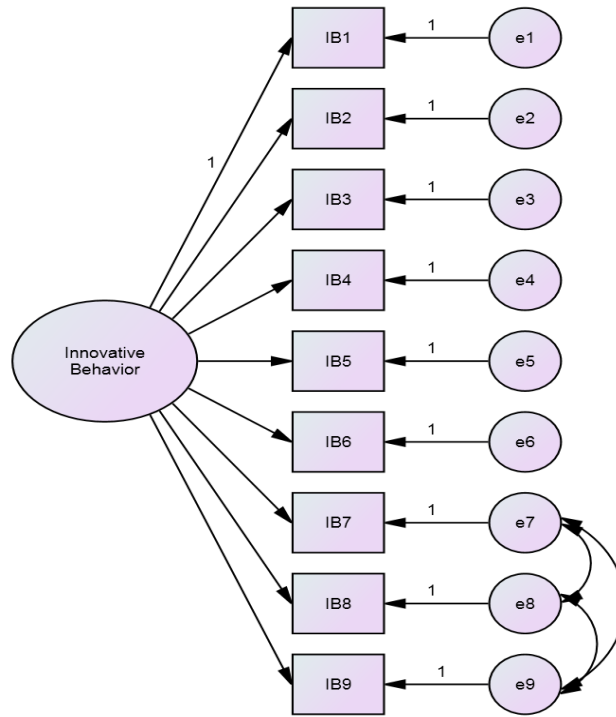
Figure 5.5 Modified unidimensional model of innovative behaviour

The overall chi-square decreased from 303.38 to 72.9, and the RMSEA from 0.2 to 0.065 (PCLOSE=0.5), while the CFI increased from 0.49 to 0.91. The RMSEA was slightly higher than the criterion of 0.06. A chi-square test showed a significantly better fit with the data, with $\Delta\chi^2$ (ΔDF=5)=230.48, greater than χ^2_{CV}=11.07, and $p< .01$.

These results identified a modified model of unidimensional innovative behaviour that could be compared with the multidimensional model.

5.4.4.2 Multidimensional model of innovative behaviour

The variables and error terms used in this section are shown in Table 5.6 below.

Model specification

The multidimensional model of innovative behaviour consists of three latent constructs, each with three measured variables (Figure 5.6 below).

Model identification

This model was over-identified, with 45 observations and 21 parameters to be estimated creating 45 – 21=24 degrees of freedom.

Table 5.6 Innovative behaviour as a multidimensional model: variables

Idea generation	Dimension
IG1, IG2, IG3	Items
egen1, egen2, egen3	Error terms
Idea promotion	Dimension
IP1, IP2, IP3	Items
epro1, epro2, epro3	Error terms
Idea implementation	Dimension
II1, II2, II3	Items
eimp1, eimp2, eimp3	Error terms
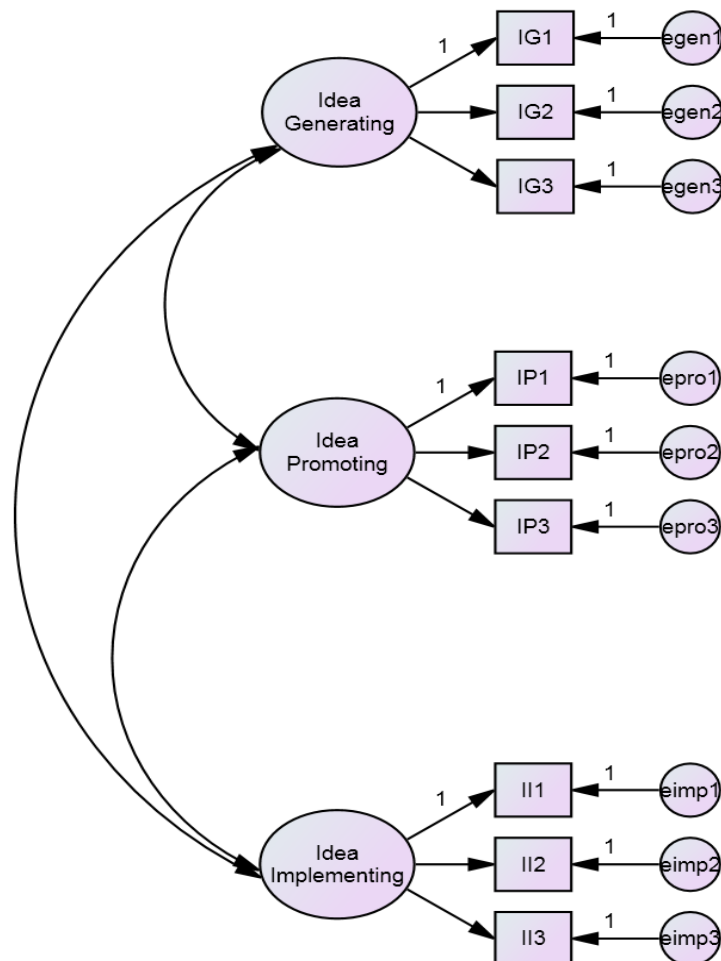
Figure 5.6 Initial multidimensional model of innovative behaviour

Model estimation and evaluation

Confirmatory factor analysis using the ML method was next conducted (Appendix G, Column 6). Most indices showed an ill-fitting model. For example, the CFI of 0.85 was below the criterion of >0.9, indicating a relatively poor fit. The RMSEA of 0.11 (PCLOSE=0.0) was much higher than the criterion of <0.06, and the χ^2/df of 4.44 was higher than the criterion of <3. Respecification was applied to make the model better represent the data.

The model parameter estimates were first checked. All variances were positive and no correlation was greater than one. Similarly, all items had a parameter CR of >1.96. Therefore, post-hoc model fitting was conducted to identify the area of misfit in the model, using MIs and regression weights. Several regression paths and covariances between error terms had large MI values. Since this model was based on an established scale, only the covariances between error terms were examined. Three covariances were of concern: **egen2** with **egen1, epro3** with **epro1**, and **epro3** with **epro2**. These error terms related to five items: **IG1** (*creating new ideas for difficult issues*), **IG2** (*searching out new working methods, techniques, or instruments*), **IP1** (*mobilising support for innovative ideas*), **IP2** (*acquiring approval for innovative ideas*) and **IP3** (*making important organisational members enthusiastic for innovative ideas*).

As Byrne (2010) suggests, when including correlated errors a strong substantive and empirical rationale is needed. Following his guidelines, Modification Indices and related Expected Parameter Change (EPC) values (2010, p. 84) were examined. The correlated error terms had the largest MI and PAR change values, suggesting there were justifiable opportunities to improve model fit by covarying error terms related to the same latent variable measure. Byrne (2010) advocates this procedure for improving model fit as long as it has some theoretical justification, the correlated error terms are all in the same hypothesised dimension and it does not produce an over-fitted model. These conditions were met here. First, the correlated error terms were all in the same hypothesised dimension, either idea generation or idea promotion. Second, there are sound theoretical justifications. Correlating the first pair of errors is consistent with the expectation that when employees create new solutions for difficult issues they also try to develop new working methods, techniques or instruments. The second correlation is consistent with the expectation that when innovators mobilising support or seeking approval will aim to make important organisational members enthusiastic. Each of these

interpretations is conceivably related to some underlying theoretical factor not captured by the two items, although the nature of these factors is left to future investigation.

With these justifications, the model was respecified as shown in Figure 5.7.
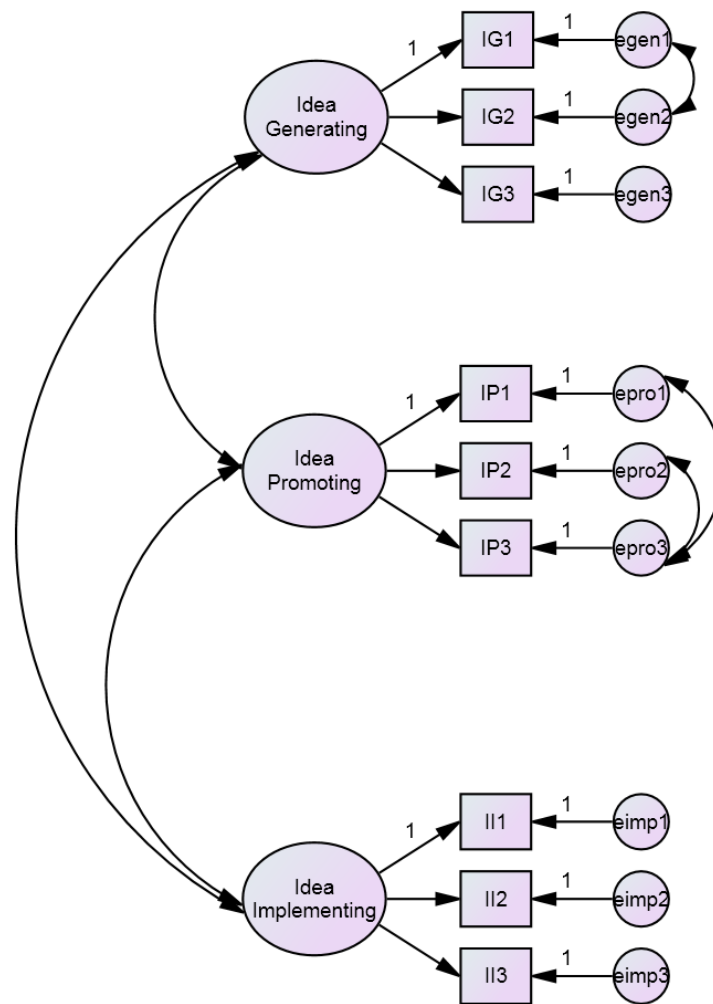
Figure 5.7 Modified multidimensional model of innovative behaviour

The CFA showed the modified model had a greatly improved fit to the data (Appendix G, Column 7). Specifically, the overall chi-square value decreased from 105.7 to 59.5. The normalised χ^2 was 2.8, within the cut-off criterion of <3, where previously it had been 4.4. The CFI increased from 0.85 to 0.93, which also exceeded the criterion of >0.9. RMSEA was 0.058 (PCLOSE=0.45), below the criterion of <0.06 and far better than the previous 0.1.

The chi-square difference test indicated a substantial improvement to the fit, $\Delta\chi^2$ (DF=3)=46.15 which exceeds the critical value of χ^2_{CV}=7.81.

This modified model was next compared with the modified unidimensional model.

Comparing uni- and multidimensional models of innovative behaviour

The χ^2 difference test indicated the multidimensional model offered a substantial improvement over the unidimensional version, with a difference in χ^2 value ($\Delta\chi^2(\Delta D$ $=5)=13.36$) larger than the critical value of $\chi^2_{CV}=3.84$, $p<.01$. This difference was consistent with the relatively low and insignificant correlations between the dimensions in the modified multidimensional model: $r=.18$ for idea promotion and idea implementation, $r=.27$ for idea generation and idea implementation. Idea generation correlated more strongly with idea promotion ($r=.50$), suggesting further confirmation of the independence of these dimensions may be worthwhile.

Therefore, while Janssen (2000) proposed a unidimensional model the present findings support the multidimensional model proposed by Kleysen and Street (2001) and de Jong and den Hartog (2010). The multidimensional construct was therefore used in assessing the causal relationship model (below), using a measure of innovative behaviour with three dimensions and nine items.

5.4.5 *THE RELATIONSHIP BETWEEN RESILIENCE AND INNOVATIVE BEHAVIOUR*

5.4.5.1 Two-step structural equation modelling

To assess the full causal structural equation model relating resilience to innovative behaviour the measurement of each variable should be psychometrically sound. In the two-step approach of Anderson and Gerbing (1988, p. 101), the measurement model is evaluated before the structural model, rather than evaluating both concurrently. The validity and reliability of the model is first assessed (Blunch, 2008) as it is difficult to identify and fix the sources of misspecification in a one-step model.

5.4.5.2 The measurement model

The quality of the measurement model was evaluated by allowing all latent constructs to correlate freely with one another. When this produced a satisfactory fit, the causal structural model was then imposed and the consistency of the model and the data examined. The model variables are presented in Table 5.7 (below).

Model specification

Five latent constructs were used to represent 24 measured variables, nine for *developmental persistency* (Dev.persis), six for *positive emotion* (POS) and three for

each dimension of innovative behaviour: *idea generation*, *idea promotion* and *idea implementation*. Figure 5.8 presents this model diagrammatically.

Table 5.7 Variables in the model relating resilience and innovative behaviour

RESILIENCE SCALE	
Dev.Persis	Dimension of developmental persistency
Per2, Per3, Grow4, Grow1, Per4, Per5, Per1, Grow2, Per7	Items
ep2, ep3, eg4, eg1, ep4, ep5, ep1, eg2, ep7	Error terms
POS	Dimension of positive emotion
Pos2, pos3, pos4, pos5, pos6, pos7	Items
Epo2, epo3, epo4, epo5, epo6, epo7	Error terms
INNOVATIVE BEHAVIOUR SCALE	
IG	Dimension of idea generation
ig1, ig2, ig3	Items
eig1, eig2, eig3	Error terms
IP	Dimension of idea promotion
ip1, ip2, ip3	Items
eip1, eip2, eip3	Error terms
II	Dimension of idea implementation
ii1, ii2, ii3	Items
ei1, ei2, ei3	Error terms
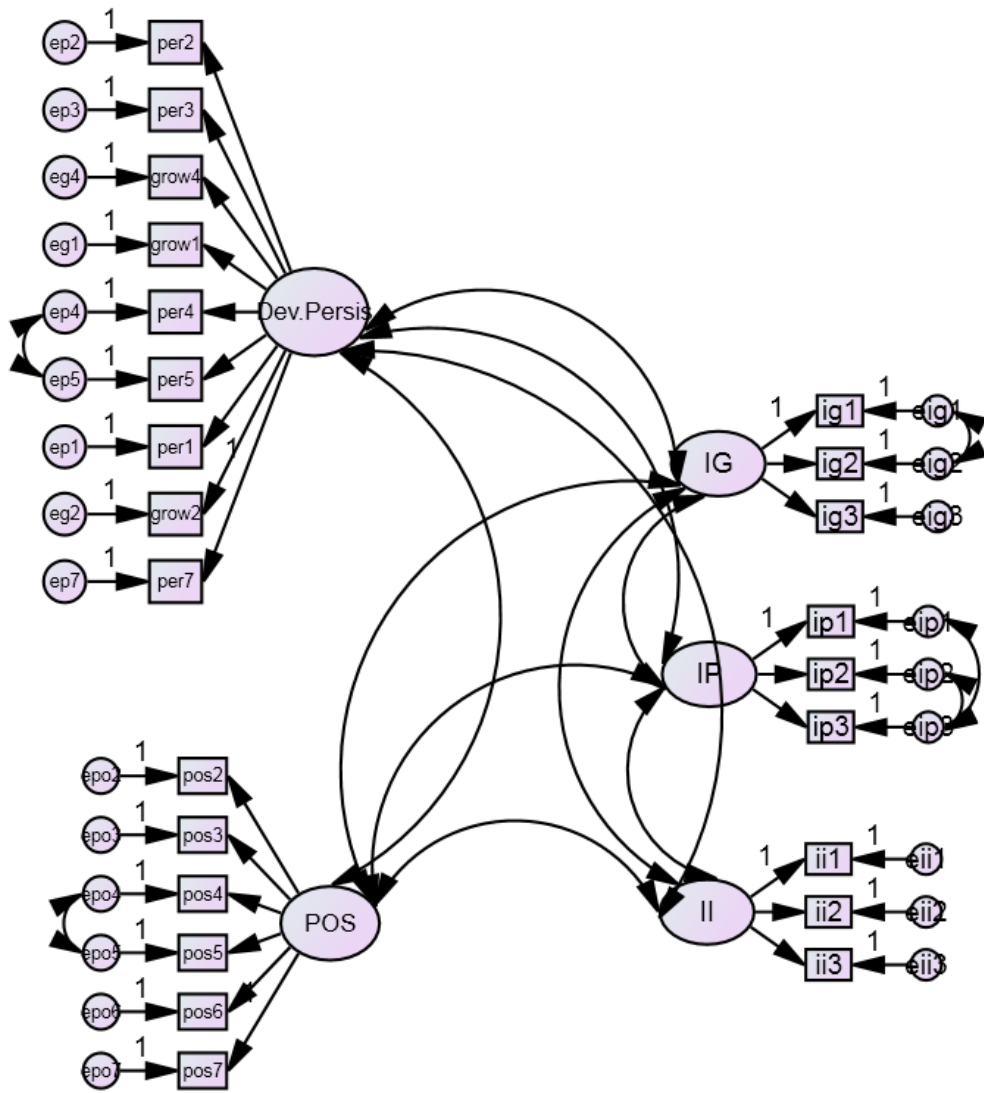
Figure 5.8 Measurement model relating resilience and innovative behaviour

Model identification

With 300 observations and 63 parameters to be estimated the model had 237 degrees of freedom and was therefore over-identified.

Model estimation and evaluation

Again, the ML estimation technique was used and the feasibility of the parameter estimates inspected. Column 8 in Appendix G shows a reasonable fit with the data, with most indices well within the criterion value. The χ^2 test result [$\chi^2(237)=346.16$] showed a relatively high value, and the $\chi^2/df=1.46$ suggested a good fit for the model, below the recommended maximum of 3. The CFI was 0.919, above the suggested value of 0.9 and implying a good fit. The RMSEA of 0.04 was below the required 0.06. Lastly, all standardised residuals were les than 2.58.

These results suggested the confirmatory measurement model relating resilience and innovative behaviour sufficiently fitted the data. Next, each parameter was checked. There were no negative variances or correlations larger than one, and no extreme values.

Factor loadings (standardised regression coefficients) ranged from 0.828 to 0.234. Against Tabachnick and Fidell's (2007) criteria most of these constituted "reasonable" indicators of their respective factors, with three "good", five "very good" and five "excellent". For example, **per7** (*I am not easily discouraged by failure*) appeared as a strong and reliable indicator of developmental persistency. Similarly, **ig3** (*generating original solutions for problems*) and **ip1** (*mobilising support for innovative ideas*) emerged as sound indicators of *idea generation* and *idea promotion* respectively. On the other hand, the factor loading of the path **ig1** to **IG** was 0.234, a poor indicator suggesting model trimming in order to improve model parsimony. However, the decision was made to retain this item (*creating new ideas for difficult issues*), since it is theoretically important as a measure of innovative behaviour. As this confirmatory analysis examines the relationship between factors and their indicators, the inter-factor correlations are not of interest here and are dealt with in a later discussion of the causal model.

In summary, the results show the confirmatory model had a reasonably good fit to the data and produced useable parameter estimates. The standardised regression analysis also supports the use of the items for measuring the latent constructs. This measurement model therefore appears valid for causal analysis.

5.4.5.3   Causal relationship between resilience and innovative behaviour

To test the causal model, the structural component of the confirmatory model was next imposed. Procedures for testing the model were identical to those described above.

Model specification

Figure 5.9 shows the hypothesised relationships between the two dimensions of resilience and the three dimensions of innovative behaviour, as argued in 5.2 and 5.4.1. As well, a path between *developmental persistency* and *positive emotion* was added to reflect the model of resilience developed from Study 1.
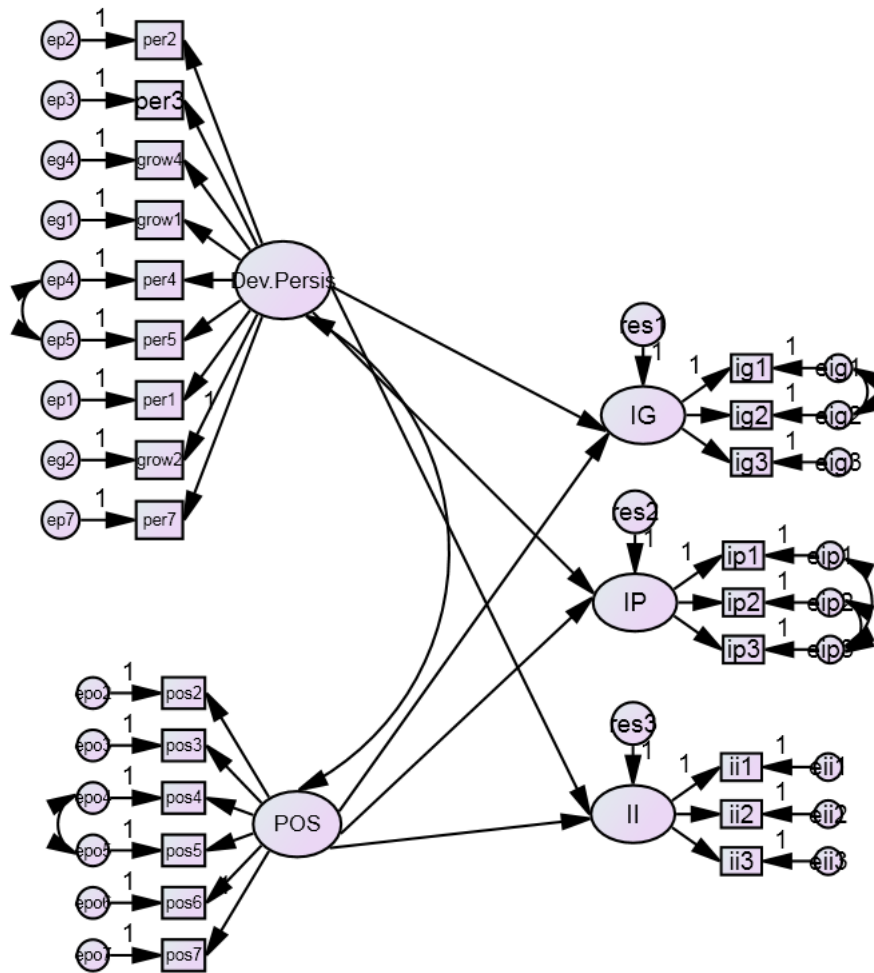
Figure 5.9 Causal structural model relating resilience and innovative behaviour

Model identification

With 300 observations available and 60 parameters, the model has 240 degrees of freedom for model estimation and evaluation. It is therefore over-identified.

Model estimation and evaluation

The ML method was again used. Model fit, including the feasibility of the parameter estimates, was evaluated using the figures in Column 9 of Appendix G.

While the χ^2=379.43 (p<.01) was nonsignificant, as noted in 5.3.5 the χ^2/df ratio is the preferred criterion and its value of 1.58 implies a reasonably good fit, below the recommended value of <3. The RMSEA of 0.04 was also below the criterion of <0.06. The CFI showed 0.89, close to the criterion of <0.9. Finally, all standardised residuals were within the criterion of <2.58. Collectively, goodness of fit indices and the standardised residual matrix confirmed the full latent variable model to be a relatively good fit.

Table 5.8 shows all six paths explaining the structural relationships between resilience and innovative behaviour. Standardised regression parameter estimates (factor loadings) were used rather than absolute values, in line with Garson's suggestion for studies with only one sample. Standardised estimates describe the effects on the dependent variable relative to differences in its means and variances, not the absolute values.

Correlations were as hypothesised, with no negative variances, correlations higher than one or extreme standard errors. However, two paths, from POS to II and from Dev.Persis to IG, were not statistically significant, with CRs of .870 and 1.268 respectively (Table 5.8).

Table 5.8 Selected unstandardised parameter estimates and factor loadings of the structural model

			SE	CR	p	Factor Loading
II	<---	POS	0.175	0.870	0.384	0.10
IP	<---	POS	0.212	3.484	***	0.44
IG	<---	POS	0.120	2.218	0.027	0.44
II	<---	Dev.Persis	0.149	3.902	***	0.45
IP	<---	Dev.Persis	0.140	3.313	***	0.34
IG	<---	Dev.Persis	0.064	1.268	0.205	0.16

The path between *developmental persistency* and *idea implementation* has a moderate path coefficient of .45. That is, *idea implementation* increases by .45 when *developmental persistency* increases by one unit. Similarly, *idea generation* has a moderate positive coefficient of .33 on *developmental persistency*. However, the path leading from *developmental persistency* to *idea generation* shows a small effect of .16, below the criterion of >.32 suggested by Tabachnick and Fidell (2007) for meaningful influence.

A similar pattern emerged for the paths between *positive emotion* and the three innovative behaviour dimensions. *Positive emotion* and *idea promotion* had a moderately large path coefficient of .44, and *positive emotion* and *idea generation* had a coefficient of .437, both statistically significant. Finally, the path from *positive emotion* to *idea implementation* had a very low coefficient of .098 and was not statistically significant.

In summary, four of the six paths shown in Figure 5.9 showed moderate relationships between the dimensions of resilience and innovative behaviour. However,

developmental persistency did not substantially affect *idea generation*, and *positive emotion* did not affect *idea implementation*.

CHAPTER SIX - DISCUSSION

6.1 INTRODUCTION

This study aimed to examine the link between individual resilience and innovative behaviour of employees in large organisations. A literature review identified the need for a new measure of resilience focused on growth rather than adaptive goals. Study 1 tested this measure using exploratory factor analysis and identified two dimensions, developmental persistency and positive emotion. Study 2 tested this measure on a second sample, and confirmatory factor analysis confirmed the predicted structure. The final scale measures developmental persistency with nine items and positive emotion with six. Construct validity was established by correlations between resilience and measures of active coping, self-esteem and psychological vulnerability, and the results were as expected. Although the AVE measure of convergent validity showed only marginal support for the new scale, overall it was judged to have a good fit to the data.

The hypothesised causal relationship between resilience and innovative behaviour was then tested with confirmatory factor analysis. The model had a relatively good fit, consistent with the hypothesised positive relationship. At the dimension level, four paths showed significant and moderately strong relationships between resilience and innovative behaviour, while two paths were not significant.

The following sections elaborate these findings. First contributions to the literature on defining and measuring resilience (6.2 - 6.5) and innovative behaviour (6.6) are outlined. Second, contributions of the main finding of this study, the link between resilience and innovative behaviour at the construct level, are explored (6.7), and interpretations of the confirmed paths between their dimensions discussed (6.9). Theoretical implications and extensions of these findings are then considered, concerning the role of negative emotions (6.10).

The chapter concludes by addressing limitations of the study (6.12), directions for future research (6.13) and practical implications including interventions for developing individuals' resilience and innovative behaviour and creating a more resilient organizational climate (6.14).

6.2 VALIDATION OF THE NEW CONSTRUCT OF RESILIENCE

The relatively good fit of the model of resilience tested in Studies 1 and 2 provides support for the conceptualisation of resilience as *an individual's response to adversities at work in ways that strengthen and develop himself or herself as a better person*. This viewpoint extends previous studies of resilience as a developable characteristic by providing a theoretical focus on growth rather than adaptation, recovery or survival.

The value of the new scale is, however, qualified by its low convergent validity measures of AVE .34 for developmental persistency and .23 for positive emotion. One explanation is suggested by the low factor loadings of some items on both dimensions. These items may have a significant impact on the AVE value for each dimension and excluding them might improve it, but they were retained because they capture theoretically important aspects of positive emotion or developmental persistency. For example, "I am optimistic and hopeful" (item pos4) is one of the main ingredients of positive emotion, and "I think about my mistakes and learn from them" (item grow2) is central to developmental persistency.

However, demonstrating stable construct validity requires multiple trials and analysis of accumulated results (Hinkin, 1998; Netemeyer et al., 2003). Therefore the new measure should be subject to further testing to clarify its internal construct validity.

The new scale was developed for three reasons. First, the theoretical prediction that learning and growth are central to resilience, as reflected in the dimension of developmental persistency, was drawn from the literature. The second reason was to test a wider range of potential items, including those describing emotional aspects of resilience. Third, previous measures were developed for different contexts and a measure suited to large established organisations was needed. The new scale improves upon existing measures by addressing each of these limitations.

6.3 RESILIENCE AS A MULTIDIMENSIONAL CONSTRUCT

Studies 1 and 2 improve the current understanding of resilience by focusing the concept on two dimensions not previously considered central, developmental persistency and positive emotion. This structure advances theory in several ways. First, the existing unidimensional constructs (Connor & Davidson, 2003; Friborg et al., 2003; Luthans, Avolio, et al., 2007) have not rigorously been tested for dimensionality. Second, the dimension of developmental persistency provides a fundamental reorientation of the concept of resilience towards growth rather than recovery, as

discussed in the next section. Third, most items in existing measures focus on *cognitive* functioning of the individual. The present findings suggest resilience has fundamentally important emotional dimension, making resilience more consistent with well-being (Bakker & Oerlemans, 2011).

6.4 RESILIENCE AS A GROWTH FOCUS

Although many studies assume resilience can be developed, it seems that none consider resilient individuals to be *aware* that adversity makes them more resilient. That is, resilience is increased when self-aware persons intentionally and purposefully face adversities because they know these events provide them with new knowledge, skills and expertise. As Rosa (2000) put it, they know that it is *because of,* not *despite,* adverse experiences that they become better persons.

Therefore, employees who view adversities as opportunities rather than solely problems are more likely to develop their personal capabilities for facing future or different adversities. This perspective is consistent with some previous studies, but has not so far been made explicit. For example, Leipold and Greve (2009) propose that resilience involves a positive attitude towards adversity as a coping strategy. In the organisational literature, Luthans et al (2006) have drawn on studies of Masten and colleagues (2001; Masten & Reed, 2002) and Bonanno (2004) in suggesting resilience is developed when individuals increase their "knowledge, skills or abilities". However, Luthans et al (2006) do not relate this very general perspective to personal growth stemming from a person's attitude toward adversity. Sutcliffe and Vogus (2003) are more specific in viewing resilience not as a personality trait but as a quality developed through facing and effectively dealing with stressful experiences. However, they focus on development of a person's general knowledge about adversity. The present results show resilience involves an attitudinal focus on growth as a person that goes beyond knowledge.

Recently, in a thorough examination of employee resilience as a trait or process, Caza and Milton (2011, p. 897) conceptualised it as a developmental process producing professional growth through responding to adversity. However, Caza and Milton do not ask whether resilient individuals need to be *aware* that facing adversity makes them more resilient. They focus on growth in professional skills and knowledge, not personal capabilities. It is unlikely professional development can be effectively separated from personal growth.

A more fundamental problem is that previous studies do not explicitly require individuals to be aware of their need for growth and the role of adversity in developing resilience. This is the focus of the developmental persistency dimension.

An important consequence of this construct of resilience is that it predicts a link to innovation. A person who faces adversity with a growth focus and positive attitude is by definition innovative in dealing with life events, and can therefore be expected to be more innovative in dealing with specific work tasks and process. The link to innovation is further discussed below (6.7).

6.5 GENERAL CONTRIBUTIONS OF THIS STUDY CONCERNING RESILIENCE

The construct validated in Studies 1 and 2 is consistent with the POS or POB framework in identifying resilience as a combination of drive for personal growth and the ability to retain positive emotions during adversity. A resilient person has an attitude towards adversity based on these two dimensions. This perspective contrasts with previous studies in both psychology and organisational behaviour that view resilience as adaptation, bouncing back, recovery or survival. Existing constructs of resilience from Block and Kremen (1996), Wagnild and Young (1993), Luthans et al. (2006) and Connor and Davidson (Connor & Davidson, 2003) do not specifically include either growth or positive emotions. The present construct also better reflects the fundamental role of positive emotion in healthy living hypothesised by POS and POB scholars, showing it as an aid to survival and growth.

Indeed, this construct may help explain why positive emotion has been related to so many variables in POS or POB studies. Although Seligman and others (Gable & Haidt, 2005; Seligman, 2003; Seligman & Csikszentmihalyi, 2000) developed positive psychology as a corrective to the perceived negative focus of previous approaches, the present results suggest positive emotion has a fundamental connection to human adaptation and growth and hence to core aspects of psychological wellbeing. It may also be intimately related to healthy uses of negative emotion (see 6.10). In linking positive emotion to resilience, the present results increase the theoretical foundation for the fundamental role of positive emotion in POS and POB studies.

Finally, this study provides the first measure of resilience specifically designed for organisational contexts. Existing measures are based in clinical or human development domains and their items may not fit the organisations context,

complicating the operational definition of resilience. Further, the current measure is specifically developed for large, established organisations. The environment in such organisations is likely to have unique characteristics, such as a formal, impersonal communication style, a high level of bureaucracy, slow adaptation or change, inflexibility, and considerable interpersonal 'politics'. These can create adversities different to those in smaller or newer organisations.

6.6 CONTRIBUTIONS OF THIS STUDY CONCERNING THE CONCEPTUALISATION OF INNOVATIVE BEHAVIOUR

A second contribution of the present results involves evidence that individual innovation is better understood as a three-dimensional or three-stage process than a unidimensional construct. Although Janssen's (2000) Innovative Behaviour Scale describes innovative behaviour as unidimensional, the chi square difference test showed that it better fits a multidimensional model. This provides a preliminary response to de Jong and de Hartog (2010) and Kleysen and Street's (2001) call for multidimensional models of innovative behaviour to better reflect the construct's domain. The three dimensions of idea generation, idea promotion, and idea implementation have been assumed by previous authors but not previously tested empirically. The present results suggest they can now be validly seen as separate yet related contributions to innovative behaviour. Although this finding should be replicated in future research it provides a more solid basis for the conceptualisation of innovative behaviour as a multidimensional construct in future studies.

6.7 CONTRIBUTIONS OF THIS STUDY CONCERNING THE RELATIONSHIP BETWEEN RESILIENCE AND INNOVATIVE BEHAVIOUR

The main contribution of this study is in providing the first evidence of a link between resilience and individual innovation. This is significant for two reasons. First, as noted above resilience has been previously conceptualised as a narrower construct, of interest primarily as a measure of 'coping' or 'recovery'. The present construct ties it more directly to psychological well-being and suggests resilience is not just another predictor of innovative behaviour but a fundamental influence on many aspects of psychological functioning. This in turn suggests a reconceptualization of innovation. While innovation requires generating, promoting and implementing ideas it also

requires attitudes favourable to persistence and personal development and a conscious focus on retaining positivity. In this framework, such psychological qualities are important because sustained innovation often involves adversity and individuals must struggle to find both inner and external resources to respond to it.

A similar viewpoint is implied in some studies of innovation (e.g.Janssen, 2000; Janssen et al., 2004) but the present evidence suggests innovation has a lot more to do with a person's capacity for psychological adjustment in the face of setbacks. Studies of innovation presently emphasise creativity (Amabile & Mueller, 2007; Shalley, 2007), a pro-innovation attitude (Damanpour & Scheider, 2008) and patience (Amabile et al., 2002; Klein & Knight, 2005) as the primary psychological requirements. The present results suggest innovation research would be improved by more emphasis on resilience as described here. This could address the "dark side" of innovation - its cost to the individual – and help researchers create interventions for reducing tension in idea generation and conflict or disagreement with colleagues, supervisors or external stakeholders during idea promotion or implementation, for example.

The results of Study 2 link the two constructs at both construct and dimensional levels, although support for two of the six hypothesised dimensional paths was not found. For reasons discussed above, these findings should be replicated and further studies of the unsupported links conducted. Interpretations of the supported links are provided below (6.9), and suggest many interesting ways future research on innovative behaviour could be broadened by including developmental persistency and positive emotion.

More generally, this study extends the POS and POB fields by linking positivity to the outcome variable of individual innovation. Resilience offers a lens on how healthy individuals frame challenges and obstacles as opportunities to build strength in innovation, moving organisational researchers away from focusing only on the negative aspects of challenges and difficulties at work such as burnout or stress. Resilient people are not merely 'survivors' but actually constitute a creative force for organisational advancement. This has consequences for the management of innovation, as discussed in 6.12.

6.8 THE RELATIONSHIP BETWEEN DEVELOPMENTAL PERSISTENCY, POSITIVE EMOTION, PASSION AND VIGOUR

The moderate positive correlation between developmental persistency and positive emotion suggests resilient people are both persistent and positive, although either attribute may predominate. One interpretation of the relationship is that positive emotion *underlies* developmental persistency by helping people stay motivated when facing adversity. Positive emotion may also help individuals perceive a wider range of alternative views on prospective paths for dealing with adversity (Fredrickson & Branigan, 2005).

These effects of positive emotion on persistency in facing and growing during adversity are to some extent congruent with recent conceptualizations of other positive emotional constructs, including vigour and passion. Vigour is defined as a feeling of physical strength, emotional energy and cognitive liveliness, considered as a set of interrelated affective experiences (Shirom, 2007, 2011). Vigour helps individuals maintain energy while handling problems and pursuing growth challenges. However, vigour is quite different from resilience, in which positive emotion combines with developmental persistency or a growth motivation in the face of adversity.

The effects of positive emotion on developmental persistency are also consistent to some extent with studies of passion at work. Passion is defined as a psychological state characterised by the experience of intense positive emotions, an internal drive to do the work and a sense of meaningful connection to it (Perttula & Cardon, 2011, p. 193). Passionate individuals gain energy from joy and subjective vitality, and cognitively gain meaningful connection with their work, driving them to high achievement. Empirical studies associate passion with high performance as a result of this extra time and effort (Perttula & Cardon, 2011). This is consistent with the conclusion that resilient people use positive emotion to maintain effort when facing difficulties.

Although passion and resilience share positivity and contribute to productive outcomes, they are conceptually distinct. In particular, passion involves only positive emotions of pleasantness such as enjoyment, happiness and love of work, while resilience involves a wider range of positive emotions that motivate behaviour, including enthusiasm, optimism, confidence and interest. The latter are not merely pleasant but lead to 'approach behaviour' (Lucas et al., 2003) and are therefore more

relevant when drive is needed, such as in adverse situations. Resilience is therefore a broader concept, incorporating the pleasantness of passion but also an emotional drive to persistently approach rather than avoid difficult situations.

Beyond its relationship to vigour and passion, the concept of developmental persistency may be similarly useful in clarifying the operation of other positive emotion constructs in future POB and POS studies.

6.9 LINKS BETWEEN THE DIMENSIONS OF RESILIENCE AND INNOVATIVE BEHAVIOUR

The sections below address the theoretical significance of the four statistically significant paths between the dimensions of the two constructs.

6.9.1 THE CONTRIBUTION OF DEVELOPMENTAL PERSISTENCY TO IDEA PROMOTION AND IMPLEMENTATION

Developmental persistency, particularly its element of commitment to growth, contributes to both idea promotion and idea implementation by helping innovators see problems in these activities as a source of learning. For example, in implementing new ideas they maintain the effort to approach useful people when difficulties occur because they see an opportunity to learn from them or to improve their social networks and skills. Spreitzer et al's (2005) model of thriving helps explain this process in terms of three agentic behaviours underlying purposeful work, *task focus*, *exploration* and *heedful relationships.* These may also underly commitment to growth, and can be related to both idea promotion and idea implementation.

6.9.1.1 Developmental persistency leads innovators to be task-focused

Task focus is the degree to which individuals focus on meeting their responsibilities at work (Mitchell & Daniels, 2003). The innovator's task is to get a new product or service implemented, but this focus can become lost as innovation often requires unfocussed, divergent thinking or exploratory activity. In idea promoting and implementation, innovators may need to refocus on specific tasks such as approaching, negotiating with, persuading or engaging their co-workers or supervisors. Developmental persistency helps them concentrate their effort and learn from mistakes or failures rather than repeating them, making innovators more efficient.

6.9.1.2 Developmental persistency drives innovators to explore

The commitment to growth element of developmental persistency encourages innovators facing uncertainty or setbacks to seek out new ideas for influencing others or implementing ideas rather than persisting with ineffective approaches. Supervisors or colleagues may reject new ideas, try to influence others against them, or block finances, for example. Governments may resist changes to regulations or policies necessary to the innovation, and consumers or communities may reject the innovation. Amabile (1988) argues that acquiring new knowledge and skills in technical and procedural areas beyond the innovation itself is very important in innovative work. A developmentally persistent innovator seeks to grow knowledge and skills in a wide range of areas related to influencing others and adapting innovations to their political and social context.

6.9.1.3 Developmental persistency encourages heedful relating

Developmental persistency helps innovators see interactions with colleagues, supervisors and people in other areas as opportunities for learning and knowledge sharing. Many scholars have found personal learning is facilitated by social interactions in which employees are working with, talking with or observing others (e.g.Edmondson, 1999). Developmental persistency drives people to forge connections with others, improving the chances of successful idea promotion and implementation.

Heedful relating has been considered important to thriving in POS studies (Spreitzer et al., 2005). Heedful relating happens when people collaborate with others on organisational goals. Innovators may develop relationships with more experienced or skilful staff, learning from them and extending the boundaries of their existing skills and knowledge.

Task focus, exploration and heedful relating are three ways of explaining the link between developmental persistency and the first two stages of innovation. Future research is likely to uncover many other theoretical explanations that could inform future studies of innovation.

6.9.2 *The contribution of positive emotion to idea generation*

The strong contribution of positive emotion to idea generation may be related to the correlation between positive emotion and developmental persistency. When innovators search for new and useful ideas, positive emotion provides the energy to be

persistent, and provides cues or signals guiding choices when facing difficulties in observing or experimenting with new ideas (Dyer et al., 2011).

Positive emotion can also stimulate creativity. For example, George and Zhou (2002) found that positive mood increases creativity at work, especially when there is also a clearly perceived recognition, reward or supportive feedback. Frederickson and colleagues find positive emotion broadens individuals' attention and cognitive ability (Fredrickson, 2003; Fredrickson & Branigan, 2005). This broadening effect leads them to be open to new possibilities and eager to explore novel ideas, new experiences, or new relationships. Positive emotion also helps people integrate and synthesise different perspectives to create new and practical outcomes.

6.9.3 *THE CONTRIBUTION OF POSITIVE EMOTION TO IDEA PROMOTION*

Positive emotion provides innovators with the energy to maintain their attempts to keep persuading relevant stakeholders during idea promotion. Persuading may involve reiterative efforts over multiple times, places and methods. When innovators sense that a party is tending towards rejecting an idea or avoiding discussion, they do not give up their approach easily. Consistent with this, Cohn, Fredrickson, Brown, Mikels and Conway (2009) found positive emotion functions as a resource for adapting to changing environments. Innovators also face challenges when many parties need convincing. Positive emotion provides confidence and a positive outlook, helping innovators to maintain their effort and find alternatives if one approach fails.

Positive emotion also provides optimism when negotiating or bargaining with stakeholders (Forgas, 1998). Optimism increases innovators' confidence that their ideas are likely to be accepted or supported. Instead of feeling anger and hostility when others have different perspectives, optimism encourages innovators to reduce their competitiveness and seek cooperative outcomes and win-win strategies.

Also supporting the role of positive emotion in negotiation is Quinn and Quinn's (2009) "purpose-centred" concept. Being purpose-centered helps individuals avoid focusing on solving problems and concentrate instead on their ultimate purpose when reacting to rejections or negative comments from others. When people see a gap between what they expect and what they face they may react negatively, seeing the situation as a problem and becoming stressed. Focusing on problems and solving them competitively in a win-lose strategy causes innovators to lose sight of their ultimate aim of gaining cooperation from stakeholders, and creates yet more problems (Quinn &

Quinn, 2009). Rather, they should look for new ways of framing problems as opportunities for collaboration or compromise. Positive emotion can help overcome negative feelings such as fear of rejection, labelling of situations as "problems", or being reactively "stuck" rather than proactively creating the outcome they seek.

Practising positive communication (Cameron, 2008) may also help negotiations. Positive emotion drives people to focus on supportive, encouraging and appreciative communication rather than disapproving or rejecting interactions (Losada & Heaphy, 2004). In a study of management teams, Losada and Heaphy (2004) found positive communication differentiated high from low performing teams. They concluded that people in high-performing teams generally use positive statements around five times more often than negative statements, while in low-performing teams positive statements were made only around three times more often. Where innovators experience positive emotion, they are likely to use positive communication patterns and strategies more often, increasing their ability to persuade colleagues and supervisors.

6.9.4 INSIGNIFICANT PATHS

The meaning of the insignificant paths from developmental persistency to idea generation and from positive emotion to idea implementation is unclear. Two general interpretations are possible. Perhaps these links do not exist, which would have important theoretical consequences. On the other hand, statistical or methodological issues may have meant the present study did not find an existing link. Future research is needed to distinguish these possibilities.

One theoretical explanation for the lack of a path between developmental persistency and idea generation involves the different challenges in idea generation, promotion and implementation. As suggested in 2.7.5, idea promotion and implementation involve both *cognitive* challenges and the *behavioural* challenges of working with other people and changing the organizational environment. While idea generation may at times involve similar behavioural challenges of working with others, the main challenge is cognitive (as suggested in the item "searching out new working methods, techniques, or instruments"). Perhaps a lack of behavioural challenge, including social and political skills, means innovators experience idea generation as less difficult than promotion or implementation. Persistency may be less important than remaining positive and cognitively effective.

The lack of a path between positive emotion and idea implementation may similarly indicate that positive emotion, as measured here, is simply not sufficiently relevant to the implementation of new ideas. Implementation may require developmental persistency and related attitudes such as mental toughness and ability to deal with negative emotions produced by setbacks more than positivity per se. Practical and social skills may be more important than a positive overall mental attitude.

The two insignificant paths may therefore indicate a more nuanced view of the relationship between resilience and innovation, reflecting different emphases at the beginning and end stages of innovation. This theoretically interesting possibility can be tested by replicating the present study. Such tests should incorporate methodological improvements such as larger samples and improved measures, as discussed below in 6.11.

Such replications should also consider alternative explanations involving moderating variables not controlled here. For example, the failure to find a link between positive emotion and idea implementation may be explained by the level of empowerment or authority experienced by respondents in this study, since this affects their ability to implement ideas. Positive emotion can only translate into idea implementation if an employee has sufficient authority to enact an innovation. Perhaps in more empowering workplaces, or with more senior respondents, the innovative ideas created by the present sample would have a better chance of being implemented. Discretionary authority therefore appears to be an important moderating variable to be included in future versions of the model. Similarly, organisational cultures may encourage creative thinking or positive emotions but actually discourage *significant* change to long-established organisational practices. The degree of innovation and its threat to existing organisational structures and power bases is therefore relevant. Many aspects of the organisational environment can stand in the way of idea implementation, and relevant moderating variables should be examined in future studies.

6.10 THE ROLE OF NEGATIVE EMOTION

While positive emotion is an important influence on innovative behaviour, it doesn't necessarily eliminate negative emotion. Fineman (2006) warns researchers to use a critical lens when adopting positivity as a guiding value, suggesting that, for example, negative emotion also helps build adaptive strength. Indeed, it appears that

positive and negative emotion are always related rather than intrinsically separate qualities (Learmonth & Humphreys, 2011, p. 425). They are related in being contingent on a person's subjective perceptions and beliefs about what is desirable ("positive") and therefore on what they perceive as "real" in their subjective evaluation of their current situation and future possibilities. Both positive and negative emotions are likely to be present in many if not all circumstances. For example, as Fineman (2006, p. 274) observes: "it is out of negative experiences that positive appraisals and meanings evolve, and vice versa". Happiness may be accompanied by anxiety, anger can feel energising and exciting, and pride can reflect a positive feeling of a job well done or blind a person to negative feelings accompanying justifiable criticism. Avoidance of "negative" feelings such as anxiety and disappointment can signify fearing rather than embracing life (Fineman, (2006). Therefore it is important to study negative emotions as part of a study of positive emotions.

Although resilience is usually considered a positive quality, it does not emerge from eliminating negative aspects of organisational life. Since negative and positive aspects are interrelated, both must be considered when improving employee effectiveness (Roberts, 2006). For example failure and disappointment are unavoidable in life, and resilient individuals are those who learn to face such events realistically and deal effectively with the negative emotions they bring.

Negative emotions have positive meanings: they signal a need to react, change, develop or grow, and what to avoid in life. A resilient person not only understands their meaning, but knows they are unavoidable and must be faced at times. Consequently, while the present construct of resilience and its links to innovation are anchored in positive emotions, it will be important for future research to also consider the important role of negative emotions.

6.11 STUDY LIMITATIONS

The two studies in this thesis have a number of common limitations, including the sample characteristics of fast-growing industry sectors and managerial employees, the relatively small sample size and low participant-to-item ratio (4.2.1), and the language and cultural issues discussed in 4.5. In addition Study 2 has five other limitations. First, it used a cross-sectional design to test a causal link, measuring the relationship between resilience and innovative behaviour at one point in time. This may produce biased estimates of any direct or indirect relationship between variables (Gollob & Reichardt,

1991). To perfectly establish a causal relationship, further evidence is needed. For example, an experimental design could test the causal relationship by measuring innovativeness before and after a resilience intervention. Cross-sectional survey research does not allow this and therefore the interpretation of the causal relationship observed in this study should be treated with caution. Future research should replicate the present findings with an experimental design.

A second limitation involves the use of self-reports. Self-reports are subject to a number of errors including leniency and social desirability bias. For example, Anderson et al. (2004) suggest studies of innovation survey both supervisors and employees to eliminate the effects of respondents' leniency bias. Future studies should also reduce social desirability bias, where participants construct reponses to 'look good'. This may bias mean scores and mask relationships between variables (Podsakoff et al., 2003).

A related limitation lies in the problem of common method bias. Since Study 2 measured both predictor and criterion variables from a single sample and questionnaire at a single point in time, an observed relationship might be at least partially due to error introduced by the measurement system. Future replications of this study could employ statistical remedies such as Harman's single-factor test procedure (Podsakoff et al., 2003), which uses factor analysis to detect common method variance by examining covariances among factors. This could improve reliability and provide evidence that inter-item correlations are not driven solely by common method bias. A second option is the CFA marker technique (H. A. Richardson, Simmering, & Sturman, 2009; Williams, Hartman, & Cavazotte, 2010), a more rigorous and detailed technique offering an accurate evaluation of common method bias. A final, more theoretically desirable, possibility is to collect data on resilience and innovation from different sources, ideally at different points in time and from different samples as in an experiment. In practice this can be difficult. Method bias is a potential issue in much organisational research (Podsakoff et al., 2003).

Fourth, Study 2 has only examined the direct relationship between resilience and innovative behaviour. In reality, the model may be more complex than presented above, with more factors involved as suggested in 6.11 and 6.13.2. As well, "third party" variables may explain the observed links between independent and dependent variables There is particularly a need to develop more complex models by including potential moderating variables such as personal characteristics of employees or the cultural context of the organisation. For example, different organizational environments, such as

those of small to medium enterprises, may provide interesting alternatives. Moderating variables may also explain the insignificance of the predicted paths between positive emotion and idea implementation, and developmental persistency and idea generation (see 6.13.2).

Finally, limitations are present in two areas of the SEM procedures used in Study 2. First, these do not include a statistical test to measure the plausibility of path directionality (Hoyle, 1995), and do not present warning messages of any sort to alert the researcher to implausible paths. For instance, if the path from positive emotion to idea generation is drawn the other way around (from idea generation to positive emotion) the model might still have a good fit but would disguise the improper directionality of the path. In other words, although the paths between the latent constructs in this study have been carefully specified, SEM procedures cannot show the "correct" direction of causality (Shook, Ketchen, Hult, & Kacmar, 2004). As hypothesised here, resilience is a usually seen as a general state-like measure of mental wellbeing and is therefore expected to affect specific behaviours such as innovation, while the reverse causality is not expected. However, although the structural model was assessed as a relatively good fit, models with the reverse causality could also show good fit. Together a number of the limitations above caution against interpreting the current findings as evidence of a *causal* relation between independent and dependent variables without further testing.

The second limitation of SEM concerns the assessment of model fit. Experts on SEM are still debating what constitutes the best measure of goodness of fit (Bentler, 2007). Although this study followed the recommendations of Kline (2011) and Byrne (2010) to use multiple fit indices, other authors suggest using only an exact fit index (e.g Barret, 2006). The accuracy of the fit indices is therefore controversial. As well, although multiple indices are relatively acceptable some results in this study were close to the conventional cut-off point, including the AVE result for developmental persistency (see 5.4.2) and the CFA results for the multidimensional model of innovative behaviour (see 5.4.3). The present findings are therefore best treated as statistically provisional.

In light of these limitations, care should be taken in generalising the findings of this study until they are replicated.

6.12 DIRECTIONS FOR FUTURE RESEARCH

6.12.1 STUDIES OF INTERVENTIONS FOR INCREASING RESILIENCE AND INNOVATIVE BEHAVIOUR

Results from Study 2 supported the hypothesis that resilience is related to innovative behaviour. An important extension of these findings would be the study of interventions to increase employees' resilience and innovativeness.

Past research has assessed two interventions for increasing employees' resilience (Luthans, Vogelgesang, et al., 2006). One uses Masten and colleagues' framework of asset-focused, risk-focused and process-focused strategies (Masten & Reed, 2002). Researchers have also experimented with "micro interventions" for developing resilience. Luthans, Avey et al. (2006) gave a control group two-hours of training based on exercises and group discussions designed to increase their psychological capital, including resilience, and subsequently compared this to an online version (Luthans, Avey, & Patera, 2008). Follow up studies of both interventions provided preliminary evidence of an improvement in participants' resilience (Luthans, Avey, Avolio, & Peterson, 2010).

These findings are consistent with a larger body of research on resilience predicting many desirable short- and long-term outcomes, including improvements to job performance (Luthans et al., 2005) and job satisfaction (Luthans, Avey, et al., 2006). However, neither empirical nor theoretical studies have yet considered resilience interventions for improving innovative behaviour.

A longitudinal study could be used to examine such interventions, responding to the call of Avey et al. (2008) for such designs in POB research. Future research questions could include:

- What are the best interventions for increasing resilience? Should they be long or short-term, and should they be self-generated or initiated by the organisation?

- How should we measure innovative behaviour? Is the present use of Janssen's scale as a multidimensional measure the best approach?

- Do interventions for improving resilience and innovative behaviour have long-term effectiveness?

To address these questions researchers need complex research designs. A latent growth or Latent Growth Curve (LGC) model, an approach to SEM for change-related questions (Byrne, 2010), should be considered. For instance, the intensity of innovative

behaviour may be measured after repeated interventions to increase resilience. Tomarken and Waller (2005) suggest several advantages to this approach. For example, a latent growth model can help the researcher assess the degree to which dimensions of innovative behaviour demonstrate an expected increase over time.

6.12.2 USING OTHER VARIABLES AS MEDIATOR OR MODERATOR VARIABLES

A second direction for future study involves the entrepreneurship variables mentioned above as mediators of the resilience – innovative behaviour relationship. This study tested a simple model that could be improved by including variables such as opportunity recognition and regulatory focus (see 6.9).

Another possibility involves employees' hierarchical level as a moderator of the resilience – innovative behaviour relationship. Employees higher in the hierarchy have different roles and face greater work intensity and difficulty (J. Ford & Collinson, 2011), which may make innovation more challenging. Unsworth and Wall (2005) consider creativity more important for higher level employees. On the other hand higher level employees may have more experience in handling challenges, which may increase their resilience and hence their innovativeness. Empirical research is needed to differentiate between these possibilities, or determine the conditions in which each occurs.

Finally, while the present study focused on individual variables, social and organisational factors might also be relevant. Many studies suggest the idea promotion and implementation stages of innovation are strongly influenced by social aspects such as leader-member exchange (Basu & Green, 1997) and social networks (Lu et al., 2005), and organisational aspects such as organisational complexity (Damanpour & Wischnevsky, 2006). A high quality leader-member exchange or social networks may reduce the challenges and lessen the need for resilience in innovators, while a more complex organisation may increase it. Again, empirical research could test these predictions.

6.12.3 INNOVATION AS AN INDEPENDENT VARIABLE

While this study has assessed the effect of resilience on innovative behaviour, the reverse relationship is also theoretically possible. Most studies treat innovative behaviour as a dependent variable, but giving staff work that requires innovation may

actually increase their personal resilience. This would be an interesting extension to the innovation research literature, meeting Anderson's (2004) suggestion for research on innovation as a causal variable. Using innovative behaviour as a predictor for resilience is also consistent with Leipold and Greve's (2009) conceptual framework which describes resilience as an outcome of situational variables reflecting challenge and an employee's coping processes. More challenging situations require innovation, which may in turn increase a person's resilience.

Therefore it is important that future studies examine resilience and innovative behaviour as interrelated variables rather than having a one-way cause-effect relationship. Their dimensions might show an even more complex set of interrelations.

6.13   PRACTICAL IMPLICATIONS

6.13.1 IMPROVING EMPLOYEES' RESILIENCE AND INNOVATIVENESS BY INCREASING DEVELOPMENTAL PERSISTENCY

The need for research on effective interventions for improving resilience, and indirectly therefore individual innovation, was raised in 6.13.1. The literature provides a range of options for developing both resilience (e.g. Luthans, Avey, et al., 2006) and innovation (e.g. Shalley & Zhou, 2011), but the present results suggest a joint approach may have many benefits. However, since the correlation between the two constructs is only moderate, managers primarily interested in short-term improvement to individuals' innovativeness might find developing their resilience less effective than directly targeting innovation.

For applications focused on both resilience and innovative behaviour many relevant options are suggested by previous studies of these constructs. First, some previous studies of the development of individual innovation and creativity present relevant strategies. For example Wijewardena et al. (2010) suggest humour is useful when generating new ideas becomes difficult, and humour may well improve employees' resilience as well. Amabile and Mueller (2007) suggest developing creativity by building domain-relevant knowledge, expertise and skills, which may increase a person's resilience when facing challenges and perhaps their sense of life or work mastery.

Alternatively, managers or organisations could develop employee's resilience to provide multiple outcomes, including innovativeness along with outcomes such as

flexibility and adaptability, lower stress, greater job satisfaction and overall performance, particularly during adverse times.

Luthans, Avolio et al.'s (2007) distinction between asset-focused and process-focused strategies has been noted. In asset-focused strategies one's knowledge and skills or social relationships and networks are viewed as assets. Employees would be encouraged to list their assets and identify those most relevant to their different challenges in order to help them perceive challenges as opportunities for developing assets. For example, someone struggling with idea promotion might view it as an opportunity to build a network and networking skills. Training in this could be provided by the organisation, or the worker might seek coaching or mentoring or otherwise take the initiative to develop relevant skill sets. Process-focused strategies include increasing self-awareness and self-regulation skills to better address adverse situations by understanding, using and managing one's personal assets.

Reivich and Shatte (2003) propose two strategies for improving resilience. First, challenging one's beliefs about adversity helps emphasise personal control (internal locus of control) rather than seeing oneself as a victim of external circumstances (external locus of control). Second, "putting it in perspective" encourages individuals to see realistically what is at stake in challenges rather than, for example, catastrophising.

Recently, Caza and Milton (2011) have proposed developing employees' identity as a resource for facing adversity. For example, a worker may consider events in their past that identify them as "a survivor", "adaptable", "embracing change", "enjoying a challenge", or "pragmatic".

More general intervention strategies have been developed by psychologists, including the Penn Resilience Program (Reivich & Shatte, 2003) and a recent, extended version, the Master Resilience Training Course (MRTC) (Reivich, Seligman, & McBride, 2011). This program focuses on the factors contributing to resilience identified by Masten and Reed (2002), such as optimism, problem solving, self-efficacy, self-regulation and emotional relationships. The MRTC includes a resilience module focussed on self-awareness, self-regulation and mental agility; a "building mental toughness" module using several cognitive-behavioural therapy skills; an "identifying character strength" module using character strengths from Peterson and Seligman (2004); and a "strengthening relationships" module for developing positive relationships and communication.

A different approach involves identifying one's "best self" in order to reframe present difficulties as opportunities for personal growth, inspiring and motivating employees to face challenges positively (Roberts et al., 2005). A view of one's "best self" is created by relating future growth to past experiences (Cross & Markus, 1994). This could be combined with journal writing, following Pennebaker's (2012) finding that free writing in a personally expressive manner improves a wide range of subjective and objective indicators of psychological wellbeing. It might therefore be useful to encourage workers to write freely about their "best possible self". Imagining such a self by considering past experiences and future growth potentials could inspire and motivate an employee facing difficulties during innovation.

Collectively these studies suggest employees' resilience, particularly their developmental persistency, could be improved by better understanding their personal assets, strengths and internal processes, improving their self-regulation capabilities, helping them to reframe adversity as a challenge, changing their identity and questioning their beliefs about control over their destiny and the reality of their goals.

However to make a significant impact on resilience or innovative behaviour, systematic long-term development activities such as coaching or mentoring, perhaps also including training or educational activities, would be required. Although these might need to be managed and resourced by the organisation, the results of this study suggest a wide range of benefits would accrue from having more resilient employees, including greater innovativeness that should directly benefit business performance. Organisations with a strong need for innovation, such as those in creative industries, may especially value this combination of benefits.

6.13.2 IMPROVING EMPLOYEES' RESILIENCE AND INNOVATIVENESS BY INCREASING POSITIVE EMOTION

The interventions for developing resilience proposed or studied so far are primarily cognitive, but the present results suggest strategies for developing positive emotion may be fundamental to improving both resilience and innovative behaviour. A variety of strategies or interventions are suggested by the literature. For example, Lyubomirsky (2007) suggests practising "gratitude" and "savouring the joy". While these have been used to improve general psychological well-being, they could also be applied to work events. An employee may feel gratitude for gaining a managers' trust, finding valuable resources, meeting interesting people or useful contacts, developing

new skills or finding career opportunities, for example, helping them face the difficulties of innovation more positively. Emmons (2003) suggests gratitude makes employees more energetic and hopeful during difficult parts of the innovation process. Interest, excitement and pride can also be expected from gratitude interventions and should help resolve problems in generating, promoting and implementing ideas.

Gable, Reis, Impett and Asher (2004) suggest a related intervention called "capitalisation" where participants generate positive emotion by sharing personal positive events. Retelling positive events creates an opportunity for relieving and re-experiencing the event, providing additional positive affect beyond the impact of the event itself. When employees elaborate their successes in innovating, for example, their self-esteem should increase, and positive responses from listeners would further assist this.

A final possibility could be a "counting kindness" intervention where participants recognise how being kind to others enhances their positive emotion (Otake, Shimai, Tanaka-Matsumi, Otsui, & Fredrickson, 2006). For example, employees could offer other employees pro-bono training programs related to their area of competency, or could use their skills by volunteering for external projects for charitable causes, bringing public credit to their organisation.

In summary, many interventions for both developmental persistency and positive emotion suggested in the literature could be employed in programs for developing employees' resilience and innovative behaviour. These are expected to have benefits beyond those specifically associated with resilience or innovative behaviour. Interventions might therefore be broadly aimed at the psychological wellbeing or performance of employees, with increased resilience or innovative behaviour only one of many benefits.

However, many of the interventions discussed here have yet to be evaluated with rigorous experimental designs and measures. This appears to be an area of great importance for future research on both resilience and innovative behaviour in organisations. However, while any authors propose theoretical mechanisms for improving resilience and innovative behaviour, few have received empirical confirmation of the benefits and there are so far no systematic comparisons of the alternatives.

At the organisational level, the present findings suggest a broader approach to developing innovative behaviour focusing on the organisational climate. Current suggestions for developing a climate fostering innovative behaviour mainly focus on developing creativity (Amabile & Mueller, 2007; Shalley, 2007), including specific interventions for improving cognitive or social skills (Binnewies et al., 2007; Mumford, 2000), the negotiation and adoption of ideas (Damanpour & Scheider, 2008), or better managing the team (Govindrajan & Trimble, 2010). Developing an environment conducive to resilience could bring a broader range of benefits.

This could be done by encouraging or training organisational leaders to incorporate concern for employees' resilience in their working relationships. Relevant interventions would involve helping leaders and employees to see adversity as a source of personal growth, a focus on the whole person rather than just training in the specific cognitive or social skills targeted by most current interventions. This is a quite different approach to developing people for innovation-related skills, and is practically useful because it offers broader benefits focused on mental health, such as reduced stress, better coping and better social supports. It would also help employees face adversities in routine work, not just innovation.

In developing interventions to make organisational climates more supportive of resilience, much can be learned from POS and POB approaches to leadership and employee relations. The following sections explore these links.

6.13.3.1 Changing the leadership approach

Effective positive leadership practices and transformational or authentic leadership 'styles' are expected to improve employees' resilience and therefore their innovativeness. Such practices and styles may not influence employees' resilience directly but create a climate that increases psychological health more generally. Practicing positive leadership, for example, can increase psychological health by creating compassion, forgiveness and gratitude amongst employees, while transformational and authentic leadership can improve communication and trust, and provide more humane relationships between staff based on genuineness and support.

Practising positive leadership

Positive leadership engenders a climate where positive emotion predominates over negative emotion (Denison, 1996). The present results suggest this would improve employees' resilience, in agreement with Frederickson (2003, p. 169) suggestion that positive emotions in the organisation produce "upward spirals toward optimal functioning and enhanced performance". An emotionally positive leader would help employees deal with adverse events to improve their functioning and performance.

Similarly, Cameron (2008) suggests leaders create a positive climate by emphasising positive emotions, opportunities and relations, and offers practical suggestions for fostering compassion, forgiveness and gratitude in leadership practices. Leaders could create a more *compassionate* climate by encouraging and modelling noticing, empathizing with and responding to employees' difficult or negative experiences (Kanov et al., 2004). For instance, a leader could proactively identify those who need help and carefully encourage others to respond, while maintaining concern for their privacy. Employees can be encouraged to express compassion in both informal and formal communications, including emails and planned forums or social events (Frost, 1999). Facilitating small groups to meet formally and informally for team-building activities, and providing role models, could also help develop compassion.

In trying times, an attitude of *forgiveness* helps create a positive climate. When people make mistakes, leaders can help by expressing forgiveness while also discouraging the hiding of unethical decisions, the violation of trust or personal affront. Bright (2006) proposes three alternatives facing individuals in such situations: to hold a grudge and seek retaliation, to neutralise angry or judgmental feelings and abandon hostility, or to actively replace negative with positive responses. A positive climate is created when leaders use positive responses to forge an attitude of forgiveness by acknowledging mistakes while relating the situation to the organisation's higher purpose, and distinguishing forgiveness from tolerance of error (Cameron, 2008).

Leaders who encourage *gratitude* also contribute to a positive climate. Emmons (2003) found expressing gratitude makes individuals more optimistic, alert, attentive, determined and energetic. He suggests leaders encourage acts of gratitude by verbally expressing it, writing a letter of gratitude or even suggesting individuals keep a "gratitude journal".

At the same time, managers should also recognise that being *too* positive can reduce realism and create an idealistic or 'pollyannaish' perspective on organisational life (Roberts, 2006), encouraging complacency while ignoring what is wrong.

Practising transformational leadership

Although predating the development of POS and POB, transformational leadership is a largely 'positive' style that is expected to improve resilience and therefore innovation. Transformational leadership is marked by consistent concern for the followers' development, open communication, trust-building and effective mentoring to increase followers' competency (Garbowski, 2009). The present finding of a fundamental developmental dimension to resilience, characterised by learning, growth and increased strength, suggests transformational leadership would promote development of employees' resilience.

Practising authentic leadership

Authentic leadership is in some ways a development of transformational leadership that focuses on a leaders' authentic or personally-felt concern for employees' development and a desire to create relationships based on interpersonal trust. Practising authentic leadership is expected to increase employees' resilience. Managers with authentic leadership skills tend to have open and transparent communication channels and encourage followers to give them genuine feedback (A. Caza, Bagozzi, Woolley, Levy, & Caza, 2010). Such feedback builds more positive relationships between leaders and their employees, helping employees see leaders as a supportive resource and consequently increasing their resilience. Authentic leaders also improve employees' resilience by providing more resources, development opportunities and empowerment.

6.13.3.2 Improving relationships and communication

Properly managing relationships and communication between employees is expected to create a climate that improves employees' resilience. As Sutcliffe and Vogus (2003, p. 105) suggest, organisations foster resilience through problem-solving networks, social capital and relationships because these provide resources for dealing with difficulties. Similarly, Heaphy and Dutton (2008) propose that good

communication and relationships significantly help an individual face challenges or stressors.

Gittle (2008) suggests "relational coordination" as a collective coping mechanism during difficulties, in which employees support each other and together process the information needed to respond effectively. Employees in different functions and roles should also coordinate with each other to build support networks. Gittle found this kind of coordination in professional hospital workers reduced the threat of challenges or difficulties. This is likely to increase employees' resilience.

Caza and Milton (2011) similarly suggest employees increase their resilience through high-quality relationships and shared social identities. Organisations can systematically design relationships so that employees share a similar outlook and behaviour, encouraging them to help each other and spend more time together in handling challenges, strengthening bonds and providing support. Such "designed relationships" produce a shared identity where employees feel more valued and connected with the group, thereby empowering them to face adversities.

CHAPTER SEVEN - CONCLUSION

The goal of this study was to examine the relationship between employees' psychological resilience and their innovativeness. The existing literature on individual innovation in organisations shows that innovators frequently encounter barriers, setbacks and other types of adversity, suggesting resilience might be an important capacity underlying innovation, but so far this hypothesis has not been tested. Following the POS-POB framework, resilience is considered here as a developable individual difference variable. Individuals with greater resilience were hypothesised to have greater innovativeness as a result of their ability to deal with setbacks and challenges in the innovation process.

Before testing this hypothesis, measures of resilience and innovation were reviewed. Psychologists and organisational behaviour scholars have produced a number of constructs of resilience but all tending to focus on recovery, bouncing back or overcoming a problem. An alternative view formulated in humanistic psychology views resilience as an active process of facing adversities as challenges and responding by developing general capabilities relevant to facing future adversity, a focus on personal growth rather than short-term recovery or survival. A second feature of existing constructs is their strongly cognitive focus. Recent organisational behaviour studies have begun to investigate the role of emotions in many phenomena, and POS-POB studies have extensively explored positive emotions. A new multidimensional construct of resilience based on personal growth and positive emotion was therefore proposed.

Study 1 tested this construct in two studies of a new measure designed for use in large, established organisations. The results of the EFA and CFA procedures supported the proposed structure of resilience and provide evidence of the new scale's reliability (Chronbach's alpha) and validity (based on CFA and correlations with related constricts).

These findings advance the POS-POB perspective on resilience in several ways. First they suggest resilience is not unidimensional as commonly assumed. Second, while growth has occasionally been implied in theories or measures of resilience it is now seen as a central dimension, consistent with the earlier view of it in humanistic psychology. Third, while previous constructs sometimes view resilience as trait-like, the case for viewing it as developable is strengthened, in line with the POS-POB

framework. Therefore, it is expected that employees' capacity to learn and thrive in the face of setbacks can be developed by interventions targeted at psychological processes for broadening and enriching the individual generally, and will be more effective than interventions focused on recovering from specific setbacks. Facing adverse events with a proactive outlook can help an individual become more confident, eager to seek out new experiences and willing to take risks.

A fourth contribution lies in revealing a critical role for positive emotion, moving beyond the cognitive focus of existing constructs. Previous studies have only suggested a peripheral role for positive emotion in resilience, but it is increasingly seen as a central aspect of human adaptive functioning, and consistently related to psychological well-being in POS-POB studies. Together, positive emotion and developmental persistency appear to offer a useful framework for developing employees' ability to face adversity by becoming stronger persons.

A final contribution to research on resilience lies in providing the first measure of explicitly developed for the context of large, established organisations. Existing scales tend to borrow items from general psychological measures or to be tested in other, usually more specific, organisational contexts.

A review of innovative behaviour measures also suggested an improvement. While existing measures are unidimensional, there is a strong suggestion that a multidimensional construct would be more appropriate (de Jong & den Hartog, 2010). The structure of Janssen's (2000) widely used measure was therefore examined, and a three-dimensional model distinguishing the generation, promotion and implementation of new ideas proposed. This was found to better fit the data while capturing theoretically important 'stages' of the process identified in previous studies.

These constructs were then used to examine the link between resilience and individual innovation. CFA showed a significant overall relationship and significant dimension-to-dimension relationships in four of the six paths in the causal model.

These findings extend research in organisational behaviour and individual innovation by providing the first evidence that organisations can increase innovation by developing employees' resilience. Previous studies have suggested developing innovativeness by developing or selecting individuals for creativity or other personal traits, or by providing conducive organisational supports. Developing resilience can now be added to this list, bringing with it the advantage of broader impacts on

employees' psychological functioning, wellbeing and ability to face adversity. Resilience interventions therefore appear to be a promising new direction for innovation research, adding to their applications in organisational behaviour studies. However, while many options for developing employees' resilience are suggested by the literature, including various types of training and coaching of individuals or groups, there is a need for more research on interventions and their role in stimulating innovation.

The current findings also suggest giving further attention to the role of developmental persistency and positive emotion in sustaining innovators through the challenges of idea generation, promotion and implementation. Specific theoretical directions and practical implications were suggested in Chapter Six. Further research is also needed to confirm and explain the insignificance of paths from developmental persistency to idea generation, and positive emotion to idea implementation.

Future extensions of these results might involve variables from the entrepreneurship literature hypothesised to mediate or moderate the effect of resilience on innovative behaviour. For example, a focus on regulating behaviour towards developing one's ideal self may moderate the link between developmental persistency and idea promotion or implementation, and an innovator's social context and ability to recognise patterns in events may moderate the effect of positive emotion on idea generation and promotion.

Other theoretical extensions involve clarifying the relationships between developmental persistency and positive emotion, and between these two concepts and idea generation, promotion and implementation. The concepts of vigour and passion appear relevant to the former goal. Explanations of the link between positive emotion and idea generation or promotion are suggested in Dyer et al.'s (2011) model of observing and experimenting and Fredrickson & Branigan's (2005) model of attention and cognitive ability. The relationship between developmental persistency and idea promotion or implementation may be related to the concepts of purposeful work, task focus and exploration behaviour in Spreitzer et al's (2005) model of thriving.

Overall, the results of this study show resilience as a strength-based capacity that helps individuals face the setbacks encountered in innovation. The challenges of finding new and useful ideas, alleviating resistance and resolving conflicts with colleagues, supervisors or other stakeholders, and managing the practical and social or political issues encountered in implementing an innovative idea can be quite significant

impediments to innovation. This perspective provides many opportunities for future research capable of improving both the resilience and innovation of employees.

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APPENDIX A - POOL OF POTENTIAL ITEMS FOR THE NEW RESILIENCE MEASURE

	Perseverance
1	I am able to adapt to change
2	I can deal with whatever comes
3	I tend to bounce back after illness or hardship
4	I don't give up when things look helpless
5	I have self-discipline
6	I tend to recover quickly from stressful events
7	I usually manage difficulties one way or the other
8	I am not easily discouraged by failure
9	I have enough energy to do what I have to do
10	I always find a solution no matter what happens
11	I know I can solve my work problems
12	I completely trust my judgment and decision
13	I know that hard times will eventually be over
	Commitment to Growth
1	I see difficulties as challenges and opportunities to learn
2	I think about my mistakes and ways to learn from them
3	I think how I could have prevented unforeseen problems when they occur
4	I can grow in positive ways by dealing with difficult situations
5	I actively look for ways to overcome the challenges I encounter
6	I look for creative ways to alter difficult situations
7	I often seek feedback on my work from others
	Meaning Making
1	I actively take the time to reflect on events that happen in my life
2	When difficult things happen, I am usually quick to see the meaning of why they happen to me
3	I have a strong sense of purpose for whatever I do
4	I have an understanding of what makes my life meaningful
5	I approach all adversities as if "every cloud has a silver lining"
6	I tend to think that my life has meaning
7	I actively focus on activities and events that I personally find valuable
8	My work means more to me than just a job or a career

	Positive Emotion
1	I can handle unpleasant feelings
2	I can get through difficult times at work because I've experienced difficulty before
3	I am determined
4	I am inspired by great things
5	I am interested in facing and solving problems
6	I am confident in doing whatever I choose
7	I am optimistic and hopeful
8	I am enthusiastic in facing problems rather than avoiding them
9	I see myself as a strong person
10	I can see the humorous side of a problem

RESILIENCE AND INNOVATION IN ORGANISATIONS

PART A
Please tell me about you by ticking the appropriate box

1. Gender   Male ☐   Female
2. Age   under 30 ☐   31 – 40 ☐   41 – 50 ☐   over 50 ☐
3. In which industry do you work?

☐ Mining   ☐ Telecommunication

☐ Property   ☐ Agribusiness

☐ Media   ☐ Infrastructure

4. In which department do you work?

☐ Marketing   ☐ Operations or Production

☐ Finance   ☐ Other (explain): _____

☐ Human Resources Department

PART B
These statements describe how people react to different situations at work. Please indicate how much they apply to you by ticking the appropriate box.

1 Does not apply at all to me   2 Does not apply to me

3 Applies somewhat to me   4 Applies to me

5 Applies very strongly to me

	1	2	3	4	5
1. I am able to adapt to change					
2. I can deal with whatever comes					
3. I tend to bounce back after illness or hardship					
4. I don't give up when things look helpless					
5. I tend to recover quickly from stressful events					
6. I usually find a solution when things go wrong					
7. I am not easily discouraged by failure					
8. I see difficulties as challenges and opportunities to learn					

9. I think about my mistakes and learn from them					
10. I think how I could have prevented unforeseen problems when they occur					
11. I can grow in positive ways by dealing with difficult situations					
12. I actively look for ways to overcome the challenges I encounter					
13. I look for creative ways to alter difficult situations					
14. I often seek feedback on my work from others					
15. I actively take the time to reflect on events that happen in my life					
16. I have a strong sense of purpose in whatever I do					
17. I have an understanding of what makes my life meaningful					
18. I try to look for the best in difficult situations					
19. I tend to think that life has meaning					
20. I actively focus on activities and events that I find personally valuable					
21. I can handle unpleasant feelings					
22. I can get through difficult times at work because I've experienced difficulty before					
23. I am interested in facing and solving problems					
24. I am usually confident in doing whatever I choose					
25. I am usually optimistic and hopeful					
26. I am enthusiastic in facing problems rather than avoiding them					
27. I can see the humorous side of a problem					

PART C

Please indicate how much these statements apply to you by ticking the appropriate box.

1 Not all true	2 Barely true

3 Somewhat true	4 Completely true

	1	2	3	4
1. I am a "take charge" person				
2. I try to let things work out on their own				
3. After attaining a goal, I look for another more challenging one				
4. I like challenges and beating the odds				
5. I visualise my dreams and try to achieve them				
6. Despite numerous setbacks, I usually succeed in getting what I want				
7. I try to pinpoint what I need to succeed				
8. I always try to find a way to work around obstacles; nothing really stops me				
9. I often see myself failing so I don't get my hopes up too high				
10. When I apply for a position, I imagine myself filling it				
11. I turn obstacles into positive experiences				
12. If someone tells me I can't do something, you can be sure I will do it				
13. When I experience a problem, I take the initiative in resolving it				
14. When I have a problem, I usually see myself in a no-win situation				

PART D

Please indicate how much these statements apply to you by ticking the appropriate box.

1 Strongly disagree   2 Disagree   3 Neither agree nor disagree

4 Agree   5 Strongly agree.

	1	2	3	4	5
1. I feel that I have a number of good qualities					
2. I feel that I'm a person of worth, at least on an equal plane with others					
3. I take a positive attitude towards myself					
4. I am able to do things as well as most other people					
5. All in all, I am inclined to feel that I'm a failure					

PART E

Please indicate how much these statements apply to you by ticking the appropriate box.

1 Does not describe me at all   5 Describes me very well

	1	2	3	4	5
1. If I don't achieve my goals, I feel like a failure as a person					
2. I feel entitled to better treatment from others than I generally receive					
3. I am frequently aware of feeling inferior to other people					
4. I need approval from others to feel good about myself					
5. I tend to set my goals too high and become frustrated trying to reach them					
6. I often feel resentful when others take advantage of me					

(Y) (N)   1. I never hesitate to go out of my way to help someone in trouble

(Y) (N)   2. I have never intensely disliked anyone

(Y) (N)   3. I sometimes feel resentful when I don't get my way

(Y) (N)   4. There have been times when I felt like rebelling against people in authority even though I knew they were right

(Y) (N)   5. I can remember "playing sick" to get out of something

(Y) (N)   6. When I don't know something I don't at all mind admitting it

(Y) (N)   7. I am always courteous, even to people who are disagreeable

(Y) (N)   8. I would never think of letting someone else be punished for my wrong-doings

(Y) (N)   9. There have been times when I was quite jealous of the good fortune of others

(Y) (N)   10. I am sometimes irritated by people who ask favors of me

Thank you for your time

APPENDIX C - CORRELATION MATRIX FOR STUDY 1

	Grow5	Per2	Per3	Grow4	Grow1	Per1	Grow7	Per7	Pos4	Pos6	Pos5	Pos3	Pos7	Pos2	Grow2	Grow3	Per4	Per5
Grow5	1.000	.609	.557	.600	.421	.488	.493	.572	.263	.363	.295	.216	.167	.349	.248	.300	.402	.347
Per2		1.000	.606	.490	.440	.637	.440	.495	.250	.414	.383	.163	.193	.389	.237	.297	.486	.423
Per3			1.000	.386	.423	.494	.272	.492	.219	.300	.247	.258	.195	.321	.135	.151	.482	.506
Grow4				1.000	.393	.419	.362	.467	.275	.274	.209	.188	.208	.252	.207	.245	.457	.346
Grow1					1.000	.429	.319	.566	.195	.295	.196	.175	.241	.183	.224	.110	.381	.334
Per1						1.000	.311	.456	.198	.243	.323	.179	.140	.281	.169	.209	.394	.377
Grow7							1.000	.359	.128	.262	.143	.194	.226	.256	.375	.420	.082	.247
Per7								1.000	.210	.403	.313	.219	.192	.335	.230	.249	.518	.493
Pos4									1.000	.596	.665	.529	.544	.499	.106	.119	.170	.200
Pos6										1.000	.658	.479	.643	.550	.074	.123	.151	.211
Pos5											1.000	.481	.463	.619	.177	.166	.118	.177
Pos3												1.000	.528	.559	.010	-.010	.108	.163
Pos7													1.000	.271	.057	.018	.096	.156
Pos2														1.000	.115	.175	.174	.187
Grow2															1.000	.495	.082	.133
Grow3																1.000	.202	.260
Per4																	1.000	.604
Per5																		1.000

APPENDIX D - VARIANCE EXPLAINED IN THE SEVENTH RUN OF THE EFA (STUDY 1)

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	6.513	36.185	36.185	6.035	33.528	33.528	5.148
2	2.546	14.144	50.328	2.082	11.569	45.098	4.284
3	1.510	8.388	58.717	.962	5.345	50.443	2.636
4	.939	5.217	63.934				
5	.895	4.971	68.905				
6	.732	4.065	72.970				
7	.692	3.846	76.816				
8	.654	3.636	80.452				
9	.583	3.239	83.691				
10	.510	2.833	86.523				
11	.408	2.266	88.789				
12	.398	2.211	91.000				
13	.391	2.170	93.170				
14	.322	1.787	94.957				
15	.257	1.428	96.386				
16	.242	1.347	97.732				
17	.226	1.255	98.987				
18	.182	1.013	100.000				

Extraction Method: Principal Axis Factoring.

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

APPENDIX E - FINAL RESILIENCE SCALE

Developmental Persistency Items

1. I don't give up when things look helpless
2. I tend to bounce back after illness or hardship
3. I tend to recover quickly from stressful events
4. I am not easily discouraged by failure)
5. I think about my mistakes and learn from them
6. I can deal for whatever comes
7. I am able to adapt to change
8. I actively look for ways to overcome the challenges I encounter
9. I see difficulties as challenges and opportunities to learn
10. I can grow in positive ways by dealing with difficult situations

Positive Emotion Items

11. I am usually optimistic and hopeful
12. I am enthusiastic when facing problems rather than avoiding them
13. I am usually confident in doing whatever I choose
14. I am interested in facing and solving problems
15. I can see the humorous side of a problem
16. I can get through difficult times at work because I've experienced difficulty before

APPENDIX F - QUESTIONNAIRE FOR STUDY 2
INNOVATION IN ORGANISATIONS

1. Gender ☐ Male ☐ Female

2. Age ☐ under 30 ☐ 31 – 40 ☐ 41 – 50 ☐ over 50

3. In which industry do you work?

☐ Mining ☐ Telecommunication

☐ Property ☐ Agribusiness

☐ Media ☐ Infrastructure

4. In which department do you work?

☐ Marketing ☐ Operations or Production

☐ Finance ☐ Other (explain): _____

☐ Human Resources Department

1 Does not apply at all to me   2 Does not apply to me

3 Applies somewhat to me   4 Applies to me

5 Applies very strongly to me

	1	2	3	4	5
1. I actively look for ways to overcome the challenges I encounter					
2. I can deal with whatever comes					
3. I tend to bounce back after illness or hardship					

	1	2	3	4	5
4. I can grow in positive ways by dealing with difficult situations					
5. I see difficulties as challenges and opportunities to learn					
6. I can get through difficult times at work because I've experienced difficulty before					
7. I am usually confident in doing whatever I choose					
8. I am able to adapt to change					
9. I think about my mistakes and learn from them					
10. I am not easily discouraged by failure					
11. I am enthusiastic in facing problems rather than avoiding them					
12. I am usually optimistic and hopeful					
13. I don't give up when things look helpless					
14. I tend to recover quickly from stressful events					
15. I am interested in facing and solving problems					
16. I can see the humorous side of a problem					

PART C
Please indicate how much these statements apply to you by ticking the appropriate box.

1 I usually don't do this at all   2 I usually do this a little bit

3 I usually do this a medium amount   4 I usually do this a lot

	1	2	3	4
1. I take additional action to try to get rid of the problem				
2. I concentrate my efforts on doing something about it				
3. I do what has to be done, one step at a time				
4. I take direct action to get around the problem				

PART D
Please indicate how much these statements apply to you by ticking the appropriate box.

1 Strongly disagree   2 Disagree   3 Neither agree nor disagree

4 Agree   5 Strongly agree.

	1	2	3	4	5
1. I feel that I have a number of good qualities					
2. I feel that I'm a person of worth, at least on an equal plane with others					
3. I take a positive attitude towards myself					
4. I am able to do things as well as most other people					
5. All in all, I am inclined to feel that I'm a failure					

PART E
Please indicate how much these statements apply to you by ticking the appropriate box.

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	1	2	3	4	5
1. If I don't achieve my goals, I feel like a failure as a person					
2. I feel entitled to better treatment from others than I generally receive					
3. I am frequently aware of feeling inferior to other people					
4. I need approval from others to feel good about myself					
5. I tend to set my goals too high and become frustrated trying to reach them					
6. I often feel resentful when others take advantage of me					

PART F

Please rate yourself on the extent to which you behave in these ways:

1 = Never   7 = Always

	1	2	3	4	5	6	7
1. Creating new ideas for difficult issues							
2. Searching out new working methods, techniques, or instrument							
3. Generating original solutions for problems							
4. Mobilising support for innovative ideas							
5. Acquiring approval for innovative ideas							
6. Making important organisational members enthusiastic for innovative ideas							
7. Transforming innovative ideas into useful applications							
8. Introducing innovative ideas into the work environment in a systematic way							
9. Evaluating the utility of innovative ideas							

Thank you for your time

APPENDIX G - SUMMARIES OF OVERALL FIT INDICES OF THE CONFIRMATORY MODEL (STUDY 2)

1 Index	2 Resilience Initial model	3 Resilience Modified model	4 Inn.Behaviour Initial model (Uni)	5 Inn.Behaviour Modified model (Uni)	6 Inn.Behaviour Initial model (Multi)	7 Inn.Behaviour Modified model (Multi)	8 Resilience and Inn.Behaviour Measurement model	9 Resilience and Inn.Behaviour Causal Structural model
χ^2	168.59	116.61	158.42	72.91	105.72	59.47	346.16	379.43
Df	103	87	27	22	24	21	237	240
p	0	0	0	0	0	0	0	0
χ^2/df	1.64	1.34	11.23	3.32	4.44	2.80	1.46	1.58
CFI	0.91	0.96	0.49	0.91	0.85	0.93	0.92	0.89
RMSEA	0.05	0.03	0.20	0.06	0.11	0.05	0.04	0.04
(PCLOSE)	(0.41)	(0.87)	(0.23)	(0.45)	(0.00)	(0.45)	(0.85)	(0.82)