INDIVIDUAL INTRAPRENEURSHIP IN ORGANISATIONS: A NEW MEASURE OF INTRAPRENEURIAL OUTCOMES.

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ABSTRACT

The motivation for this study is to surface a new perspective of intrapreneurship by demonstrating a measurable correlation between key attributes for individual intrapreneurship from the literature and outcome benefits for the organisaton.

The major deliverable is the design of a new measure of individual intrapreneurial outcomes, through a survey of 248 industrialists. SEM and EFA are used to provide both theory-driven and data-driven perspectives. Given the similarity between the indices, no one single index stands out as providing a superior measurement of intrapreneurship, however an index based on an 11-item factor analysis is proposed. The measure presented is used to show how attributes often associated with intrapreneurs in the literature correlate with positive organizational outcomes generated by those individuals. These attributes are personality, tested via the Big Five Personality Questionnaire; self-perceptions of emotional intelligence, via Schutteet al's (1998) SSEIT; and perceptions of innovation climate, via the Dolphin Index. Three of the Big Five personality traits – neuroticism, extraversion, openness – are statistically significant at the 99% level. Self-perception of emotional intelligence is positively and statistically significantly correlated with the new derived Intrapreneurial Outcome measure, which supports the hypothesis that the greater the individual's self-perceptions of emotional intelligence, the greater the Intrapreneurial Outcome. Innovation climate dimensions that are most associated with intrapreneurship are dynamism, risk taking, ideaproliferation and idea support.

In summary, the benefits of correlating key attributes of successful intrapreneurs to positive organisational outcomes are identified, and measurement of these outcomes by individuals is shown to be a gap in the literature. A new, generically applicable measure of individual intrapreneurial outcomes on a scale is proposed, correlations are identified between positive intrapreneurial outcomes at the organisational level and specific elements of personality, emotional intelligence and innovation climate. These resonate with some of the key themes within the intrapreneurship literature.

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DECLARATION

I declare that this thesis is a presentation of original work and I am the sole author. This work has not previously been presented for an award at this, or any other, University. All sources are acknowledged as References.

Chapter 1

INTRODUCTION

Context of the Study

The study of intrapreneurship sits as a distinct field within the wider domain of the entrepreneurship literature. It broadly stretches along a continuum with large collective groups of people at one end, organisations large to small, departments and teams within organisations, through to individual people at the other. The present thesis is located within the field of individual intrapreneurship as a specific and specialist subset of the entrepreneurship literature.

Motivation for the Study

Nations, organisations and teams arguably need intrapreneurship at the individual level in order to generate collective intrapreneurship. Organisations per se do not have ideas, the people who work within them do. Ideas that are successfully developed and implemented provide the root of competitive differentiation, problem-solving, opportunity-finding and ultimately create the intellectual capital that sets organisations apart from each other.

The motivation for this study is to surface a new perspective of intrapreneurship that will add value to organisations and their intrapreneur employees by demonstrating a measurable correlation between some of the key attributes of individual intrapreneurs from the literature and outcome benefits for the organisation. The purpose of so doing is to begin the early stages of a process of wider academic debate on the commercial impact of intrapreneurship, so that organisations will become better informed, based on evidence, of the importance of individual intrapreneurs to overall organisational success.

The role of intrapreneur is hardly ever a specific job title in the same way that the term entrepreneur is, and intrapreneurs may operate in any kind of organisation, large or

small, and in any function or department. Yet being an intrapreneur is not classed as a profession or discipline, so specific training and development is rare. It is perhaps because intrapreneurs exist so widely and almost generically that their visibility of their current contributions to the success of their organisations and ultimately to the wider economy is sub-optimal. There is a good deal of latent potential that probably could be accessed through better understanding of intrapreneurs and by providing targeted support learning and development for them.

It is the long-term ambition for this thesis to be the beginning of a potentially lifelong study and communication of how individual intrapreneurs and their employing organisations can identify and leverage key attributes for positive and beneficial intrapreneurial outomes, creating more sustainably robust and competitive organisations.

Statement of the Problem

As organisations are often budget-constrained and highly conscious of return-on-investment for any activities, the argument can be made more persuasively to the corporate audience if potential commercial benefits of better understanding and developing individual intrapreneurs are considered. The intrapreneurship literature features a great deal of reliable, valid, insightful and helpful research findings. These generally arise from observational and interview studies, mainly qualitative, of individuals who others (such as peers and line managers) agree are successful intrapreneurs within their employing organisations. The quantitative studies that have been located for this study mainly deal with the measurement of personality, behaviours or intention, rather than on the business performance outcomes generated by intrapreneurial individuals.

Attempts to make a link between intrapreneurial behaviour at the individual level and measurable positive outcomes for the employing organisation are rare, possibly because doing so carries inherent risks and difficulties. For example, success for one organisation may not be so for another due to issues of intent, purpose and scale or

relativity; and sometimes it is difficult to separate the contribution of a single individual from that of a wider team. However, despite these challenges, efforts can still be made to generate useful progress and insight to complement the existing body of literature. The problem statement for this study is therefore summarised as:

How can the positive organisational outcomes of individual intrapreneurship be measured on a scale, so that the attributes often associated with successful individual intrapreneurs in the literature can be explored?

In particular, this problem statement is applied to focus on the following separate but mutually complementary and overlapping specific research objectives:

1. To determine a measure of individual intrapreneurial outcomes.

2. To use the measure of individual intrapreneurial outcomes to explore correlation with some of the attributes often associated with individual intrapreneurs, i.e:

    a. Personality traits;

    b. Self-perception of emotional intelligence; and

    c. Perception of innovation climate.

Aim and Scope

This study proposes what is intended to be a generically-applicable (i.e. relevant to organisations of all kinds and sizes) measure of the beneficial outcomes of individual intrapreneurship to the employing organisation to create a scale. This scale is then used to test whether some of the attributes of individual intrapreneurs from the literature do indeed correlate with positive organisational outcomes. The aim is to begin to investigate the key attributes of individual intrapreneurs who generate positive outcomes for their employing organisations.

Significance of the Study

On a theoretical level, this study aims to develop a scale that allows investigation of the correlations between key attributes of individual intrapreneurship from the literature – namely the role of personality, self-perceptions of emotional intelligence and perceptions of innovation climate – and intrapreneurial outcomes for the organisation measured on the scale. Another intended aim of this study on a practical level is to begin to build an evidence-based, conceptual argument for business focus on developing and supporting individual intrapreneurs. It is also to help individual intrapreneurs better understand how they can develop and use their capability more effectively within their organisations through better awareness of their modus operandi.

Literature Review

This is a study that aggregrates a selection of key themes from the literature and shapes a fresh, original perspective through both the research design and the combination of texts explored.

To achieve the synthesis of the literature reviewed and evaluated in this study, the scope of texts used range from the field of intrapreneurship specifically, entrepreneurship and innovation more broadly and widen out to encompass specific areas of psychology (Chapters 5 and 6) and organisational development and management (Chapter 7). The research design chapters also incorporate application of some of the fundamental literature regarding Structural Equation Modelling, Exploratory Factor Analysis and associated statistical theory relevant to this study.

When reviewing the literature throughout this study the aim is to present a comprehensive coverage of both theoretical and empirical studies of intrapreneurship and the related dimensions of personality, emotional intelligence and innovation climate. The searches are focused on these domains and employ digital and physical academic libraries readily available to the intrapreneurship and entrepreneurship

research community. Literature is used from international sources, predominantly in the English language. Google Scholar as an aggregator database has been a significant source of journals, conference papers and signposting to key texts and a gateway to recognised academic publications. In addition, reference and bibliography sections of the texts reviewed have often been explored for further materials. The main search terms used from the intrapreneurship literature specifically are 'intrapreneur', 'entrepreneur', 'corporate entrepreneur', 'entrepreneur-manager', 'venturing' and 'innovator'. These searches are supplemented with manual explorations of relevant journals and websites, as well as recommendations from colleagues and peers. The volume of literature on intrapreneurship is a small fraction of what is available for entrepreneurship, and the former is lacking in robust attempts to correlate dimensions relating to the individual intrapreneur to positive outcomes for their organisation.

Overview of the Study

A 'logico-deductive' approach (Charmaz, 2006) is taken and the study is organised as follows. There are fifteen further chapters. Chapters 2 to 7 inclusive locate the present study in the related literature. In Chapter 2 the definitions of an intrapreneur are discussed to guide the enquiry and summarise the ontological discussion in the literature regarding the nature of intrapreneurship. This includes a review of the definitions of an entrepreneur and the context in which intrapreneurship can be found, as well as a review of why intrapreneurship is necessary for organisational survival and growth. In this regard, a critical evaluation and synthesis of the entrepreneurship and intrapreneurship literature are undertaken to shape the definition of an intrapreneur that is used in this study. Chapter 3 further sets the context for this study via exploration of the Intrapreneurship Process – i.e. what it is that an intrapreneur actually does to make intrapreneurial concepts a reality within their employing organisation, and what drives the individual intrapreneur to do so. This chapter provides a conceptual framework for the themes that follow and draws on the literature of creativity and

business innovation as well as the intrapreneurship literature. Key insights are then synthesised to shape a derived intrapreneurship process.

The literature review in Chapter 4 focuses on the theme of measuring intrapreneurship. Chapters 5, 6 and 7 hone in on some of the key attributes of intrapreneurs identified by the literature: personality traits, emotional intelligence and perceptions of innovation climate respectively.

Chapter 8 outlines the aims, philosophy and methodology for this research. Chapter 9 comprises a description of the sample, and Chapters 10 to 14 inclusive present the results from the analysis: Chapters 10 and 11 describe the development and results of the SEM and EFA respectively. In Chapter 10 the results of the SEM development testing and refinement are shown in detail. Chapter 11 includes the results of the complementary data-driven approach taken to investigate the hypothesised model discussed in the previous chapter using exploratory factor analysis (EFA).

Chapter 12 shows the outcomes of sensitivity analysis via differing sample sizes carried out on the SEM and EFA to assess the adequacy of the sample. In Chapter 13 the relationship between the SEM and EFA derived indices are analysed and results presented. Chapter 14 presents the results from the correlation of the data from selected inventories for personality, emotional intelligence to the derived new Individual Intrapreneurial Outcomes measure.

Chapters 15 and 16 present the discussion, recommendations and conclusions of this study. Chapter 15 summarises the research findings from the measure development and application; also of the correlation of the selected personality, emotional intelligence and innovation climate inventory data to the new Individual Intrapreneurial Outcomes measure. It includes expansion of the key findings of this research that are used to propose potential implications for supporting and developing individual intrapreneurs within organisations. Chapter 16 summarises the conclusions

and reflective evaluation of the study and puts forward potential opportunities for further research.

Chapter 2

DEFINING INTRAPRENEURSHIP

Overview of the Chapter

This chapter comprises a synthesis and critical evaluation of definitions and interpretations of intrapreneurship from the literature in order to underpin and justify a) a proposed new descriptive model of intrapreneurship and b) a unifying definition of the term intrapreneur. The model and definition inform the context of this thesis, setting the scene for the specific research questions that follow.

History of the Term 'Intrapreneurship'

Unlike the term 'entrepreneur', which has a long and rich history in the literature, being first attributed to Cantillon in the eighteenth century, the first publication of the term 'intrapreneur' did not occur until the late 1970s (Pinchot & Pinchot, 1978), around 240 years later (Table 1).

Table 1: Overview of the Published Use of the Word 'Intrapreneurship'

Year	Author(s) / Publication	Context
1978	Pinchot & Pinchot – University paper	Reported to be the first time that the terms 'intrapreneur' and intrapreneurship' were published in writing.
1982	Macrae – The Economist	Intrapreneurship was used and credited to Pinchot.
1982	Haller	First formal academic use in a Master's thesis.

1985	Time Magazine	Article published called 'Here Come the Intrapreneurs'.
1985	Newsweek	Article published in which Steve Jobs said that intrapreneuring was what the Macintosh team were doing before the term was even conceived.
1992	The American Heritage Dictionary	Included the term 'intrapreneur' in its 3rd 1992 edition as follows: 'A person within a large corporation who takes direct responsibility for turning an idea into a profitable finished product through assertive risk-taking and innovation'. Pinchot was credited as the originator of the term.
2015	The American Heritage Dictionary	Still includes the term 'intrapreneur' in its 5th 2015 online edition. Definition is 'A person within a large corporation who takes direct responsibility for turning an idea into a profitable finished product through assertive risk taking and innovation.'

The meaning of the term 'entrepreneur' has evolved over time, its starting point being in 1755 by Cantillon meaning someone who has the ability to take charge (Cantillon, 1755) through to today's definitions which focus on alertness to and exploitation of

opportunities in business (Kirzner, 1999) an overview of this history being reported by Burns 2008 (p.9). In its comparatively much shorter history, the meaning of the term 'intrapreneur' and synonyms for 'intrapreneurship' have also evolved and widened.

Other Terms for Intrapreneurship and Intrapreneur

Intrapreneurship has a number of synonyms in the literature. These include: 'intrapreneuring' (Pinchot, 1985); 'corporate entrepreneurship' (Burgelman, (1983); Vesper, 1984; Guth & Ginsberg, 1990; Hornsby et al., 1993; Stopford & Baden-Fuller, 1994; Antoncic & Hisrich, 2004); 'internal corporate entrepreneurship' (Schollhammer, 1981, 1982; Jones & Butler, 1992); 'entrepreneurial activities' within an organisational setting (Heinonen & Korvela, 2003); and 'corporate venturing' (Macmillan, 1986; Vesper, 1990). Baruah & Ward (2015) note that some researchers (e.g. Toftoy and Chatterjee, 2004; Fitzsimmons et al., 2005; Christensen (2005); Bosma et al., 2010; Amo, 2010) use these different descriptions as 'interchangeable terminologies'.

Likewise, the literature features synonyms for intrapreneur. Examples are Patterson et al.'s (2009) generic term 'innovative people', which based on their description have much in common with intrapreneurs. Their 'innovative people' (2009; p.5) display *"innovation [that] goes beyond individual creativity as it also concerns the extent to which employees sustain and implement innovations."* Patterson et al. (2009; p.5) use NESTA's definition of innovation in the context of their research into 'innovative people', i.e.:

> *"change associated with the creation and adaptation of ideas that are new-to-world, new-to-nation / region, new-to-industry or new-to-firm. This definition encompasses both the processes individuals use and the outcomes that they develop."*

Veronica et al (ND) refer to intrapreneurs as domestic entrepreneurs. Wunderer (2001; p.194) refers to intrapreneurs also as 'internal entrepreneurs' who have a strong drive

towards co-operation with colleagues. 'Corporate employee-entrepreneur' is also used as a synonym for intrapreneur (Monsen et al., 2010; p.105).

Intrapreneurship and Entrepreneurship

Numerous researchers agree that intrapreneurship has its roots in entrepreneurship (Amo & Kolvereid, 2005; Antoncic & Hisrich, 2003; Heinonen & Karvela, 2003; Pinchot & Pellman, 1999) and many definitions refer to intrapreneurship as being entrepreneurship within an existing organisation (Antoncic, 2007; Sinha & Srivistava, 2013; Pinchot & Pellman, 1999; Blundel & Lockett, 2011). Memon (2010) says that 'Intrapreneurs are inside entrepreneurs who follow the goal of the organization.' Cooper et al. (2014) observe that intrapreneurship is often a precursor for female high-technology entrepreneurship, providing the industry knowledge, skills and business networks needed to set up a successful new business.

As intrapreneurship is closely related to entrepreneurship, it is useful to begin with a definition and understanding of entrepreneurship from the literature. Blundel and Lockett (2011; p.5) and Burns (2008) circa fifty years later still concur with Penrose's (1995 [1959]; p.33) view of entrepreneurship as:

> *"a slippery concept…not easy to work into a formal analysis because it is so closely associated with the temperament or personal qualities of individuals."*

Baruah & Ward (2015; p.65) note a "lack of clarity and consensus in definition or distinct research approach" to entrepreneurship research and propose a new term, "X'trapreneurship", to "classify different domains of entrepreneurship" recognising different intrapreneurship processes, i.e. bottom-up, top-down and independent.

The OECD-Eurostat (from Blundel and Lockett, 2011; pp.6-7) definition of entrepreneurship is:

> *"the phenomenon associated with entrepreneurial activity";* and

"Entrepreneurial activity is enterprising human action in pursuit of the generation of value through the creation or expansion of economic activity, by identifying and exploiting new products, processes or markets."

In general, as Burns (2008, p16) observes, "entrepreneurs are defined by their actions, not by the size of organization they happen to work within", and the same can be said of intrapreneurs, as shown below.

Sinha and Srivastava (2013, p.99) describe intrapreneurs as being "more like entrepreneurs than being traditional managers" and four key differences between entrepreneurs and intrapreneurs can be found in the literature. These are:

1. Setting or context: intrapreneurs operate inside an existing organisation, often needing to influence internal decision-makers. Entrepreneurs create a new organisation (Camelo-Ordaz et al., 2011; Blundel & Lockett, 2011) and where funding or other support is required need to influence externally (Molina & Callahan, 2009; de Jong et al., 2011; Camelo-Ordaz et al, 2011; Sinha & Srivistava, 2013; Chisholm, 1987; Luchsinger & Bagby, 1987).

2. Risk and resources: intrapreneurs use employers' resources to implement risky decisions. Entrepreneurs either use their own resources, or sometimes also external investors' resources to implement risky decisions. (Molina & Callahan, 2009; Camelo-Ordaz et al., 2011). Intrapreneurs do expose themselves to risk – reputational, and potentially career-risk at the individual level if they fail to deliver successfully – and they also take on risk on behalf of their organisation. With innovation there is always the risk that things will not go to plan and that losses will result (de Jong et al., 2011). Just asking for additional resources to undertake an intrapreneurial initiative can be risky. Intrapreneurs pursue opportunities beyond the resources already available to them (Stevenson & Jarillo, 1990) and shape activities that are different from the current situation (Antoncic & Hisrich, 2003) and in unpredictable,

changing environments (de Jong et al., 2011). Parker & Collins (2010; p.642) observe that proactive employees who generate change, having much in common with the intrapreneurs of this study, often need to sell "controversial" issues and ideas internally.

3. Reward: intrapreneurs are not always rewarded financially or otherwise for their enterprising successes. Reward outcomes are contingent on terms of employment and organisational policy. Entrepreneurs (along with their shareholders / investors) are likely to benefit directly from their endeavours, both financially and non-financially (Baruah & Ward, 2015; Morris & Kuratko, 2002).

4. Tangible and intangible infrastructure: to a greater or lesser extent, depending on the initiative, intrapreneurs use systems, procedures, knowledge, processes and ways of working that exist within the employing organisation to get decisions made to get things done. Entrepreneurs either need to create their own systems, procedures, knowledge, processes and ways of working (Molina & Callahan, 2009; Antoncic & Hisrich, 2001; Morris et al., (2008); Camello-Ordaz et al. (2011) or access / borrow them from potential suppliers, partners, investors or other outside agencies.

Sources and Levels of Intrapreneurship – an Organising Framework

The literature features intrapreneurship at three levels, arranged as a hierarchy in points 1-3 below. This hierarchy also connects with Baruah & Ward's (2015) identification of intrapreneurship as being bottom-up, top-down or independent, as discussed above:

1. Organisational or 'firm' level (Rauch et al., 2009; Lumpkin et al., 2009; Ling et al., 2008).

2. Team level. Wunderer (2001, p.193) introduces the term "co-intrapreneurship" (shortened form of 'co-operative intrapreneurship', which he describes as combining:

   "*the organization-internal competition with a long-term, win-win-oriented co-operation"* (p.200).

   He also describes the concept as follows:

   "co-intrapreneurial orientation unites a responsibility for the whole and at the same time enables teams to practice their own local flexibility and freedom" (p.194).

   Lucas et al. (2009) observe that it is important that innovation and new knowledge is generated from all levels of the organisation, rather than just top down, as competition and pressure become more challenging, especially in new technology sectors that are knowledge intensive. They comment that Ancona and Bresman's (2007) distributed model of leadership applies to innovation for growth and competitiveness. Some researchers postulate that the team or group rather than the individual should be the focus for organisations in generating positive intrapreneurial outcomes (Kanter, 1989; Reich, 1987; Stewart, 1989).

3. Individual level (de Jong et al., 2011; Monsen et al., 2010; Marvel et al., 2007).

The focal interest of this study is the individual intrapreneur.

Where does intrapreneurship happen?

Blundel & Lockett (2011; p.8) observe that a great deal of intrapreneurship takes place "in existing organizations in the commercial, public, and voluntary sectors." Heinonen & Korvela (2003; p.2) comment that:

> *"It seems that different kinds of organisations are eagerly promoting entrepreneurial activities within their staff and management teams."*

Despite the definition from the American Heritage Dictionary cited in Table 1 above, intrapreneurship takes place in organisations of all sizes (Antoncic & Hisrich, 2001, 2004). Some researchers have focused on larger firms (Zahra, 1995, 1996; Heinonen & Korvela, 2003), others on small to medium sized enterprises (SMEs) (Camelo-Ordaz et al., 2011), including micro-businesses (Carrier, 1994).

The word 'firm' features regularly in the literature (e.g. Carrier, 1994; Antoncic & Hisrich, 2003) suggesting that the research focus has been on commercial organisations aiming to survive, grow and become more profitable. However, there is substantial evidence that the concept of intrapreneurship is alive and well in the public sector. Some examples of intrapreneurship as a key theme for the National Health Service (NHS) in the academic literature include Probst et al., (2013); Wilson et al., (2012); Sanderson & Neal, (2010); Boore & Porter, (2011).

Why is intrapreneurship important?

> *'Organizational and economic development is substantially dependent on entrepreneurship in existing organisations (intrapreneurship)…Firm performance can be considered the most important consequence of intrapreneurship.'*
>
> (Antoncic, 2007; p.309).

Intrapreneurship is also linked with improved growth and profitability (Covin & Slevin, 1991; Antoncic, 2007) and as a feature of successful organisations (Peters & Waterman, 1982; Kanter, 1984; Pinchot, 1985), including the growth of small to medium-sized enterprises (SMEs) (Camelo-Ordaz et al, 2011; Covin, 1991). It has been identified as being essential for driving positive firm performance in competitive or challenging environments (Covin & Slevin, 1989) and creates competitive differentiation through new products or services (Auruskevidene et al., 2006).

Intrapreneurship as a Trend

Entrepreneurship is much more prolific in the literature than intrapreneurship, as demonstrated in Table 2 which tracks the number of items including the term 'intrapreneur' and 'entrepreneur' (excluding patents and citations) from a year-by-year Google Scholar search undertaken in September 2015. The table also shows how much better-established the term 'entrepreneur' was in the literature in the late 1970s when the term 'intrapreneur' was first coined.

Table 2: Number of items containing 'intrapreneur' and 'entrepreneur' by year. (Google Scholar search undertaken September 2015).

YEAR	Number of results INTRAPRENEUR ITEMS	Number of results ENTREPRENEUR ITEMS	YEAR	Number of results INTRAPRENEUR ITEMS	Number of results ENTREPRENEUR ITEMS
1976	0	1,180	**1996**	48	5,640
1977	0	1,350	**1997**	52	6,100
1978	1	1,330	**1998**	53	7,320
1979	0	1,500	**1999**	57	8,370
1980	0	1,500	**2000**	102	9,910
1981	0	1,620	**2001**	112	11,100
1982	2	1,700	**2002**	106	12,800
1983	4	1,800	**2003**	144	14,300
1984	2	1,970	**2004**	144	16,400
1985	10	2,270	**2005**	167	18,600
1986	18	2,340	**2006**	197	21,800
1987	32	2,510	**2007**	176	24,300
1988	44	2,930	**2008**	249	29,100
1989	20	3,220	**2009**	236	30,900
1990	29	3,190	**2010**	285	31,500
1991	36	3,560	**2011**	281	32,100
1992	29	3,930	**2012**	312	31,600
1993	31	4,150	**2013**	408	29,700
1994	53	4,800	**2014**	368	27,700
1995	43	5,070			

Intrapreneurship studies have tended to surge and wane – globally as well as in specific geographies. The intrapreneurship phenomenon appears to have started in the US apparently driven to an extent by economic conditions, and has been picked up by other countries as they have worked to strengthen and restructure their commercial economies, for example in India (e.g. Capelli, 2010; Bhatia and Khan, 2013), Eastern Europe (Antonic and Hisrich, 2000) and Latin America (d'Angelo et al., 2015).

What activities are included in the term Intrapreneurship?

De Jong et al. (2011) provide a broad definition of the activities associated with intrapreneurship:

> *"Intrapreneurship captures the identification and exploitation of opportunities within incumbent organisations"* (p.3).

The literature shows intrapreneurs driving growth and renewal through introducing new products, processes, services, technologies (Camelo-Ordaz et al, 2011; Menzel et al, 2007; Antoncic & Hisrich, 2003; Covin & Miles, 2007; Covin & Slevin, 1991; Gapp & Fisher, 2007; Kuratko et al., 2005; Miles & Covin, 2002; Srivistava & Lee, 2005).

Intrapreneurship is also described as the activity to start a new venture in an existing firm (de Jong et al., 2011; Sharma & Chrisman, 1999; Kanter & Richardson, 1991; Badguerahanian & Abetti, 1995; Schollhammer, 1982; Zahra, 1991; Hisrich & Peters, 1984; Macmillan et al., 1994; Vesper, 1984; Rule & Irwin, 1988; Stopford & Baden-Fuller, 1994).

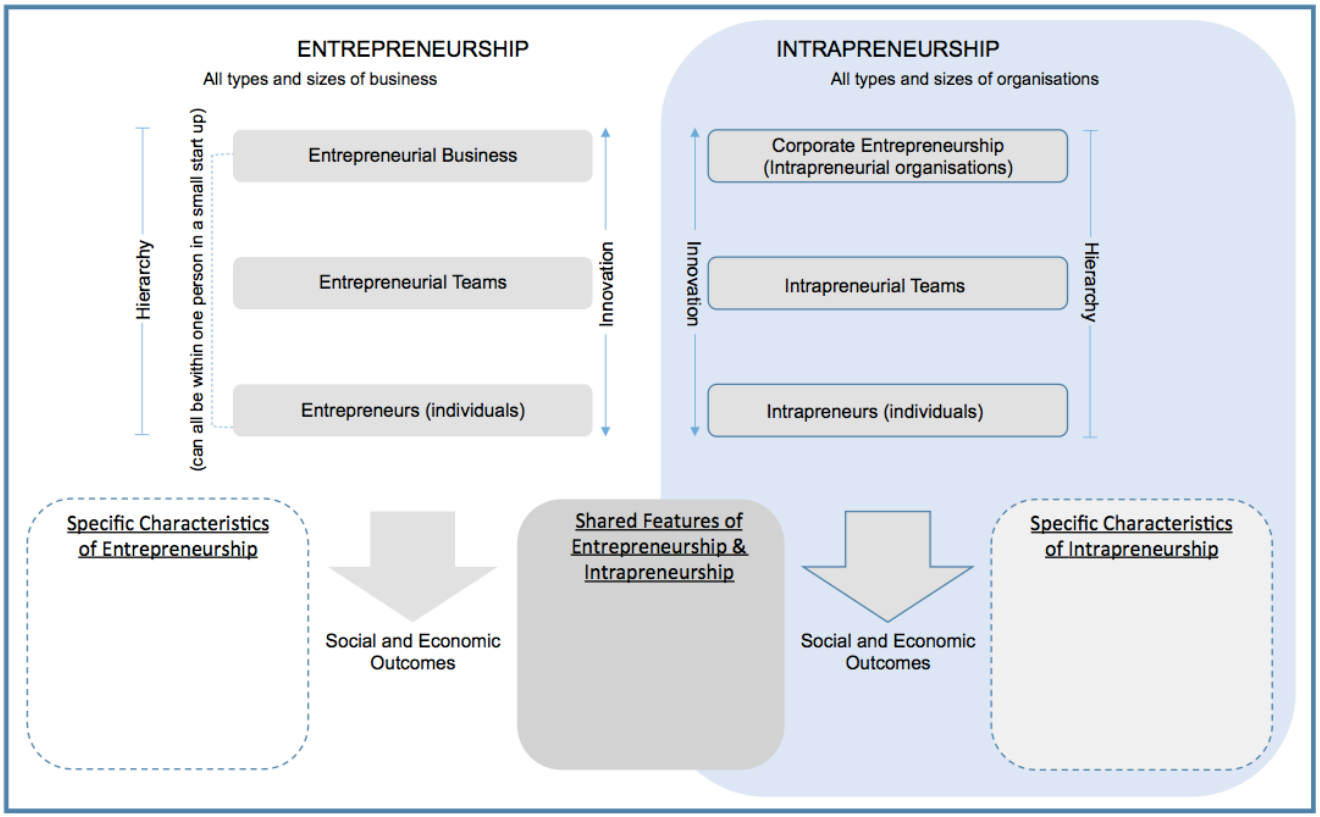
There is an underlying theme of innovation throughout the definitions of intrapreneurship (Sinha & Srivistava, 2013; de Jong et al., 2011; Napier & Nilsson, 2006). Camelo-Ordaz et al. (2011; p.514) describe intrapreneurs as "architects, supporters and developers of the firm's creative capabilities" in the context of SMEs in the creative sector. BIS (2011; online) defines innovation as "the development of new products, services and processes."

Intrapreneurial innovation also appears in the literature in the form of organisational self-renewal, which Antonic (2007; p.311) describes as: "the transformation of organizations through renewal of the key ideas on which they are built."

Conclusion

To synthesise the diverse findings on the nature of intrapreneurship from the literature, the descriptive model shown in Figure 1 is proposed:

Figure 1: Descriptive Model of Intrapreneurship derived from the Literature



The definition of an intrapreneur in the context of this research is as follows:

"An intrapreneur practises **entrepreneurial activity in an established organisation**. He/she successfully **spots opportunities** that are not immediately obvious to most colleagues and **makes them happen** to generate positive, material **results** for his /her employing organisation. These results can constitute **reputational, product or service development, or market development** benefits to the organisation."

Chapter 3

THE INTRAPRENEURSHIP PROCESS

Overview of the Chapter

This chapter comprises a descriptive synthesis and critical evaluation of the theories of innovation, entrepreneurship and intrapreneurship process from the creativity, innovation, entrepreneurship and intrapreneurship literature in order to provide a model of the Intrapreneurship Process that is informed by the conclusions of the review and critique. This literature-derived Intrapreneurship Process provides the context and conceptual framework of this thesis and is referred to throughout. This chapter also introduces the individual attributes that are likely to be required during the Intrapreneurship Process to contribute to the achievement of successful Intrapreneurial Outcomes for the employing organisation and which will be explored in more depth in subsequent chapters.

Introduction

The intrapreneur undertakes a range of activities towards accomplishment of the desired result, i.e. the successful exploitation of an appropriate opportunity to achieve intended positive intrapreneurial outcome for the organisation. In the context of this research it is important to explore these activities as a process because they show how successful intrapreneurs operate and inform analysis of the key attributes (defined as positive qualities or characteristics) that are required by the intrapreneur. The focus of this chapter is on the fundamental steps and actions that the intrapreneur is likely to take in most intrapreneuring situations. The key attributes that underpin and enable achievement of these steps and actions (i.e. successful completion of the entire process to attain the desired outcome) are explored in later chapters.

What do Intrapreneurs do to generate successful Intrapreneurial Outcomes? A Review of the Intrapreneurship Literature

Antoncic and Hirsch (2003; p.20) state:

> *"Intrapreneurship…is an essentially activity-based or activity-oriented concept that operates at the organizational boundary and stretches [the organization]… in new directions."*

Pinchot (1985; p.xv) succinctly refers to intrapreneurs as "dreamers who do", albeit in the context of the intrapreneur as the instigator and deliverer of new venture creation within the corporate environment. Although simple, Pinchot's (1985) description does capture two necessary phases of the Intrapreneurship Process: creativity and innovation. Dreaming is the creativity phase: it involves the generation of new ideas or concepts and recognition of a new opportunity by the individual intrapreneur. Doing is the innovation phase: it involves the individual intrapreneur developing the new idea or concept generated from the creativity phase further and progressing it to implementation.

A review of the intrapreneurship literature reveals a lack of a comprehensive and specific focus on the intrapreneurship process per se, although some key themes and descriptions emerge as a secondary focus within the literature. For example, based on evidence from her studies which took place over five years, involving more than 100 companies before she focused on ten core case study companies that she examines in depth, Kanter (1983) describes the process by which successful corporate innovators, synonymous with this thesis' definition of an intrapreneur, achieve their goals. Her research took place at a time when corporate America (the context for the book) had been hit hard by global recession, and was beginning the process of recovery. However, she gives one of the most comprehensive accounts of intrapreneurial activities encountered in the literature. The role of the intrapreneur in this thesis is directly aligned to Kanter's (1983; p.205) description of "figuring out how to do what

[the organisation] …does not yet know." The intrapreneurship process that she describes is about testing "limits and [creating] new possibilities" (Kanter, 1983; p.210). The steps in the process that successful intrapreneurs take to achieve their goals have been extracted from her text and summarised below:

(1) They *"mobilize people and resources to get things done"* (p.213);

(2) "*Problem definition"– "active listening to the information circulating…to translate a set of vaguely expressed needs…into an opportunity for concrete action that produces innovation."* In so doing, the intrapreneur discovers *"the basis for …conflicting perspectives - acquiring technical information, political information and supporting data…and making the project 'saleable'"* (p.218);

(3) *"Coalition-building"* (p.228) – getting others to actively support and engage, obtaining investment and resources. This stage also includes *"horse-trading…offering promises of payoffs from the project in exchange for the support of…time and money"* (p.223); and

(4) *"Mobilization and completion"* (p.229). External communication is a critical part of this stage to ensure that the intrapreneur maintains and gains credibility for progressing the project well and delivering according to the promises he or she made.

To Kanter's (1983) stages could be added one of reflection and review. Successful intrapreneurs are likely to continue to learn with every experience, perhaps intuitively rather than formally, and carry those lessons forward to future projects.

Whilst the themes in Kanter's (1983) study resonate today and are based on robust data and insight on those organisations studied, the findings are based on a small number of American companies at a specific point in history some time ago. Twenty-five years on, Chakravarthy and Lorange (2008) present the role of the 'entrepreneur-manager', who has much in common with the definition of the Intrapreneur in this thesis and Kanter's (1983) corporate innovator. Their 'entrepreneur-manager'

possesses both operational management and entrepreneurial skills, the research supporting the premise that successful entrepreneur-managers work within the parameters of the overall corporate strategy, yet find space and autonomy to develop new initiatives and projects that enable the firm to innovate and evolve. This echoes the rule-bending associated with Pinchot's (1985) intrapreneur. Pinchot's (1985) 'The Intrapreneur's Ten Commandments' include items such as: 'Come to work each day willing to be fired', 'Circumvent any orders aimed at stopping your dream', and 'Remember, it is easier to ask for forgiveness than for permission.' These 'commandments' are probably reflective of the business culture of America in the 1980s – whereas more recently Pinchot (2011; online) has added items that are more reflective of today's greater focus on social responsibility, such as 'Keep the best interests of the company and its customers in mind, especially when you have to bend the rules or circumvent the bureaucracy' and 'Don't ask to be fired; even as you bend the rules and act without permission, use all the political skill you and your sponsors can muster to move the project forward without making waves.' Chakravarthy and Lorange (2008) propose some key actions taken by their entrepreneur-managers as seeing 'the big picture' and 'shaping strategy'. They also 'communicate and market the value proposition'. Chakravarthy and Lorange (2008) provide little discussion of how the entrepreneur-managers generate ideas or of the implementation process, though, and describe success as specific individual traits rather than as actions that the individual takes or the outcomes achieved – initiatives are driven through by 'passion and inner fire', 'an action orientation' and 'self-confidence', along with a 'propensity to take risks'. To achieve the game-changing results that shape strategy in the way that Pinchot (1985; 2011) and Kanter (1983) outline, these qualities are certainly likely to help the intrapreneurship process. The limitations of Chakravarthy and Loranges's (2008) research are that the findings are based on a small number of qualitative observations from only five organisations, all large, multi-national, product-led businesses. As a result, the data to support the authors' (in the main, very sensible) assertions are lacking and are weak on describing process stages.

Table 3 summarises the themes arising from the intrapreneurship literature. These themes are organised into the discrete, logical and sequential steps that the intrapreneur takes in the process of generating successful outcomes for the employing organisation. A consistent theme in the literature is that successful intrapreneurship follows from a number of key stages. These include:

1. Some sort of creative stimulus that leads to an opportunity, which is recognised by the intrapreneur as having the potential to be successful: Belousova and Gailly (2013); Colarelli O'Connor and Rice (2001); Gapp and Fisher (2007); Kanter (1983); Menzel (2007); Menzel et al. (2007); Seshadri and Tripathy (2006).

2. Creative development in which the idea and opportunity are further explored or worked on: Belousova and Gailly (2013); Colarelli O'Connor and Rice (2001); Gapp and Fisher (2007); Koen et al. (2002); Menzel (2007) and Menzel et al. (2007); Seshadri and Tripathy (2006).

3. Generating support and getting the go ahead to proceed through influencing and persuasion: Belousova and Gailly (2013); Chakravarthy and Lorange (2008); Colarelli O'Connor and Rice (2001); Gapp and Fisher (2007); Kanter (1983); Koen et al. (2002); Moriano et al. (2014).

4. Of course, at some point the successful intrapreneur needs to put the plan into action and make it happen: Belousova and Gailly (2013); Chakravarthy and Lorange (2008); Colarelli O'Connor and Rice (2001); Foley (2012); Gapp and Fisher (2007); Kanter (1983); Menzel (2007); Menzel et al. (2007); Moriano et al. (2014); Seshadri and Tripathy (2006).

These stages 1-4, although sequential, are unlikely to be always carried out in a linear fashion as the intrapreneur needs to navigate internal politics and overcome hurdles on the way (Kanter, 1983).

5. Some examples of the literature also refer to a post-implementation learning phase: Gapp and Fisher (2007); Menzel (2007); Menzel et al. (2007); Moriano et al. (2014).

Table 3: Intrapreneurship Process stages - Themes from the Literature

			Creativity		Innovation					
Reference	**Method**	**Context**	**Creative Stimulus**	**Opportunity Recognition**	**Creative Development**	**Idea Testing**	**Generate Support**	**Get the Go Ahead**	**Make It Happen**	**Learn from the Results**
Kanter (1983)	Study of corporate innovators and employee participation at the end of recession in the USA.	Intrapreneurship	Active listening to the information circulating...to translate a set of vaguely expressed needs...into an opportunity for concrete action that produces innovation'				making the project 'saleable'; 'making cheerleaders'; 'offering promises of payoffs from the project in exchange for the support of...time and money'	clearing the investment with superiors'; 'securing blessings'	mobilize people and resources to get things done'; 'Mobilization and completion'; create favourable and up-to-date impressions in the minds of peers and key supporters'	
Colarelli O'Connor and Rice (2001)	Focus on 'opportunity recognition and breakthrough innovation in large, established firms'	Intrapreneurship	Breakthrough idea'; 'Idea generation'	Opportunity recognition'	Initial evaluation as a precursor to the formation of a commercialization effort'		The 'continuity of the informal network of individuals engaged in the conversion of breakthrough innovations into new ventures'..'Upward networks (access to senior managers) provide protection and		Breakthrough innovation commercialization'	
Gapp and Fisher (2007)	Intrapreneur-led Three Phase Model of Innovation. Based on Deming's PDSA (Plan, Do, Study, Act) cycle. Links 'team, service innovation and 'product innovation'.	Intrapreneurship	Establishment and development of an effective intrapreneurial team'; 'Analyse the current situation'; 'Stimulus for intrapreneurial activity'.		Visualise the impacts of any decision before making it'; 'Plan of implementation drawn up and communicated'; 'trialling change on a small scale'; 'Plan service / product intervention'		This is a 'participative intrapreneurship model' throughout, focusing on intrapreneurial teamwork. Part of the team development 'were supported through the use of an internal team of experts ...with an understanding of the issues and important facts that influenced		Implementation'.	Repeat of the 'PDSA' (Deming, 1986) cycle as a 'spiral', to drive continuous improvement and learning.
Seshadri and Tripathy (2006)	Interviews with managers at Tata Steel	Intrapreneurship	Imagination'; 'A powerful vision'			Experimentation'; 'Assessment'			Scale-up'; '[make] reality'	
Bélousova and Gailly (2013)	3 case studies in 1 organisation	Intrapreneurship	Discovery' stage: 'Think about new work-related ideas'; 'Suggest' and 'Generate ideas'; 'Decide to act entrepreneurially'; 'Initiate'; 'Identify opportunity'.		Evaluation' stage: 'Normative assessment of an idea and its development into a valuable project.'		Legitimation' stage: 'Getting attention, recognition, and approval from organisational members'		Exploitation' stage: 'Different action modes directed towards gathering resources and bringing the project to market'	
Moriano et al. (2014)	Context for quantitative study on the influence of coaching and management on individual intrapreneurship	Intrapreneurship	Out of the box thinking'	Initiative'			Networking behavior'; 'championing'		Taking charge'	...philosophy of continuous learning'
Foley (2012)	Practitioner	Intrapreneurship	Seek out opportunities'; 'Experiment with new ideas'.	Design and develop the future'	Create something from nothing'; 'Driving change'; 'Execution'.					
Menzel et al (2007)and Menzel (2007)	The Process of Intrapreneurship	Intrapreneurship	Opportunity discovery'		Preparation for exploitation'				Opportunity exploitation'	New means-ends relationship)
Chakravarthy and Lorange (2008)	Qualitative Interviews with a small sample of intrapreneurs	Intrapreneurship	See the big picture and shape strategy'				Communicate and market the value proposition'; 'Informal lobbying and influencing key stakeholders'		Gain support and mobilize resouces; ''Assemble and motivate a team of experts'	
Koen et al. (2002)	Regression study - mapping start-up funding in multi-company intervention over a 12-week period with employees from 37 large companies... and one small Venture Capital Start- Up	Intrapreneurship	Creativity		Create a business plan		Persuasion'	Obtain start-up funding'		

Models of Creative Problem Solving, Product & Service Innovation and Entrepreneurship from the Literature

As discussed in the section above, the intrapreneurship literature deals predominantly with the skills, behaviours and traits of intrapreneurs – the intrapreneurship process is only a secondary consideration at best. Therefore, models of the Creative Problem Solving Process, Product Innovation Process and Entrepreneurship Process are now reviewed and the findings synthesised into proposed new model for the Intrapreneurship Process as a key contextual framework (i.e. a representational model that organises a number of key underpinning ideas) for this research because to date it has not been possible to locate such a model that specifically applies to the intrapreneurship context.

1. Creative Problem Solving Processes

Creative Problem Solving (CPS) is a step-by-step process designed to spark creative thinking, resulting in the generation of innovative solutions and purposeful change. Puccio et al. (2012) define CPS as follows:

> *"By "creative" we mean the production of ideas or options that are both new and useful…By "problem" we mean a situation that exists when there is a gap between what you have and what you want…By "solving" we mean taking action in some way… By "process" we mean a particular method of doing something, generally involving a number of steps or operations."*

With every new idea, opportunity, challenge or venture, the individual intrapreneur has at least one, often several or many, creative problems to solve. It could be argued that the Intrapreneurship Process, which generates innovation with the intention of achieving successful intrapreneurial outcomes for the organisation, is a very specific example of the Creative Problem Solving Process in action. The Creative Problem Solving Process is therefore applied specifically here to identify similarities and useful

transferable insights in the context of developing the contextual framework of the Intrapreneurship Process for this thesis.

Evolution of the Creative Problem Solving Process

Detailed reviews of the evolution of the Creative Problem Solving Process are found in Puccio et al. (2005); and Isaksen and Treffinger, (2004). However, a high level summary of points of interest for the purposes of this research is included here.

The originator of the Creative Problem Solving Process, Alex Osborn, was a founding partner of an American advertising agency. He published a seven-stage Creative Problem Solving Process (Osborn, 1952), which comprises 'Orientation', 'Preparation', 'Analysis', 'Hypothesis', 'Incubation', 'Synthesis', and 'Verification'. Further publications (Osborn 1953; 1957; 1967) raised general awareness of the method (and also launched the concept of 'brainstorming' into common practice and language for the first time). Later, Osborn refined his process to contain only three stages (Osborn, 1967): 'fact-finding'; idea finding'; and 'solution finding'. Osborn met and began to collaborate with Sidney Parnes, who continued to develop Osborn's work after he died to create a five-stage process (Parnes, 1967a; 1967b) with the educational purpose of enabling students to develop their personal creativity. Through the application of the five-stage process in a range of education progammes in the US, the model became known as the Osborn-Parnes Creative Problem Solving Model (Parnes, 1967a; 1967b), the 5 stages being 'fact-finding', 'problem-finding', 'idea-finding', 'solution-finding' and 'acceptance-finding'. This was further developed collaboratively with others through the 1970s (e.g. Noller et al., 1976).

Isaksen and Treffinger (1985), in their article on the history, development and implications of Creative Problem Solving for Gifted Education and Talent Development, provide a comprehensive summary of how Osborn's (1952) original Creative Problem Solving model has been improved and refined over time with experience, improved knowledge and changing requirements. They contrast earlier

versions of the model with the process they propose for contemporary use – Version 6.1 (2005; 2010).

One of the most recent models developed is the Creative Problem Solving Thinking Skills Model (TSM) by Puccio, Mance & Murdock, 2011):

> 'This [TSM] model…contains three conceptual stages (clarification, transformation, and implementation); six explicit steps (exploring the vision, formulating challenges, exploring ideas, formulating solutions, exploring acceptance, and formulating a plan), each including divergence and convergence; and one executive step at the heart of the model to guide them all (assessing the situation). By implementing the skills incorporated within this model, organizations can prepare their staffs to deliver more creative and innovative results.'

Table 4 summarises the themes arising from the Creative Problem Solving literature organised into discrete, sequential steps. Analysis of this summary in Table 4 highlights some consistent themes. Each of these key steps that can be transferred from Creative Problem Solving Models to the Intrapreneurship Process using the descriptions also derived from Table 3, the Intrapreneurship Literature Review – i.e. Creative Stimulus, Opportunity Recognition, Creative Development, Idea Testing, Generate Support, Get the Go Ahead, Make it Happen and Learn from the Results.

Table 4: Themes from the Creative Problem Solving Literature

		Creativity		*Innovation*					
Reference	**Method**	**Creative Stimulus**	**Opportunity Recognition**	**Creative Development**	**Idea Testing**	**Generate Support**	**Get the Go Ahead**	**Make it Happen**	**Learn from the Results**
Osborn (1952)	7-Stage Process	Orientation Preparation	Analysis Hypothesis	Incubation	Synthesis	Verification			
Parnes (1967a; 1967b); further developed by Noller et al. (1976)	5-Stage Process	Fact-finding	Problem-finding	Idea-finding	Solution-finding	Acceptance finding		Action	New challenges
Isaksen and Trefinger (2006)	CPS Version 6.1	Understanding the challenge		Generating ideas	Developing solutions	Building acceptance			
Puccio et al. (2012)	Thinking Skills Model	Clarification, which includes exploring the vision and formulating challenges		Transformation		Implementation, which includes exploring acceptance and formulating a plan			

2. Innovation Processes

Jacobs and Snijders' (2008) definition of the innovation process is used in the context of this research because it is directly parallel to the activities undertaken by the individual intrapreneur. Jacobs and Snijders (2008) describe the innovation process as being first the development and selection of ideas for innovation followed by the transformation of these ideas into the innovation. This could be adapted for the Intrapreneurship Process as follows: 'the development and selection of ideas for positive intrapreneurial outcomes for the organisation and the transformation of these ideas into those positive intrapreneurial outcomes.'

Links are identified between corporate entrepreneurship and the innovation process (McFadzean et al., 2005), i.e. corporate entrepreneurship requires an individual internal entrepreneur (intrapreneur) to interact with the organisation's innovation process, where one explicitly exists, to bring innovation / intrapreneurial outcomes to fruition. Other research provides empirical links between corporate entrepreneurship and innovation (Hitt et al 2001; Lumpkin and Dess, 1996; Ireland et al., 2006).

Whilst innovation models are sometimes justifiably criticised for being too simplified e.g. Tidd et al. (2005) and Jacobs and Snijders (2008), they can provide a useful summary of the key steps. The Intrapreneurship Process is consistent with innovation process models in the literature in that it also includes key phases of main activities that may or may not occur in a non-linear fashion. 'The process of innovation involves search and selection, exploration and synthesis, cycles of divergent thinking and convergence' (Khurana, 2013, online). Bucherer et al. (2012, pp.183-186), make the following observations with regard to Product Innovation:

- There is usually a 'logical sequence of process steps';
- 'Normative process models can be used for guidance';
- There can be 'difficulties for existing organizations to serve the old and the new concurrently'; and
- There may be 'rather chaotic process, at least in early phases'.

Each of these observations could equally be applied to the Intrapreneurship Process proposed in this thesis. A key difference between the Intrapreneurship Process and Product Innovation Processes is that organisations may have a defined business process for Product Innovation, especially where it is a core organisational component for survival and where financial and other resources exist to support new product development.

Innovation processes feature similar concepts of divergence and convergence as the Creative Problem Solving models discussed earlier in this Chapter, for example Ahmed and Shepherd (2010, p.49).

Cooper's (2000) Stage Gate process is actively used in numerous organisations in addition to being an academic model. The commercial Stage Gate website in August 2014 shows case studies from organisations such as Mars and Kelloggs amongst others. Gassman and von Zedtwitz (2003) describe the model as being suitable for 'market pull' and 'incremental innovations.' The Stage Gate process is not without its critics, however. Koetzier, Alon, and Hooper (2012) in their global research study for Accenture, which is of course a commercial competitor to Stage Gate, describe this sort of gate process in these terms: 'For many companies, the funnels end up producing only weak, incremental ideas that often come to market slowly and miss cost targets.'

Potentially it is not the process itself that is the issue, variable results suggest that it is more about how effectively and efficiently the organisation applies the process and how well it is adapted and developed to the organisation's specific needs in practice. Alon, Koetzier and Culp's (2012, online) recommendation from their research into 60 innovative companies from the perspective of the impact of innovation on risk and market value is for the focus to be on three key areas: 'governance', 'portfolio' and 'process'. 'Governance' and 'process' are integral within Cooper's (2000) model. However, Alon, Koetzier and Culp's (2012, online) additional dimension of 'portfolio' introduces the need for organisations to manage individual innovations in the context of the wider business and be able to experiment with a wider number of innovations to establish early on which ones are likely to be the most successful. The literature points to the risk of failure in the innovation process which requires mitigation by building risk consideration into the decision-making processes, a consideration that is incorporated in the Stage Gate (Cooper, 2000) model (Bowers and Khorakian, 2014).

The 'Generate support' and 'Get go ahead' phases of the Intrapreneurship Process are woven throughout Cooper's (2000) Stage Gate process at each decision 'gate'. These

elements are required to not only get through every screening point, but are also needed to mobilise progress between screenings. This is also likely to be the case in practice for many intrapreneurs – particularly as some intrapreneurs operate their own individual Intrapreneurship Process within an organisational Stage Gate process or similar. Certainly intrapreneurs need to generate ongoing support and are usually required to get some sort of official sign-off to proceed at key points in the development of the initiative.

Rafinejad (2007, p.164) presents a high-tech product innovation process, called 'NPDCP', or 'New Product Development and Commercialization Process', described in his text as:

> "A generic process for the development and commercialization of new high-tech products (NPDCP…)…In this process, knowledge generation and integration proceed through a series of phases (each with distinct purpose) until the product design and the process are qualified as satisfying the target market needs and as meeting business objectives. The PDCP is linked to the firm's product strategy (at the intersection of business, market, and technology strategies)."

Table 5 summarises the key stages of each of these three different Innovation Processes: Cooper, 2000; Rafinejad, 2007; Ahmed and Shepherd; 2010.

Table 5: Innovation Process Stages

		Creativity		*Innovation*					
Reference	**Method**	**Creative Stimulus**	**Opportunity Recognition**	**Creative Development**	**Idea Testing**	**Generate Support**	**Get the Go Ahead**	**Make it Happen**	**Learn from the Results**
Cooper (2000)	6-Stage Gate Model – for products	Opportunity identification and concept definition		Planning and design	Prototype development	Screen at each stage – progressing through a series of 'gates'.		Manufacturing development Distribution and marketing Market testing and launch	Product retirement
Rafinejad (2007)	NPDCP (New Product Development and Commercializati on Process Model – for high-tech products	Exploration and feasibility – includes market segment analysis, business requirements, technology strategy and R&D as inputs		Product and project planning		Customer and manufacturing qualification		Commercialization and product ramp	Continuous improvement projects
Ahmed and Shepherd (2010)	CPS Version 6.1	Understanding the challenge		Generating ideas	Developing solutions	Building acceptance			
Puccio et al. (2012)	Thinking Skills Model	Clarification, which includes exploring the vision and formulating challenges		Transformation		Implementation which includes exploring acceptance and formulating a plan			

3. Entrepreneurship Processes

'The intrapreneurial process is similar to the entrepreneurial process, with business plans and idea champions,' (Pinchot, 1985). Definitions of entrepreneurship are discussed in more detail in the earlier Chapter 2. For the purposes of this research, the entrepreneurship process is defined as the series of actions or steps taken from the generation of an idea for a new business venture to the successful commercialisation of that venture idea and the launch of a new business or organisation.

Chandler and Jansen (1992) extend earlier work undertaken by Pavett and Lau (1983) to identify three key areas of competency that entrepreneurs need to be successful in business venturing. These are: entrepreneurial, being able to see opportunity and how to use that opportunity to start up a firm; managerial, being able to project manage, co-ordinate and influence others to achieve business strategy implementation; and technical-functional, having the knowledge and skills necessary to be successful in a particular field. These competencies are enablers of the entrepreneurship processes discussed here.

Bhave's (1994) 'Entrepreneurial Venture Creation Process' Model separates the 'opportunity recognition sequences' and 'venture creation' phase, consistent with Pinchot's (1985) description of intrapreneurs as 'dreamers who do', distinguishing between the creativity and innovation phases of entrepreneurship.

Morris, Lewis and Sexton's (1994, online) 'Integrative Approach' is based on inputs being transformed into outputs. They state that it is applicable to new start-ups but also to established companies beginning new ventures, creating further applicability to the Intrapreneurship Process. The authors assert that their input-output model attempts 'to clarify the nature of entrepreneurship…The input component enables…focus on the process nature of entrepreneurship and distinguishes the entrepreneur from the

entrepreneurial process. The output component stresses the variable nature of entrepreneurship and recognizes the variety of possible consequences that can result when inputs are combined.'

They claim that "importantly, the framework is descriptive of entrepreneurial efforts in organizations of all sizes and types," and therefore has relevance also to the intrapreneurial context.

Morris, Lewis and Sexton (1994) also note that entrepreneurial behaviours and activities vary across industry and firms. This is also deemed to be the case for intrapreneurship.

Research by Levie and Lichenstein (2010, p.318) indicates that 'Most models of new business growth assume a limited number of distinct stages through which businesses pass as they age (e.g., Churchill & Lewis, 1983; Greiner, 1972; Hanks, Watson, Jansen, & Chandler, 1993). The stages approach to modeling growth can achieve extremely high face validity: 100% of founding entrepreneurs in one study were able to unambiguously identify their company as being in one of five defined stages (Eggers, Leahy, & Churchill, 1994). They note that: "many experts find it convenient to talk about six different phases through which companies move, (Baron and Shane, p. 336)."

Levie and Liechenstein (2010) propose a 'Dynamic States' Model: 'A dynamic state is a network of relationships and systems that convert opportunity tension into value for a venture's customers, generating new resources that maintain the dynamic state', (Kuratko, 2013, p.13). It is the role of the successful intrapreneur to identify and convert 'opportunity tension into value' for the employing organisation.

The Dynamic States Model shows ventures as being reliant on the external environment for survival. Kuratko (2013, p.13) describes this model as being a 'process-oriented view that incorporates an array of individual, organizational and

environmental elements', going on to observe that the 'dynamic states model is more optimistic [than the integrative model] for entrepreneurs…enabling entrepreneurs to organize for the current and anticipated demands of the market.' The role of the 'entrepreneur' used throughout descriptions of the Dynamic States Model, both by the authors Levie and Liechenstein (2010) and commentators such as Kuratko (2013), could be interchanged with the term 'intrapreneur' for the purposes of this research, as the model has relevance for existing firms as well as start-up situations because it addresses organisational growth stages.

Table 6: Entrepreneurship Processes

		Creativity		*Innovation*					
Reference	**Method**	**Creative Stimulus**	**Opportunity Recognition**	**Creative Development**	**Idea Testing**	**Generate Support**	**Get the Go Ahead**	**Make it Happen**	**Learn from the Results**
Chandler and Jansen (1992)	Entrepreneurship	Recognise and envision the opportunity		See firm creation through to fruition					
Bhaves (1994)	Entrepreneurial Venture Creation Process Model	Need recognised	Business opportunity recognised	Opportunity refinement	Business concept identified	Commitment to venture creation		Organisation created	Strategic feedback loop
Morris et al. (1994)	Integrative Model of Entrepreneurial Outputs and Inputs	Entrepreneurial opportunities, unique business concepts	Identify opportunity	Assess		Acquire necessary resources		Implementation	Number of events
Shane et al. (2003)	Entrepreneurial Motivation	Entrepreneurial opportunities, environmental conditions	Opportunity recognition	Idea development		Resource assembly		Execution	
Hisrich et al. (2005)	Entrepreneurship	Identification and evaluation of the opportunity		Development of the business plan Determination of the required resources				Management of the resulting enterprise	
Baron and Ensley (2006)	Quantitative study – entrepreneurial opportunity recognition	Opportunity recognition, pattern recognition - noticing connections between seemingly independent events or trends							
Levie and Liechenstein (2010)	Dynamic States Approach (based on a biological metaphor)	Opportunity tension and perception of an untapped market		Strategy for venture creation	Projection for possible growth	Strategic decisions		Value creation	Keep up with changes and evolving needs of customers

The Dynamic States Model indicates that reading and responding to the external environment through innovation is a key success factor for organisational survival. It is the intrapreneurs within organisations who propose and implement the risks associated with innovation, and there is strong consensus in the literature that the risk in intrapreneurial innovation goes hand in hand with at least occasional failure (Kanter, 1983; Sauser, 1987; Manimala et al., 2006; Martiarena, 2013; Subramanian, 2005; Lombriser & Ansoff, 1995). This inherent risk of failure of intrapreneurship prompts reflection on the factors that drive individual intrapreneurs to put themselves forward to take such risk as they embark on navigating the Intrapreneurship Process, often repeatedly for different projects and innovations. The subject of human motivation is a highly complex one and a specialised field, and a detailed study, although exceptionally interesting is outside the scope of this study. However, it is useful to observe as part of the consideration of the intrapreneurship process that the task of the intrapreneur does not always appear to be easy. Dealing effectively with risk, influencing others to take new initiatives and the creative problem solving needed to operationalise opportunities can be very challenging. For the intrapreneur to take on such challenge and to stick their head above the proverbial parapet requires self-belief and courage at times. This self-belief and courage can be expressed as 'self-efficacy', defined by Bandura (1994; p.71) as "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives." From the perspective of self-efficacy in the work environment, there is evidence that self-efficacy in a particular area influences individual choice of career (Lent et al., 1999); domain-specific self-efficacy gives confidence to pursue an innovative action (Lucas et al., 2009; Koellinger, 2008) and take on challenges (Bandura, 1997; Fletcher, 1990); and links to how well people perform at work (Stajkovic and Luthans, 1998), in the entrepreneurial setting (Anna et al., 2000) and business growth (Baum 1994). Entrepreneurial self-efficacy has also been shown to relate to new venture creation (Krueger, 1993; Krueger et al., 2000; Zhao et al., 2005).

The links between self-efficacy and intention are demonstrated in the literature in the specific domain of entrepreneurship (Ajzen, 1991; Boyd and Vozikis, 1994; Krueger, 1993; Krueger and Brazeal, 1994; Krueger et al., 2000; Shapero and Sokol, 1982; Zhao et al., 2005). Lucas et al. (2009) find in their study of engineering undergraduates that the scale of venturing self-efficacy presented correlates with the intention measure used. The evolution of entrepreneurial intention models in the 1980s and 1990s is summarised by Guerrero et al. (2008). Up to the 2008 publication date, Guerrero et al.'s (2008) research shows that the most recent entrepreneurial intention model was published in 1995, Davidsson's Model (Davidsson 1995a; 1995b) which is based on concepts similar to self-efficacy from earlier approaches (i.e. to Krueger & Carsrud, 1993; Krueger and Brazeal, 1994). Guerrero et al. (2008) depict the Davidsson Model (Davidsson 1995a; 1995b) as the latest in a series of incremental, evolutionary model developments beginning with the Entrepreneurial Event Model (Shapero, 1982) and the later Theory of Planned Behavior (Ajzen, 1991) which directly influence the Entrepreneurial Potential Model (Krueger and Brazeal, 1994) that precedes the Davidsson Model (Davidsson 1995a, 1995b). Separately in 1991 Robinson et al. published the Entrepreneurial Attitude Orientation that uses scales of attitude and reaction prediction, later used in a number of empirical studies of potential entrepreneurs (e.g. Tkachev and Kolvereid, 1999; Paramond, 2004).

It has been described how intrapreneurship is different from but closely related to entrepreneurship in Chapter 2, and it follows that in order to follow the intrapreneurship process through to completion, potentially time after time, the individual intrapreneur not only requires sufficient domain-specific self-efficacy, but also intent that is powerful enough to drive action in order to propel the individual intrapreneur to take a path that many of their colleagues might feel is too risky, involves too much hard work, or even see as unrealistic. The literature cites Ajzen's Theory of Planned Behavior (1985; 1991; 2011) as one of the most frequently applied and 'influential models for the prediction of human social behavior' (Ajzen, 2011; p.1113) across a diverse range of research domains, especially in social science

relating to health. Its generic applicability has been criticised in favour of models designed to test intent and specific elements of behaviour, also to help the creation of interventions designed to help people change where they wish to do so (Sniehotta et al., 2014). However, considering the Theory of Planned Behavior (Ajzen, 1991) in the context of individual intrapreneurship suggests that any employee who undertakes the intrapreneurship process has confidence: confidence that they possess the ability to work things out and see the project through to successful fruition; confidence that what they are proposing will be judged positively by internal influencers and ultimately by the target market; and confidence that they have the inner power to effect and influence the desired outcomes. The rewards of so doing may vary according to the individual's role, the employing organisation, industry and location. In the case of the individual intrapreneur, although some may receive large financial performance bonuses, many may not. Expectancy theory (Vroom, 1964) also suggests that in addition to the individual intrapreneur having the self-belief that they expect to achieve the first-order outcome of successful achievement of the project, the principle of instrumentality indicates that the second-order outcomes, the rewards of successful attainment, will be forthcoming and also actually worth the individual intrapreneur's effort. These rewards may include praise and recognition from superiors, promotion, salary benefits, job security and greater acceptance by colleagues, as well as the intrinsic motivation of doing interesting, stimulating work and successfully overcoming the challenge. As stated earlier, a detailed study of intrapreneurial intent and motivation is beyond the scope of this study. However, a review of the intrapreneurship process demonstrates that the individuals who embark on the intrapreneurial journey and succeed are driven and possess the self-efficacy necessary to challenge the status quo and achieve positive outcomes for the organisation.

Discussion and Conclusion

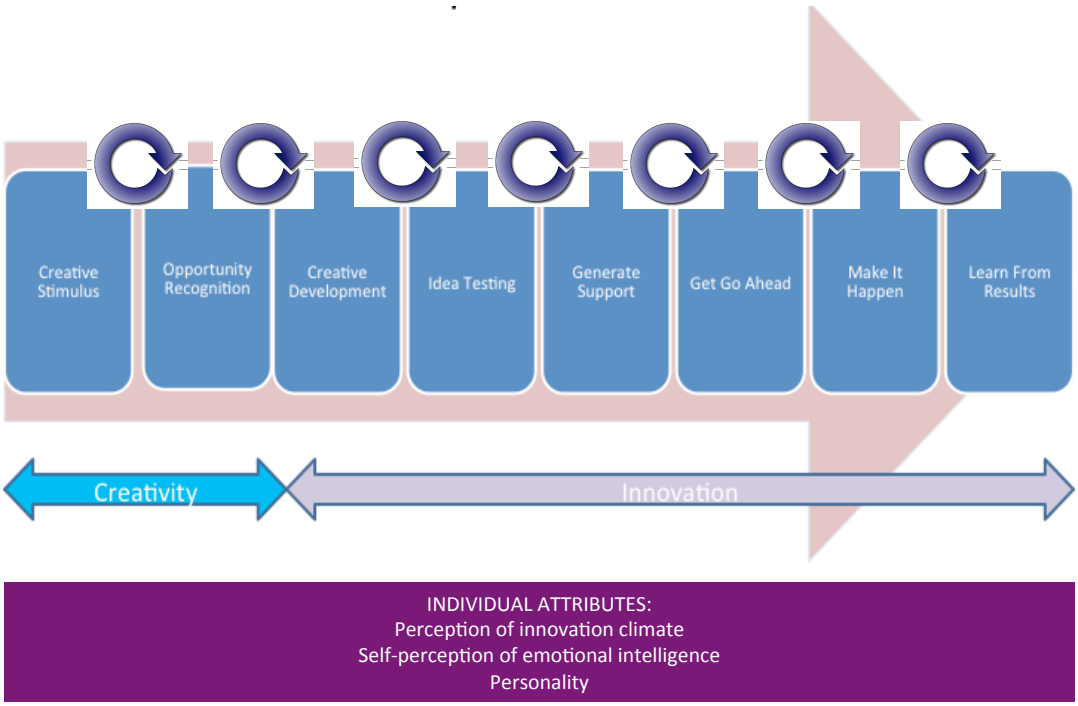
Combining the Intrapreneurship, Creative Problem Solving, Innovation and Entrepreneurship Process literature reviewed above has led to the identification of the

Creativity Phase (Pinchot's (1985) dreaming) in the Intrapreneurship Process as including a number of sub-phases, which are described as follows and depicted in Figure 2, which shows a proposed new model of the individual intrapreneurship process.

- Creative stimulus stage – in which the intrapreneur is absorbing information, connections and inspiration as the source of the potential new intrapreneurial idea or concept.

- Opportunity recognition – in which the intrapreneur experiences a cognitive process to identify what the new idea is and how the new idea could be exploited or realised (O'Connor and Rice, 2001).

Figure 2: Individual Intrapreneurship Process Model, Synthesised from the Literature



The Innovation Phase of the Intrapreneurship Process (Pinchot's (1985) 'do'-ing) involves the individual intrapreneur developing the new idea or concept generated from the Creativity Phase and progressing it to implementation. This can be further broken down into the following sub-phases based on the literature:

- Creative development – in which the intrapreneur develops the new concept further to make it more robust or add greater intrinsic value.

- Idea testing – in which the intrapreneur undertakes some research or takes soundings to test the potential for the new concept to succeed.

- Generate support – influencing to mobilise active support from enabling individuals or organisations to access resources, funding, political endorsement. Chakravarthy and Lorange (2008), in their research on 'the entrepreneur-manager', describe this as including the need to "Manage stakeholders, gain support and mobilize resources" and "assemble and motivate a team of experts". This refers to the need for the entrepreneur-manager to be able to motivate people internally across functions to support the implementation and delivery of his / her initiative and also lead a diverse team of people. Kanter (1983) observes from her research into corporate entrepreneurs in America the need for the capacity to mobilise people and resources to make things happen, as well as getting others to buy-in, lining up supporters in advance of formal approval from higher levels, with emphasis on one-to-one meetings to remove obstacles and opposition upfront. This stage also includes influencing, "horse-trading" (p.223), providing reassurance of success and results.

- Get the go ahead – generating the final permission to proceed with launching the new intrapreneurial concept.

- Make it happen – delivering the launch and live application of the new concept.

- Learn from the results – reflective practice to identify how to strengthen the outcomes from the project to develop and launch the new concept; lessons identified that can also be applied to future projects.

The literature-derived Intrapreneurship Process presented above provides the context conceptual framework of this thesis and is referred to throughout. This Intrapreneurship Process is not likely to be completely linear when it takes place in reality. It is much more likely that the intrapreneur will cycle forwards and backwards between stages as new information, challenges or opportunities emerge. In addition, if a potential intrapreneurial initiative appears likely to lack the generation of organisational traction as activities develop, the intrapreneur may choose to abandon or postpone pursuit of the initiative at any stage. This may be to replace such initiatives with ones that have greater potential, to protect the intrapreneur's credibility, or to simply await better timing, along with other potential reasons for cessation or postponement. The successful intrapreneur will use his / her judgement in determining which ideas should be fully pursued and which should be left. As Bucherer et al. (2012, p.185) observe: "innovation processes often include proliferation of ideas into several paths" and there are often unpredictable issues and challenges to overcome (Schroeder et al., 1999). As Eveleens (2010, p.4) notes: "Models are simplified versions of reality". The intrapreneur is unlikely to pursue all the creative ideas for growth that he / she generates, using a self-imposed and potentially intuitive rather than deliberative personal 'innovation funnel' or 'filter' that is analogous to organisational processes, if not as deliberate (Cooper and Edgett, 2009; Dunphy et al., 1996; Wheelwright and Clark, 1992); or 'gates' (Cooper, 2000). Selecting the most appropriate new intrapreneurial initiatives to progress and identifying which ones should be rejected is likely to comprise a critical success factor for the intrapreneur. How intrapreneurs conceive of and select their proposed initiatives for development does have potential for further research.

In order to action this process, as indicated by the literature, the intrapreneur needs to possess domain-specific self-efficacy and intrapreneurial intent, supported by a positive organisational innovation climate (e.g. Amabile, 1997; Antoncic, 2007; Colarelli O'Connor and Rice, 2001; Eesley and Longenecker, 2006; Gapp and Fisher, 2007; Kuratko et al. 1990; Manimala et al., 2006; Menzel et al. 2007) and also needs to possess the appropriate individual attributes if he or she is to achieve each stage. These attributes have been surfaced from the literature (e.g. Chakravarthy and Lorange, 2008; Colarelli O'Connor and Rice, 2001; Kanter, 1983; Koen et al., 2002; Seshradi and Tripathy, 2006) and are shown in the Intrapreneurship Process depicted in Figure 2 as 'Individual Attributes', and are required throughout the Intrapreneurship Process. They are not discussed in this Chapter because each attribute, along with the organisational innovation climate, has its own dedicated analysis within this thesis in the Chapters that follow.

Limitations of the proposed new Individual Intrapreneurship Process Model shown in Figure 2 are as follows:

- Some organisations have formal innovation processes for product or service development. It is likely that the individual intrapreneur intuitively develops his or her own version of this process for their own intrapreneurial initiatives, in all likelihood generated through experience and heuristics (Gigerenzer and Gaissmaier, 2011; Gigerenzer et al., 1999) based on their own cognitive map of how things work and how best to get things done. Heuristics and cognitive maps are specialist areas within the Psychology domain; to study them in detail from the specific perspective of intrapreneurship is beyond the scope of this thesis. However, it is a useful point to note and a potentially rich area for further new research.

- Having noted that each intrapreneur is likely to take a highly individual approach, the steps depicted in the Intrapreneurship Process are likely to be

common to most intrapreneurs, albeit delivered differently and with varying levels of focus, as they undertake intrapreneurial endeavours.

- In some circumstances the individual intrapreneur may be required to work within (or alongside / outside) any existing organisational innovation processes, taking into account Pinchot's (1985) 'commandments': 'Work underground as long as you can'; 'Do any job needed to make your project work, regardless of your job description'; 'Circumvent any orders aimed at stopping your dream') – when organisational processes are unhelpful, delaying or could potentially block the intrapreneur's progress.

- The individual intrapreneur needs to possess sufficient self-efficacy and intent, in addition to a sense that the rewards and outcomes of the effort and risk imbued within the Intrapreneurship Process will be forthcoming and worthwhile respectively.

From the perspective of this study, having selected an idea that has potential for the organisation, the successful intrapreneur is likely to undertake a series of activities that require the intrapreneur to demonstrate different attributes in order for the process to be negotiated successfully, to bring new ideas through to implementation. It is unlikely that all employees are intrapreneurial, in the context of the definition of an intrapreneur presented in Chapter 2, to the same extent. It is also likely that some employees are more inclined towards intrapreneurial endeavours than others. The activities that comprise the literature-derived Intrapreneurship Process presented in this chapter form the conceptual, operational context for this research based on the literature. The following chapter considers how individual employee intrapreneurship is measured in the literature from the perspective of achieving positive outcomes for the employing organisation.

Chapter 4

MEASURING INDIVIDUAL INTRAPRENEURIAL OUTCOMES

Overview of the Chapter

The literature is reviewed to identify individual measures of intrapreneurship that may exist. This short chapter argues for the importance of providing a measure to identify those employees who actively contribute to successful intrapreneurial outcomes, in line with the definition of intrapreneurship proposed in Chapter 2.

Measuring Organisational Performance

Organisations measure their performance in numerous ways, using a wide variety of indicators (Rauch et al., 2009; Lumpkin & Dess, 1996; Combs, Crook & Shook, 2005; Ventkatraman & Ramanujam, 1986; Jimenez-Jimenez and Sanz-Valle, 2011; Quinn and Rohrbaugh, 1983). Performance indicators of course can include financial and non-financial items, (Neely et al., 2002; Kaplan & Norton, 1996; Yeo, 2003). In addition, due to environmental conditions, growth and other dynamic circumstances, organisations sometimes need to evolve their performance measurement approaches (Kennerley & Neely, 2003). An example of a non-financial example of this is the move by many organisations to begin to measure and monitor their social media statistics, for instance by volume of activity or through sentiment analysis (Greve, 2015). Whether organisational performance measures are financial or non-financial, the variety of measures and different methods of assessment used, combined with the evolving picture over time, present challenges for academic researchers who aim to incorporate quantitative business performance data into their studies. For example, Rauch et al. (2009) note this challenge in their meta-analysis of studies relating entrepreneurial orientation to organisational performance. The literature indicates that this challenge becomes even greater when organisations of different sizes, at varying stages of development and from diverse sectors form part of a study. Not only that, but

accessing reliable data can be a challenge. Rauch et al. (2009; p. 765) comment: "measures may be subject to bias because of social desirability, memory decay, and/or common method variance."

Finally, measuring actual business performance is also challenging due to exogenous factors such as the broader economic climate. To have meaning, business performance information requires a context within which it can be interpreted. The data ideally need to be considered against variables such as local, national and global economic indicators, specific market and industry performance, growth stage of the organisation and so on.

The challenges of using actual business performance as a measure for other organisational and individual factors are complex indeed.

Measuring Human Performance at Work

Schultz, who was interested in the qualitative as well as quantitative perspective of economics, defines 'human capital' as 'attributes of acquired population quality, which are invaluable and can be augmented by appropriate investment.' (Schultz 1981; p.21). Schultz (1979, 1982) also identified entrepreneurial ability as an important, specific element of human capital in organisations. Therefore, the attribute of being intrapreneurial based on the definition and process outlined in this study is arguably a potentially important element of human capital within organisations. The literature is explored to identify potentially useful themes regarding the perspective of measuring human performance at work that could be applicable or useful to the specific intrapreneurship context of this study.

The literature features a range of studies that link effective management actions to improved employee performance, which in turn achieves benefits for the employing organisation. For example, Fitz-enz (2000) studied how human capital measurably impacts organisational goals at the macro-level, finding that "people, not cash,

buildings or equipment, are the critical differentiators of a business enterprise" (Fitz-enz, 2000; p.1). Buckingham and Coffman's (1999) U.S. study of 80,000 interviews with managers over 25 years via the Gallup Organization demonstrates the link between effective human resources practice and positive organisational performance through employee engagement and motivational line management. The metrics they use include sales, profit, customer satisfaction scores, staff turnover data and employee survey scores. Oldham and Cummins' (1996) study of 171 employees finds that the most creative work is produced by individuals when possess creativity-relevant characteristics, enough latitude and freedom to tackle projects in their own way and the opportunity to work on more challenging tasks. Bontis and Fitz-enz (2002) use a sample of 76 senior executives from 25 firms in the financial services sector in the U.S. to create a structural equation model to enable organisations and researchers to assess the effectiveness of their human capital on "economic and business results" (Bontis and Fitz-enz, 2002; p.223). Keogh et al. (2005) comment that human capital is essential to the growth of SMEs as well as to larger corporates, specifically the highly technical sector of Information Technology. Support for the development of entrepreneurial competencies is seen by government and other organisations as an engine for successful business and wider economic growth (Mitchelmore and Rowley, 2010). Findings from Palilla-Melendez et al.'s (2014) study of individual entrepreneurs in social economy enterprises in Andalusia link human capital in the form of attitude and education, especially towards innovation, as being beneficial for organisational success, and ultimately social and economic impact.

There is a body of literature that highlights the challenges of being able to demonstrate statistically the impact of human resources interventions on a variety of measures of organisational performance in both the public and private sectors, the general consensus being that there is a correlation between effective human resources management and organisational performance. Examples include: Wright et al. (2005); Gould-Williams (2010); Antonovsky et al. (2015).

Measuring the Impact of Entrepreneurship on Organisational Performance

Entrepreneurial orientation (defined as comprising "risk-taking", "innovativeness", "proactiveness", "competitive aggressiveness" and "autonomy" of teams and individuals (Rauch et al., 2009; pp.6-7) has been shown to positively impact business performance as indicated by perceived and archival financial and non-financial measures (Rauch et al. 2009) based on a meta-analytic review of the literature. Perhaps unsurprisingly, the study shows a greater effect of entrepreneurial orientation on smaller businesses than on larger ones, most probably due to the more direct influence that can be achieved by leaders on the rest of the business. Rauch et al. 2009's investigation started with what they refer to as "top managers" (p.17). Results from this study also vary by industry, and statistically significant differences were found between high-tech and non high-tech sectors, the former showing a higher entrepreneurial orientation to performance outcomes correlation than the latter.

Smart and Conant (1994) create a scale for measuring entrepreneurial orientation against organisational marketing-related and performance measures. Smart and Conant (1994) present their entrepreneurial orientation measure based on the sum of six items and converted their item-sum measure (on the ordinal scale of 7 to 42) into high, medium and low entrepreneurial orientation groups and then, statistically tested to see if the mean values of each of the 25 items of Distinctive Marketing Competency and 7 items of Organisational Performance are statistically different between the high, medium and low entrepreneurial orientation groups. They compare results for high, medium and low entrepreneurial orientation group and show results for a large number of statistics tests using multivariate analysis, i.e. each in isolation of each other, whereas the correlation coefficients reflect all responses simultaneously.

Measuring the Impact of Intrapreneurship on Organisational Performance

Krueger (2000; p.5) comments:

> *"We can increase an organization's entrepreneurial potential by increasing the quality and quantity of potential entrepreneurs within that organization. In turn, we do that by increasing the quality and quantity of opportunities perceived by organization members (Shapero, 1982, 1985; Krueger & Brazeal, 1994)."*

A range of studies investigates the impact of corporate entrepreneurship (i.e. the collective intrapreneurial efforts of employees) on organisational performance. Lucas et al. (2009; p.2) note the varying terminology employed in the literature, i.e. dynamic capabilities (Teece et al, 2007), radical innovation (O'Connor et al., 2008), entrepreneurial orientation (Li et al., 2008, Lumpkin and Dess, 1996) and innovation (Kirzner, 1979, Schumpeter, 1934). However, there is some empirical evidence that corporate entrepreneurship improves organisational performance (Zahra & Covin, 1995). Zahra (1996; p.1713) shows that "corporate entrepreneurship is important for organizational survival, profitability, growth, and renewal" using stock ownership data from 127 Fortune 500 companies. Long-term stock ownership is positively associated with corporate entrepreneurship; short-term institutional ownership is negatively associated with it, "as is a high ratio of outside directors on a company's board" (p.1713). Engelen et al. (2015; p.1069) in their international study based on 790 SMEs spanning six nations agree that entrepreneurial orientation is "postively associated with firm performance", although highlight potential "contingencies", such as "transformational leadership" that impact how strongly entrepreneurial orientation is linked with business performance.

Antoncic (2007) undertook a comparative study of 51 large (i.e. > 50 employees) firms in America and 141 from Slovenia across a range of industries to understand the impact of the firm's environmental characteristics and organizational characteristics on intrapreneurship, and also to test the hypothesis that "Intrapreneurship will be

positively related to growth and profitability of an organization" (p.314). Antoncic describes the measurement of intrapreneurship as follows:

> *"[It] was performed across four dimensions (new business venturing, innovativeness, self-renewal and proactiveness) by combining two scales: corporate entrepreneurship scale and ENTRESCALE. New business venturing (five items, a part of innovativeness (11 items) and self-renewal (13 items) were measured by items on Likert-type scales from the corporate entrepreneurship scale (Zahra, 1993). The second part of innovativeness (three items) and proactiveness (five items) were assessed by items on semantic differential type scales from the ENTRESCALE (Khandwalla, 1977; Miller & Friesen, 1978; Covin & Slevin, 1989; Knight, 1997)' (p.315) Antoncic (2007) also measured performance 'in terms of growth and profitability (absolute and relative)"* (p.315).

Antoncic (2007; p.319) created a "relatively robust" structural equation model, although the sample sizes when split by country are small, especially for the American component. The study found that intrapreneurship can have beneficial effects on the firm's growth and profitability, and that:

"such growth and profitability comes from organisations having 'characteristics' such as 'open and quality communication, existence of formal controls, intensive environmental scanning, management support, organizational support and values will all help an organization become more intrapreneurial" (p.320).

In Antoncic's (2007) study, two versions of the same model are fitted to explore differences in the relationships between intrapreneurship and antecedent variables for Slovenia versus U.S. Two main observations are:

1. This analysis method provides evidence of whether the relationships with Intrapreneurship are consistent between the two countries and hence the model could be reasonably argued to generalise (to all countries).

2. This same method (modelling countries as separate groups) is used to test whether a model is (somewhat wrongly) representing an average of two different populations and therefore flawed - gender is a classic example. If the model parameters of men and women are significantly different it might be inappropriate to use a model fitted to men+women sample combined.

Antoncic (2007) assesses the impacts of control variables by carrying out a similar analysis method where categories of control variables (e.g. big and small organisations) are again analysed as separate groups in the model and the results are inspected to see if there are significant differences in the Slovenia+US (combined) population. The method is appropriate where modelling is required as separate groups, as here.

A close relation to intrapreneurship, innovation is shown to be empirically linked to business performance in the literature (Bierly and Chakrabati, 1996; Brown and Eisenhard, 1995; Caves and Ghemawat, 1992). Innovation, organisational learning and business performance are studied together in a single model using Structural Equation Modelling (SEM) by Jimenez-Jimenez and Sanz-Valle (2011). The results, based on data from 451 Spanish organisations, indicate that organisational learning has a strong effect on innovation, which in turn affects business performance, regardless of the size, industry sector, age or broader economic setting of the organisation.

The literature shows that effective human resources management and corporate intrapreneurship each correlate positively with organisational performance. But can a correlation still be identified at a more micro-level to establish differences in intrapreneurial contributions to organisational performance at the level of the individual employee?

Measuring the Impact of Individual Intrapreneurship on Organisational Performance

Antonic's (2007) study addresses the complex issue of intrapreneurship in firms from two very different nations, taking into account their environmental context and their organisational characteristics. However, such a study has not yet been found at the individual level, i.e. one that explores the characteristics of the individual intrapreneur and their perceptions of their environment to positive intrapreneurial outcomes for the firm.

De Jong et al. (2011) present a measure for employee's intrapreneurial behaviour in organisations using surveys completed by 189 individuals and peers in a single Dutch organisation. They note that research over the previous decade predominantly focuses on organisation-level rather than individual-level intrapreneurship, exceptions being Monsen et al. (2010) and Marvel et al. (2007). Whilst de Jong et al.'s (2011) measure for intrapreneurial behaviour is an empirically validated measure, it does not attempt to make any connection between intrapreneurial behaviour and the actual results or outcomes achieved by intrapreneurs as a result of their behaviour.

Heinonen and Korvela's (2003) small quantitative study of small businesses in Finland is aimed at measuring potential outcomes of intrapreneurship. However, the items in the questionnaires used are limited to these outcomes only: employees' work and job satisfaction; employees' perceived customer satisfaction (which logic suggests should lead to growth and profitability, but the study does not state that explicitly) and employees' external satisfaction, i.e satisfaction with workload and the atmosphere of the workplace.

Other studies designed to measure intrapreneurship focus on measuring intrapreneurial behaviours rather than on the resulting performance outcomes for the organisation. For example, Rauch and Frese (2007) report a meta-analysis of individual business owners' entrepreneurial traits and show that there is a positive correlation with these

and their entrepreneurial success. However, their research is focused on correlating personality traits to the behaviours deemed necessary for venture creation and success (referred to as the "task of entrepreneurship" (p.360)) and not to actual organisational performance outcomes. The Entrepreneurial Behaviour Inventory is 'an instrument for measuring the entrepreneurial behaviours of corporate managers' (Lau et al., 2012; p.673), with no attempts to demonstrate the links of these behaviours to measurable business outcomes.

Camelo-Ordaz et al. (2011; p.2) comment:

> *"In spite of its relevance, the impact of intrapreneurs on their firms' innovation performance is still not well understood theoretically because the literature remains sparse. (Davidsson, 2005; Koellinger, 2008; Koppel, 2007; McMullen et al., 2007). However, there is a growing interest in explaining the relationship between corporate entrepreneurship and innovation and in explaining how the intrapreneur's profile affects the firm's innovation performance (Gapp and Fisher, 2007; McFadzean et al., 2005; Menzel et al., 2007)."*

Koellinger (2008; p.22) says that a key question for research is why are some individuals "more innovative than others." Camelo-Ordaz et al. (2011; p.516) note: "Most of the studies published have centred on analysing intrapreneurial traits and … individual characteristics."

The research into intrapreneurship measures in some of the literature that focus on the firm level is important work because it is a useful way of showing return on investment and the benefits of intrapreneurship in organisations. This is the case too for research aimed at better understanding intrapreneurial outcomes from individual teams. One of the most famous examples is Lockheed Martin's Skunk Works which has run for over 70 years (Lockheed Martin, 2015). An actual measure of intrapreneurial team performance cannot be located, though. Measures such as the PCI model (Luthans, 2005) focus on shared characteristics of intrapreneurial team members (Zhao and Hou,

2009). There appears to be a missing tier, however, as intrapreneurship within organisations comes from individuals – organisations do not innovate per se, people do (de Jong et al., 2011), and if organisations can identify, nurture and cultivate individual intrapreneurship, then that will be to the overall benefit of the organisation in terms of achieving positive organisational outcomes. Accenture (2015) reports that identifying and supporting intrapreneurs is one of the greatest challenges for achieving entrepreneurial leadership in businesses.

Camelo-Ordaz et al. (2011) present a small and specific study of 80 intrapreneurs in small creative firms in Spain to explore the role of the demographics and personal value systems of intrapreneurs in achieving innovation outcomes, based on the OECD's (1997; 2006) definition of innovation. They use five measures of innovation performance:

> *"The extent to which the firm has introduced new or improved creative products or services to the market (two items); the extent to which the firm has utilized new processes and technologies (two items); and the extent to which the firm has created new markets (one item)"* (p.522).

Whilst a small and specific study, it is positive that the authors aimed to research intrapreneurial dimensions in the context of actual outcomes for the organisation, an approach which in general is greatly lacking in the literature, possibly because it may be considered difficult to do, as has already been discussed. However, Camelo-Ordaz et al. (2011) succeed by using simple statements on a Likert scale in a self-report questionnaire to the intrapreneurs. The mean score of all five items is used to create a single index, against which demographic and personal variables are analysed using multiple regression analysis. Results from Camelo-Ordaz et al.'s (2011) study show that items such as organisational tenure, business background, age and educational level negatively impact innovation and that having a creative background and values supports intrapreneurship. Identifying correlations of different demographic items and personal values with actual innovation outcomes for the firm enables Camelo-Ordaz

et al. (2011) to make some suggestions on how better to support and educate intrapreneurs in small creative firms. The single index using the mean score for five items does appear to be a very simplistic approach – especially as, although they are all valid elements from an intrapreneurship perspective, the items are in principle very different. New processes and technologies in the context of this study seems to be internal (i.e. the firms have 'utilized' them, rather than innovated or introduced them to the market); bringing new products or services to market is product or service development per Ansoff (1957); creating new markets is market development per Ansoff (1957). The questionnaire does not include any questions on Ansoff's (1957) diversification, although this is probably because the authors are interested in a specific context (i.e. small creative firms).

Discussion and Conclusions

The literature features studies of apparently successful intrapreneurs, sometimes without any apparent reliable quantitative measurement to show whether these individuals are actually contributing to the successful outcomes included in the intrapreneurship definition, or where these individuals stand in relation to other more or less successfully intrapreneurial people. That is not to say that the successful intrapreneurs studied in the literature are not so – on the contrary, as seen by the literature reviewed in this chapter, researchers sometimes use evidence such as peer or management feedback, or results from specific projects, to identify the subjects of their studies. But if organisations are to know more robustly which individuals are achieving successful outcomes more than others, then it will be possible to undertake more specific and targeted research to understand what conditions contribute to this success so that:

- It enables testing of a variety of hypotheses about the key attributes of successful intrapreneurs as derived from the literature to identify how they correlate with measurable outcomes.

- Organisations may better be able to replicate these conditions to repeat these successes elsewhere or in more cases amongst other employees; and

- Organisations may be able to use some of the insights to identify successful intrapreneurs and enable them to become even more successful by building on their strengths and providing targeted support and development.

- Organisations in these competitive times are often keen to know that if they invest in something, then they will get a return. A quantitative measure will help demonstrate to organisations that if they support and develop their successful intrapreneurs, they have the potential to gain tangible, financial and non-financial benefits as a result. It will also provide a method of assessing developmental interventions and training courses aimed at developing an individual's ability to generate more effective outcomes for themselves and their employing organisation.

This chapter identifies a gap in the literature relating to the measurement of successful intrapreneurship. Despite the presence in the literature of several methods of measuring intrapreneurial outcomes at the organisational level, and the availability of several methods of measuring intrapreneurial traits and behaviours within individuals, no research has to date been located which measures successful intrapreneurial outcomes at an individual level.

Addressing this gap has the potential to open up a new debate on whether research conducted to identify individual intrapreneurial traits is compromised by the lack of statistically reliable correlations between individuals' intrapreneurial traits and the intrapreneurial outcomes delivered by individuals.

These conclusions lead to the core problem statement of this study:

How can the positive organisational outcomes of individual intrapreneurship be measured on a scale, so that the attributes often associated with successful individual intrapreneurs in the literature can be explored?

Therefore, a measure of intrapreneurial outcomes at the individual level has the potential to aid more robust identification and testing of the components of successful intrapreneurs within organisations. The following hypothesis is proposed:

H1: Individual intrapreneurship contribution can be quantified on a scale.

The following three chapters move on investigate some of the attributes associated with successful intrapreneurs in the literature and how they might be measured, beginning with a consideration of personality.

C h a p t e r 5

INVESTIGATING KEY ATTRIBUTES - PERSONALITY

Overview of the Chapter

The study of personality traits is a sizeable, significant and complex field in the domain of Psychology. This chapter is not intended to challenge or extend that field, rather to explore how a key measure of personality traits can be used with a measure of intrapreneurial outcomes to gain insights in the specific intrapreneurship context. So far, the literature does not contain such a study of personality traits and intrapreneurial outcomes and it is intended that this study begins a new debate.

The chapter begins with a summary review of the literature on personality in the wider psychological domain and the application of trait theory in the context of this research to identify which personality traits, if any, successful intrapreneurs have in common.

A review of some of the key methods of measuring personality traits is then undertaken and a rationale presented for deciding on the most appropriate method for the purposes of this study.

Goals of Personality Trait Research in the Context of this Study

Regarding the field of personality study more broadly, Fleeson, (in Deaux and Snyder, 2012; p.34) observes:

> *"Personality psychology is a wide and explosive field, with a huge amount of new and exciting research, and a whole diversity of topics."*

The study of personality is a sizeable, significant and complex field in the domain of Psychology.

Fleeson, (in Deaux and Snyder, 2012; p.34) identifies four goals of personality research, summarised here:

1. *"To determine how to characterize the person…determining the basic ways people differ from each other…"*

2. *"Also to determine how to characterize the person, but this goal is to identify the internal processes and structures that link various parts of the person together… and ambitious goal."*

3. *"To explain why people differ from one another."*

4. *'To provide a foundation for interventions to improve people's lives.'*

The goals of this study are:

1. To determine how it might be possible to characterise the successful intrapreneur, determining the basic ways successful intrapreneurs differ from less intrapreneurial employees. This means attempting to link intrapreneurial personality with measurable intrapreneurial outcomes, a link that is significantly lacking in the literature.

2. To begin to provide a foundation for supportive interventions to help organisations and their intrapreneurial employees to become more successful.

Items 2 and 3 in the summary of Fleeson's (2012) goals of personality research above have the potential to be highly valuable in intrapreneurship research, however these worthwhile aims are ambitious and beyond the scope of this study.

Given the aims of this section, the focus of the literature review has been to identify those areas of personality trait research that can best support the achievement of characterising the successful intrapreneur, as a starting point for better understanding, interventions and as a basis for further research.

Defining 'Personality'

The literature contains numerous definitions of personality. The definitions of modern personality as it is understood today appear to have evolved from those of Lewin (1936) and Allport (1937), their definitions being as relevant today as they were over 70 years ago. The two definitions that seemingly appear to be the most used are from Allport (1937; p.48):

> *"Personality is the dynamic organization within the individual of those psychological systems that determine his unique adjustments to his environment."*

and Lewin (1936; p.12):

> *"Every psychological event depends upon the state of the person and at the same time on the environment, although their relative importance is different in different cases."*

According to Lewin (1936) and his 'Dynamic Theory of Personality', understanding people comes from knowing about them as individuals and how they interact with the social world around them. Lewin expressed this in his heuristic formula B=f(P,E) – Behaviour (B) is a function of Personality (P) and Environment (E). This research begins the process of understanding the intrapreneur's perceptions of his or her environment from a social psychology perspective later in Chapter 7. The study of the personality of intrapreneurs is important because creating the optimal innovation climate within organisations is not enough – people are very different from one another and it is likely that identifying any shared personality features of intrapreneurs will be helpful from managerial and developmental perspectives.

"Personality is the relatively enduring pattern of recurrent interpersonal situations which characterize a human life." (Sullivan, 1953; pp.110-111).

More recently, a regularly cited definition comes from Phares (1986; p.4):

"Personality is that pattern of characteristic thoughts, feelings, and behaviors that distinguishes one person from another and that persists over time and situations."

There are features in common with most definitions of personality presented in the psychology literature:

"Most definitions of personality psychology include references to the quest for an understanding of how the actions of individuals reflect stable and enduring traits, dispositions, tasks, purposes, narratives, and other personal attributes that are thought to reside with individuals and to move them to act in accordance with these features of their personalities", (Snyder and Deaux, in Deaux and Snyder, 2012; p.3).

Regarding the stability and enduring nature of personality, Specht et al. (2011; p.4) investigated whether personality changes across the entire life course, and whether those changes are due to "intrinsic maturation or major life experiences". They undertook a "longitudinal study on changes in the mean levels and rank order of the Big Five personality traits in a heterogeneous sample of 14,718 Germans across all of adulthood" (2011; p.4). Their findings indicate that:

"personality can change due to factors other than intrinsic maturation… [that] personality changes throughout the life span, but with more pronounced changes in young and old ages, and that this change is partly attributable to social demands and experiences" (2011; p.41).

However, despite changes, underlying personality traits do endure. Their review of longitudinal studies shows that these dispositions are stable after approximately age 30 and comprise an important element of ongoing self-identity as well as being a constant that enables individuals to cope with the changing world around them.

Theories of Personality

John et al. (2008) categorise their descriptions of approaches to personality research and theory into four groups based on how individuals are characterised. These four groups are:

- Cognitive
- Motivational
- Disorder-based
- Trait-based

Cognitive theories

> *"Cognitive perspectives try to characterize persons by how and what they think."* (Fleeson, in Deaux and Snyder, 2011; p.35).

Whilst some of the literature (e.g. Cervone et al., 2001; Pervin, 2003) apparently presents the Cognitive approach to personality in competition with other theories, especially Trait-based theory, it seems that each theory contributes a different and complementary perspective to understanding personality and could provide powerful insight if combined, much like using them to change the pattern in a kaleidoscope. The Cognitive approach to understanding personality appears to have a great deal to offer researchers who want to understand how individuals make their choices based on their perceptions of their environment and it continues to be an emerging and complex area of personality research. Whilst it would indeed be interesting to understand more about individual intrapreneurs from a cognitive perspective, the research question for this study is to establish whether individual intrapreneurial outcomes correlate to a particular set of key attributes, to put some shape around different descriptions that arise in the literature. The intention at this point is not to understand their "personal

determinants of action that contribute to development over the course of time" (Cervone at al., 2001; p.46) or the variability that Cervone et al. (2001) identify as being shown by individuals in different situations. The cognitive theory of personality will not therefore be used in the context of this research.

Motivational theories

> *"Motivational perspectives try to characterize persons by the goals they pursue."* (Fleeson, in Deaux and Snyder, 2011; p.43).

A motivational perspective has the potential to be a very rich research area for individual intrapreneurship. Understanding what truly drives intrapreneurs could help organisations and their intrapreneurial employees to leverage motivational factors to reward and possibly even increase successful intrapreneurial outcomes. Some discussion on what drives intrapreneurs to embark upon and navigate the Intrapreneurship Process is presented in Chapter 3, although this is a substantial topic, and detailed investigation of it is beyond the scope of this thesis. Descriptions do appear to dominate the intrapreneurship literature and much more is written about intrapreneurial traits than their individual goals, possibly because true goals are highly personal and not always expressed, whereas traits are visible through intrapreneurs' behaviours.

Disorder-based theories

> *'Disorder-based perspectives try to characterize persons by their problems in living.'* (Fleeson, in Deaux and Snyder, 2011).

It could be argued that excellence in any domain can often be driven by over-compensating for some form of weakness or apparent disorder, and maybe some intrapreneurs are successful at what they do either due to actual short-comings or the intrapreneur's efforts and strategies to over-compensate for their weaknesses.

Disorder-based theories in the field of personality psychology are usually not concerning general or minor personality flaws, however. This area of study tends to focus on defined psychological disorders that require professional diagnosis and support, often at the clinical level. Disorder-based personality theory has therefore been discounted for the purposes of this research.

Trait theories

A trait is defined as:

"the primary unit of personality description" and "*the structure of personality is the organization of traits…a trait is a characteristic form of behaving, thinking, or feeling, such as 'friendliness', 'rigidity', or 'anxiousness',"* (Haslam, 2007; p.18).

"Trait perspectives try to characterize persons by descriptions of them, usually focused on describing persons' style of behaviour" (Fleeson, in Deaux and Snyder, 2011; p.35).

Fleeson (in Deaux and Snyder 2011; p. 36) remarks:

"The research on traits over the past 10-20 years has been astounding. Not only has the research been voluminous, but it has also been persuasive and it has been innovative".

Over the last 70+ years personality psychologists have aimed to create a structure of a small number of meaningful traits using factor analysis from literally thousands of potential traits, examples being Allport, (1937); Cattell, prolific between the 1940s and 1980s, cited examples being (1946); (1957); (1973); Esyenck, (1990): John and Srivastava, (1999); Matthews et al., (2003); McCrae and Costa, (2002). However, today there does seem to be consensus that trait theory has significant merit in describing personality and also predicting behaviour – the debate appears to be how best to organise and analyse traits to achieve these goals, quite a challenge given that

Allport (1937) who began the process identified more than 17,000 trait descriptors in the English language.

Allport (1937) supported the progress of trait theory, which remains very relevant in the literature today. As Pettigrew and Cherry (in Deaux and Snyder, 2012) observe, the Big Five trait structure of personality (John and Srivastava, 1999; McCrae and Costa, 2008) with its hundreds of articles and many thousands of references, individual differences and traits remains the leading emphasis of the field.

Although personality does develop and evolve as we age and as our environment changes, our underlying, core personality is found to be enduring as discussed above. Personality literature shows that individuals' traits can be measured reliably and with validity, and that traits can be connected to behaviour, some examples being Goldberg (1990) and Macrae and Costa (1987).

Snyder and Deaux (in Deaux and Snyder (2011) comment that traits provide information on individuals' regular, habitual behaviour, and that the repetition of habitual behaviours by individuals further reinforce the traits that drive the behaviours in the first place. They give the example of a competitive individual:

> *"…a lifetime spent in situations in which success depends on competition may produce a consistent pattern of competition across situations and over time – a pattern that, at a minimum, may reinforce an underlying competitive disposition, or that may even be internalized to actually create a competitive disposition to support a life spent in competitive situations"* (p.5).

The same self-reinforcing principle as the one above is possible of course for an intrapreneurial individual, i.e. successful intrapreneurial actions by the individual may become self-reinforcing. Sometimes these repeated traits become part of the individual's schematic (Ajzen, in Deaux and Snyder 2011; Markus, 1977; Baumeister & Tice, 1988) and associated by them with their self-image and deliberately projected

and protected identity. Some individuals are more aware of their schematic than others – the schematic may be consciously developed and managed to a significant extent by the individual or be unnoticed by them. Traits are also how we tend to describe one another, a statement that is supported by Park's (1986) study which showed that when describing others, her sample group's descriptions used traits the most (65%) followed by behaviours (23%). Therefore, one of the potential benefits of trait theory is that it can seem more relevant and familiar with how we naturally think about personality, especially given potential applications of this research to the live organisational environment.

Personality Theory for this Research

Whilst all four types of theory described above appear to be competing with each other, it is likely that they are rather complementary and focus on different dimensions of understanding personality. This complementarity is to be expected because each type of theory views the individual from different, interconnected perspectives. However, so far no integration of two, three or all four approaches truly seems to exist. The research question focuses specifically on traits, as these have been observed to be almost ubiquitous in the intrapreneurship literature, and therefore the trait-based model is the theory that can best be applied to this study.

The psychology literature on personality presents additional strong arguments for selecting trait-theory over other models. Boyle et al. (2008; p1) present a case that the "trait model of personality constitutes normal science" and refer to other models as "alternative scientific approaches." Following their review of contemporary personality research and theories, Fleeson in Deaux and Snyder (2011) considers how much influence each of the four (John et al., 2008) categories of personality research is having and comments that trait theory is generating much more coverage in the personality psychology literature than are cognitive, motivational or disorder perspectives. This is leading to faster progress in the development of trait theories than in other personality perspectives (John et al., 2008). Part of the appeal of trait

perspectives is that they relate directly to what people do and how they behave, as well as focusing on those aspects of individuals' personality that are relatively stable and which become associated with individuals' identity (Fleeson, in Deaux and Snyder, 2011).

Therefore, the trait perspective was selected as the most appropriate one for this study because:

- The literature often describes intrapreneurs using traits, albeit with a lack of quantitative measurement in many cases (e.g. Patterson et al. 2009; Davis, 1999; de Jong et al., 2011; Vandermerwe & Birtey, 1997; Sexton & Bowman, 1984) and certainly with a lack of linkage of the intrapreneurial traits described to outcomes, a gap that this study aims to begin to address.

- The trait model is widely accepted by psychologists as having the most traction and scientific acceptability.

Big Five Traits

John and Srivastava (1999; pp.2-3) describe the Big Five as follows:

> *"After decades of research, the field is fast approaching consensus on a general taxonomy of personality traits, the "Big Five" personality dimensions. These dimensions do not represent a particular theoretical perspective but were derived from the analyses of the natural language terms people use to describe themselves and others…the Big Five taxonomy serves an integrative function because it can represent the various and diverse systems of personality description in a common framework."*

The history of the development of the Big Five has been well documented (e.g. John and Srivastava, 1999), so only a headline overview is presented here. The Big Five were developed by a combination of psychologists – beginning with Cattell (1943,

1945) who pioneered reducing Allport's (1936) 4,500 traits (which Allport himself had whittled down from more than 17,000) down to 35 through factor analysis. (John and Srivistava, 1999). Cattell's work was again simplified by Fiske (1949), developed and clarified by Tupes & Christal (1961), who discovered "five relatively strong and recurrent factors and nothing more of any consequence," (1961; p.14). Norman (1963) labelled these five factors as follows: Extraversion or Surgency; Agreeableness; Conscientiousness; Emotional Stability versus Neuroticism; Culture; and later, via Goldberg (1981) were known as the Big Five because of their broadness.

Research into the Big Five then went quiet until the 1980s and continued into the 1990s and beyond, with numerous researchers exploring different aspects, a handful of examples being trait descriptions and adjectival measures (Goldberg, 1990; 1992; Wiggins, 1995; Trapnell & Wiggins, 1990) including in different languages / cultures (Hofstee et al., 1997; Yang & Bond, 1990). The Big Five continue to be explored today, for example in different languages (such as Fossati et al, 2015) and in combination with the highly current field of positive psychology, being applied to better understand subjective wellbeing (such as Keyes et al., 2015). The Big Five traits have a rich research history and strong pedigree that continue through to today.

Intrapreneurship and Personality – Findings from the Literature Review

The definition of an intrapreneur in the context of this research is as follows (see Chapter 2 for more details):

"An intrapreneur practises **entrepreneurial activity in an established organisation**. He/she successfully **spots opportunities** that are not immediately obvious to most colleagues and **makes them happen** to generate positive, material **results** for his /her employing organisation. These results can constitute **reputational, product or service development, or market development** benefits to the organisation."

So what sort of personality traits might the successful intrapreneur need to achieve this, and keep seeing the Intrapreneurship Process derived from the literature and presented in Chapter 3 of this study through from beginning to end? The literature is reviewed to seek insights into successful intrapreneurs and their key attributes.

In the specific context of entrepreneurship, some authors (e.g. Cross and Travaglione, 2003) reject trait theory, alongside other theories, in favour of a specific focus on emotional intelligence:

> *"Trait, cognitive and achievement-motive theory have in some ways enriched the literature and have at least encouraged the debate of an underlying individual difference that sets these personalities apart from the rest. However, the story behind what defines an entrepreneur remains relatively elusive,"* (Cross and Travaglione, 2003; p.222).

Bager et al. (2010) describe studying "the personality traits of different entrepreneurial groups"' as "a dead-end research trajectory" (p.340), citing Garner (1988); Aldrich (1999); Shane and Venkataraman (2000). However, they are writing in the context of comparing and contrasting different entrepreneurs, intrapreneurs and spin-off entrepreneurs, and given that potentially these have much in common, it can be seen how studying personality traits may not be useful. The aim of this research is to understand more about individual intrapreneurship specifically, and therefore the study of potential shared personality traits may be helpful.

De Jong et al. (2011) undertook a study of 189 employees and their peers in a Dutch company to develop a proposed measure for employees' intrapreneurial behaviour in organisations against which to test a number of variables such as proactive personality, demographics, and job-specific items. Their study has limitations in that it only tests hypotheses within a single organisation, but the results do show that a proactive personality trait is an important variable.

Harms et al. (2007) tested the "relationship between the core elements of personality and status attainment" (p.690) Whilst their study was not focused on intrapreneurs, it does examine the role of personality on status and social influence – and as has been shown in discussions on the Intrapreneurship Process in Chapter 3 of this study, intrapreneurs require sponsorship, confidence and support from others in order to be successful. Harms et al.'s work (2007) uses the 53-adjective measure of the Big Five personality traits (Goldberg, 1993), by Walton and Roberts (2004). They report that, of the Big Five, Extraversion and Conscientiousness are strongly linked to social influence and that Extraversion and Emotional Stability (Neuroticism) predict subjective influence. Haslam et al. (2007) suggest the following explanation of these results:

> *"Extraversion facilitates getting noticed and Conscientiousness enables individuals to present themselves as a role model… …individuals who think highly of themselves are also individuals who believe themselves to have more power and more control over their lives and surroundings"* (p.697).

Judge et al.'s (2002) study on personality and leadership does not focus specifically on intrapreneurs, but does address an individual's ability to influence colleagues. Their meta-analysis applies the Big Five traits and finds that Extraversion has the strongest correlation to leadership. Conscientiousness and then Neuroticism and Openness to Experience displayed the next strongest correlations with leadership. The relationship between Agreeableness and leadership is a weak one. Also on the theme of leadership, Parks, in Deaux and Snyder (2011) observes that power-based solutions and more aggressive approaches to negotiation are seen more often for individuals with low Agreeableness, supported by Graziano et al., (1996); Jensen Campell et al., (1996) and Wood and Bell, (2008). Harms et al. (2007) report that extraverted individuals are perceived to be better at influencing than less extraverted people.

However, Patterson et al. (2009) state that, from an innovation rather than a leadership perspective, of the Big Five traits, Openness is most closely linked to innovation and

Conscientiousness the least, with the other three traits being dependent on the domain and environment. As has been seen in the Intrapreneurship Process in Chapter 3, intrapreneurs require elements of innovation to complement their leadership and influencing capability at different stages of the process. Lessem (1988) created an Intrapreneurship Scale based on his definition of the intrapreneur being a combination of an entrepreneur and business manager. He says that intrapreneurship bridges the gap between management and enterprise and between enterprise and development. Based on a number of observations of intrapreneurs, he defined a number of archetypal profiles of intrapreneurs that can generate different types of positive outcomes in different circumstances. These types are: 'adventurer', innovator, 'designer' ('enabler'), 'leader' 'entrepreneur', 'change agent' and 'animateur'. Sayeed and Gazdar (2003) undertook further research with 101 managers to further evaluate Lessem's (1988) scale, finding that only four of the seven dimensions (i.e. 'adventurer', 'innovator', 'entrepreneur' and 'animateur') had any meaningful significance. These dimensions are connected with personality traits, as shown in Table 7, which is extracted and adapted from Sayeed and Gazdar (2003):

Table 7: Spectrum of Intrapreneurial Types and Personality Trait, from Sayeed and Gazdar (2003).

Trait	Intrapreneurial Type	Key Attributes
Imagination	Innovator	Originality, inspiration, love, transformation.
Intuition	New designer / enabler	Evolution, development, symbiosis, connection.
Authority	Leader	Direction, responsibility, structure, control.
Will	Entrepreneur	Achievement, opportunity, risk-taking, power.
Sociability	Animateur	Informality, shared values, community, culture.
Energy	Adventurer	Movement, work, health, activity.
Flexibility	Change agent	Adaptability, expressiveness, curiosity, intelligence.

Whilst intrapreneurs may indeed show themselves to have one or more dominant 'types' shown in Table 7, in reality successful intrapreneurs may need a blend of all the 'types' and 'attributes' listed, certainly at different stages of the Intrapreneurship Process as described in detail in Chapter 3.

Sinha and Srivastava (2013) undertook a study of 272 executives working in the manufacturing sector in India, investigating (alongside work values and socio-cultural factors) personality factors based on the Big Five Locator Questionnaire (Howard et al., 1996). Items from Sayeed and Gazdar (2003) and Shetty's (2004) Intrapreneurial Orientation Scale were used, these scales both being personality scales. Their results show that:

> *"…neuroticism significantly but negatively, and extraversion, altruism, creativity management and achievement positively predicted intrapreneurial orientation"* (p.97).

They go on to describe intrapreneurs as follows:

> *"The personality of intrapreneurs includes attributes such as proactiveness, pursuit of opportunity, self-determination, confidence, risk-taking, defying rules and a dislike of bureaucratic systems"* (p. 98-99).

Nicholson et al. (2005) in their risk-focused study of over 2,000 people using the NEO PI-R personality instrument (Costa and McCrae, 1992) find a strong correlation between an individual's personality traits and appetite for risk, in summary high Extraversion and Openness with low Neuroticism, Agreeableness, and Conscientiousness. Nicholson et al. (2005) also find, perhaps unsurprisingly, that propensity to take risk differs according to an individual's job role and industry sector. They group risk takers into three non-exclusive categories: stimulation seekers, goal achievers, and risk adapters. Only the first group actively seek to take risks, the other two are comfortable bearing risk that comes their way but do not go after it. The focus of Nicholson et al.'s (2005) study is generic and not intrapreneurship-focused, it also went beyond work and covered recreation, health, career, finance, safety and social dimensions. However, intrapreneurs are to some extent risk-takers, and certainly need to bear risk as an integral element of their projects in the organisational context because they propose, champion and deliver innovations for their employers. Testing intrapreneurs against the Big Five traits, therefore, could reveal some similarities with the personality profile that Nicholson et al. (2005) correlate with risk-propensity above.

Successful intrapreneurial outcomes are generated due to a blend of contributing individual factors, of which personality traits could form a key part, based on the literature. An interpretive summary of how examples from the literature map to the

Big Five traits is shown below, from which it can be seen that, based on this analysis, more successful intrapreneurs are likely to demonstrate the following positions in relation to less intrapreneurial individuals, based on the Big Five personality trait categories:

a) A high level of Openness – in order to be creative and to innovate:

- Wunderer (2001; p.197) "conceptual competencies";
- Patterson et al. (2009; p.13) "openness";
- Davis (1999; p.316) "creative and innovative";
- Vandermerwe & Birtey (1997; p.346) "openness to change and to new approaches";
- Lau et al. (2012; p.673) "innovativeness" and "change orientation".

b) A low level of Conscientiousness – to push organisational boundaries:

- Wunderer (2001; p.197) "implementation competencies";
- Patterson et al. (2009; p.13) "conscientiousness [is]…a negative predictor of innovation";
- Sinha & Srivistava (2013; p.105) "intrapreneurial activity significantly but negatively related to conscientiousness";
- Vandermerwe & Birtey (1997, p.346) "action-based – deliver the promise."

c) A low level of Agreeableness – to influence, lead and drive through change:

- Sexton & Bowman (1984) describe a low need for affiliation and conformity;

- MacMillan (1983) refers to intrapreneurs as being skilled at organisational politics;

- Davis (1999) describes intrapreneurs as being "aggressive" (p.316) and "unconventional" (p.317) on occasions;

- Sinha & Srivistava (2013; p.105) find that "intrapreneurial activity [is] significantly but negatively related to agreeableness."

- Vandermerwe & Birtey (1997) state that intrapreneurs "do whatever is needed to make the relevant change happen."

d) A high level of Extraversion – also to influence, lead and drive through change:

- Wunderer (2001; p.197) "social competencies";

- Patterson et al. (2009; p.13) "extraversion is likely to be domain / context dependent";

- De Jong et al. (2011; p.12), intrapreneurs are "more externally focused and have diverse networks".

e) A low level of Neuroticism – to have the personal resilience to deal with the risk and uncertainty that are inherent in significant innovation projects:

- De Jong et al. (2011; p.7) and Lau et al. (2012; p.673) "risk taking";

- Davis (1996; p.316) and Vandermerwe & Birtey (1997; p.347) "resilient";

- Sinha & Srivistava (2013; p.105) “neuroticism was significantly but negatively correlated to intrapreneurial orientation”.

The literature does not feature a quantitative study to investigate the relationship of the Big Five personality traits with successful intrapreneurship as measured by performance outcomes, however. Therefore, the research question that emerges from the literature review in this chapter is as follows:

Do successful intrapreneurs have a similar personality profile?

The question arises because the intrapreneurship literature gives numerous descriptions and makes claims about the sorts of people intrapreneurs tend to be. By addressing the research question, it will be possible to begin to put some shape around those descriptions that the literature provides, and also start the process of better understanding the perspective of what an intrapreneurial personality profile might consist of.

Based on the apparent connections between achieving a successful intrapreneurship process and personality from the literature, the following hypothesis is tested in this study:

H2: Individual intrapreneurial outcome positively correlates with personality traits as defined and measured by the Big Five.

A range of personality tests from the literature is now reviewed to identify a potential measure for this study.

Personality Tests in the Context of this Research

Because personality is such a specialist area and is supported by a large body of research, especially in the domain of psychology, it is deemed that a personality questionnaire that has already been published, peer-reviewed and tested for validity

and reliability should be used for this thesis. This section comprises a critical review of some of the main personality trait tests found in the literature.

A number of inventories measure the Big Five traits. John and Srivistava (1999) list a number that have been developed to apply the Big Five 'to specific research applications'. They conclude that:

> *"...availability of so many different instruments to measure the Big Five makes it clear that there is no single instrument that represents the gold standard"* (p.23).

Four of the most recognised instruments in the literature are reviewed here: the TDA (Goldberg, 1992), NEO FFI and NEO PI-R (Costa and McCrae, 1992) and BFI (John, Donahue and Kentle, 1991). John & Srivistana (1999) have some extensive analysis of how the three inventories perform, and have found substantial consistency across all three, with differences appearing to arise from differing interpretations of the trait facets. A summary is shown in Table 8.

Table 8: Summary of Big Five instruments: NEO, BFI and TDA

Inventory	Reference	Summary	Reliability and Viability
240-item NEO Personality Inventory (NEO-PIR)	Costa & McCrae (1992)	Measures each of the Big Five via 6 specific items per factor (Costa & McCrae, 1995). It 'was developed in samples of middle-aged and older adults, using both factor analytic and multitime method procedures of test completion.' (John & Srivistava, 1999, p.110). A lengthy instrument.	The scales have shown substantial internal consistency, temporal stability, and convergent and discriminant validity against spouse and peer ratings (Costa & McCrae, 1992; McCrae and Costa 1990)…the factor structure of the 30-facet scales replicates very closely in a broad range of languages and cultures (McCrae & Costa, 1997, P.111). (John & Srivistava, 1999.) 'In general the NEO questionnaires represent the best-validated Big Five measures in the questionnaire tradition.' (John & Srivistava, 1999, p.115).
60-item NEO Personality Inventory (NEO-FFI)	Costa & McCrae (1992)	A shorter questionnaire based on an earlier inventory (NEO PI) that the authors had created in the 1980's (Costa & McCrae, 1985).	The reliabilities shown in the manual (Costa & McCrae, 1992) are acceptable. The mean is 0.78 across the 5 scales. 'The NEO-FFI scales are substantially correlated with the NEO PI-R scales, suggesting that they inherit a substantial portion of the validity of the longer scales.' (John & Srivistava, 1999, p.111). 'In general, the NEO questionnaires represent the best-validated Big Five measures in the questionnaire tradition.' (John & Srivistava, 1999, p.115).
44-item Big Five Inventory (BFI)	John, Donahue and Kentle (1991)	This was 'developed to represent the prototype definitions developed through expert ratings and subsequent factor analytic verification in observer personality ratings.' (John & Srivistava, 1999, p.114). Short scales not only save testing time, but also avoid subject boredom and fatigue.' (Burisch, 1984). It 'uses short phrases based on the trait adjectives known to be prototypical markers of the Big Five (John, 1989, 1990).' (John & Srivistrava, 1999, p.115). 'The BFI has been used frequently in research settings in which subject time is at a premium and the short-phrase item format provides more context that Goldberg's single adjective items but less complexity that the single question format used by the NEO questionnaires.' (John & Srivistava, 1999, p.115).	Although the BFI scales include only eight to ten items, they do not sacrifice either content coverge or good pshychometric properties…In U.S. and Canadian samples, the alpha reliabilities of the BFI scales typically range from .75 to .90 and average above .80 three-month test-retest relaibilities range from 0.80 to 0.90, with a mean of 0.85. Validity evidence includes substantial convergent and divergent relations with other Big Five instruments as well as peer ratings.' (John & Srivistava, 1999, p.115).
TDA (Trait Descriptive Adjectives)	Goldberg (1992)	This is 'the most commonly used measure consisting of single adjectives.' (John & Srivistava, 1999, p.115). Has not yet been shown to predict ratings by peers. Comprises 100 trait descriptive, all unipolar. Saucier (1994) shortened the 100-item TDA to a set of 40 mini-markers to get a more time-efficient questionnaire.	Goldberg (1992) conducted a series of factor analytic studies to develop and refine the TDA as an optimal representation of the five-factor space in English, selecting for each Big Five scale only those adjectives that uniquel defined that factor. These scales have impressively high internal consistency, and their factor structure is easily replicated.' (John & Srivistava, 1999, p.106)

Any of the four Big Five instruments summarised in Table 8 displays sufficient reliability and validity for this research.

There is broad (although not complete) consensus in the literature that the Big Five Inventory, also known as the Five-Factor Model, is the leading measure for quantitatively assessing personality traits:

> *"Today it [i.e. the Five-Factor Model] is the default model of personality structure, guiding not only personality psychologists, but increasingly developmentalists (Kohnstamm et al., 1998), cross-cultural psychologists (McCrae and Allik, 2002), industrial / organizational psychologists (Judge et al., 1999), and clinicians (J.A. Singer, 2005)"* McCrae and Costa, in Boyle et al., 2008; p.273).

The BBC, with Professor Michael Lamb and Dr Jason Rentfrow of Cambridge University, ran a national Big Five study to complement the series *Child of Our Time.* The following text is an extract from the Lamb & Rentfrow (2014) and the BBC's (2014) website:

> *"The Big Five test, or 'Five Factor' personality test, is a widely recognised and well-used scientific measure of personality. The traits it measures are Openness, Conscientiousness, Extroversion, Agreeableness and Neuroticism (OCEAN). The Big Five test is generally acknowledged as the most stable measure of personality over time. This means that someone who takes the test even years apart is likely get a similar result both times."*

Selection of the Big Five Inventory for this Research

The Big Five Inventory is selected for this research for the following reasons:

- As Matthews in Boyle et al. (2008; p.73) asserts: "Strong claims have been made for the FFM [Five Factor Model] as the defining paradigm for trait psychology. Its merits are well known and need no defense" (citing McCrae and Costa, 1997).

- The literature demonstrates that, despite Allport (1937) identifying 17,000 different traits, there is a general (if not complete) consensus amongst psychologists in this specific field that these can be condensed down to the five key traits contained within the Big Five (via factor analysis). Trait descriptions of intrapreneurs used in the literature can be mapped interpretively onto the Big Five items, as has been shown earlier in this chapter. A specific factor analysis of all the traits associated with successful intrapreneurship in the literature to produce a new Intrapreneurial Personality Assessment would in many ways be an interesting way to proceed from a statistical perspective, however such an exercise is beyond the scope of this thesis. However, descriptors from the literature show the potential for the Big Five, as an existing measure that has high reliability and validity, to be a useful way of beginning to test traits associated with successful intrapreneurship.

Discussion and Conclusion

The distillation of all traits to only five does lose some subtleties from the results, that some psychologists have addressed by creating an hierarchical tree structure with levels that sit above and below the Big Five. Anusic et al. (2009) have simplified the Big Five into only two – Growth, which combines Extraversion and Openness, and Citizenship, which combines Agreeableness, Conscientiousness and Emotional Stability (also known as Neuroticism).

Roberts and Pomerantz (2004) show traits, and specifically the Big Five, at the broad end of understanding how a person interacts with a situation. Cervone et al. (2001) also criticise the Big Five for being monolithic and unwieldy. However, in this study intention behind using the Big Five is neither to track changes over time nor to explore how intrapreneurs respond to different situations; the intention is simply to explore whether successful individual intrapreneurs exhibit the same broad personality traits, so the limitations noted by Roberts and Pomerantz (2004) and Cervone et al. (2001) are not concerning.

Boyle, in Boyle et al. (2008; p.297) in his critique of the Five-Factor Model of Personality finds that:

> *"…two factors (extraversion and neuroticism) appear to be universally accepted and appear in all major contemporary models of broad personality traits. However, interpretation of the remaining three… dimensions…continues to remain controversial."*

Boyle (2008) goes on to list a number of alternative dimensions that have been proposed in the literature and argues that a more inclusive and dynamic personality model is needed. To date, however, such a structure has not been created and peer-validated, and the Big Five remains the most supported trait-based personality model available.

Fleeson, in Deaux and Snyder (2011) observes that the Big Five describe the differences in individuals but do not provide any insight into why these differences occur or how they show themselves in behaviour. This additional richness of explanation behind description is indeed lacking in the Big Five, as noted by Fleeson (2011), and would be very useful in analysing intrapreneurial personality further, but for the purposes of this study the Big Five traits and their descriptions provide a satisfactory start to understanding whether successful intrapreneurs do or do not share a similar profile and, if so, what that profile is.

The analysis based on the literature review in this chapter indicates that the study of any similarities that may exist within the personality trait profiles of individual intrapreneurs who generate positive outcomes for their employing organisations could provide the following benefits:

- Presentation of a perspective that complements and tests the existing literature by relating personality traits from the Big Five with a measure of individual intrapreneurial performance.

- Insights that may assist academic researchers, individual intrapreneurs and organisations in beginning to develop further understanding of the personality traits that are seen in successful intrapreneurs so that over time interventions may be developed to better support the achievement of individual intrapreneurial outcomes in organisations.

The literature suggests that there are correlations between individual intrapreneurial outcome and aspects of personality as defined by the Big Five. It creates a picture of the successful intrapreneur as an individual who is highly driven when it comes to pushing boundaries to make things happen, who gets energy from external sources and who does enough to get along with others and play closely enough to the organisation's rules. They are open to new thinking but also have a clear vision of their own for what should be done and how to achieve success. The intrapreneur is also aware of the risks that are inherent to driving innovation, which makes them vigilant, focused and assertive to avoid failure and optimise the chances of success for their project. Consequently, the following hypothesis is proposed for the purposes of this study:

H2: Individual intrapreneurial outcome positively correlates with personality traits as defined and measured by the Big Five, specifically:

a. Individual intrapreneurial outcome positively correlates with Openness.

b. Individual intrapreneurial outcome negatively correlates with Conscientiousness.

c. Individual intrapreneurial outcome negatively correlates with Agreeableness.

d. Individual intrapreneurial outcome positively correlates with Extraversion.

e. Individual intrapreneurial outcome negatively correlates with Neuroticism.

Closely related to but different from personality traits is emotional intelligence, an attribute that enables intrapreneurs to apply their personality traits to positive effect, as the following chapter goes on to explore.

C h a p t e r 6

INVESTIGATING KEY ATTRIBUTES - EMOTIONAL INTELLIGENCE

Overview of the Chapter

This chapter uses definitions and models of Emotional Intelligence from the literature to explore the role of Emotional Intelligence in achieving successful intrapreneurial outcomes throughout the Intrapreneurship Process Model described in Chapter 3.

Then follows a review of the literature for specific links between intrapreneurship and Emotional Intelligence.

A review of some of the key methods of measuring Emotional Intelligence is then undertaken for deciding on the most appropriate method for this study.

Models of Emotional Intelligence

Emotional Intelligence (EI) is a concept popularised amongst managers and leaders of organisations by Goleman (1995) in his best-selling book aimed at business practitioners.

The following academic definition of EI comes from The Encyclopaedic Dictionary of Psychology (Ed. G. Davey, 2005; p.306):

> "*The construct of emotional intelligence (EI) posits the existence of actual or perceived differences in the extent to which people attend to, process and utilise affect-laden information. The distal roots of EI are in E.L. Thorndike's (1920) construct of 'social intelligence' which concerns the ability to understand and manage people and to act wisely in human relations. Its proximal roots are in Gardner's (1983) two personal intelligences (intrapersonal and interpersonal)… which concern the ability to understand the emotions and mental states in one's own self and in other people, respectively.*"

Other definitions in the literature are based on three main models of EI, shown below along with their key proponents in the literature:

1. Ability Model – e.g. Mayer et al, 2001

"Ability EI …concerns the actual ability to perceive, process and utilise affect-laden information. The construct pertains primarily to the realm of cognitive ability." (Davey, 2005; p.307).

2. Mixed Model – e.g. Goleman, 1998.

3. Trait Model – e.g. Petrides, 2000, 2001. The trait model is also referred to as "emotional self-efficacy" (Davey, 2005; p.306).

The Intrapreneurship Process is discussed in Chapter 3 and shown in Figure 2. It illustrates the key stages that the successful intrapreneur usually goes through in order to deliver a positive intrapreneurial outcome. Whilst a full explanation and discussion of the process along with an overview of significant intrapreneurial, entrepreneurial and innovation processes is presented in Chapter 3, a general summary of the stages is as follows:

Phase: Creativity (C) – generation of new ideas or concepts and recognition of a new opportunity:

- Creative stimulus stage (S) – in which the intrapreneur is absorbing information, connections and inspiration as the source of the potential new intrapreneurial idea or concept.

- Opportunity recognition (O) – in which the intrapreneur experiences a cognitive process to identify how the new idea could be exploited or realised.

Phase: Innovation (I) – Developing the new idea or concept further and progressing it to implementation

- Creative development (D)– in which the intrapreneur develops the new concept further to make it more robust or add greater intrinsic value.

- Idea testing (T) – in which the intrapreneur undertakes some research or takes soundings to test the potential for the new concept to succeed.

- Generate support (Su) – influencing to mobilise active support from enabling individuals or organisations to access resources, funding, political endorsement.

- Get the go ahead (G) – generating the final permission to proceed with launching the new intrapreneurial concept.

- Make it happen (H) – delivering the launch and live application of the new concept.

- Learn from the results (R) – reflective practice to identify how to strengthen the project outcomes to develop and launch the new concept; lessons identified that can also be applied to future projects.

Of course, in reality this process is usually not completely linear. It is much more likely that the intrapreneur will cycle forwards and backwards between stages as new information, challenges or opportunities emerge.

The intrapreneur is more likely to be successful if he or she possesses high levels of actual emotional intelligence (i.e. ability emotional intelligence, as observed and recognised by others) and of self-efficacy with regard to their own emotional intelligence, (i.e. trait emotional intelligence). That is, to innovate and shape change, the intrapreneur will be helped by influencing and social ability, as well as self-belief in that ability in order to have the confidence to challenge the status quo. However, as Petrides et al. (2007; p.273) identify:

"The conceptual differences between the two constructs are directly reflected in empirical findings, which reveal very low correlations between measures of trait and ability EI (e.g. O'Connor & Little, 2003; Warwick & Nettelbeck, 2004)".

This suggests that these two models address different dimensions of EI.

The EI literature supports the role of emotional intelligence in achieving successful intrapreneurial outcomes. The different types of EI model, described by Mayer, Salovey and Caruso in Sternberg (2000), plus Petrides et al's (2007) trait model, are summarised in the following Table 9 and overlaid with the elements of the Intrapreneurship Process (C,S,O,I,D,T,Su,G,H,R) from the description above.

Table 9: E.I Models from the literature overlaid with stages from the Intrapreneurship Process Model from the literature

Mayer & Salovey (199&) - *Ability*	**Bar-On (1997) - *Mixed***	**Coleman (1995a) - *Mixed***	**Petrides et al. (2007) - *Trait***
Key Skills and Specific Examples			
Perception and Expression of Emotion Identifying and expressing emotions in self **ALL STAGES** Identifying and expressing emotions in others **ALL I ESPECIALLY Su, G, H** *Assimilating Emotion in Thought* Emotions prioritise thinking in productive ways **ALL STAGES** Emotions generated as aids to judgment and memory **ALL STAGES** *Understanding and Analysing Emotion* Ability to understand relationships associated with shifts of emotion **ALL STAGES ESPECIALLY I: Su, G, H** *Reflective Regulation of Emotion* Ability to monitor and regulate emotions reflectively **ALL STAGES**	*Intrapersonal Skills:* Emotional self-awareness **ALL STAGES** Assertiveness and Independence **Su, G, H** Self-regard and self-actualisation **ALL STAGES** *Interpersonal Skills:* Interpersonal relationships **Su, G, H** Empathy **ALL STAGES** *Adaptability Scales:* Problem solving and reality testing **ALL STAGES** Flexibility **ALL STAGES** *Stress-Management:* Stress tolerance and impulse control **ALL STAGES** *General Mood:* *Happiness and optimism* **ALL STAGES**	*Knowing One's Emotions* Recognising and monitoring feelings **ALL STAGES** *Management of Emotions* Handling feelings **ALL STAGES** Ability to shake off negative moods **ALL STAGES** *Motivating Oneself* Marshalling emotions in the service of a goal **ALL STAGES** Impulsiveness (low) **ALL STAGES** Being able to get into 'flow' **ALL STAGES ESPECIALLY C,O** *Recognising Emotions in Others* Empathetic awareness and attunement **ALL I** *Handling Relationships* Skill in managing emotions in others and interacting smoothly **ALL I**	*Self-efficacy regarding own EI* Adaptability **ALL STAGES** Assertiveness **Su, G, H** Emotion perception (self and others) **ALL I** Emotion expression and regulation **ALL STAGES** Emotion management (others) **ALL I** Impulsiveness (low) **ALL STAGES** Relationships **ALL STAGES** Self-esteem **ALL STAGES** Self-motivation **ALL STAGES** Social awareness **ALL STAGES** Stress management **ALL STAGES** Trait empathy, happiness and optimism **ALL STAGES**

The perspective of Petrides et al. (2007) positions trait EI in the domain of personality and links it to the mainstream personality literature. Their research shows however that:

> *"a sufficient number of trait EI facets share enough common variance to define a separate factor in joint analyses with … the Big Five, which constitutes clear evidence of discriminant validity"* (p.274).

Personality as measured through the Big Five and intrapreneurship forms the subject of an earlier section of this research, Chapter 5. The two themes – emotional intelligence and personality – appear to be interrelated. Petrides et al. (2007) use factor analysis to show the relationship link emotional intelligence with personality traits. In practice it appears that EI is both a trait and an ability – hence the mixed model. Individuals are all born with their own personality traits – these are then developed (or not) through their experiences and environment, via nature and nurture.

Patterson et al. (2009) write as a 'Key Message' in their NESTA paper that the relationships between emotional state and innovation are complex and are worthy of further investigation. They are of the view that EI is likely to be an important attribute for effective innovation but that its role in innovation has not been widely studied. However, there are still indications in the literature that connections along the lines of those identified above exist between EI and successful intrapreneurship. Within the same review, Patterson et al. (2009) identify that the attributes that individuals need to lead innovation in organisations, which can be summarised as intelligence, influencing and planning ability, creative problem-solving, risk management, collaboration, communication, positivity and self-management, are all underpinned by EI capability. Given that the successful intrapreneur personally drives the intrapreneurship process and needs to influence and engage others, often including his or her superiors, these emotional intelligence dimensions are relevant to the intrapreneur, an observation that is echoed by Zhou and George (2003) who identify that leaders have a key role to play

in encouraging employee creativity and influencing the positive innovative climate of the work group.

As presented in Chapter 3 regarding the Intrapreneurship Process, elements of the intrapreneur's role include elements of transformational leadership capability. Transformational leaders, defined by Bass and Riggio (2008; p.3), are:

> *"those who stimulate and inspire followers to both achieve extraordinary outcomes…[responding] to individual followers' needs by empowering them and by aligning the objectives and goals of the individual followers, the leader, the group, and the larger organization."*

Transformational leadership skills are required because the intrapreneur needs to persuade, influence and direct others throughout the process to bring about successful delivery of the intrapreneurial initiative. Quite often, the individuals that the intrapreneur needs to affect are not necessarily his or her direct reports – they may include superiors, peers and people in other departments in the organisation over whom the intrapreneur has no authority.

As the intrapreneurship process moves into putting an initiative into action, the intrapreneur also requires project management skills in addition to transformational leadership ability in order to mobilise people and other resources effectively and bring the idea to fruition. Project management is defined by Barnes (2012; online), until recently President of the UK Association of Project Management, as "people getting things done," an interesting definition that includes nothing about risk management or innovation. The difference between intrapreneurs and project managers is that the intrapreneur conceives and generates buy-in for his or her idea and then delivers it. Project managers are not necessarily, but may be, the originators of the project ideas that they manage. Their role is to manage others to successfully achieve the project outcome, being heavily reliant on their EI skills in order to do so (Leban and Zulauf, 2004). During implementation of a new intrapreneurial initiative, the intrapreneur, as

defined in Chapter 2 of this study, also undertakes some project management to make the new initiative happen. EI is therefore likely to be fundamental to the ability to mobilise and positively influence others, read changes in the environment and the attitudes of others and adjust approaches accordingly in the project management phases of the Intrapreneurship Process (Chapter 3). Leban and Zulauf's (2004) research also shows that there are several connections between EI and transformational leadership, which in turn positively affects actual project performance. This suggests that EI ability enables transformational leadership behaviour and positive project performance as a beneficial outcome for the organisation.

The intrapreneur needs to be resilient, (personal resilience being a feature of all the EI models presented in this chapter) in stressful situations at any stage through the Intrapreneurship Process derived from the literature in Chapter 3, for instance when his or her proposals are rejected, are highly innovative or do not go as planned. Intrapreneurs expose themselves more than their non-intrapreneurial colleagues because, in proposing and driving new initiatives for their organisation, they take career and personal credibility risks in putting their heads above the parapet. Maier and Pop Zenovia (2011; p.972) call the intrapreneur the "revolutionary" within the organisation, and note that this striving for revolution is often not without conflict. Shabana (2010) finds that inertia and resistance to change slow intrapreneurship down and that failure is often an unavoidable aspect of intrapreneurship, suggesting that the intrapreneur sometimes has to battle to implement innovation. These factors have potential to generate stress that the intrapreneur needs to manage effectively to succeed. Research into the impact of EI on performance outcomes by Lyons and Schneider (2005) indicates that individuals who are able to manage their emotions may also be able to choose more effective self-management strategies at potentially stressful times. Their study of 126 undergraduates suggests that the presence of latent dimensions of EI in individuals, (emotional management, emotional understanding and emotional perception), may be related to more positive performance under stress than individuals demonstrating lower levels of EI. A more recent study (Schneider,

Lyons and Khazon, 2013) confidently concludes that EI supports stress resilience and that EI capability provides the individual with the self-management skills to deal with the psychological and physiological aspects of stress effectively.

Allan et al. (2002) identify the following EI-related characteristics that are required to generate successful innovation in the workplace, all of which are consistent with literature review themes relating to EI described earlier in this chapter:

- *"Realness"* – defined as *"the art of bringing ideas to life"* (p.79);
- *'Signalling'* – which *"helps us to navigate between a creative, judgement-free world, and a business world"* (p.143); and
- *'Courage'* – because *"a new idea …requires the creative person to stand up and dare to be different"* (p.163).

The capabilities that Griffin, Price and Vojak's (2012) serial innovator, (also discussed in more detail in Chapter 1 of this study), requires to be successful are directly aligned to the concepts of EI outlines by Allan et al. (2002) above, i.e. they need to be creative and expansive within organisational contraints, possess political capability that enables them to influence and work with others and commercial skills to bring new ideas to market.

As well as actually possessing EI, the literature indicates that intrapreneurs also need to feel confident in their own ability. Lucas et al. (2009) cite studies from Stajkovic & Luthans (1998), and Barling & Beattie (1983), that correlate higher levels of work performance with higher self-efficacy. Lewis (2011), in her literature review that focuses on the spectrum of entrepreneurs, identifies the following themes (amongst others – the themes below have been selected for their connections with Emotional Intelligence) from her literature review of entrepreneurial traits from the sociological perspective and identifies them as entrepreneurial attributes. These are: feeling in control of one's own present and future, rather than simply feeling lucky or

unfortunate. Within this attribute, Lewis includes a strong internal locus of control, and high levels of self-efficacy and autonomy; and being emotionally stable and robust, capable of recognising and positively influencing emotion in oneself and others, per Goleman (2001).

In their exploration of intrapreneurs at Tata Steel, Seshadri and Tripathy (2006) contrast the intrapreneurial mindset with what they call the "employee mindset" (p.17), identifying through their interviews that intrapreneurs have greater psychological ownership of initiatives than other employees. This psychological ownership should not be confused with commitment – many of us are likely to have worked alongside less intrapreneurial people who take great pride in their work, enjoy being involved in company life and who would volunteer and go beyond normal requirements to help the organisation when it is needed. Psychological ownership is described by Pierce et al. (2002; p.5) as:

> *"a condition, of which one is aware through intellectual perception. It reflects an individual's awareness, thoughts, and beliefs regarding the target of ownership. This cognitive state, however, is coupled with an emotional or affective sensation ... and are accompanied by a sense of efficacy and competence (White, 1959)."*

This theme is also recognised by Chakravarthy and Lorange (2008) who note that intrapreneurs are different from functional business managers, identifying that the former will only take on projects to which they are committed and for which they have inner passion. So intrapreneurs need a strong sense of ownership and personal investment in order to maintain momentum throughout the Intrapreneurship Process. They are also likely to need high levels of EI to maintain balance and generate support and commitment from others in the projects in which they are so personally and emotionally invested.

The literature features a number of examples of the different elements of EI that are displayed by intrapreneurs. Seshadri and Tripathy (2006) identify that "Credibility is

key for intrapreneurs," (p.22) as is a "powerful vision" (p.24) that can motivate people to get behind a project. Molina and Callahan (2009) observe that intrapreneurs need to be skilled at working in the context of organisational politics, suggesting that intrapreneurs need EI to understand, navigate and influence through them. Murphy and Dweck (2010; p.284) note that:

> *"Self-presentation research has shown that when they wish to be accepted, [people] …display the qualities that they believe others will value. (Gardner and Martinko, 1988; Leary 1995)."*

Intrapreneurs may often require sophisticated EI to adapt their approach and to intuit the accepted behavioral norms of their environment in order to influence and gain support for their endeavours. By understanding and then displaying the behaviours that are valued by their employing organisation, they will gain greater acceptance and credibility, a theme which is reinforced by Ready, Conger and Hill (2010), whose study into high-potential employees, who have much in common with the intrapreneurs that are the focus of this thesis, showed that those who achieve higher levels of performance than others in organisations demonstrate behaviours that reflect their companies' culture and values to an exceptional standard, in full knowledge that this helps them to be judged positively by their managers. This is a fundamental aspect of EI and one that necessitates a strong sense of EI self-efficacy on the part of the intrapreneur in order for the intrapreneur to successfully adopt these behaviours in practice to challenge the status quo.

Based on the apparent connections between achieving a successful intrapreneurship process and the requirement for high levels of self-efficacy in having and using emotional intelligence from the literature, the following hypothesis is tested in this study:

H3: Individual intrapreneurial outcome positively correlates with a positive self-perception of emotional intelligence.

Assessing Emotional Intelligence

Methods of assessing EI differ according to the particular Emotional Intelligence framework that the instrument authors are basing their work on.

1. Ability Model – Mayer et al's MSCEIT (2002)

2. Mixed Model– Boyaztzi and Goleman's ECI (2000)

3. Trait Model– Schutte et al's SSEIT (1998); Bar-On EQ-I (1997); TEIque (Petranides)

Davey (2005; p.306) states:

> *"The measurement of ability EI is problematic because the inherently subjective nature of emotional experience undermines the effort to develop tests items along cognitive ability lines, such as those used in standard IQ tests…The measurement of trait EI is more straightforward because the construct consists of self-perceptions and behavioural dispositions, which are compatible with the subjective nature of emotions."*

Review of Potential Emotional Intelligence Assessments

The following EI assessments were reviewed to identify the most appropriate inventory for the purposes of this study:

1. Yong's (2003) EQ inventory;

2. Emotional Competence Inventory (ECI);

3. Emotional Quotient Inventory (EQI);

4. Mayer–Salovey– Caruso Emotional Intelligence Test (MSCEIT);

5. TEIQue (Petrides and Furnham, 2001); and

6. Schutte et al.'s (1998) SSEIT.

The review was informed also by Conte's (2005) review and critique of emotional intelligence measures.

1. **Yong EQ Inventory (2003) – Method: self-report. EI Model – not stated, interpreted as Mixed.**

The Yong EQ Inventory was used to assess a sample of Malaysian managers. Its form is a self-report questionnaire comprising 28 items, designed to measure seven dimensions of EI. It employs a 5-point Likert style format (disagree strongly, disagree a little, neither agree nor disagree, agree a little, agree strongly). The seven emotional intelligence dimensions measured by the Yong EQ Inventory are:

1. Intrapersonal skills

2. Interpersonal skills

3. Assertiveness

4. Contentment in life

5. Resilience

6. Self-esteem

7. Self-actualization

These are based on Yong's (2003) literature review on the concept of emotional intelligence and a few of the available inventories that are designed to measure it.

Concurrent, predictive and construct validity were not established in Yong's (2003) manual and it has not been possible to locate a later version to date. Nor does the Cronbach's alpha coefficient appear to have been established for reliability. In summary, the inventory in its current form lacks the demonstrable robustness required for this research and is rejected.

2. **ECI (Boyatzis, Goleman and Rhee, 2000) – Method: self-report (360 degree options also available). EI Model: Ability.**

The ECI tests 20 EI competencies through a questionnaire of 110 items. These items are grouped as: (1) Self-Awareness; (2) Social Awareness; (3) Self-Management; and (4) Social Skills. One positive feature of the ECI but which is outside the scope of this study is that it can also be extended to include 360-degree assessment techniques so that self, peer and supervisor ratings can also be tested.

Conte (2005; p.434) reports:

> *"The internal consistency reliability of the self-assessment ECI scales ranges from 0.61 to 0.85 ... However, for proprietary reasons, the developers of the ECI have allowed very few items to be evaluated by other researchers."*

In addition, as also observed by Conte (2005), Matthews et al. (2002) and Van Rooy & Viswesvaran (2004) both report overlaps with four of the Big Five personality dimensions (Conscientiousness, Emotional Stability, Extraversion, and Openness). Due to this significant overlap with the Big Five (which is being tested as a separate and specific questionnaire dimension in this research as presented in Chapter 5), and the high number (110) of questions, the measure has been rejected as an option for the purposes of this study.

3. Bar-On (EQ - I) (1997) - Method: self-report. EI Model – Ability.

The Bar-On EQ-I (1997) is based on over 20 years of international research and appears to be a reliable and valid inventory based on the technical information available (MHS, 2009). It is designed to assess the respondent's social and emotional strengths and weaknesses and is organised into 15 key areas of emotional skill that the author claims contribute to individuals' high performance in complex and challenging organisational contexts. The questionnaire comprises 133-items and has a normative database of circa 4,000 participants. The technical manual and website (Bar-On, 1997; MHS 2009) claim:

- Internal reliability, with nine different studies reporting alpha statistics ranging from .69 to .86.
- Test-retest reliability, with 1-month and 4-month test-retest values available for 11 of the 15 scales. The 1-month values range from .78 to .92, and the 4-month values range from .55 to .82.
- Validity and comparison against a range of personality questionnaires, a depression inventory and an attributional style questionnaire.
- Predictive validity within a specific military / air force setting.
- Discriminant validity between a variety of different groups (Bar-On, 1997).

A few of the questions within the inventory are somewhat confusing in that what is being asked sometimes does not grammatically match the answer (so it does not seem to make sense), or there is a double negative, meaning it may be easy for respondents to accidentally misinterpret the question and / or response. Other than that, the format is standard with statements being presented and a choice of 5 possible responses from "very seldom like me / not at all like me" through to "very often like me / very like

me" available for selection. The result format is not made widely available so a comment cannot be made on the results or report format.

Since initial research into the Bar-On EQ-I (1997) was conducted at the beginning of 2009, efforts have been made to track further developments of the inventory. Based on Bar-On's own observations (Bar-On, 2012; online), any developments have not been significant:

> *"In 2011, a mildly revised version of the EQ-i -- referred to as the "EQ-i 2.0" -- was renormed [www.mhs.com]. Although some of the items were reworded and others added, the 15 factorial structure of the Bar-On model was confirmed, for the most part, in spite of the cosmetic changes that were introduced."*

Conte (2005; p.435) identifies that the inventory is lacking in discriminant validity evidence, and that "few studies have examined whether it provides incremental predictive validity above the contribution of established predictors such as cognitive ability and Big Five personality dimensions." The Big Five is also used as part of this study (Chapter 5), so it was not considered appropriate to use Bar-On (1997) in this research for this reason. Also, the Bar-On EQ-I (1997) questionnaire comprises 133 questions and was rejected for the purposes of this research principally for pragmatic reasons. Asking respondents to complete 133 items for one questionnaire is deemed too onerous when shorter inventories with good reliability and validity are available.

In summary, due to pragmatic concerns based on time for respondents to complete and cost of this questionnaire, and to the use of the Big Five questionnaire to assess personality dimensions as a specific area of this research, an alternative EI measure is required for the purposes of this study.

4. MSCEIT (Mayer et al, 2002) – Method: Ability Test. EI Model: Ability.

The MSCEIT™ (MHS, 2009) claims to be an ability-based measure of EI. It assesses EI skills by asking participants to respond to 141 task-oriented questions, designed to

test EI ability objectively (rather than via subjective self-reporting). Respondents are asked to identify the emotions presented in a face or design. The owners of MSCEIT (MHS, 2009; online) claim their test will "predict how someone will react emotionally", assessing skills that they say "play a crucial role in just about every key organizational function, from leadership and team-building to negotiation and planning." Participants' responses are scored against the correct answers, which have been arrived at via a combination of the consensus of a number of earlier inventory participants and a panel of subject matter experts. The test was created by researchers at the Universities of Yale and New Hampshire and is supported by independent, peer-reviewed scientific literature that confirms the test's validity and reliability, internal consistency, retest reliability, and a good degree of predictive certainty. In the inventory's technical manual, Mayer et al. (2002) claim internal reliability as follows: full scale reliability of .91, with area reliabilities of .90 (Experiential) and .85 (Strategic). Brackett & Mayer (2001) found a test-retest reliability for the full-scale MSCEIT V2.0 of r = .86. Branch score reliabilities range from .74 to .89. The MSCEIT is therefore a very reliable test at the Branch, Area, and Total scale levels. It is shown to have good predictive validity, being positively related with job performance, leadership style, occupational choice, attachment style, academic success and negatively related with problem behaviours and violence.

The MSCEIT is an interesting test to take. It is rather subtle, unclear and subjective in places, but the ambiguity is probably necessary to identify subtle differences in levels of ability, and at the core of EI is understanding, responding and influencing such subtleties in oneself and in others. The test consists of interpreting photos of landscapes, patterns, people and written scenarios and language.

Whilst the MSCEIT appears to be an excellent test of EI, Conte (2005) notes some concerns, principally based on the observation that MSCEIT validity claims are largely based on an earlier version of the measure, MEIS, which is quite different from MSCEIT. Additional criticisms of MSCEIT come from Roberts et al. (2001) and

Brody (2004). The former argues that MSCEIT measures 'conformity' rather than ability based on the 'consensus-based assessment method'; the latter that it measures 'knowledge' rather than ability – i.e. the individual knows what response is required but that knowledge does not necessarily always translate into the implementation of that knowledge.

MSCEIT's benefits are interesting and potentially useful, however, especially because it uses an objective ability test rather than a self-report method. However, the test has 141 question items and is deemed to be too onerous in terms of time commitment for respondents in this study.

5. **TEIQue (Petrides and Furnham, 2001) – Method: Self-Report. EI Model: Trait**

Petrides and Furnham's (2001) Trait Emotional Intelligence Questionnaire (TEIQue) was achieved through a systematic content analysis of a range of Trait EI models, (Davey, 2005). The method arrived at 15 facets, which form the basis for the TEIQue: adaptability, assertiveness, emotion perception, emotion expression, emotion management (others), emotion regulation, impulsiveness (low), relationship skills, self-esteem, self-motivation, social competence, stress management, trait empathy, trait happiness and trait optimism. The measurement is being used by the London Psychometric Laboratory at UCL.

The inventory consists of 153 items, so is a long questionnaire, although a short-form 30-item version is available. 360 degree versions are available too, but use beyond self-reporting is beyond the scope of this research.

Cooper and Petranides' (2010) study of the psychometric properties of the short form questionnaire indicates that the most items have good discrimination and threshold parameters along with high information values. It demonstrates acceptable psychometric properties. Cooper and Petranides' (2002) evaluation indicates that the

TEIQue-SF is a sufficiently robust and pragmatic inventory for measuring Trait EI via self-reporting. TEIQue, therefore, is a potential option for measuring EI in the context of this research.

6. SSEIT (Schutte et al., 1998) – Method – Self-Report. Model: Not stated – interpreted as Mixed (self-perceptions of trait and ability).

Schutte et al. (1998)'s SSEIT, is a self-report questionnaire based on the model of Emotional Intelligence developed by Salovey and Mayer (1990). Schutte et al.'s (1998; p.169) intention was "to provide a solid foundation for a measure of individuals' current level of emotional intelligence".

Bar-On's (1996) and Schutte et al.'s (1998) inventories are based on two different theoretical approaches to emotional intelligence. The former was derived from an extensive literature review of the key components of emotional functioning whereas the latter was derived using a three-component model of EI (appraisal/expression of emotions, regulation of emotions and utilisation of emotions) proposed by Salovey and Meyer (1990).

The inventory was developed by condensing a pool of 62 items representing different dimensions of the EI model Schutte et al. (1998) to a 33-item scale using factor analysis, based on responses from a sample of 346 respondents. Additional studies show that the 33-item measure has good internal consistency and test-retest reliability. It comprises 33 statements for each of which respondents choose from a five-point scale.

Schutte et al. (1998) report that their internal consistency analysis indicates a Cronbach's alpha of 0.90. They also undertook an internal consistency replication, reported in the same article referenced here. The cross-check showed a Cronbach's alpha of 0.87.

Two-week test-retest reliability was 0.78 amongst 22 female and six male college students from the U.S. who completed the inventory twice, with a two-week gap in between (Schutte et al.,1998). This is a small sample, however it appears acceptable in the test-retest context.

Regarding validity, Schutte et al. (1998; p.176) write:

> *"Scores on the scale were related to eight of nine measures predicted to be related to emotional intelligence…Scores on the emotional intelligence scale differed between groups one would expect to differ on level of emotional intelligence."*

Independent analysis of SSEIT by Austin et al. (2004) indicates that the inventory does indeed supply a reliable and valid trait EI measure, supported by analysis undertaken by Ciarrochi et al., 2001; Saklofske et al., 2003; and Schutte et al., 1998, 2001.

Discussion and Conclusion

The 'Big Five' questionnaire is used in this research to explore intrapreneurship and its links to the following personality dimensions: neuroticism, extraversion, agreeableness, conscientiousness and openness to experience. It is discussed in more detail in the previous chapter.

In order to ensure that the selected EI inventory for this research does indeed add a useful new dimension to the study, it is important that the scores from the selected EI inventory do not correlate so highly with those from the Big Five that they do not reveal any additional insight. Schutte et al. (1998) undertook studies on discriminant validity to assess the place of emotional intelligence and ensure that the scale is not duplicating elements of the Big Five. The results they report are as follows:

> *"Higher scores on the measure of emotional intelligence were significantly associated with greater openness to experience, $r(22) = 0.54$, $p < 0.009$ and not significantly related to any of the other Big Five dimensions. The magnitude of these*

nonsignificant correlations between the emotional intelligence measure and the other four dimensions was as follows: neuroticism, -0.28; extraversion, 0.28; agreeableness, 0.26 and conscientiousness, 0.21" (pp.174-175).

SSEIT comprises only 33 questions, compared with other commonly used EI questionnaires such as the Bar-On (1996), which is made up of 133 items. Bar-On (1996) is also a commercial test. SSEIT is freely available for non-commercial research purposes.

Limitations stem from the self-selecting and self-reporting aspects of the overall research methodology. The most obvious limitation is that the questionnaire does not provide deep insights into actual EI ability, e.g. through specific, targeted questions relating to the intrapreneurial context or through external observations and perceptions of EI ability from the respondents' colleagues. However, self-reporting is a deliberate practical criterion for inventory selection for this study, and self-reporting could be argued to reveal self-efficacy in the domain, which has been established through the literature review as an important attribute of successful intrapreneurs.

Austin et al. (2004), Petrides and Furnham (2000) and Saklofske et al. (2003) have all noted the lack of reverse-keyed items in SSEIT. Some longer questionnaires such as the Bar-On (1996) do not have this issue because they employ positive and negatibe impression scales in addition to an inconsistency index. The results of Austin et al.'s (2004) study investigating the potential impact of including more reverse-keyed items in SSEIT are inconclusive.

The selection criteria for an appropriate method of testing for this study requires it to:

- Have reliability and validity and already have been published and peer-reviewed. Because the study of Emotional Intelligence (EI) is such a specialist area with an extensive literature, especially in the domain of psychology, it is

decided that an EI questionnaire that has already been published, peer-reviewed and tested for validity and reliability should be used for this research.

- Be designed as a self-report. The method of this study is based on self-report questionnaires, so a measure of self-perceptions of EI is deemed more appropriate than an allegedly objective, IQ-style ability test, especially given that the tests of this kind that are currently available are generic and not designed for the context of business innovation.

- Be of a reasonable length. Because the sample comprises working adults, questionnaires that are time-consuming for participants to complete are not ideal.

- Test individuals' self-perceptions of EI (because successful intrapreneurs need to be confident challengers and influencers to drive through the intrapreneurship process and make things happen).

SSEIT is therefore selected as the most appropriate measure for this study to test the hypothesis that is presented as a result of the literature review in this chapter:

H3: Individual intrapreneurial outcome positively correlates with a positive self-perception of emotional intelligence.

Having reviewed personality traits and EI as key attributes of successful intrapreneurs, the following chapter explores the role of innovation climate within organisations in the context of intrapreneurship, and how perceptions of innovation climate link with individual intrapreneurial outcomes.

C h a p t e r 7

INVESTIGATING KEY ATTRIBUTES - INNOVATION CLIMATE

Overview of the Chapter

This chapter explores the role that innovation climate plays in contributing to the achievement of successful intrapreneurial outcomes by the individual intrapreneur. The literature on innovation climate is reviewed and the Dolphin Index, a development of Ekvall's (1996) CCQ / SOQ innovation climate instrument are evaluated.

Introduction

As demonstrated in the research presented in Chapter 3 on the Intrapreneurship Process, the activities and success of individual intrapreneurs are influenced to some extent by the perceptions of their external environment. To explore the impact of perceptions of all elements of the intrapreneur's external environment (i.e. beyond the boundary of the employing organisation) is outside the scope of this research. However, this research does explore the impact of the intrapreneur's perceptions of their employing organisation's innovation climate on achieving successful Intrapreneurial Outcomes. A range of models and theories of organisational creativity and innovation from the literature are reviewed to explore the dynamics between individual creativity and innovation and the employing organisation and some of the principal, available innovation climate instruments are critically reviewed.

Individual Creativity and the Organisation

It has been demonstrated through the literature review in Chapter 3 that the Intrapreneurship Process requires the individual intrapreneur to use Creative Problem Solving and Innovation skills in order to achieve successful Intrapreneurial Outcomes. Csikszentmihalyi (1999) identifies that creativity is only recognised and acknowledged within the social context that it exists within, and depends not just on

the individual creativity of those who have new ideas, but also on how receptive the surrounding organisation is to those new ideas. This is highly relevant in the context of this research because individual intrapreneurs operate within the 'community' of their employing organisation – the receptiveness of the organisation to the individual intrapreneur's creativity will influence whether or not successful intrapreneurial outcomes for the organisation are produced.

Amabile's (1997) model of individual and team creativity proposes that individual / team creativity fuels organisational innovation, which in turns impacts on individual / team creativity as a mutually reinforcing virtuous circle. It also proposes that creativity is an antecedent to innovation – i.e. appropriate ideas and opportunities need to be recognised and communicated by individuals in order for the ideas to be used in practice. The Intrapreneurship Process (Chapter 3) also features individual creativity as a required precursor to innovation, as the idea becomes realised for organisational gain.

Building on Amabile's (1997) model as part of the conceptual framework of this research, the view that is developing in this study, based on the literature, is that the intrapreneur acts an organisational catalyst, mobilising the motivation and resources of the organisation and activating its management practices to achieve the desired intrapreneurship outcome – and as the organisation enjoys and gains confidence from the intrapreneur's successful generation of beneficial organisational outcomes, so is likely to become more receptive to further intrapreneurial initiatives. This in turn may also be catalytic in motivating the intrapreneur to propose and effect more intrapreneurial opportunities to the organisation, thus creating a virtuous circle.

Whilst Amabile's (1997) model, which is also designed to show the differences and linkages between creativity and innovation, is useful in describing the dynamic between the individual and the organisation, it is constructed at a high level and does not attempt to segment the creativity and innovation processes into discrete steps. It does show conceptually how intrinsic and extrinsic motivations drive creativity.

Woodman et al.'s (1993) model, in line with the one proposed by Amabile (1997) and that is discussed above, shows similar high-level interrelationships and interdependencies between the individual (in the context of this research, the individual maps to the successful intrapreneur) and his or her organisational context. 'Organisational creativity' in the model generates the 'output' – the equivalent of Intrapreneurial Outcomes in this thesis. Woodman et al.'s (1993) approach is somewhat more detailed but also very consistent with the Amabile's (1997) model. They each possess interactive dynamics (Ahmed and Shepherd, 2010) and the commentary on the differences and similarities between the Intrapreneurship Process and Amabile's (1997) model that are described above also apply to Woodman et al.'s (1993) model. It should be noted though that Woodman et al. (1993) have also included their version of the transformation model (i.e. input –> transformation –> output), often used in operations management, (e.g. Open University, 2014), and combined it with the requirement for creativity. The principle of creative transformation for organisational benefit is at the very core of the Intrapreneurship Process – the latter and Woodman et al.'s (1993) model are both entirely consistent on this fundamental theme.

Intrapreneurs as agents of change and improved performance

Kanter (1983) proposes a clear link between the organisation and individual employee performance. At the time of Kanter's (1983) writing, the world of corporate America was becoming hypercompetitive, less stable and unpredictable, and Kanter (1983) argued that innovation on all levels within organisations was essential if American industry were to prosper in the future, and, to do this, employees need to be in an environment that supports innovation, because:

> *"When environments and structures are hospitable to innovation, people's natural inventiveness and power skills can make almost anything happen."*

Although Kanter's (1983) research was undertaken in the USA over two decades ago, it is extensive, comprehensive and contains a number of themes that are of interest to this research, either because they apply more universally or because the 6 years over which this study was undertaken included substantial financial downturn and presented new challenges for the participating intrapreneurs and their employers. These emergent themes and insights from Kanter (1983) relating to this research are discussed in turn as follows:

1. *People as an "economic stimulus"* (p.18)

Kanter's (1983) research indicates that long-term growth and profitability is linked with progressive human resources practice. It is of course sensible to propose that employees can contribute substantially to business turnaround. However, Kanter's (1983) position does sometimes come across as being "the" solution to an American "corporate renaissance" (p.15) rather than one of a range of measures in what was likely to be a complex issue at the time – some examples are structural issues, political issues, leadership competency. That said, Kanter's (1983) core proposition that organisations need to learn how to trust their employees and give them the opportunity and encouragement to use their creativity to benefit the business, using their innovation capability as an economic stimulus, appears to be as relevant today as it was in the early 1980s, and is consistent with the key themes of this research.

Whilst Kanter (1983) finds links between companies with high profits and financial growth and progressive people management practices, Chapter 4 in this thesis discusses measurement of the impact of human resource practices on organisational performance, an important consideration for this study which explores the correlation between the individual intrapreneur's perceptions of innovation climate with that individual's generation of positive intrapreneurial outcomes for the organisation. Clearly each individual's perceptions are likely to be different, but the perceptions of human resources practice and perceptions of innovation climate are complementary and potentially overlapping dimensions. Intuitively it would make sense if a link does

indeed exist – better-treated and more motivated staff are probably more likely to share innovative ideas that contribute to company success. On the other hand, organisations with more progressive human resources approaches are arguably likely to be more progressive across the board and potentially a more innovative culture and way of doing business could be the key success factor for these successful companies.

2. Organisational style – "integration" versus "segmentation" (p.365)

Kanter's (1983) study links positive innovation outcomes with what she calls an "integrative" approach to problem-solving, which she describes as a combination of personal stretch (i.e. individuals operating at the very edge of their competency), being future-focused and having the ability to synthesise ideas from sources that appear to have no obvious connection. She explains that less innovative and successful organisations in contrast take a segmented approach, reminiscent of Lawrence and Lorsch's (1967; p.2) organisational "differentiation", but practised to such an extent that the organisation's performance is significantly sub-optimal: employees work in a siloed manner and there is minimal sharing of ideas and information. Kanter's (1983) observations also resonate with Kirton's (1991) individual 'adaptor-innovator' (KAI) creative style preferences, but operating at the organisational level. Later Csikszentmihalyi (in Henry, 2006; p.9) also echoes Lawrence and Lorsch's (1967) work and Kanter's (1983) integrative theme, stating that:

> *"Ideal conditions for creativity would be a social system that is highly differentiated into specialized fields and roles, yet is held together by…the bonds of organic solidarity."*

The two styles suggested by Kanter (1983) are polarised – in practice it is likely that companies sit along a continuum between the two extremes. Also, different subcultures exist beneath the umbrella culture of the total organisation – some functions may be segmentalist, others integrative. It is useful to recognise the levels of cultural complexity that exist in organisational subsystems.

3. Reward systems and trust

Both the innovative organisation and individual need to be comfortable with the stretch and challenge that are associated with Kanter's (1983) findings. However, this is a potential solution to keeping Chakravarthy and Lorange's (2008) 'corporate entrepreneurs' motivated, as they easily become restless unless they have variety and new opportunities or problems to solve. Kanter's (1983) inferred but not overtly stated view seems to be that, if there is trust and mutual recognition of competence between the individual and the organisation, and between individuals within the company, then the risks of this stretch and challenge are mitigated. As Kanter (1983; p.34) states:

> *"For people to trust one another in areas of uncertainty, where outcomes are not yet known, they need to respect the competence of others."*

Ekvall (in Henry and Mayle, 2002; p.99) echoes Kanter's (1983) views on mutual trust between the organisation and the individual employee:

> *"As risk-taking and anxiety are ingredients of creative acts, culture elements that make risk taking and failure less threatening and dangerous promote creative behaviour, whereas in situations where creative initiatives are met with suspicion, defensiveness and aggression, the fear of failure becomes strong and holds creativity back."*

Dimensions that Inspire and Support Intrapreneurship within Organisations

In addition to identifying the stretch and challenge needed to encourage innovation, the literature also reveals dimensions that inspire and support intrapreneurship within organisations. Hunter et al. (2007) carried out a meta-analytic review of 42 published studies and found that, in addition to the challenge and intellectual stimulation discussed above, positive interactions and relationships with colleagues, along with provision of resources, support and the allowance of individual task autonomy indicate strong relationships with creative achievement. They particularly highlight the

importance of providing the opportunity for employees to stretch and engage intellectually with their work. Hunter et al. (2007; p.69) conclude that their findings:

> *"underscore the importance of climate in that (a) creative people, people evidencing the individual attributes related to creative achievement, appear especially reactive to climate variables (Oldham and Cummings, 1996); (b) climate perceptions, at both the individual and group level, have been found to be effective predictors of creativity and innovation (Tesluk, Farr, and Klein, 1997)."*

This suggests that there is a correlation between successful intrapreneurial outcomes for the organisation generated by individual intrapreneurs and the individuals' perceptions of a positive innovation climate.

Consistent themes also emerge elsewhere from the literature with regard to the cultivation of an organisational climate that inspires and supports intrapreneurship and innovation. Ekvall's (1996; p.105) definition of climate as "an attribute of the organization, a conglomerate of attitudes, feelings, and behaviours which characterizes life in the organization" is used as a conceptual framework for this research chapter, although the latter part of Ekvall's (1996) definition, i.e '[Climate]…exists independently of the perceptions and understandings of the members of the organization' is contested because unless employees have perceptions and understanding of the climate, it could be argued not to exist – rather climate is an intangible that exists only as perceptions and as interpreted by the people who operate and work in the community that generates the climate. Ekvall (1996; p.106) argues that "climate plays the part of an intervening variable which affects the results of the operations of the organization."

Ekvall's (1996; p.106) position conceptually echoes that of the positive intrapreneurship cycle presented above in discussions on Amabile (1997), Woodman et al. (1996) and Csikszentmihalyi (1999):

"Climate exerts a strong influence on these outcomes. But the effects in turn influence both resources and climate. The causal picture becomes complicated. Good or bad circular movements are in action."

Ekvall's (1990; 1996) research, the results of large-factor analyses, identifies ten dimensions that influence the effectiveness of organisational climate, or CCQ. These are: "Challenge"; "Freedom"; "Idea Support"; "Trust / Openness"; "Dynamism / Liveliness"; "Playfulness / Humour"; "Debates"; "Conflicts"; "Risk-Taking"; "Idea Time" (1996; pp.107-108). Laurer (1994), also as noted by Ekvall (1996) demonstrates that these ten dimensions of the CCQ are supported in creativity theory within the literature.

Kanter (1983) identifies three organisational 'roadblocks' to employees delivering innovation:

1. *"Dominance of restrictive vertical relationships"* (p.76);
2. *"Departments as fortresses: poor lateral communication"* (p.79); and
3. *"Limited tools"* (p.82).

The literature was searched for quantitative evidence of the themes 1-3 identified by Kanter (1983) above linking to positive performance outcomes. Eesley and Longenecker (2006) undertook quantitative research on a sample of 179 managers from more than 20 U.S. manufacturing and service organisations. Participants completed a survey exploring their experience with intrapreneurship via open-ended questions about what organisations do to stimulate intrapreneurship. Whilst useful, the findings are not linked to any quantifiable intrapreneurial outcomes and the open nature of the questioning makes the responses subjective and open to different interpretations. Manimala et al. (2006) undertook case study research on 31 public sector intrapreneurial projects in India, specifically in the petroleum sector. Their analysis was qualitative and identified a number of organisational barriers to

innovation. These findings were consistent with other themes found in the literature (see Table 10), however the methodology was not statistically robust and the sample was very specific.

Table 10: Innovation Climate Themes from the Literature

	Dolphin Index Innnovation Climate Dimensions												
Reference	**Commitment**	**Freedom**	**Idea Support**	**Positive Relationships**	**Dynamism**	**Playfulness**	**Idea Proliferation**	**Stress**	**Risk-taking**	**Idea Time**	**Shared View**	**Work Recognition**	**Pay Recognition**
Antoncic (2007)	Support from senior employees'; 'style of management'	Work discretion'	Formal contols used to monitor intrapreneurship'		Intensive environmental scanning'		Gathering feedback from customers...and employees'			Time availability'	Communication openness" 'emotional and value commitment'	Rewarding venture activities'	
Anderson and West (1998)	Support'		Support'	Participative safety'	Task orientation'						Vision'		
Hunter et al. (2007)	Positive supervisor relations'; 'Top management support'	Autonomy'	Resources'; 'organizational integration'	Positive peer group'; 'positive interpersonal exchange'	Intellectual stimulation'; 'Flexibility'	'Product emphasis' defined as 'committed to quality as well as originality of ideas'; 'participation'		Challenge'	Risk-taking'		Mission clarity'	Reward orientation'	
Amabile et al. (1996)	Supervisory encouragement'	Freedom / Autonomy'	Organisational Encouragement'; 'Resources'	Work group encouragement'			Encouragement of ...idea generation';	Pressures'; 'Challenging work'	Encouragement of risk taking'		Cross- fertilization of ideas that results from participative management and decision making'; 'goal clarity'	Reward and recognition of creativity'	
Menzel et al. (2007)	Reduction of organizational hierarchy is ...important to promote intrapreneurship'; 'Top management's role and interest for innovation is important'	Provision of opportunities for the intrapreneur to experience 'self-determination, [having]...freedom and autonomy to make decisions. can take action to exercise influence in his / her role'	stakeholders...[who] can support the intrapreneur with their broad experience in conducting projects, corporate politics and professional knowledge'	diversity and conflict are needed'; 'increasing tolerance'; 'The physical environment should...stimulate mutual co-operation that goes beyond time and space'	Corporate communication structures must be capable of adapting to [intrapreneurial] environments'		Environments should be designed to make accidental meetings happen'			People require privacy and quiet - often solitary spaces where they can work and be able to concentrate without interruption'		Potential intrapreneurs should be identified early in their careers...[and] addressed by intrapreneurship programs and training'	
Eesley and Longenecker (2006)	Management support and encouragement at all levels'	A culture of workforce empowerment'	Ongoing encouragement and promotion of risk-taking and new ideas'; Providing resources to support new ideas'	Developing better cooperation and teamwork'			Free-flowing customer information and internal communication'; 'Cross-training and special assignments'		A culture of ...risk-taking'	Developing processes for idea generation and advancement'	Clearly defined organizational needs, vision and direction'	Celebrating and rewarding ideas, progress and results'	
Seshradi and Tripathy (2006)	Support of the top management to the intrapreneurs'; 'recognize, mentor and encourage people who demonstrate intrapreneurial traits'	the intrapreneur, especially one with a proven track record of intrapreneurial performance, must be allowed the latitude to act freely'						Address 'resource constraints and time pressure'	Freedom to fail, and the ability of management to condone mistakes and create an atmosphere of learning from them'; Companies that have 'an aversion to risk and want to play safe' inhibit intrapreneurship		Constant reminders ... of the vision and mission of the company, ..play a major role in harnessing intrapreneurial energies of the employees'	Recognition of work well done, rewarding innovative ideas, sharing of success stories'	
Manimala et al. (2006)	Support from the immediate supervisor'		Recognition for innovations in non-core areas'; recignition of contributions by support functions'	Informal team formation'	Failure-analysis systems'; 'handling of change management'; [Lack of] procedural delays'		Patenting initiatives'; 'Emphasis on dissemination and commercialization'			Facility for pilot testing'; 'documentation and maintenance of records'	Systems for the promotion and management of ideas'	Linking innovations with career growth'	
Colarelli O'Connor and Rice (2001)	A project oversight board'		Make it easy for opportunity recognizers to come forward'	Informal networks play an important role in propagating waves of opportunity recognition within and external to the firm'						Organise 'enabling activities - e.g conferences, think-tanks, brown-bag lunches with world-renowned scholars ...in arenas of strategic focus for the firm, technology forecasting exercises and idea generation sandboxes'	Articulating a call to action...when senior managers communicate a need for breakthrough ideas they get a response'		

Table 10: Innovation Climate Themes from the Literature (continued)

Buckingham and Coffman (2005)	The manager is the critical player in turning each employee's talent into performance'; 'Value world-class performance in every role'										Keep the focus on outcomes…strong companies become experts in the destination and give the individual the thrill of the journey'; 'teach the language of great managers'		
Ekvall |(2005)		Freedom'	Organizational principles, systems and processes create structure and stability but shrink the scope for high-level creativity'	Debating'	Dynamic ...atmosphere'	Playful atmosphere'		Creativity and time pressure, speed and stress can be counteracting forces'	Higher risk inclination'	Organizations generally need to be lean and efficient to survive, yet creativity requires resources'			
McGinnis and Verney (1987)	High standards of performance'		Positive values for innovation'	Good user-designed working relationships'; 'teams of professionals'	Interaction with environment'; 'organisational adaptability'		Diversity of experience'		Ambiguity in goals and processes'	Problem-solving orientation'			
Kuratko et al. (1990)	Management support for intrapreneurship'	Organizational Structure'	Management support for intrapreneurship'	Organizational Structure'	Management support for intrapreneurship'			Organizational Structure'	Management support for intrapreneurship'	Management support for intrapreneurship'	Management support for intrapreneurship'	Reward and research availaibility'	
Kanter (1983)	A culture of pride…based on high performance in the past'	The freedom to act, which arouses the desire to act'; 'Managerial assignments …that sketch out an area and point people in a direction but leave it to them to define their means of transportation and traveling companions'	Seed capital is available for projects'; 'decentralization of resources helps [intrapreneurs] to get the resources to mobilize for action'	People..trust ine another in areas of uncertainty, where outcomes are not yet known, they need to respect the competence of others''; 'Network-forming arrangements help..build a coalition of supporters'	…entrepreneurial organizations... measure themselves not by the standards of the past…but by the visions of the future'; 'change [is seen] as a normal way of life'				…entrepreneurial organizations always operate at the edge of their competence'		[People feel] integrated with the whole'; 'open communication systems'	The reward systems in innovating companies tend to be much more invetment-oriented, more future-oriented…People are promoted before they are ready so that they stretch to do the next job'	
Krueger (2000)	Mentoring…is..vital for…innovation development'		Some sort of supporting infrastructure both tangible and intangible'	teams…provide multiple perspectives…and a cognitive and emotional buffer from the rest of the organization …[and] help innovators actually implement an idea'			Making innovation-supportive information readily available through formal channels'				Benchmarking and best practices…[increase] the credibility of what is feasible'		
Csikszentmihalyi (2005)			how responsive the social system is to new ideas'		Potentially creative …people will mot be drawn to domains where all the basic questions have been solved and which, therefore, appear to be boring'					advances [are] made …[with] the means and the leisure'	Creativity presupposes a community of people who share ways of thinking and acting, who learn from each other and imitate each other's actions'		

As a result of the development of the conceptual framework of the Intrapreneurship Process (detailed in Chapter 3) and the review of the innovation climate literature presented in this chapter, the following hypothesis is proposed:

H4: Successful individual intrapreneurship positively correlates with a positive perception of organisation innovation climate by the individual intrapreneur.

The hypothesis H4 is specifically worded to include the term 'perception' because individual evaluation of an organisation's innovation climate will always be subjective, regardless of the instrument used to test it. Different employees working in very similar circumstances in the same organisation could hold very different perceptions of the innovation climate of that same organisation.

Assessment of the Potential Instruments for this Research

Mathisen and Einarsen (2004) provided a review of the available instruments for measuring work environments conducive for creativity and innovation. This review highlighted five key measures: KEYS, CCQ, SOQ, TCI and SSSI. It is worth noting that the CCQ and SOQ are primarily the same questionnaire. Moreover, the Dolphin Index was developed from the CCQ / SOQ, but has added dimensions which it claims to be improvements on Ekvall's (1996) version.

With the exception of the TCI, (Anderson and West, 1998), the Dolphin Index / Ekvall's (1996) Creative Climate Questionnaire and Amabile et al.'s (1996) 'KEYS' instrument, the literature on innovation climate is lacking in robust quantitative research, especially in recent years. The 'Siegel Scale of Support of Innovation' (Siegel & Kaemmerer, 1978) was developed, but as Amabile et al. (1996) note, this instrument was validated in the educational environment with school teachers and students, so its relevance on business organisations has not been demonstrated.

Ekvall's CCQ and SOQ rights were acquired by the Innovation Centre Europe, developed further and named The Dolphin Index. Innovation Centre Europe 'added

four additional scales that are important in team, departmental and organizational creativity and innovation… added 'stress', 'shared view', 'pay recognition', and 'work recognition', while two other new scales ('idea-proliferation' and 'positive relationships') …[were] modifications of Ekvall's original 'debates', 'trust', and 'conflicts' dimensions.' Innovation Centre Europe instigated these developmemts based on their ongoing data collection and research.

Amabile et al. (1996) also undertook research into creative climate in organisations at similar time to Ekvall (1996) and developed a scale they called 'KEYS' to assess 'perceived work environments' (p.1154) and 'discriminate between high-creativity projects and low-creativity projects' (p.1154)

The Team Climate Inventory (TCI) (Anderson & West, 1998) was designed for work groups who regularly collaborate and interact to achieve shared tasks and objectives (Anderson & West, 1998; Mathisen and Einaresen, 2004).

The Innovation Climate instruments assessed for the purposes of this research are:

1. KEYS (Amabile et al, 1997)

2. The Dolphin Index (as a development of Ekvall's 1996 CCQ, or SOQ based on Isaken et al's (1999) English translation from the original Swedish of Ekvall's (1996) version)

The Siegel Scale of Support for Innovation (Siegel and Kaemmerer, 1978) is excluded from the assessment because it is designed for educational rather than business use. The Team Climate Inventory (TCI), (Anderson and West, 1998) is not considered for this research because as Mathieson and Einarsen (2004) note, it is a tool that is designed to focus on teams and the focus of this particular element of research is on the individual intrapreneur's perception of the innovation climate of their organisation.

Mathisen and Einarsen's (2004) review of Ekvall's (1996) CCQ / SOQ and Amabile et al.'s (1997) KEYS instruments was used to inform the assessment. The authors' conclusions from this review are summarised in Table 11

Table 11: Summary of Mathisen and Einarsen's (2004) Review of KEYS and CCQ / SOQ

	CCQ / SOQ	KEYS
What does it measure?	'Individual perceptions of the organisational environment' (p.125).	'Emplyees' perceptions of the work environment, and the relationship between those perceptions and judgments of actual creativity and productivity'; 'focused upon the environment for creativity [only]'
Psychometric quality	'Although Ekvall (1983, 1996) claimed that the CCQ has adequate psychometric quality, he often did not present adequate information to support his claim' (p.125). 'Results from validity studies indicate that…the 10-factor model, although insufficiently reported, has acceptable predictive validity' (p.125); 'Not much research has been published in peer-reviewed literature' (p.136); 'there is a need for more information about their psychometric quality' (p.136); 'no information given about the intercorrelations' (p.123); 'acceptable criterion validity' (p.137)	'The norms are based on large samples, including many organisational settings'; 'acceptable reliability and validity. However, the validity studies have weakness…[and] only two studies have been conducted, involving external ratings of creative outputs' (p.128); 'Norms and manuals have been produced'; 'high intercorrelations between the factors'; 'acceptable criterion validity' (p.137).
Summary	'The CCQ is an interesting instrument, but better documentation of its psychometric properties required'.	'A promising instrument for assessing the work environment for creativity. However, a revision of the instrument may be needed to improve the factor structure, and more studies are recommended to assess the validity of KEYS' (p.128).

The KEYS and the Dolphin Index are both sold commercially, KEYS is owned by the Center for Creative Leadership in the U.S., the Dolphin Index by Innovation Centre Europe, based in the U.K.

Questions from KEYS and the Dolphin Index were compared and contrasted using a KEYS sample report published by Amabile and the Center for Creative Leadership (2010). The questions for each instrument are grouped into dimensions differently, but at the individual question level, each questionnaire covered broadly the same themes with no major gaps noted for either questionnaire. The principal differences between the questionnaires are that:

- KEYS questions contain no reverse-scored items; the Dolphin Index contains some. It is generally advisable for questionnaires to include some reverse-scored items to minimise the risk of "extreme response bias" and "acquiescence bias" (Sauro and Lewis, 2012; p.208).

- KEYS questions feature a high proportion of 'I' statements; Dolphin Index questions do not include any 'I' statements. The Dolphin Index appears to be asking its participants to respond from a more removed and dispassionate, less introspective perspective. This puts greater psychological distance between the respondent and their perceptions of the climate, leading potentially to a more removed set of responses.

- The KEYS questionnaire goes into much more detail in some areas than does the Dolphin Index. For example, KEYS includes ten questions specifically relating to the respondent's line manager. The Dolphin Index covers these with fewer, much more generic questions. Responses from the Dolphin Index are therefore likely to show a more high-level, less granular set of findings than from KEYS.

- The KEYS questionnaire assesses the outputs of innovation climate as Creativity and Productivity using participants' subjective views on how creative, innovative and productive the employing organisation is, without any link to tangible or quantifiable organisational performance outcomes, rather descriptive statements such as: 'Overall, this organization is effective'; or

'Overall, this organization is productive'. This approach is useful from the point of view of understanding employees' perceptions, however cannot be mapped to any real, specific outcomes, which is a weakness. As Hulsheger (2009) et al. report from their 'meta-analysis of team-level antecedents of creativity and innovation in the workplace' (p.1128):

"Innovation researchers should ...switch their design orientations away from overly simplistic self-report designs toward the incorporation of independent and objective outcome measures in this domain" (p.1140).

The Dolphin Index scoring is not intended to link objective outcome measures to innovation climate but could be linked with a measure of individual intrapreneurial outcomes.

- Some dimensions included as 'Resources' in the KEYS measure are separated out into distinct dimensions in the Dolphin Index. For example, 'Idea Support' and 'Idea Time' are separate dimensions in the Dolphin Index, but not in KEYS. These two dimensions are separate constructs within an organisation and therefore it is helpful for them to be evaluated separately because providing 'support for the generation of ideas' is different from allowing 'the time to generate ideas'. For an organisation to encourage and enhance creativity it needs both.

Discussion and Conclusion

Based on this assessment of these two innovation climate instruments, KEYS and the Dolphin Index, either inventory would be useful for this research. The Dolphin Index is selected because it includes all the key dimensions of innovation climate discovered in the literature review. The literature does suggest that individual's perceptions of the innovation climate within their employing organisation do have a relationship with individual's intrapreneurial performance. In order to explore this relationship from a

quantitative perspective and attempt to investigate the potential impact of innovation climate perceptions on organisational outcomes, individuals' scores from each dimension of the Dolphin Index can be correlated with their scores from an individual intrapreneurial outcomes measure.

The measures and the dimensions encountered in the literature are shown in Table 10 and mapped against the 13 dimensions of the Dolphin Index. This shows that the Dolphin Index covers all the themes from both the literature review and other inventories presented in this chapter. The Dolphin Index therefore appears to present comprehensive coverage of the key dimensions of innovation climate and to be a comprehensive tool that includes all dimensions reported in inventories and conceptual, qualitative and quantitative studies as being an important dimension of innovation climate. It is noted that the location of some of the dimensions from other questionnaires shown in Table 10 is open to interpretation, and some dimensions could be shown in more than one Dolphin Index category.

The Dolphin Index is also selected because it is a tool used by recognised institutions such as the Open University (e.g. as part of the learning for the *Creativity, Innovation and Change* MBA module until that module was recently removed), as well as some leading businesses such as Nestle.

The hypotheses for this study and supporting rationale are now established. The chapter that follows presents the research aims, philosophy and methodology used to test these hypotheses.

Chapter 8

RESEARCH AIMS, PHILOSOPHY AND METHODOLOGY

Overview of the Chapter

No significant, generically-applicable measure of individual intrapreneurial outcome contribution has been found to exist in the literature review presented in this study. Measures do exist for intrapreneurial conditions, traits and behaviours, however these conditions, traits and behaviours are not robustly identified as antecedents to successful Intrapreneurial Outcomes at the organisational level. This chapter describes the research aims, objectives, philosopy and outline of the design of the statistical and analytical process of developing a proposed new Individual Intrapreneurial Outcomes measure against which key attributes of intrapreneurs can be correlated as a key deliverable of this study.

Statement of the Problem

As organisations are often budget-constrained and highly conscious of return-on-investment for any activities, the case can be made more persuasively to the corporate audience if potential commercial benefits of better understanding and developing individual intrapreneurs are considered. The intrapreneurship literature features a great deal of reliable, valid, insightful and helpful research findings. These generally arise from observational and interview studies, mainly qualitative, of individuals who others (such as peers and line managers) agree are successful intrapreneurs within their employing organisations, e.g. Patterson et al, 2009; Chakravarthy and Lorange, (2008). The quantitative studies that have been located for this study mainly deal with the measurement of personality, behaviours or intention, rather than on the business performance outcomes generated by intrapreneurial individuals.

As the literature review for this study shows, attempts to make a link between intrapreneurial behaviour at the individual level and measurable positive outcomes for

the employing organisation are rare, possibly because doing so carries inherent risks and difficulties. For example, success for one organisation may not be so for another due to issues of intent, purpose and scale or relativity; and sometimes it is difficult to separate the contribution of a single individual from that of a wider team. However, despite these challenges, efforts can still be made to generate useful progress and insight to complement the existing body of literature. The problem statement for this study is therefore summarised as:

How can the positive organisational outcomes of individual intrapreneurship be measured on a scale, so that the attributes often associated with successful individual intrapreneurs in the literature can be explored?

In particular, this problem statement is applied to focus on the following separate but mutually complementary and overlapping specific research objectives:

- To determine a measure of individual intrapreneurial outcomes.
- To use the measure of individual intrapreneurial outcomes to explore correlation with some of the attributes often associated with individual intrapreneurs, i.e:
    - Personality traits;
    - Self-perception of emotional intelligence; and
    - Perceptions of innovation climate.

As a result, the study presents the following hypotheses:

H1: Individual intrapreneurship contribution can be quantified on a scale.

H2: Individual intrapreneurial outcome positively correlates with personality traits as defined and measured by the Big Five, specifically:

a) Individual intrapreneurial outcome positively correlates with Openness.

b) Individual intrapreneurial outcome negatively correlates with Conscientiousness.

c) Individual intrapreneurial outcome negatively correlates with Agreeableness.

d) Individual intrapreneurial outcome positively correlates with Extraversion.

e) Individual intrapreneurial outcome negatively correlates with Neuroticism.

H3: Individual intrapreneurial outcome positively correlates with a positive self-perception of emotional intelligence.

H4: Successful individual intrapreneurship positively correlates with a positive perception of organisation innovation climate by the individual intrapreneur.

Research Philosophy

This study has been created throughout from the perspective of an academically robust researcher who also brings a grounded organisational practitioner view in terms of the potential use and application of the findings from this research. A deductive approach is taken, beginning with the statement of a theoretical position derived from the literature, which is then tested through collection and analysis of sample data to create a 'substantive theory' (Saunders et al., 2015; p. 53) aimed at developing further understanding of individual intrapreneurship.

The research philosophy that is applied is based on the following assumptions, using Burrell and Morgan's (1979, pp.1-3) general research classifications:

- Ontological
    - Successful individual intrapreneurs are those who intentionally generate positive outcomes for their employing organisation.

- Individual intrapreneurs collectively shape the way an organisation behaves and how successful it is; likewise the organisation's behaviour and success influence how well individual intrapreneurs perform. This is a complex interaction that varies according to the combination of the individual and their employing organisation. The perspective of social constructionism is applied, i.e. a perspective in which 'reality is constructed through social interaction in which social actors create partially shared meanings and realities.' (Saunders et al, 2015; p.130).

- It is the joint responsibility of individual intrapreneurs and their employing organisation to work on training, development and other interventions that may lead to improved individual intrapreneurial outcomes for the organisation. Through better understanding of some of the key attributes of individual intrapreneurship, intrapreneurs and their organisations can become better informed. Better understanding has the potential to lead to still more successful intrapreneurial outcomes through the design of more appropriate interventions.

- Whilst successful intrapreneurs may be highly individual and have different backgrounds, organisations and job roles, they have several similar attributes in common.

The academic researcher of this study possesses many years of experience as an intrapreneurial business practitioner. It is important in this study that any researcher bias based on personal experience and views are mitigated as far as possible. Measures put in place to avoid subjective bias from the researcher include basing the study from a "functionalist paradigm", (Saunders et al., 2015; p.132) as follows:

- Proposal of hypotheses derived from the literature review;

        - Quantitative methodology that includes a data-driven approach;
        - Endeavours to achieve a sample from a wide range and large number of practising industrialists.
        - Testing of the face-validity of questionnaire items authored by the researcher with business practitioners before launching the survey with respondents.

- Epistemological
    - Positive outcomes generated by individual intrapreneurs are measurable.
    - Key attributes that successful intrapreneurs have in common are measurable.

- Axiological
    - This research is based on a value-set that aims to create new understanding that benefits all interested parties: individual intrapreneurs, because if they are better understood it may lead to a more supportive environment at work; organisations, so that they may see how investing in and developing intrapreneurs contribute to positive organisational outcomes; and interested academic researchers, so that they may be benefit from the new substantive theory proposed here.

The underpinning research philosophy is at once "positivist" and "pragmatic" (Saunders et al, 2015; p.143), the two being complementary.

Positivist:

- Existing theory from the literature is used to develop hypotheses.
- The researcher aims to remain as independent from the research as possible, so that the analysis and conclusions are data-driven and evidence-based.
- It is the aim to use findings of this research to help explain successful individual intrapreneurship in organisations.

Pragmatic:

- The findings from this research will be most useful if they lead to further action by business practitioners and new avenues of exploration and discovery for academic researchers.

The approach taken in this study is deductive (May, 2011; Matthews & Ross, 2010; Marcyk et al, 2005: Jupp, 2006), i.e. it starts from the hypothesis statements based on themes arising from the literature review that can be tested and answered. The study aims to answer each hypothesis statement, to show if it is supported or not, i.e. the study progresses from the theory found in the literature review, to research hypotheses, data collection and testing of each of the hypotheses to either reject or confirm them. To support this deductive approach, mono-method (Riemer et al., 2012) quantitative data capture is undertaken through surveys completed by respondents actively working in the UK and Ireland, because the study specifically aims to measure individual intrapreneurial outcomes on a scale, and also measurably test the correlations that do / do not exist between individual intrapreneurial outcomes of the organisation and key attributes of individual intrapreneurs from the literature. Due to the time and resource constraints of this study, the design is cross-sectional, i.e. it provides a snapshot of the individual respondents' individual intrapreneurial outcomes and key attributes at the point of survey completion. Longitudinal study is not within the scope of this research.

Data collection and analysis is designed to be congruent with the research philosophy and approach presented above. This study aims to create a generically-applicable (i.e. relevant to organisations of all kinds and sizes) measure of the beneficial outcomes of individual intrapreneurship to the employing organisation to create a scale. This scale can then be used to test whether some of the attributes of individual intrapreneurs from the literature do indeed correlate with positive organisational outcomes, enabling the investigation of the key attributes of individual intrapreneurs who generate positive outcomes for their employing organisations.

Research Methodology

The aim of the research methodology is to answer the problem statement identified for this study using an approach that is consistent with the research philosophy described above. The problem statement is:

How can the positive organisational outcomes of individual intrapreneurship be measured on a scale, so that the attributes often associated with successful individual intrapreneurs in the literature can be explored?

For such a measurement to have practical value, ideally it needs to apply to intrapreneurs in the real work environment who are actively practising intrapreneurship, rather than people who are only learning or thinking about it. It also ideally needs to include intrapreneurship along a continuum or scale, so that individuals achieving successful intrapreneurial outcomes for their employing organisation can be distinguished from less intrapreneurial individuals. Such a measure will then be able to be used to test the benefits of creating an index against which contributing attritributes to individual intrapreneurship identified by the literature can be correlated, linking these attributes for the first time (based on available published research located to date) to actual outcomes at the individual level for the individual intrapreneur's employing organisation.

As Fitz-enz (2000; e-version) states:

> *"Each company is unique. It is a combination of management philosophy, financial strength, culture, employee relations, market reputation, competitors, and customers in a singular mix."*

So finally the measure needs to be applicable across all kinds of organisational context and be generically relevant to different job roles, industry sectors and organisation sizes. Longer term this will allow organisations to benchmark their individuals against selected groups or populations should they wish to do so, and importantly it will allow for wide study of intrapreneurship.

Research Methodology - Rationale for SEM

Using the proposed new definition of an intrapreneur based on the literature (Chapter 2) the next step is to use this as a basis for measuring intrapreneurial outcomes, i.e. as criteria for establishing how successfully an individual achieves the elements contained within the definition. Smart and Conant (1994) apply a similar approach to using definitions from the literature as an input to their Entrepreneurial Orientation Scale. In the study presented here, the key themes from the literature are used to create a new definition of the individual intrapreneur (presented in Chapter 2) and then separate the different components of that new definition to be reassembled as a scale. Individuals can receive a single measure on this scale and be located on a scale according to their score. An appropriate method to develop and test this scale, based on a search of the statistics literature, is to create a Structural Equation Model (SEM) based on the 12 component items from this new definition of an intrapreneur.

An alternative to using SEM is to follow a similar approach to the one taken by Smart and Conant (1994) to create a scale for measuring entrepreneurial orientation against organisational marketing-related and performance measures. Smart and Conant (1994) present their entrepreneurial orientation measure based on the sum of six items and

converted their item-sum measure (on the ordinal scale of 7 to 42) into high, medium and low entrepreneurial orientation groups and then, statistically test to see if the mean values of each of the 25 items Distinctive Marketing Competency and 7-items of Organisational Performance are statistically different between the high, medium and low entrepreneurial orientation groups. They compare results for high, medium and low entrepreneurial orientation group and show results for a large number of statistics tests using multivariate analysis, i.e. each in isolation of each other, whereas the correlation coefficients reflect all responses simultaneously. However, the literature shows that using SEM rather than multivariate techniques has significant benefits, as discussed below:

> *"Structural equation modeling (SEM) is a comprehensive statistical approach to testing hypotheses about relations among observed and latent variables."* (Hoyle, 2013; p.1).

The SEM approach also receives recognition in the literature for its versatility, having:

> *"a more comprehensive and flexible approach to research design and data analysis than any other single statistical model in standard use by social and behavioral scientists."* (Hoyle, 2013; p.15).

The key benefit of an SEM approach is the ability to test the relationships between variables (Nachtigall et al, 2003), but SEM does have its critics as well as its advocates. Nachtigall et al. (2003; p.2) observe that "SEM inspires enthusiastic praise as well as persistent rejection." It attracts praise for its versatility and capacity for consideration of multiple equations at the same time, and of latent variables (Luque, 2000: Tabachnick and Fidell, 1996). It allows complex dependencies to be modelled. It receives rejection due its perceived complexity. But Nachtigall et al. (2003) demonstrate the increase in popularity of the use of SEM in the literature since the 1970s, largely aided by better understanding and more accessible production via modern software.

Schumaker and Lomax (2010; p.7) identify some key reasons to use SEM, which are summarised here:

1. To confirm or disconfirm *"theoretical models in a quantitative fashion"*;

2. Because SEM techniques *"explicitly take measurement error into account when statistically analyzing data"*; and

3. Due to SEM's *"capability to analyze sophisticated theoretical models of complex phenomena"*.

Byrne (2012; NP[1]) supports the preference for SEM:

> *"SEM lends itself well to the analysis of data for inferential purposes. By contrast, most other multivariate procedures are essentially descriptive by nature (e.g., exploratory factor analysis), so that hypothesis testing is difficult, if not impossible."*

A SEM approach is used elsewhere in the intrapreneurship and entrepreneurship literature, e.g. to measure entrepreneurial intent (Guerrero et al., 2008); in a comparative study by Antoncic (2007) discussed earlier in Chapter 4. A SEM approach is selected to allow the comparison of the structural model to the empirical data collected through the research questionnaires designed for this study, the aim being to test the extent to which the sample data support the theoretical model for the individual intrapreneurial outcomes measure proposed. SEM is appropriate because it enables postulation on the observed measures and underlying factors from theoretical deduction followed by testing of the hypothesised structure statistically using the data from the study, in line with Byrne's (2012) recommendations, i.e based on the literature review for this study there exists some understanding of the relationship between the different components of the proposed definition of an intrapreneur in creating intrapreneurial outcomes. The purpose here is to measure individual

[1] NP = no page. NP is used where the key texts cited are Kindle editions that do not feature page numbers.

intrapreneurship as an underlying latent construct, a construct being defined by Cronbach and Meehl (1955; p.238) as "some postulated attribute of people, assumed to be reflected in test performance." Where constructs are intangible and not easily observable, as is often the case, multi-item scales are often used. (Noar, 2003):

> *"Although single items are used to measure variables in some cases, it is believed that multiple item scales better assess constructs."* (Noar, 2003; p.624).

For this reason, Confirmatory Factor Analysis using a SEM was selected as a potential method for testing the proposed individual intrapreneurial outcome measure.

An approach in line with Byrne's (2010) description is taken to developing the SEM for this thesis, following these steps:

1. A statistical, or hypothesised model is suggested based on the literature.

2. The hypothesised model's plausibility is tested using sample data for all the observed variables in the suggested model.

3. How well the sample data fit the model and the nature of the residual, i.e. the differential between the sample data and the hypothesised model – are assessed.

4. Joreskog (1993) identifies three scenarios, which he refers to as strictly confirmatory, alternative models, and model generating. This study applies a data-driven, model generating approach for the development of the model, progressing in an exploratory (rather than confirmatory) way to shape and re-estimate the model and identify a model that more suitably represents the sample data in what Byrne (2012; NP) describes as being "both substantively meaningful and statistically well- fitting." This approach is model generating because, although the model is tested with each iteration, a new model version

is also created. Byrne (2012) reports that the model generating approach is the most-used of Joreskog's (1993) three scenarios.

Intrapreneurial Outcomes Questionnaire

The 12-item questionnaire is designed to collect input data for the SEM. The questionnaire comprises a statement for each component, against which individuals score themselves. The questionnaire is hosted online. As the individual intrapreneurial outcomes measure is intended to be unidimensional (i.e. resulting in the calculation of a single score), 12 items are deemed to be sufficient. The literature (e.g. Comrey, 1988; Noar, 2003) proposes that 10 or fewer items are an acceptable number of items for measuring a unidimensional construct. Figure 3 lists the 12 individual intrapreneurial outcome questions, which are applied to a typical Likert scale from 1-7, good practice to enable variance and covariance (DeVellis, 1991). A 7-point Likert scale has been found to generate more variability of responses and greater reliability than a 5-point one (Cummins & Gullone, 2000). At the end of each item is a shorthand reference that is used in the presentation of the results and commentary relating to these measures.

In line with Noar's (2003) recommendations, the item pool was first piloted by a small number of participants to test the face validity of the questions, it was also discussed with a small number of more expert colleagues to probe content validity. Both the initial participant group and expert colleagues fed back that they found the items to be clear, unambiguous and appropriate.

Figure 3: Individual Intrapreneurial Outcomes instrument

Examples from the Literature	Individual Intrapreneurial Outcomes Index Item
Antoncic, (2007, p.309): 'Firm performance can be considered the most important consequence of intrapreneurship.' Intrapreneurship generates improved growth and profitability: Covin & Slevin, (1991); Camelo-Ordaz et al., (2011). Customer focus (Parker, 2011). Vandermerwe & Birley, (1997, p.345): 'customer transformation.' Intrapreneurship is connected to entrepreneurial orientation (Heinonen & Korvela, 2003). Related to Smart & Conant's (1994, p.32) 'distinctive marketing competencies' of entrepreneurs.	**1. My new ideas have generated new customers for my organisation. (NewCusts)**
Patterson et al. (2009, p.5): 'change associated with the creation and adaptation of ideas that are new-to-world, new-to-nation / region, new-to-industry or new-to-firm. This definition encompasses both the processes individuals use and the outcomes that they develop.' Intrapreneurship creates competitive differentiation through new products or services (Auruskevidene et al., 2006). Intrapreneurs drive growth and renewal through introducing new products, processes, services, technologies: Camelo-Ordaz et al., (2011); Menzel et al., (2007); Antoncic & Hisrich, (2003); Covin & Miles, (2007); Covin & Slevin, (1991); Gapp & Fisher, (2007); Kuratko et al., (2005); Miles & Covin, (2002); Srivistava & Lee, (2005). Intrapreneurs generate diversification strategies for their employing organisations, (Hisrich, 2003).	**2. My new ideas have led to new products or services being developed by my organisation. (NewProducts)**
Antoncic, (2007, p.309): 'Firm performance can be considered the most important consequence of intrapreneurship.' Intrapreneurship generates improved growth and profitability: Covin & Slevin, (1991); Camelo-Ordaz et al., (2011). Customer focus (Parker, 2011).	**3. My new ideas have generated significant additional business from existing customers. (NewBusiness)**

Vandermerwe & Birley, (1997, p.345): 'customer transformation.' Related to Smart & Conant's (1994, p.32) 'distinctive marketing competencies' of entrepreneurs.	
Patterson et al. (2009, p.5): 'change associated with the creation and adaptation of ideas that are new-to-world, new-to-nation / region, new-to-industry or new-to-firm. This definition encompasses both the processes individuals use and the outcomes that they develop.' Antonic (2007, p.311) describes intrapreneurs as delivering: 'the transformation of organizations through renewal of the key ideas on which they are built.' Business model innovation, per Bucherer et al. (2012).	**4. My new ideas have influenced the way my organisation does business. (InfBusiness)**
Antoncic, (2007, p.309): 'Firm performance can be considered the most important consequence of intrapreneurship.' Related to Smart & Conant's (1994, p.32) 'distinctive marketing competencies' of entrepreneurs.	**5. My new ideas have enhanced the reputation of my organisation. (Reputation)**
Customer focus (Parker, 2011). Vandermerwe & Birley, (1997, p.345): 'customer transformation.' Customer satisfaction is an outcome of intrapreneurship, (Heinonen & Korvela, 2003).	**6. My new ideas have measurably contributed to improved customer satisfaction for my organisation. (CustSat)**
Kanter, (1983, p.213). [ICorporate innovators] 'mobilize people and resources to get things done.' Chakravarthy and Lorange's (2008) entrepreneur-manager works within the parameters of the overall corporate strategy, yet consistently finds space and autonomy to develop new initiatives and projects that enable the firm to innovate and evolve.	**7. My innovations have been successfully adopted by my organisation on more than three occasions. (InnovAdopt)**
Patterson et. al (2009); Chakravarthy & Lorange (2008); Kanter (1983).	**8. I have a reputation as a successful innovator within my organisation. (InnovRep)**
Intrapreneurs 'fail often and fast: Launching a new internal venture means access to an existing company's resources and a faster start-up time. If the venture is not successful, it will fail within an existing support network. If an intrapreneur's	**9. Some of my innovations fail from time to time. (InnovFail)**

project fails, the larger company can usually move on unaffected,' Memon Shabana, (2010, p.33). 'a high failure rate is common (Simon, 2009): 35 per cent of innovation projects fail commercially, accounting for 45 per cent of new product expenditure (Halman & Keizer, 1994). In some industrialised countries the success rate of new products is 15 per cent and among developing countries, such as Hong Kong, it is just 2 per cent (Ozer, 2006)', in Bowers & Khorakian (2014, p.26). High rate of failure of innovation projects, (Christensen, 1997).	
'Learning resulting in new organizational competencies' , Memon Shabana, (2010, p.33). Entrepreneurial failure (Cope, 2005).	**10. When my innovations fail, I learn from them and try to improve next time. (LearnFail)**
Patterson et. al (2009); Chakravarthy & Lorange (2008); Kanter (1983); Pinchot (1985).	**11. People in my organisation often turn to me when there is a need for a new approach. (OrgInnov)**
Patterson et. al (2009); Chakravarthy & Lorange (2008); Kanter (1983).	**12. Once my ideas have been accepted by the organisation and move to the development and implementation stages, I stay closely involved throughout the process, right up to launch. (OwnsInnov)**

(Likert scale 1-7: 1= not at all like me, 7 = a lot like me)

Elements of Smart and Conant's (1994) entrepreneurial outcomes scale are consistent with the items used in this study to measure intrapreneurial outcomes, specifically the ones that Smart and Conant (1994; p.30) refer to as 'marketing orientation', i.e. the introduction of new products or services, processes, markets and ways of doing business, resilience and recognising customer needs and wants. Other studies also identify a similar link between entrepreneurial orientation and marketing-related performance outcomes that also resonate with the intrapreneurial findings from this study (Miles and Arnold, 1991; Morris and Paul, 1987).

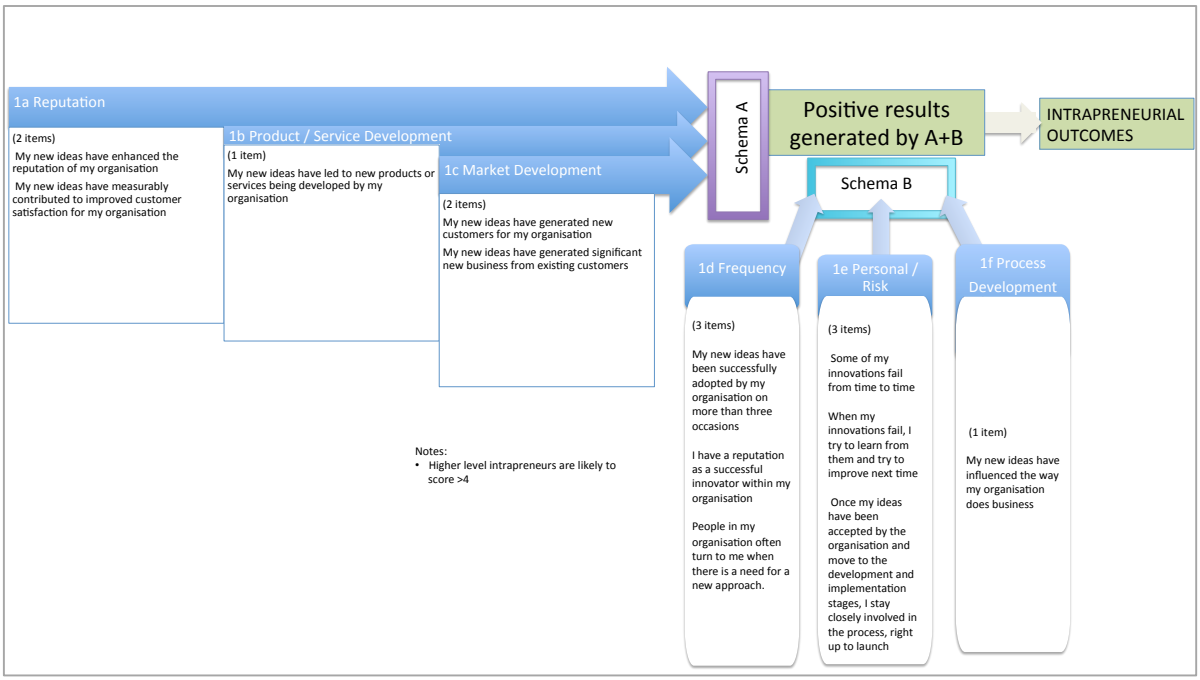
Whilst all of these items are positively framed, two of them refer to negative outcomes (i.e. InnovFail and LearnFail).

Magnitude items (e.g. those concerning specific monetary values or growth rates) were deliberately excluded from the questionnaire because they are unlikely to generate meaningful insights - actual values would need to normalised to reflect different business sizes / types / sectors, activity and so on, which would make for further interesting research but that is beyond the scope of this study.

Hypothesised model for individual intrapreneurial outcome index

First, the items shown in Figure 4 are assembled to create a hypothesised measurement model for individual intrapreneurial outcome index as shown below in Figure 4. Table 12 shows how the questions identified from the literature review are included in Chapter 4.

Figure 4: Intrapreneurial Outcomes – Structural Equation Model Early Hypothesised Design



The initial approach to Schema A, Schema B and A+B are outlined below. In summary, the initial approach is to create an individual intrapreneurial outcome measure as a linear combination of the response scores to each of the twelve Intrapreneurial Outcome (IO) questions grouped into the six dimensions.

The Schemas A and B (presented in Table 12) are constructed as follows:

1. Questionnaire items relating to marketing-related outcomes (Smart and Conant, 1994) are grouped into Schema A.

2. Questionnaire items relating to internally-oriented outcomes (i.e. personal and organisational) are grouped into Schema B.

3. Hypothetical scores for each item within the questionnaire are attributed to three scenarios:

    i. Respondent X – an individual who generates material, positive and overarching intrapreneurial outcomes for their employing organisation;

    ii. Respondent Y – an individual who generates some material, positive intrapreneurial outcomes for their employing organisation in specific situations or functions; and

    iii. Respondent Z – an individual who does not generate material, positive intrapreneurial outcomes for their employing organisation.

4. Because each item on the questionnaire requires a response on a Likert scale from 1-7, scores of > 4, the median point on the scale, are deemed to indicate greater intrapreneurial outcomes. The rationale for using score criteria of >4 (see Table 12 below) is also to arrive at a measure that better differentiates the levels of intrapreneurship between individuals.

5. Individuals' scores for Schemas A and B are summed to create an overall intrapreneurial outcomes score, that is then plotted on a scale to differentiate those individuals who generate greater intrapreneurial outcomes than others.

6. It is helpful to have a threshold because it provides an informed cut-off point on the continuum of a scale, i.e. a transition point on the index.

Table 12: Schemas A and B

Schema A - Example

Hypothetical Respondent	Item	Sample Score Scenarios	➢ 4	> Mean of Sum of 1a,1b,1c (for scores >4 only)
X	1a	7	Yes	
X	1b	7	Yes	21 - Yes
X	1c	7	Yes	
Y	1a	7	Yes	
Y	1b	2	No	7 -Yes
Y	1c	2	No	
Z	1a	4	No	
Z	1b	4	No	0 - No
Z	1c	4	No	

Schema B - Example

Hypothetical Respondent	Item	Sample Score Scenarios	➢ 4	> Mean of Sum of 1d,1e,1f (for scores >4 only)
X	1d	7	Yes	
X	1e	7	Yes	21 - Yes
X	1f	7	Yes	
Y	1d	7	Yes	
Y	1e	2	No	7 -Yes
Y	1f	2	No	
Z	1d	4	No	
Z	1e	4	No	0 - No
Z	1f	4	No	

A+B Example

Schema Score	Respondent X	Respondent Y	Respondent Z
A	21	7	0
B	21	7	5
Sum	42	14	0

Smart and Conant's (1994) measure of entrepreneurial orientation is developed based on the sum of just six items. In this study are presented four Individual Intrapreneurial Outcome (IIO) measures (the proposed mean of 12 items (with >4 threshold applied); two data-driven item-weighted EFA based measures (11-item single factor EFA and 12-item single factor EFA); and a Baseline measure - the mean of the 12 items.) Smart and Conant's (1994) approach is mathematically the same concept as the Baseline measure presented in this study. The additional analysis that is completed for this research, the SEM approach and the more granular use of 12 items rather than 6 provides assurance that the analytic approach in this study is sound.

Questionnaire Limitations

This questionnaire, as most do, has limitations. Some of the most significant limitations are as follows:

- Because the questionnaire (as all the questionnaires used in this study) are self-reports from single participants, respondents may be inclined to be more positive or modest or less objective about their achievements. Single participants are not uncommon in studies of this nature (Jimenez-Jimenez and Sanz-Valle, 2011). Multiple respondents would potentially improve the validity (Jimenez-Jimenez and Sanz-Valle, 2011), although they of course would also potentially be as prone to the same subjective bias as the individual participants.

- As with all the questionnaires that form the basis of this research, because the sample in some ways self-selecting (even in so far as they are engaged or enthusiastic enough to want to complete the survey or engage in research), the results generated may indicate a higher level of individual intrapreneurship successes than may be the case for the wider population.

- The questionnaire does not account for exogenous factors – such as economic conditions, industry sector, size and age of the organisation. However, because the items do not require value- or scale-specific responses, this issue is not of concern, although it can also be argued of course that a limitation of this questionnaire is that it does not attempt to measure such value- or scale-specfic elements of business performance.

Structural Equation Modelling

The literature indicates that SEM "usually requires sample sizes from 100 to 200" (Antoncic, 2007; p.320).

Non-normality tests

This study applies tests for the three main characteristics of non-normality. These are:

- Skew is a measure of asymmetry in the distribution of responses the IO questions. A skew of 0 indicates the distribution is perfectly symmetrical, the further from zero the less symmetrical the distribution is. The values skew between -2 and +2 are considered acceptable in order to prove normal univariate distribution (George and Mallery, 2010). Kline (2005) suggests that the value of 3.0 for skewness is acceptable for a SEM.

- Kurtosis is a measure of the extent to which the shape of the distribution is more peaked or flatter than the normal distribution. A kurtosis of zero indicates no deviation in shape from the normal distribution when measured in terms of how high or low the peak of mean and how wide or narrow are the tails of the distribution. For kurtosis, Byrne (2010) (p.103) says:

  "Although there appears to be no clear consensus as to how large the nonzero values should be before conclusions of extreme kurtosis can be drawn (Kline,

2005), West et al. (1995) consider rescaled β_2 [Kurtosis] values equal to or greater than 7 to be indicative of early departure from normality."

Kline (2005) proposes that a value of 10 for kurtosis is acceptable for a SEM.

- Outliers are responses that are distinctively outside the range of responses that would be expected from the distribution of it were normally distributed.

- Byrne (2010, NP) states:

  "Multivariate kurtotic, the situation where the multivariate distribution of the observed variables has both tails and peaks that differ from those characteristic of a multivariate normal distribution (see Raykov & Marcoulides, 2000)."

  Bentler (2005) suggests that, in practice, values > 5.00 suggest data that are non-normally distributed. It is often the case that two univariate normally distributed variables are not multivariate normally distributed (Mardia, 1970; 1974).

- Presence of multivariate non-normality typically leads to standard errors for the estimated model parameter being too small which risks overstating the significance of the model parameter. To overcome this, Bootstrap ("a method for assigning measures of accuracy (defined in terms of bias, variance, confidence intervals, prediction error or some other such measure) to sample estimates", (Efron and Tibshirani, 1993)) and Bayesian methods and the Satorra-Bentler scaled statistic (defined for continuous rather than categorical outcomes) are options available to address this. With this in mind, Bayesian estimates of the model parameters and standard errors are included into the analysis routines in the SEM model development for this study.

Measures of Goodness-of-Fit

Byrne (2010) provides a comprehensive overview of the numerous goodness-of-fit measures that are reported by Amos, the package employed for SEM development for this study. Three goodness-of-fit measures, i.e. χ^2, RMSEA and CFI are used in this research.

- The χ^2 statistic is a measure of the extent to which each of intrapreneurial variances and covariances obtained from the model and observed are equal. A target value of >0.05 for the p-value associated with the χ^2 statistic is used to determine whether the model adequately represents the observed data. The χ^2 statistic represents the Likelihood Ratio Test Statistic that is sensitive to sample size.

  Consequently *"findings of well-fitting hypothesized models, where the χ^2 value approximates the degrees of freedom, have proven to be unrealistic in most SEM empirical research."* Byrne (2010) (p.76).

- RMSEA (root mean square error of approximation) was proposed by Steiger and Lind in 1980, but has only recently been identified by the literature as being appropriate and relevant for SEM (Byrne, 2010). The RMSEA takes into account the error of approximation in the population and asks the question *"How well would the model, with unknown but optimally chosen parameter values, fit the population covariance matrix if it were available?"* (Browne & Cudeck, 1993, pp.137–138). Byrne (2010; p.80) states that values less than .05 indicate good fit, and values as high as .08 represent reasonable errors of approximation in the population (Browne & Cudeck, 1993). MacCallum et al. (1996) propose that RMSEA values between .08 and .10 demonstrate mediocre fit, and those that are greater than .10 demonstrate poor fit. The intrapreneurship literature includes examples of RMSEA of less than .05 as indicating a good fit, e.g. Antoncic (2007; p.317).

- The Comparative Fit Index (CFI) is preferred over the Normed Fit Index (NFI) for the purposes of this study because the literature shows that the latter has a propensity to underestimate fit in small samples. The CFI is a revised version of the NFI that does take sample size into account, devised by Bentler (1990). Values for both the NFI and CFI range from zero to 1.00 and are generated by comparing the hypothesized model with the independent (or null) model to give a measure of complete covariation in the data. Byrne (2010: pp.78-9) observes:

  "Although a value > .90 was originally considered representative of a well-fitting model (see Bentler, 1992), a revised cut-off value close to .95 has recently been advised (Hu & Bentler, 1999). Both indices of fit are reported in the AMOS output; however, Bentler (1990) has suggested that, of the two, the CFI should be the index of choice."

Modification Indices

Modification indices (a χ^2 statistic with one degree of freedom, or df) indicate how appropriately the model is described based on statistical fit rather than theoretical considerations. The literature does not present any hard and fast rules about what is or is not an acceptable result because results depend on the specific model design and sample, for example measurement error covariances can arise either from the items in the instrument used (e.g. because a small factor has been left out) or from participants' responses (e.g. due to respondent bias) (Aish & Joreskog, 1990). Also, if there is substantial duplication of item content error, covariances will be found due to item redundancy (i.e. the same question is asked in more than one way). However, it is deemed useful for this study to investigate modification indices to better understand and develop the statistical fit of the model.

Exploratory Factor Analysis

The next stage after using Byrne's (2010) approach to developing the SEM and benchmarking it against the criteria is to undertake Exploratory Factor Analysis (EFA). It is recognised that the results from the EFA and the SEM will not be very different because they are derived from the same dataset, so EFA is not undertaken as an additional test to verify the SEM. It is carried out simply to provide a different perspective of the data collated. Differences between the two methods are that the SEM requires specification of the model derived from theory as well as specification of the number of factors, the items that load onto each factor and explicit specification of error; EFA, on the other hand, generates the model or factor structure and explains a maximum amount of variance (Suhr, 2006).

Before proceeding it is important to check that the sample size collated for this study is large enough for EFA. Tabachnick and Fidell (2001, p.588) cite Comrey and Lee's (1992) recommendation on sample size: 50 cases is very poor, 100 is poor, 200 is fair, 300 is good, 500 is very good, and 1000 or more is excellent.

The EFA criteria for determining the number of factors that explain the most variance in the data are derived from the literature (Suhr, 2006) and comprise:

1. The Pearson product-moment correlation coefficient is used (Pearson's *r*) to measure the strength and direction of the linear relationship between pairs of variables within the data set. The range of correlation coefficients fall between -1 and 1. A value of 1 indicates an exact positive linear relationship, a value of zero indicates that no linear relationship exists (Stigler, 1989). Correlation co-efficients are explored via scatter plots as a first stage before any EFA takes place.

2. Cronbach's alpha (α) measure of internal consistency is the selected test applied to the items in the Individual Intrapreneurial Outcomes Questionnaire (details presented in the previous chapter) to see how closely the items are related as a group.

It is used in this study as a precondition to check the coefficient of reliability, i.e. the consistency (Bland, and Altman, 1997), of the data, to establish the data's suitability for EFA.

3. The descriptive statistics of the dataset are then presented to show the mean and standard deviation scores for each item in the Individual Intrapreneurial Outcomes questionnaire.

4. Providing that the suitability of the dataset for EFA is established, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is applied to test whether the partial correlations among items are small. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy is a measure that varies between 0 and 1 and is a test of whether the partial correlations among variables are small. The optimum is 1, the recommended minimum is 0.5. 0.8 or above is considered good. Less than 0.5 necessitates remedial action, either through removal of the relevant variables or by incorporating additional items to complement these variables (Cerny and Kaiser, 1977; Dzuiban and Shirkey, 1974; Kaiser, 1970). Also Bartlett's Test of Sphericity (Bartlett, 1937; Snedecor and Cochran, 1989) is used to establish whether the correlation matrix is an identity matrix, which would indicate that the factor model is inappropriate. Bartlett's Test of Sphericity tests the null hypothesis that the correlation matrix is an identity matrix (a matrix in which all of the diagonal elements are 1 and all off diagonal elements are 0). A correlation matrix that is an identity matrix indicates that there is no correlation between any of the variables, i.e. all variables are completely independent from each other which would result in the factor analysis producing 12 factors corresponding to the 12 IO variables. A p-value of 0.000 means that there is no evidence that the null hypothesis is true. Taken together, the Kaiser-Meyer-Olkin and Bartlett's Sphericity tests provide a minimum standard to be passed before conducting a factor analysis.

Once the above tests are complete, the EFA is designed to follow the process outlined here:

1. Calculation of the orthogonal factors (i.e. those that describe the variance in the 12 Individual Intrapreneurial Outcomes questionnaire items). The communalties, being the proportion of each variable's variance that can be explained by the factors, are presented. In Principal Components (PC) Factoring, usually only factors >1 are retained and not screened out. The extraction method used for this study however is Principal Axis Factoring, in which the initial values on the diagonal of the correlation matrix are determined by the squared multiple correlation of the variable with other variables, meaning that scores >1 are not applicable in this approach. Principal Axis Factoring (PAF) is selected because it is the most widely used method in factor analysis (Warner, 2012). It is not uncommon that when PC and PAF are each applied to the same dataset, both methods give similar results on the number and behaviour of factors within that dataset (Warner, 2012) due to many mathematical similarities. The PC approach aims to show all of the variance in the variables via a small number of components, but PAF aims to model only the shared variance between variables and is therefore deemed to be the most suitable method for this study. It provides a degree of greater clarity and is shown by the literature (Warner, 2012) to be the method preferred by researchers in the behavioural and social science domains.

The Extraction value results from PAF indicate the proportion of each variable's variance that can be explained by the single retained factor. Variables with high values are well-represented variables while low values are not, although no specific value citations for what constitutes a high or low value could be located in the literature.

2) Cattell's (1966) scree test, which advocates retention of factors above the elbow on the scree plot and rejection of factors below it.

3) Proportion of variance accounted for keeps a factor if it accounts for a predetermined amount of the variance. The literature indicates that 75-95% of the

variance should be accounted for (Garson, 2010; Pett et al., 2003), although sometimes as little as 50% is acceptable (Beavers et al., 2013).

4) Inter-item correlations within the EFA are then examined to identify the variable(s) that explain the majority of the variability in the 12 Individual Intrapreneurial Outcome measure variables.

Finally, sensitivity test analyses are carried out on the dataset to explore the effects of sample size and sample selection on results for the SEM and EFA analyses using response items from the Individual Intrapreneurial Outcomes questionnaire. The method of so doing is to re-run the analysis on different sample sizes from within the same dataset, comparing randomly split sub-samples and the whole dataset through analysis.

- For the SEM model the estimated model parameters are explored for consistency across the samples. Standard error for estimated model parameters results are used to demonstrate the levels of variation in the sample sizes. Then the same criteria are applied that are described in the development of the SEM design earlier in this chapter, i.e. χ^2, P-value, RMSEA and CFI. Cronbach's alpha of internal consistency is also applied, using criteria consistent with those stated earlier in this chapter. Hoelter (0.05) and Hoelter (0.10) results are also included but with little significance attached because it is only appropriate to apply it if the number of respondents is more than 200 and if the χ^2 is statistically significant (Kenny, 2003). Some authors, such as Hu and Bentler (1998) do not advise use of Hoelter.

- For the EFA reproduced correlation coefficients are presented, produced by running the same EFA on all the sample sizes derived randomly from the same dataset to identify linear relationships specifically for the purpose of understanding the sensitivity of sample size on the data. Reproduced communalities, covariances and Cronbach's alpha are produced for each sub-

sample in line with the criteria for EFA described earlier in this chapter and factor analysis is conducted. KMO and Bartlett's Test for Sphericity are applied, followed by a scree plot and the same EFA process and criteria is repeated per the approach outlined for EFA above.

The study then progresses to explore the relationship between the Individual Intrapreneurial Outcomes measure derived by both the SEM and the EFA. As has been stated above, it is not expected that the two different methods will generate substantially different results because they are each applied to the same dataset. However, it is interesting to observe the two different perspectives and identify a method that may be the best suited to use for further research and also in practice as this research develops beyond the current study. The results from each method are correlated item-by-item and shown visually as well as numerically.

Respondents to the Individual Intrapreneurial Outcomes questionnaire also completed the inventories selected (Chapters 5, 6 and 7) to test personality traits, self-perception of emotional intelligence and perception of innovation climate respectively. In this study items and scoring of the selected inventories remain unchanged from the content published by the inventory orginators. The next stage in the research design is to apply the selected Individual Intrapreneurial Outcomes measure to each of the selected inventories to test the hypotheses derived from the literature review for this study concerning personality traits, self-perception of emotional intelligence and perception of innovation climate. This application is designed to fulfill the dual purpose of providing an additional validation of the derived Individual Intrapreneurial Outcomes measure as well as testing the correlations between each of the key attributes, as found in the literature, of successful individual intrapreneurs and their scores on the Individual Intrapreneurial Outcomes measure, thus providing a new measurable perspective on those attributes by linking them with dimensions of individual intrapreneurial performance. Data acquired for this study using the selected inventories

for each key attribute are computed using the same methodology specified by the inventory originators.

Data Quality Checks

Data quality checks were undertaken for all the instruments used in this study. These checks are summarised as follows:

1. Code checks to verify that the data were consistent with the specified codes and corresponding answer categories.

2. Range checks to confirm that responses were within the range implied by the question answer categories.

3. Distribution checks that assessed whether the distribution of responses to questions with known distributions were a reasonable match (e.g. a reasonable distribution of age and gender groups).

4. Consistency checks to identify respondents whose responses to the questionnaire were atypical of everyone else.

Responses to individual questionnaires were also checked. There was one respondent who had given the same answer to all questions in the SSEIT Emotional Intelligence questionnaire, a clear anomaly, especially as everyone else had a response range of at least two. The results of the analysis were used to identify the respondent (User_Legend=453). Visual inspection of the raw data for this respondent confirms that this respondent has answered 1 for all 34 questions in the SSEIT questionnaire. A review of responses made by the respondent to other questionnaires suggests that they had completed the other questionnaires properly having provided a reasonable mix of responses. However, verbatim questions included responses such as "hxdg", "duy" and "yest" which casts further doubt of on the legitimacy of the responses. Consequently,

the respondent was excluded from the final dataset of 249 respondents, leaving a final, cleaned dataset of 248 responses.

C h a p t e r 9

SAMPLE DESCRIPTION

Because the aim is to create a scale of individual intrapreneurial outcomes, the sample is selected not to include only highly intrapreneurial people. A sample of 248 questionnaires completed by adults employed in a business / work environment was used for the study and no prior screening for intrapreneurial orientation was undertaken. The questionnaires were hosted online and respondents either volunteered or were invited to participate through business networks. A broad range of people at work was encouraged in order to generate a diverse sample. Further details of how the data for this study were collated are as follows:

A study-specific website, called the Centre for Intrapreneurial Excellence (CfIE), was created via the University of York's preferred website provider. The site was constructed so that all instruments used in this study could be hosted online and accessed by participants, whilst also ensuring confidentiality and data security for respondents. After an initial testing period to make sure that the online instruments were operating correctly, and that the questions and hosting were straightforward for respondents to access and use, a small number of participants were initially invited to participate from the researcher's own existing business and public sector employee networks to gain participant feedback on content and construct validity, ease of use and the vocabulary selected for the Individual Intrapreneurial Outcomes instrument (see Figure 3). This was not necessary for the other instruments used (namely The Big Five, SSEIT and Dolphin Index) because these are already established and peer-reviewed in the literature.

The CfIE was also set up so that, on completion of some of the instruments, respondents received on their screens a small 'reward' relevant to the questionnaire completed to give them some additional, hopefully useful insight into the key

attributes explored in this study. Participants were aware that they would receive these 'rewards' in advance of completing the surveys, which in total took each person about an hour to complete.

Once testing was complete, participants were recruited via the following activities:

- Personal invitation from the researcher to individuals working in a wide variety of organisations across the UK and Ireland;
- The researcher's contacts in turn asking their colleagues and working people in their own networks to participate;
- A short article in the Federation for Small Businesses newsletter asking for volunteers to take part in the research;
- The researcher asking for volunteers to participate in the research when giving industry presentations and engaging in business networking activities; and
- Use of the researcher's social media networks, in particular via LinkedIn.

All participants were made aware that their individual responses would remain confidential and non-attributable.

Examples of the communications sent to participants, the 'reward' items mentioned above and the Federation for Small Business email are shown in Appendix 3.

The recruitment of the 248 participants in this research was conducted over a period of approximately 6 months. Individuals who agreed to participate were registered on the CfIE website by the researcher and emailed a link to the questionnaires. All participants who committed to complete the surveys fulfilled their commitment to do so.

Ideally, the entire measurement would be performed on a fully representative sample of the working population (i.e. representative of age, sector, seniority, location, job function and so on), but this approach is very expensive and time consuming, and well beyond the resources available for this study. Also, the literature (DeVellis, 1991; Fava et al., 1995) shows that sample representativeness is not as essential when developing a measure as it is when the research is population-based, as long as the sample is not 'qualitatively different' (Noar, 2003; p.626) from the population it is ultimately intended to measure. A convenience sample for this study has therefore been used, however it is one that is qualitatively as similar to the full working population as could be achieved in that every participant is an employed adult working in a live business / organisational environment in the UK and Ireland.

The sample split between males and females is 54:46. The average age of males is 45 years; for females it is 41 years. 6% of respondents do not provide their date of birth details, and so do not have an age recorded. 92% of the sample state that they are of British nationality. 3% and 2% are Irish and French respectively. The remaining 5% comprise people of Swedish, Canadian, Gambian and Indian nationalities.

Industry sector

The following table contrasts the profile of Broad Industry Group derived from the Standard Industry Classification (SIC) 2007 for the CfIE survey with ONS's Business Register and Employment Survey 2014.

Table 13: Broad Industry Group

Broad Industry Group	**Survey**	**BRES 2014**
Agriculture, Forestry & Fishing	0%	1%
Mining, Quarrying & Utilities	2%	1%
Manufacturing	23%	8%
Construction	0%	4%
Motor Trades	0%	2%
Wholesale	0%	4%
Retail	2%	10%
Transport & Storage (inc. Postal)	9%	4%
Accommodation & Food Services	0%	7%
Information & Communication	3%	4%
Finance & Insurance	6%	4%
Property	0%	2%
Professional, Scientific & Technical	2%	8%
Business Administration & Support	34%	9%
Education	12%	9%
Health	3%	13%
Public Administration	0%	5%
Other	3%	4%
Number of employees	**247****	**28.0m**

* Source: Business Register and Employment Survey 2014

** One respondent did not answer the question.

The main differences are a greater proportion of survey respondents in the Manufacturing and Business administration sectors than in the UK as a whole (23% vs. 8% and 34% vs 9% respectively) and a smaller proportion of employees in the Retail and Health sectors (2% vs 10% and 3% vs 13% respectively).

Table 14 presents the profile of research respondents in terms of their job function.

Table 14: Job Function

Job function	**Percentage**
Sales	12%
Finance and commercial analysis	12%
Administration	14%
Project programme management	11%
Engineering and production	6%
HR	6%
Business operations general management	33%
Logistics and distribution	1%
Research and product service development	5%
Number of respondents	239

A third (33%) of respondents' job function is business operations and general management.

The following three Tables 15 and 16 present the profile of qualifications held and the qualification requirements of their current role.

Table 15: Highest Qualification Held

Highest qualification held	Percentage
Doctoral degree or equivalent	2%
Masters degree or equivalent	30%
Bachelors degree or equivalent	37%
A Levels / Highers (Scotland) or equivalent	20%
GCSE / O levels / Standards (Scotland) or equivalent	10%
No academic qualifications	1%
Number of respondents	248

Nearly seven-in-ten (69%) are qualified to degree level or higher. This is about twice that of the Annual Population Survey (Nomis, 2014), which estimates that 34.4% of the working age population of Great Britain, aged 16 to 64, achieved NVQ4+ (a degree-level or equivalent qualification or above).

Table 16: Technical / Professional Requirements

Technical/professional requirements of current role	Percentage
None required	16%
Desirable	30%
Highly desirable	30%
Compulsory	25%
Number of respondents	248

Only about one-in-seven (16%) of roles held by respondents do not require any technical or professional qualifications.

Geographic coverage of role

Table 17 presents the distribution of roles by geographic region covered.

Table 17: Geographic Coverage

Geographic coverage of current role	**Percentage**
Local	22%
Regional	20%
National	30%
European	10%
USA	0%
Australasia	1%
Global	18%
Number of respondents	248

Conclusion

The make-up of the sample for this study does not accurately represent the UK working population. To achieve a sample with the same demographic profile across roles, ages, sectors, regions etc. would be prohibitively expensive and time-consuming and beyond the scope and resources of this study. However, the descriptions of the sample composition presented in this chapter do demonstrate that it compromises a reasonable mix of individuals' roles, sectors, locations and qualifications. A key benefit of the sample used is that all respondents are actively working in organisations. These factors

indicate that the data derived from this sample provide meaningful and insightful content for the analysis undertaken in this study with the aim of developing a proposed new Individual Intrapreneurial Outcomes measure, against which key attributes of intrapreneurs can be correlated.

Chapter 10

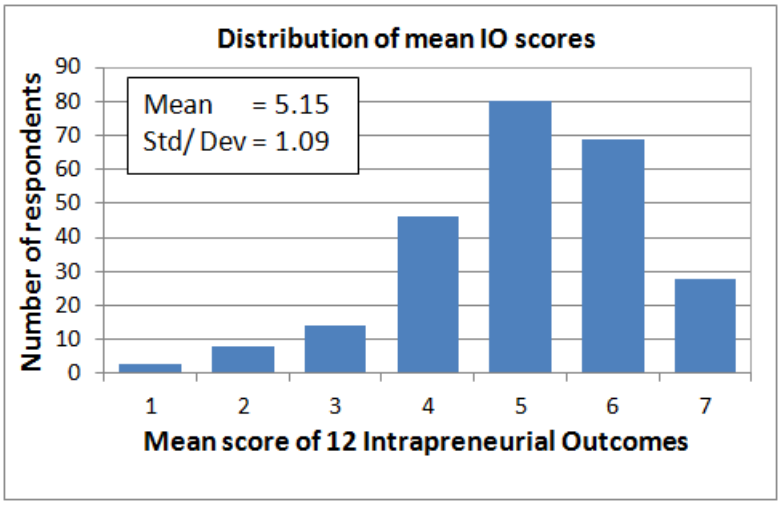
SEM – DEVELOPMENT OF THE HYPOTHESISED MODEL

Derivation of hypothesised Individual Intrapreneurial Outcomes Index

The purpose of this stage of analysis is to derive an individual intrapreneurial outcome index based on the hypothesised measurement model using the 12 intrapreneurial outcome (IO) measures. As an initial measure, a simple intrapreneurial index was derived as the arithmetic mean of the 12 IO variables: it equally reflects responses to all 12 intrapreneurial outcomes and is consistent in that those who have highest IO scores will score highest in the Individual Intrapreneurial Outcomes Index.

The following chart in Figure 5 shows the distribution of responses for the simple mean score intrapreneurial index.

Figure 5: Distribution of Mean IO Scores



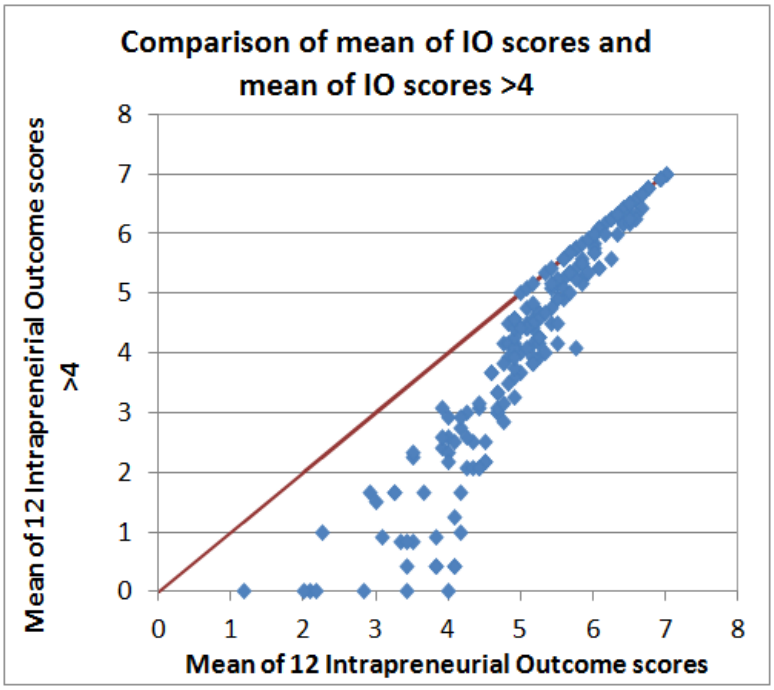
As can be seen in a similar analysis of the responses to the 12 intrapreneurial outcome questions, the majority of the responses in the index are 5 (32%) and the neighbouring

categories 4 (19%) and 6 (28%): 79% of all respondents are in just three of the seven categories. This is the main limitation of the simple intrapreneurial index: arguably a better index would be one that a more evenly distributed spread of respondents across the range of the index so that it better differentiates the level of intrapreneurship across the whole spectrum.

Next the hypothesised individual intrapreneurial outcome index was calculated according to the hypothesised measurement model. The key difference from the initial index is that a threshold is applied to each of the 12 IO variables: responses of 4 or less were set to zero and the index was calculated as the mean score of the 12 IO variables with the threshold applied.

The following scatter plot in Figure 6 shows the effect of the new index on individual responses by comparing the indices for mean score of IO with the mean score of IO >4 threshold.

Figure 6: Scatterplot of Mean Intrapreneurial Index Scores



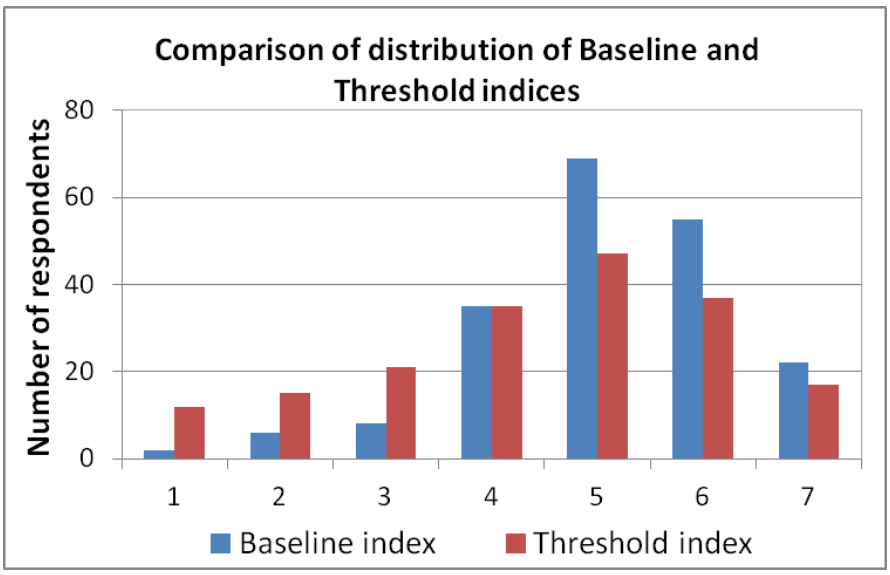
The red line shows where the responses would be if the effect of the threshold had not been applied to the respondents' scores on the index. The points in the chart that lie on the line are those individuals who had responded with a score of 5 or more for all 12 IO questions and hence were unaffected by the application of the threshold. The chart shows that for the vast majority of individuals the proposed 'threshold' index based on IO scores with threshold >4 applied are lower than (rather than equal to) their initial index based on the mean score without the threshold applied.

The impact on the distribution is shown in the following Table 18 and chart below which contrast the distributions of initial 'baseline' and the proposed 'threshold' indices.

Table 18: Baseline and Threshold Distributions

Score	**Baseline**	**Threshold**
1	1%	8%
2	3%	10%
3	6%	11%
4	19%	17%
5	32%	24%
6	28%	21%
7	11%	9%
Mean	5.15	4.25
Standard deviation	1.09	1.87

Figure 7: Comparison of Distribution of baseline and threshold indices



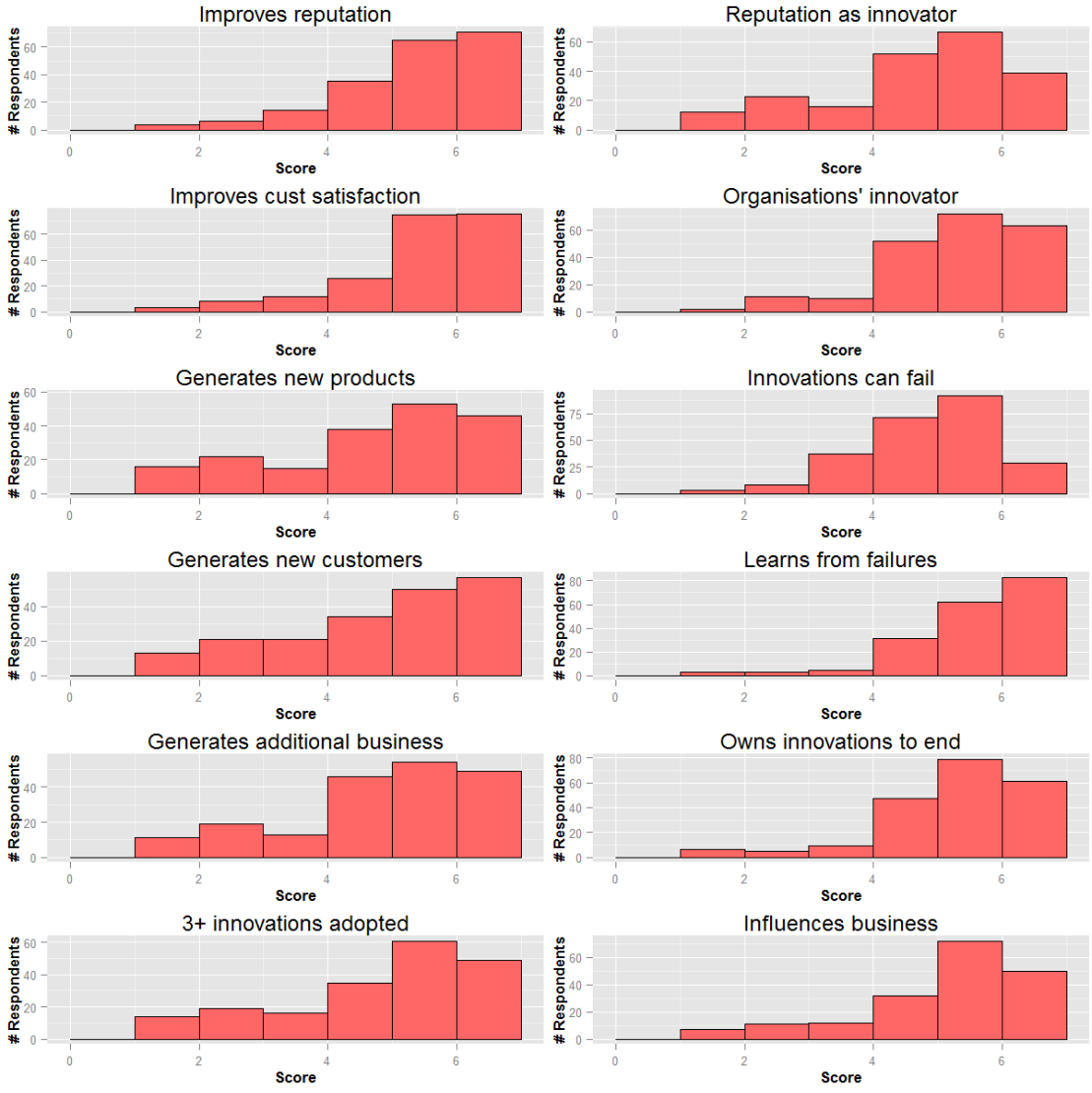
The effect of the threshold was to redistribute the initial index much more evenly across the range of the index, resulting in an index that better differentiates between individuals' levels of intrapreneurship. It was not an objective to produce a more 'normal' distribution of intrapreneurial outcome measures across the sample, although the distributions do have a bell-shaped curve similar to normal distribution. The shape of the bar chart in Figure 7 illustrates that the >4 criteria achieves better differentiation of levels of intrapreneurship between individuals. It is helpful to have a threshold because it provides an informed cut-off point on the continuum of a scale, i.e. a transition point on the index.

Testing normality of intrapreneurial outcome measures

The first SEM developed, referenced as SEM0, was a simple model that regressed the twelve IO variables on the threshold intrapreneurial index based on the hypothesised intrapreneurial measurement model. Before looking at the model specification and results, the distribution of the responses to the twelve intrapreneurial outcome measures were assessed for normality and consistency to check the adequacy of the data for the SEM.

A graphical presentation of the distribution of responses to each of the twelve IO variables was reviewed to see if their shape was similar to the normal curve and hence approximately normally distributed. The following Figure 8 presents charts for the twelve IO variables:

Figure 8: Distribution of responses to each of the twelve variables



The charts in Figure 8 above show that responses to five of the twelve intrapreneurial questions were not uni-modal and have two or more peaks rather than one. All twelve

questions have their 'primary' peaks (the highest number of responses) in the positive response categories 5, 6 or 7; five questions additionally have much smaller, 'secondary' peaks in the 'Not like me' category 2, probably brought about by a general trend for people to apparently avoid responding with 'Not much like me'. Three of these five questions had three peaks coinciding with response categories 2, 5 and 7. Generally, the data are skewed towards the positive response categories rather than symmetrical per normal distribution. Table 19 presents the non-normality test results reported by Amos from the SEM0 model run.

Table 19: Tests of Non-normality

Variable	Min	Max	Skew	c.r.	kurtosis	c.r.
Threshold index	0	7	-0.568	-3.649	-0.747	-2.403
Reputation	1	7	-0.835	-5.366	0.295	0.95
CustSat	1	7	-0.775	-4.985	0.884	2.842
NewProducts	1	7	-1.033	-6.644	1.572	5.055
NewCusts	1	7	-0.284	-1.824	0.266	0.854
NewBusiness	1	7	-0.567	-3.648	0.134	0.432
InnovAdopt	1	7	-0.457	-2.935	-0.472	-1.518
InnovRep	1	7	-0.666	-4.28	-0.419	-1.347
OrgInnov	1	7	-0.628	-4.035	-0.4	-1.286
InnovFail	1	7	-0.616	-3.959	-0.609	-1.959
LearnFail	1	7	-0.602	-3.873	-0.63	-2.027
OwnsInnovtn	1	7	-0.929	-5.972	0.847	2.724
InfBusiness	1	7	-0.828	-5.326	0.512	1.645
Multivariate					49.183	19.61

There are no 'uni-variate' outliers relating to individual IO variables since the responses all fall in the range (0,7). However, responses such as individuals' scores of 7 for all twelve IO variables are potential multivariate outliers. All twelve IO variables show significant levels of skew.

Using Byrne's (2010) value of 7 as a guide, a review of the kurtosis values reported in the above table reveals none of the twelve IO variables appear to be substantially kurtotic.

In this application, the z-statistic of 19.594 testing whether the multivariate kurtosis figure of 49.183 is statistically significantly different from 0 strongly indicates non-normality in the sample. It is often the case that two univariate normally distributed variables are not multivariate normally distributed.

Presence of multivariate non-normality typically leads to standard errors for the estimated model parameter being too small which risks overstating the significance of the model parameter. To overcome this Bayesian estimates of the model parameters and standard errors were included into the analysis routines in the SEM model development. Examination showed very small differences between the maximum likelihood and Bayesian fitted model parameters and standard errors that were too small to change the outcome of the t-tests applied to the model parameters. For brevity, the results from the Bayesian fitted model are only reported for the final model SEM3.

Overview of SEM development

As an overview level, the SEM for this research was developed in four stages resulting in four intermediate models that were named SEM0 to SEM3. A high-level overview is presented here, and is supported by a more detailed explanation of each SEM model in the section that follows.

SEM0 was a simple model that regressed the twelve Intrapreneurial Outcome measures on the proposed Individual Intrapreneurial Outcome Index, calculated as

described earlier from the 12 Intrapreneurial Outcomes with a threshold of 4**.** (The model identified that there are statistically significant relationships between the individual intrapreneurial outcome index and the twelve intrapreneurial outcome measures, but the goodness of fit model statistics showed that overall SEM0 was a poor fit to the observed data.)

SEM1 was an incremental development of SEM0 which included an additional six error covariances in the model specification. A poor fitting model can be an indication that the model is mis-specified. Accordingly, the modification indices, which reflect the extent to which the hypothesised model is appropriately described were examined. There were several error covariances with large modification indices. The model fit can be improved by extending the model specification to include these error covariances. To avoid simply developing a model that gave the best statistical fit, only error covariances that sat within the six hypothesised model dimensions were considered for inclusion in the model specification.

SEM2 was an incremental development of SEM1 and additionally included error covariance Err3<-->Err4.

SEM3 was an incremental development of SEM2 and additionally included error covariance Err3<-->Err5.

SEM2 and SEM3 models additionally included error covariances between the Generated New Products or Services item (in the Product / Service Development dimension of the hypothesised model) and Generated New Customers and Generated New Business items respectively (both in the Market Development dimension of the hypothesised model). In the original hypothesised model, it was considered that Generated New Product is distinct from the Product / Service Development and Market Development dimensions were considered to be distinct dimensions of the hypothesised model. The process of developing the SEM model through examining modification indices led to a model that integrates these dimensions on the basis that,

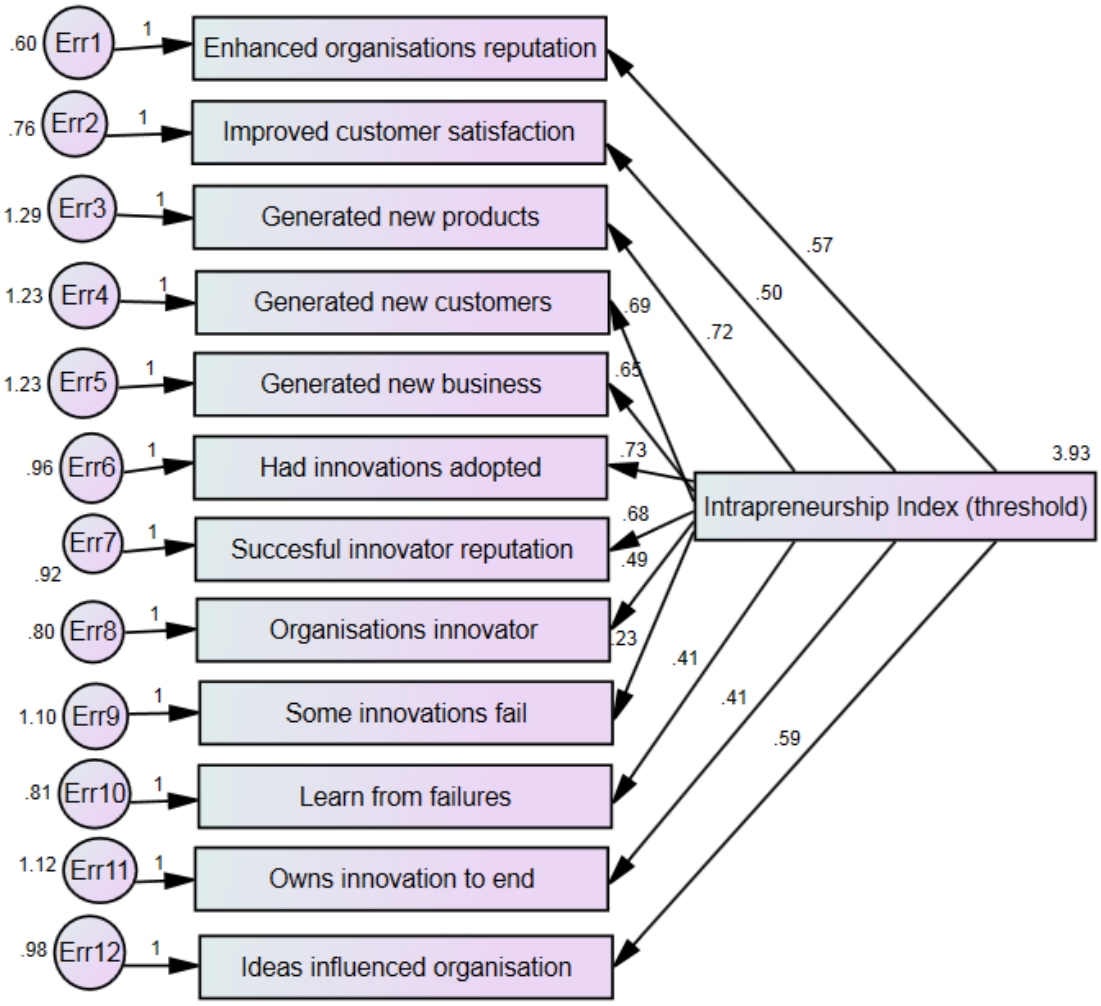
from the perspective of an intrapreneur, developing a product or service is simply a stepping stone or part of the overall process of generating new customers and new business.

The following four sections report the results and findings of the four models in greater detail.

Simple SEM model – SEM0

Figure 9 is the path diagram of the SEM that specifies the model in graphical form. The numbers on the arrows between the Intrapreneurship index, the twelve IO variables and their errors are the 23 parameters estimated by the model. The twelve estimates between the IO variables and the intrapreneurship index are regression weights. For instance, for each unit increase in the intrapreneurship index, the 'Enhanced organisation reputation' intrapreneurial outcome measure increases by on average 0.571, simultaneously, the 'Improved customer satisfaction' intrapreneurial outcome measure goes up by 0.50 etc. Err1 to Err12 in the diagram are the measurement errors corresponding to the twelve Intrapreneurial Outcome variables in describing the individual intrapreneurial index.

Figure 9: Path Diagram for SEM0



The estimated model parameters for the regression weights between the twelve IO variables and the intrapreneurial index are presented in the following Table 20. The twelve parameters listed in the table correspond to the twelve intrapreneurial outcomes presented in the above path diagram. The Intrapreneurship index is referenced by 'Threshold-I'.

Table 20: Estimated Model Parameters

Parameter			Estimate	S.E.	C.R.	P
Reputation	<--	Threshold-I	0.571	0.025	22.939	0.000
CustSat	<--	Threshold-I	0.5	0.028	17.842	0.000
NewProducts	<--	Threshold-I	0.719	0.037	19.688	0.000
NewCusts	<--	Threshold-I	0.695	0.036	19.489	0.000
NewBusiness	<--	Threshold-I	0.649	0.036	18.21	0.000
InnovAdopt	<--	Threshold-I	0.73	0.031	23.263	0.000
InnovRep	<--	Threshold-I	0.683	0.031	22.208	0.000
OrgInnov	<--	Threshold-I	0.493	0.029	17.145	0.000
InnovFail	<--	Threshold-I	0.234	0.034	6.964	0.000

LearnFail	<-- -	Threshold-I	0.413	0.029	14.341	0.000
OwnsInnovtn	<-- -	Threshold-I	0.412	0.034	12.128	0.000
InfBusiness	<-- -	Threshold-I	0.589	0.032	18.506	0.000

The estimates for all 12 variables are positive, indicating that they each increase with increasing intrapreneurship as expected. P-values of less than 0.001 very strongly reject the null-hypothesis that there is no association between the intrapreneurial outcome and the intrapreneurial index. This is to be expected since the intrapreneurial index was derived from (a linear combination of) the twelve IO variables, albeit the linear relationship disturbed by the application of the threshold.

Measures of Goodness-of-Fit

Table 21 reports the χ^2, RMSEA and CFI measures of goodness-of-fit for SEM0.

Table 21: χ^2, RMSEA and CFI measures of Goodness-of-Fit for SEM0

				Target values:		
				>0.05	**<0.05**	**>0.95**
Model ID	**Description**	**χ^2**	**df**	**p-value**	**RMSEA***	**CFI**
SEM0	Simple model	453.171	66	0.000	0.154	0.862

***** RMSEA thresholds: <0.05 Good; 0.05-<0.08 Reasonable; 0.08-<0.10 Mediocre; >0.10 Poor

Comparison of the p-value for the χ^2 test, RMSEA and CFI measures with the target values listed above show that the model is a poor fit to the observed data. A poor fitting model can be an indication that the model is mis-specified.

Modification Indices

Table 22 presents the modification indices for the SEM0 model.

Table 22: Modification Indices for the SEM0 Model

Parameter			Modification Index
Err4	<-->	Err5	104.131
Err3	<-->	Err4	54.964
Err3	<-->	Err5	49.348
Err6	<-->	Err7	43.453
Err1	<-->	Err2	26.953
Err7	<-->	Err8	19.716
Err9	<-->	Err10	15.506
Err6	<-->	Err12	15.103
Err3	<-->	Err6	12.073
Err4	<-->	Err10	11.732
Err10	<-->	Err11	10.755
Err3	<-->	Err7	9.689
Err5	<-->	Err10	9.43
Err8	<-->	Err10	6.904
Err3	<-->	Err10	5.004
Err1	<-->	Err12	4.882
Err5	<-->	Err9	4.458
Err2	<-->	Err5	4.331

There are several very large error covariances: the top four modification indices alone account for over half (56%) of the error between the model and observed variances and covariances. Including the Err4 <--> Err5 error covariance in the model specification would reduce χ^2 by 23% - a big improvement at the relatively low cost of having to estimate a single additional model parameter. However, it is inappropriate to add error covariances to the model simply to improve fit. Doing so would result in an over-fitted model that respresents the data rather than one that provides a parsimonious representation of the relationship between the 12 intrapreneurial outcomes and the index. Accordingly, the list of error covariances was reviewed with respect to the original hypothesised measurement model for the intrapreneurial index. The original measurement model identified 6 dimensions of intrapreneurship as listed under the 'Dimension' column identified in Table 23.

Table 23: Dimensions of Intrapreneurship

Dimension	IO variable	Description
Reputation	Reputation	Enhanced organisation reputation
	CustSat	Improved customer satisfaction
Product/Service dev	NewProducts	Created new products
Market development	NewCusts	Generated new customers
	NewBusiness	Generated additional business
Frequency	InnovAdopt	Had 3+ innovations adopted
	InnovRep	Has reputation as an innovator
	OrgInnov	Organisation turns to me for innovation
Personal/Risk	InnovFail	Some of my innovations fail
	OwnsInnovtn	Owns innovation to completion
	LearnFail	Learns from innovation failure
Process development	InfBusiness	Innovations have influenced business

The column 'IO variable' lists the questions that correspond to and measure the dimension. Arguably the six groups of variables corresponding to each dimension specified in the original hypothesised model identify those variables that have highly overlapping information content. So, Reputation and CustSat IO variables that describe the Reputation dimension can be expected to have significant systematic measurement error.

This analysis led to identifying 6 error covariances between variables within the six dimensions above. These error covariances were included in the next model, SEM1.

SEM1

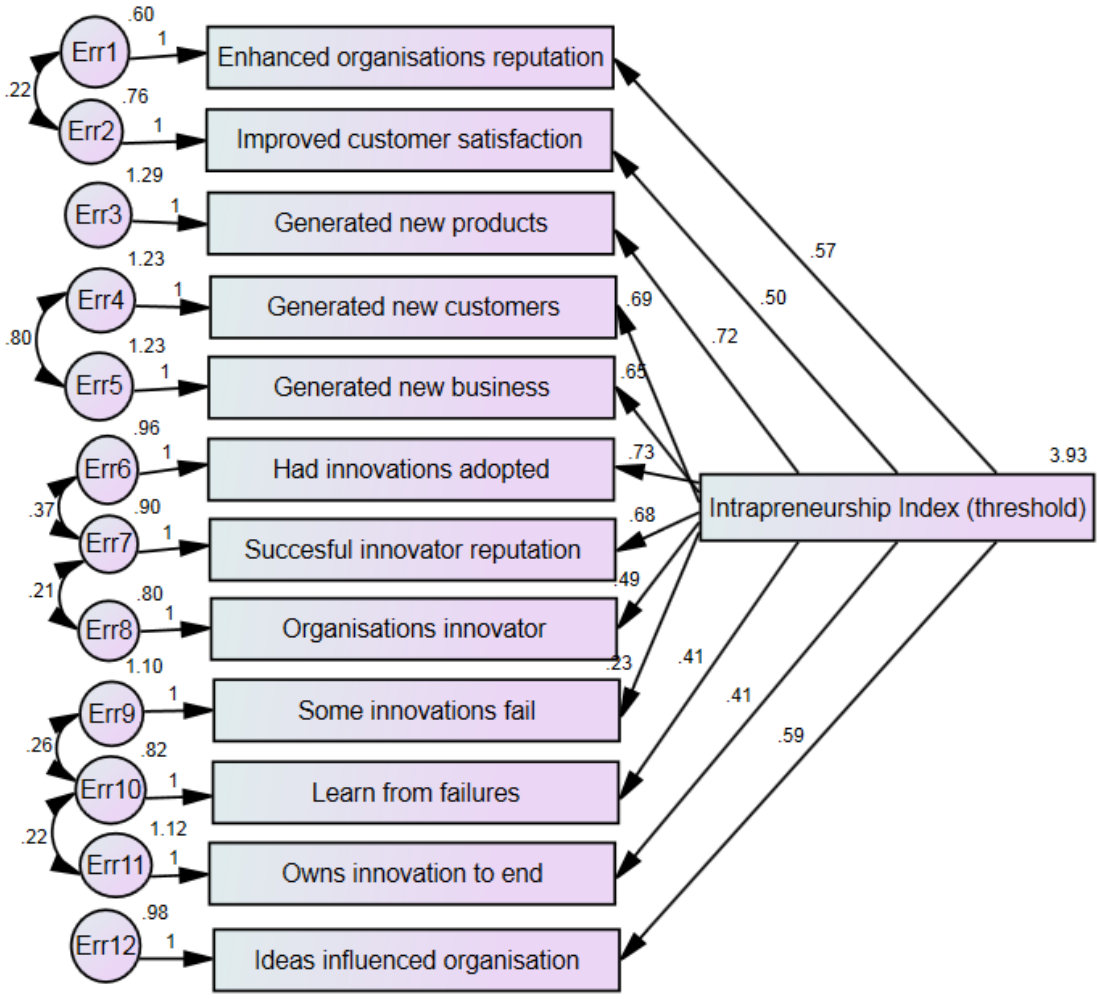
Table 24 lists the error covariances added to the SEM0 model to specify SEM1. The multiplication indices (MI) in the total row indicate an estimate of the amount by which the χ^2 statistic will reduce as a result of including these covariances.

Table 24: List of Error Covariances Added in order to Specify SEM1

Error Covariances added to SEM0			M.I.
Err4	<-->	Err5	104.131
Err6	<-->	Err7	43.453
Err1	<-->	Err2	26.953
Err7	<-->	Err8	19.716
Err9	<-->	Err10	15.506
Err10	<-->	Err11	10.755
Total			**220.514**

Figure 10 presents the path diagram for SEM1.

Figure10: Path Diagram for SEM1



The path diagram in Figure 10 above shows that the inclusion of the 'within dimension' error covariances has not changed the parameter values estimated: the parameters for SEM0 and SEM1 are the same.

Table 25 presents the goodness-of-fit measures for the SEM0 and SEM1 models.

Table 25: Goodness-of-fit Measures for SEM0 and SEM1

				Target values:		
				>0.05	**<0.05**	**>0.95**
Model ID	**Description**	χ^2	**Df**	**p-value**	**RMSEA***	**CFI**
SEM0	Simple model	457.026	66	0.000	0.155	0.861
SEM1	Error covariances within dimensions	198.524	60	0.000	0.097	0.951

* RMSEA thresholds: <0.05 Good; 0.05-<0.08 Reasonable; 0.08-<0.10 Mediocre; >0.10 Poor

The inclusion of the six error covariances has significantly improved the model. Based on the benchmarking criteria for the SEM set out in Chapter 8, the key features defining SEM1 with respect to SEM0 are:

- Reduction of the degrees of freedom (df) by six (from 66 to 60 in SEM0 and SEM1 respectively)
- Reduction of the χ^2 statistic by over 250, which is a similar order of magnitude to the sum of the modification indices reported above.
- The P-value for the likelihood ratio χ^2 test has not shown any improvement at or above 3 decimal places.
- RMSEA has improved substantially but still only qualifies as a mediocre fit.
- The CFI measure has met the 0.95 threshold of a model with good fit.

Whilst the inclusion of six error covariances between intrapreneurial outcomes that sit within the six measurement model dimensions had improved the model fit, two

remaining modification indices representing the error covariances Err3<-->Err4 and Err3<-->Err5 accounted for 28% and 25% of the SEM1 χ^2 statistic respectively, were having a significant impact on model fit. Further examination identified that both error covariances concerned the correlation between the intrapreneurial outcome measure in the Product/ service development dimension and the two intrapreneurial outcome measures in the Market development dimension. The modification indices were highlighting apparent content overlap between these two measurement model dimensions. The conclusion was that this result was not entirely unexpected, given that there could understandably be little to differentiate the product and market development. Accordingly, two further models – SEM2 and SEM3 – which incrementally include error covariances Err3<-->Err4 and Err3<-->Err5 respectively were developed.

Figure 11: Path Diagram for SEM3

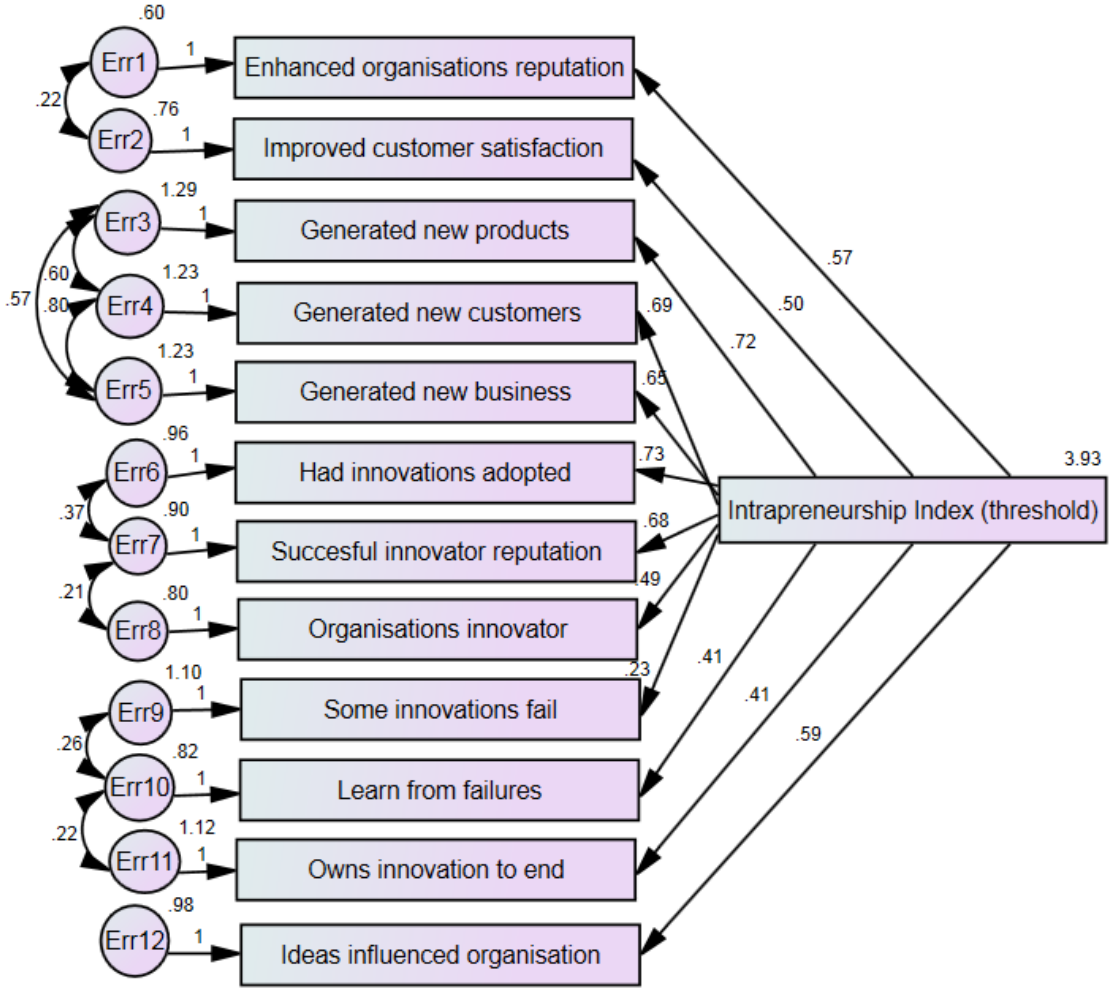


Table 26 presents both the standard (maximum likelihood) and Bayesian estimated model parameters, standard errors and critical ratios for the twelve individual intrapreneurial outcome measures regressed on the intrapreneurial index. The comparison shows that there is very little difference between the estimates and that the presence of ordinal, non-normal data has little impact.

Table 26: Estimated Model Parameters

			Maximum likelihood (M.L.)			Bayesian (B.)			
Parameter			Estimate	S.E.	C.R.	Estimate	S.E.	C.R.	M.L. - B. Difference
Reputation	<---	Threshold-I	0.571	0.025	22.939	0.568	0.029	19.586	1%
CustSat	<---	Threshold-I	0.5	0.028	17.842	0.490	0.033	14.848	2%
NewProducts	<---	Threshold-I	0.719	0.037	19.688	0.727	0.042	17.310	-1%
NewCusts	<---	Threshold-I	0.695	0.036	19.489	0.699	0.042	16.643	-1%
NewBusiness	<---	Threshold-I	0.649	0.036	18.21	0.649	0.044	14.750	0%
InnovAdopt	<---	Threshold-I	0.73	0.031	23.263	0.721	0.037	19.486	1%
InnovRep	<---	Threshold-I	0.683	0.03	22.441	0.663	0.037	17.919	3%
OrgInnov	<---	Threshold-I	0.493	0.029	17.145	0.494	0.034	14.529	0%
InnovFail	<---	Threshold-I	0.234	0.034	6.964	0.247	0.042	5.881	-6%
LearnFail	<---	Threshold-I	0.413	0.029	14.252	0.399	0.033	12.091	3%
OwnsInnovtn	<---	Threshold-I	0.412	0.034	12.128	0.419	0.042	9.976	-2%
InfBusiness	<---	Threshold-I	0.589	0.032	18.506	0.597	0.038	15.711	-1%

Table 27 presents the goodness-of-fit measures for all four models to illustrate the progression in the improvement in fit.

Table 27: Goodness-of-Fit Measures for All Four SEMs

				Target values:		
				>0.05	**<0.05**	**>0.95**
Model ID	**Description**	χ^2	**df**	**p-value**	**RMSEA***	**CFI**
SEM0	Simple model	453.171	66	0.000	0.154	0.862
SEM1	Error covariances within dimensions	193.148	60	0.000	0.095	0.953
SEM2	Incl E3<-->E4	174.91	59	0.000	0.089	0.959
SEM3	Incl E3<-->E5	119.859	58	0.000	0.066	0.978

* RMSEA thresholds: <0.05 Good; 0.05-<0.08 Reasonable; 0.08-<0.10 Mediocre; >0.10 Poor

The key features defining SEM3 based on the benchmarking criteria presented in Chapter 8 are:

- The degrees of freedom measure (df) has now reduced by 8 (from 66 to 58 in SEM0 and SEM3 respectively)
- The SEM3 χ^2 statistic is a third of that SEM0 but the p-value for this measure indicates the model fit is still not good. This is likely to be primarily reflecting the modest sample size.
- RMSEA has improved substantially and indicates that SEM3 is a reasonable fit.
- The CFI measure has far exceeded the 0.95 threshold, indicating a model with good fit.

- SEM3 incorporates error covariances for the top seven largest modification indices observed in SEM0. The largest remaining modification index unspecified in SEM3 (Err6 <--> Err12) accounts for just 13% of the error between the observed and model variances and covariances.

Discussion and Conclusion

This task performed a Confirmatory Factor Analysis based on a simple SEM model regressing the twelve IO variables on to the threshold intrapreneurial index. The conclusions of the CFA were that the simple model was not a good fit.

Using modification indices which identify aspects of the simple model that could be potentially be mis-specified three further models (SEM1, SEM2 and SEM3) were developed. The specification of SEM1, which included error covariances between IO variables within the same dimension as identified in the hypothesised measurement model improved the model fit significantly but did not qualify as a good fit. The selection and inclusion of the error covariances were based and justified on the fact that it was reasonable to expect there to be overlap in the information obtained by IO variables informing the same dimension and reasonable to expect that they would not be zero and the associated IO variables be totally independent from each other.

SEM2 and SEM3 models accounted for the apparent content overlap between the Product/ service development and Market development measurement model dimensions by including the remaining two error covariances between IO variables in these dimensions unspecified in SEM1. Their inclusion was prompted by the modification indices for these two error covariances that revealed that they had the biggest impact on model fit. The conclusion was that it was not entirely unexpected for there to be large error covariances between the two dimensions given that there would understandably be little to differentiate the two dimensions. Consequently, SEM3 was adopted as the final model.

The overall conclusion is that the SEM adequately demonstrates the validity of the hypothesised measurement model as a sound structural basis for deriving an individual intrapreneurial outcome index. The potential to further refine the SEM model specification was considered to be of little value since the objective of CFA was to validate the relationships between the intrapreneurial index and the outcome measures defined in the proposed measurement model rather than derive an alternative index of intrapreneurial outcome.

Chapter 11

EFA – DATA-DRIVEN ANALYSIS

Exploratory Factor Analysis

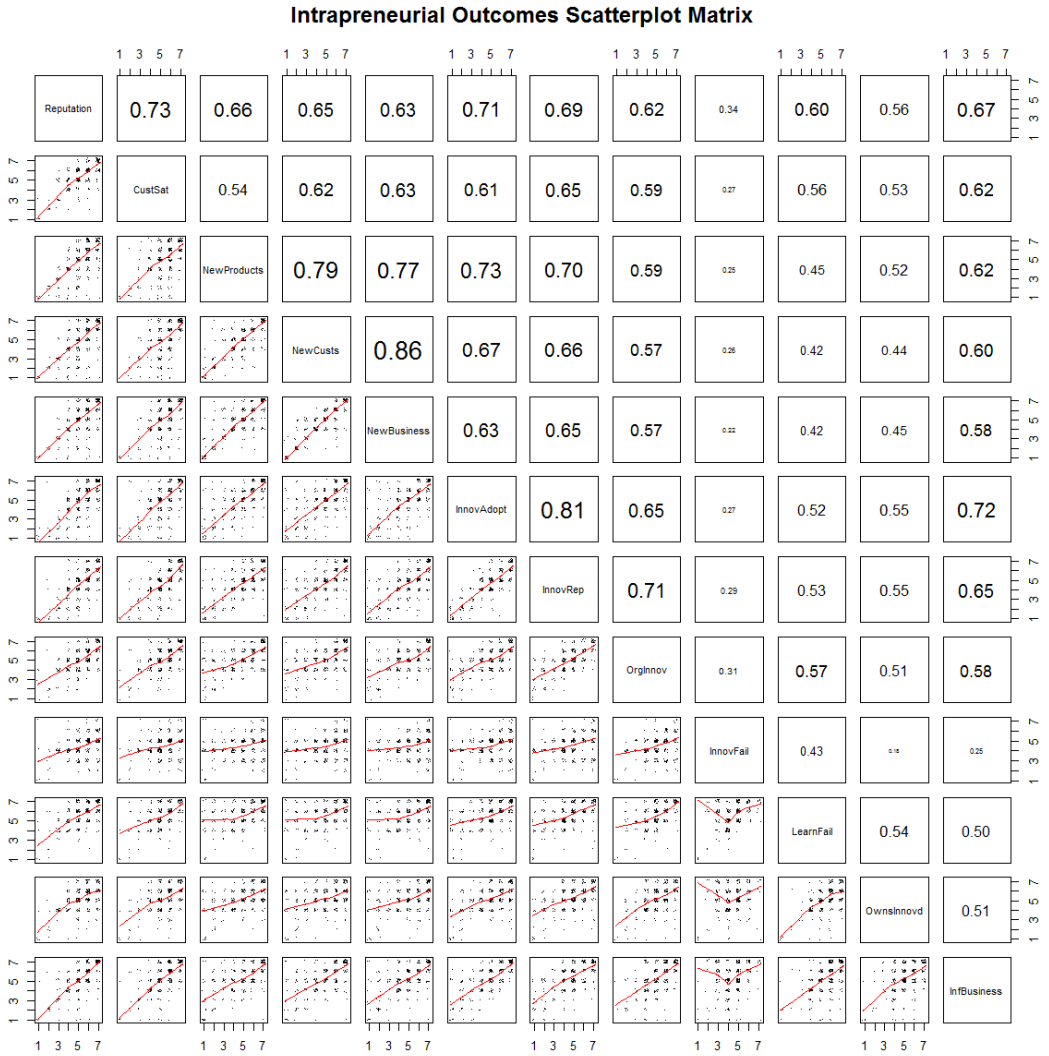
This chapter presents the findings of an exploratory factor analysis (EFA) of the twelve Intrapreneurial Outcomes (IO) items.

EFA provides a data-driven means of identifying the underlying factors that summarise and represent the information in the twelve intrapreneurial outcomes. In the context of this study, EFA is used as means of deriving alternative Individual Intrapreneurial Outcome Indices against which the proposed Intrapreneurial Outcome Index is benchmarked. i.e. it is used as a simple, complementary sense-check of the findings from the SEM approach described in the previous chapter. EFA began with an analysis comparing the responses coded as scores (responses "Strongly disagree" through to "Strongly agree" corresponding to 1-7) of each of the twelve IO items with each other: A total of 12*(12-1)/2 = 66 comparisons. The following matrix plot in Figure 12 contains the results of the analysis that consists of 66 scatter plots (below the diagonal) and 66 correlation coefficients (above the diagonal), corresponding to the 66 comparisons (combinations of the 12 of IO items against each other).

The scatter plots include a smoothed line fitted to the data to illustrate the relationship between the two IO item pairs.

The correlation coefficients are the Pearson product-moment correlation coefficient. This is a measure of the strength and direction of the linear relationship between two variables (defined as the covariance of the variables divided by the product of their standard deviations). Correlation coefficients range from -1 to 1, with 1 indicating an exact positive linear relationship between, 0 indicating no linear relationship at all.

Figure 12: Scatter Plots



Some 'jitter' – i.e. a small random number taken from uniform distribution - has been added to the responses in the above plots so that the individual responses can be seen. (Without jitter everyone who responded with a score of 5 for Reputation and score of 5 for Customer satisfaction would appear as a single dot – lots of dots on top of each other.) Consequently, the correlation coefficients in the matrix above the diagonal are not exact. Nonetheless, they are sufficient to provide a convenient means within the figure of identifying the pairs of outcomes with the strongest relationships. Jitter has been applied to data analysed in the above plot only. All other analyses have been

carried out on the data without jitter. Table 28 presents the correlation coefficients calculated on the scores without any noise added.

Table 28 – Correlation Coefficients without 'Noise'

	Reputation	CustSat	NewProducts	NewCusts	NewBusiness	InnovAdopt	InnovRep	OrgInnov	InnovFail	LearnFail	OwnsInnovd	InfBusiness
Reputation		0.742	0.664	0.648	0.631	0.706	0.699	0.627	0.357	0.609	0.558	0.680
CustSat			0.547	0.633	0.625	0.612	0.647	0.588	0.278	0.548	0.518	0.624
NewProducts				0.793	0.774	0.725	0.709	0.585	0.263	0.461	0.521	0.622
NewCusts					0.856	0.673	0.662	0.570	0.266	0.424	0.441	0.608
NewBusiness						0.634	0.652	0.575	0.226	0.416	0.452	0.582
InnovAdopt							0.812	0.652	0.275	0.533	0.549	0.721
InnovRep								0.712	0.289	0.530	0.546	0.658
OrgInnov									0.314	0.580	0.499	0.581
InnovFail										0.442	0.178	0.261
LearnFail											0.534	0.509
OwnsInnovtn												0.503
InfBusiness												

The correlation coefficients have been colour-coded so that strongest linear relations appear in cells shaded bright red and the weakest in blue shaded cells.

The correlation coefficients show that: there are some reasonably strong linear relationships between pairs of outcomes in the first eight outcomes; a very weak relationship between the InnovFail outcome and all other outcomes; and, weak relationships associated with the last three outcome variables. These stronger correlations naturally align with the high correlations in the previous section.

Cronbach's alpha measure of internal consistency for all 12 Intrapreneurial outcomes items was 0.94. This is substantially higher than the accepted threshold of 0.7, where the items are considered to be consistent.

Factor analysis was carried out using the Factor command in SPSS. The remainder of this section presents the results from this analysis along with explanatory commentary.

Table 29 presents a summary of the responses to the twelve Intrapreneurial Outomes questions as Descriptive Statistics.

Table 29: Descriptive Statistics

Short name	Question	Mean	Std. Deviation	Analysis N
Reputation	My new ideas have enhanced the reputation of my organisation	5.32	1.374	248
CustSat	My new ideas have contributed to improved customer satisfaction for my organisation	5.35	1.323	248
NewProducts	My new ideas have led to new products or services being developed by my organisation	4.85	1.827	248
NewCusts	My new ideas have generated new customers for my organisation	4.88	1.773	248
NewBusiness	My new ideas have generated additional business from existing customers	4.95	1.704	248
InnovAdopt	My innovations have been successfully adopted by my organisation on more than three occasions	4.91	1.750	248
InnovRep	I have a reputation as a successful innovator within my organisation	4.66	1.661	248
OrgInnov	People in my organisation often turn to me when there is a need for a new approach	5.10	1.327	248
InnovFail	Some of my innovations fail from time to time	4.45	1.148	248
LearnFail	When my innovations fail, I learn from them and try to improve next time	5.59	1.217	248
OwnsInnovtn	Once my ideas have been accepted by the organisation and moved to the development and implementation stages, I stay closely involved throughout the process, right up to launch	5.16	1.339	248
InfBusiness.	My new ideas have influenced the way my organisation does business	5.25	1.535	248

All the mean scores are all between 4.5 and 5.6, i.e. centred around the "Quite like me" response. The standard deviations show that well over half of the responses are in the "Quite like me" or neighbouring categories.

Table 30 shows the results of Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity tests.

Table 30: Results of Kaiser-Meyer-Olkin and Bartlett's Tests

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.[a]		0.934
Bartlett's Test of Sphericity[b]	Approx. Chi-Square	2281.266
	Df	66
	Sig.	.000

Kaiser-Meyer-Olkin Measure of Sampling Adequacy is a measure that varies between 0 and 1 and is a test of whether the partial correlations among variables are small. A value of 0.934 is close to the optimum of 1, well above the recommended minimum of 0.5.

Bartlett's Test of Sphericity tests the null hypothesis that the correlation matrix is an identity matrix (a matrix in which all of the diagonal elements are 1 and all off diagonal elements are 0). A correlation matrix that is an identity matrix would mean that the there is no correlation between any of the variables, i.e. all variables are completely independent from each other which would result in the factor analysis producing 12 factors corresponding to the 12 IO variables. A p-value of 0.000 means that there is no evidence that the null hypothesis is true so the hypothesis that all variables are completely independent of each other is rejected.

Taken together, these tests provided a minimum standard to be passed before conducting a factor analysis (or a principal components analysis).

The analysis proceeded onto the factor analysis which calculated 12 orthogonal factors – factors that describe the variance in the twelve IO variables. Table 31 presents the communalities, i.e the proportion of each variable's variance that can be explained by the factors. All 12 factors were analysed, none were screened out.

Table 31 Communalities

Short name		Initial[a]	Extraction[b]
Reputation	My new ideas have enhanced the reputation of my organisation	.710	.718
CustSat	My new ideas have contributed to improved customer satisfaction for my organisation	.645	.602
NewProducts	My new ideas have led to new products or services being developed by my organisation	.743	.679
NewCusts	My new ideas have generated new customers for my organisation	.791	.661
NewBusiness	My new ideas have generated additional business from existing customers	.770	.632
InnovAdopt	My innovations have been successfully adopted by my organisation on more than three occasions	.751	.729
InnovRep	I have a reputation as a successful innovator within my organisation	.746	.733
OrgInnov	People in my organisation often turn to me when there is a need for a new approach	.588	.581
InnovFail	Some of my innovations fail from time to time	.229	.132
LearnFail	When my innovations fail, I learn from them and try to improve next time	.529	.430
OwnsInnovtn	Once my ideas have been accepted by the organisation and moved to the development and implementation stages, I stay closely involved throughout the process, right up to launch	.439	.406
InfBusiness	My new ideas have influenced the way my organisation does business	.602	.605

Extraction Method: Principal Axis Factoring.

a. **Initial** - With principal factor axis factoring, the initial values on the diagonal of the correlation matrix are determined by the squared multiple correlation of the variable with the other variables. For example, if CustSat through to InfBusiness on Reputation is regressed, the squared multiple correlation coefficient would be 0.710.

b. **Extraction** - The values in this column indicate the proportion of each variable's variance that can be explained by the single retained factor. They are the reproduced variances from the factor extracted. Variables with high values are well-represented in the common factor space, while variables with low values are not well-represented.

Correlation coefficients of 1 or -1 represent total correlation between the two variables whereas correlation coefficients of 0 represent no correlation at all. There are no hard and fast values against which to benchmark good versus poor correlation coefficients. However, Figure 11 (scatter plots above) visually confirm a reasonable degree of correlation is evident between variables which have a correlation coefficient of 0.5 to 0.7 and quite strong correlation between variables with correlation coefficients above 0.7. Three of the twelve Intrapreneurial Outcome variables have relatively high value in excess of 0.7; six mid-value variables of between 0.5 and 0.7 and one particularly low value of 0.132 (‘Some of my innovations fail from time-to-time’). (These values on the diagonal of the reproduced correlation matrix are shown later).

A large proportion of the variation - over 60% - is being explained by one factor, as shown here in Table 32

The EFA below retains Factor 1 only. Factor 2 is so close to 1 that it does not add much extra value. There is no such thing as rotated EFA when 1 factor is retained.

Table 32 Total Variance Explained

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.283	60.695	60.695	6.906	57.548	57.548
2	1.055	8.788	69.484			
3	.783	6.528	76.011			
4	.526	4.384	80.395			
5	.506	4.214	84.609			
6	.444	3.700	88.309			
7	.362	3.017	91.326			
8	.310	2.580	93.906			
9	.247	2.062	95.968			
10	.178	1.480	97.448			
11	.170	1.418	98.865			
12	.136	1.135	100.000			

a. **Factor** - The initial number of factors is the same as the number of variables used in the factor analysis.

b. **Initial Eigenvalues** - Eigenvalues are the variances of the factors. The factor analysis was carried out on the correlation matrix, so the variables are standardised, which means that each variable has a variance of 1, and the total variance is equal to the number of variables used in the analysis, 12.

c. **Total** - This column contains the eigenvalues. The first factor always accounts for the most variance (and hence has the highest eigenvalue), and the next factor accounts for as much of the left over variance as it can, and so on. Hence, each successive factor will account for less and less variance. A factor with an Eigenvalue of less than 1 means that the factor is explaining less variance than a single IO variable would and usually does not add enough, in terms of describing the data, to be included in the chosen set of factors.

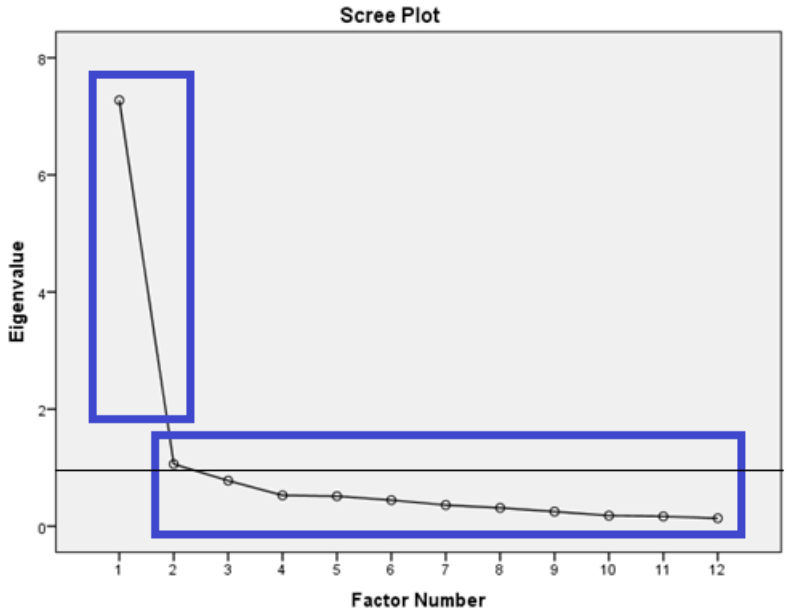
d. **% of Variance** - This column contains the percentage of total variance accounted for by each factor.

e. **Cumulative %** - This column contains the cumulative percentage of variance accounted for by the current and all preceding factors. For example, the first row shows a value of 60.695 meaning that the factor accounts for over 60% of the total variance.

f. **Extraction Sums of Squared Loadings** - The number of rows in this panel of the table correspond to the number of factors retained. The values in this panel of the table are calculated in the same way as the values in the left panel, except that here the values are based on the common variance. The values in this panel of the table will always be lower than the values in the left panel of the table, because they are based on the common variance, which is always smaller than the total variance.

Figure 13 is a scree plot of the initial eigenvalues in the total column from the previous table for each of the 12 factors.

Figure 13: Plot of Initial Eigenvalues



The scree plot provides a way of assessing how many factors to retain in the factor analysis. The plotted line typically has two sections, a steep line and a horizontal line as highlighted in the blue coloured rectangles. Factors corresponding to the points on the steep line explain the vast majority of the variation in the twelve intrapreneurial outcomes and represent the key factor(s) underlying the data. Conversely, the factors corresponding to the points on horizontal section of the curve (factors 2 to 12) contribute only a relatively small amount towards explaining the variation in the 12 items and are considered as either irrelevant or non-existent (i.e., they are assumed to reflect measurement error or noise).

Accordingly, only Factor 1 was retained in the Factor Analysis since this explained the majority (60.7%) of the twelve IO variables, whilst the explanatory power of each of the remaining eleven factors was no stronger than the data upon which they are intended to represent.

Factor 2 was a candidate for retaining in the analysis since its initial eigenvalue of 1.055 indicates that the factor contributed more explanatory power than an individual variable. However, the case for doing so was marginal given how close it is to 1.

Had there been evidence to retain more than 1 factor, there was the potential to explore the existence of factors that represent or aligned with the six measurement model dimensions. A single factor solution supports the notion of a single summary measure of intrapreneurial outcome that is analogous to the hypothesised individual intrapreneurial outcome index.

Table 33 shows the Factor Matrix which are the correlations between the twelve IO variables and the factor.

Table 33: Factor Matrix

Short Name		Factor 1
Reputation	My new ideas have enhanced the reputation of my organisation	.847
CustSat	My new ideas have contributed to improved customer satisfaction for my organisation	.776
NewProducts	My new ideas have led to new products or services being developed by my organisation	.824
NewCusts	My new ideas have generated new customers for my organisation	.813
NewBusiness	My new ideas have generated additional business from existing customers	.795
InnovAdopt	My innovations have been successfully adopted by my organisation on more than three occasions	.854
InnovRep	I have a reputation as a successful innovator within my organisation	.856
OrgInnov	People in my organisation often turn to me when there is a need for a new approach	.762
InnovFail	Some of my innovations fail from time to time	.363
LearnFail	When my innovations fail, I learn from them and try to improve next time	.655
OwnsInnovtn	Once my ideas have been accepted by the organisation and moved to the development and implementation stages, I stay closely involved throughout the process, right up to launch	.637
InfBusiness	My new ideas have influenced the way my organisation does business	.778

Factor 1 is strongly correlated (>0.7) with nine of the twelve items and has a good level of correlation with two items (LearnFail and OwnsInnovt) and weakly correlated with InnovFail.

Table 34 contains two elements: the reproduced correlations in the top part of the table, and the residuals in the bottom part of the table.

Table 34: Reproduced Correlations and Residuals

Reproduced Correlations

		Reputation	CustSat	Products	Custs	Business	InnovAdopt	InnovRep	OrgInnov	InnovFail	LearnFail	Innov	InfBusiness.
Reproduced Correlation[a]	Reputation	.718[a]	.657	.698	.689	.673	.723	.725	.646	.307	.555	.540	.659
	CustSat	.657	.602[a]	.639	.631	.616	.662	.664	.591	.281	.508	.494	.603
	NewProducts	.698	.639	.679[a]	.670	.655	.704	.705	.628	.299	.540	.525	.641
	NewCusts	.689	.631	.670	.661[a]	.646	.694	.696	.620	.295	.533	.518	.632
	NewBusiness	.673	.616	.655	.646	.632[a]	.678	.680	.606	.288	.521	.507	.618
	InnovAdopt	.723	.662	.704	.694	.678	.729[a]	.731	.651	.310	.559	.544	.664
	InnovRep	.725	.664	.705	.696	.680	.731	.733[a]	.652	.310	.561	.546	.666
	OrgInnov	.646	.591	.628	.620	.606	.651	.652	.581[a]	.276	.499	.486	.593
	InnovFail	.307	.281	.299	.295	.288	.310	.310	.276	.132[a]	.238	.231	.282
	LearnFail	.555	.508	.540	.533	.521	.559	.561	.499	.238	.430[a]	.418	.510
	OwnsInnovtn	.540	.494	.525	.518	.507	.544	.546	.486	.231	.418	.406[a]	.496
	InfBusiness	.659	.603	.641	.632	.618	.664	.666	.593	.282	.510	.496	.605[a]
Residual[b]	Reputation		.085	-.035	-.041	-.042	-.017	-.026	-.018	.049	.054	.018	.021
	CustSat	.085		-.092	.002	.009	-.050	-.017	-.003	-.004	.040	.023	.021
	NewProducts	-.035	-.092		.123	.119	.021	.004	-.043	-.036	-.079	-.005	-.019
	NewCusts	-.041	.002	.123		.209	-.021	-.033	-.050	-.029	-.109	-.077	-.025
	NewBusiness	-.042	.009	.119	.209		-.045	-.028	-.031	-.062	-.105	-.054	-.036

	InnovAdopt	-.017	-.050	.021	-.021	-.045		.081	.002	-.035	-.026	.004	.057
	InnovRep	-.026	-.017	.004	-.033	-.028	.081		.060	-.022	-.031	.001	-.007
	OrgInnov	-.018	-.003	-.043	-.050	-.031	.002	.060		.038	.081	.013	-.011
	InnovFail	.049	-.004	-.036	-.029	-.062	-.035	-.022	.038		.205	-.054	-.021
	LearnFail	.054	.040	-.079	-.109	-.105	-.026	-.031	.081	.205		.116	-.001
	OwnsInnovtn	.018	.023	-.005	-.077	-.054	.004	.001	.013	-.054	.116		.007
	InfBusiness	.021	.021	-.019	-.025	-.036	.057	-.007	-.011	-.021	-.001	.007	

Extraction Method: Principal Axis Factoring.

a. **Reproduced Correlation** - The reproduced correlation matrix is the correlation matrix based on the single retained factor. The closer the reproduced correlation matrix is to the original correlation matrix the better. If the reproduced matrix is very similar to the original correlation matrix, then the factors that were extracted account for a great deal of the variance in the original correlation matrix, and the single factor does a good job of representing the original data. The difference between the original and reproduced correlation matrix is measured by the residuals in the bottom half of the table.

b. **Residual** - These represent the differences between original correlations (shown in the correlation table earlier on) and the reproduced correlations based on the single retained factor. The closer the residuals are to zero the better. A zero residual for a pair of IO variables indicates that the one factor (rather than all 12) is explaining the correlation between the two IO variables as well as the data itself.

There are 21 (in cells highlighted amber) (31.8%) non-redundant residuals with absolute values greater than 0.05, which suggests that the single factor is explaining over two-thirds of the 66 correlations between the twelve IO variables well.

Table 35 is the Factor Score Coefficient Matrix. This is the factor weight matrix and is used to compute the factor scores for each of the 248 respondents. In terms of measuring Intrapreneurial Outcomes the factor scores can be considered as an alternative, data-derived Individual Intrapreneurial Outcome Index. An EFA-based Intrapreneurial index was calculated by computing the factor scores as follows. For a given survey respondent, the survey respondent standardised score for each IO variable was multiplied by the corresponding coefficient in the table below and these products summed.

Table 35: Factor Score Coefficient Matrix

Short name		Factor 1
Reputation	My new ideas have enhanced the reputation of my organisation	.164
CustSat	My new ideas have contributed to improved customer satisfaction for my organisation	.094
NewProducts	My new ideas have led to new products or services being developed by my organisation	.118
NewCusts	My new ideas have generated new customers for my organisation	.115
NewBusiness	My new ideas have generated additional business from existing customers	.094
InnovAdopt	My innovations have been successfully adopted by my organisation on more than three occasions	.141
InnovRep	I have a reputation as a successful innovator within my organisation	.149
OrgInnov	People in my organisation often turn to me when there is a need for a new approach	.092
InnovFail	Some of my innovations fail from time to time	.020
LearnFail	When my innovations fail, I learn from them and try to improve next time	.073
OwnsInnovtn	Once my ideas have been accepted by the organisation and moved to the development and implementation stages, I stay closely involved throughout the process, right up to launch	.051
InfBusiness.	My new ideas have influenced the way my organisation does business	.088

Discussion and Conclusion

The majority of the twelve Intrapreneurial Outcome measures are strongly correlated with each other, which suggests that they in combination represent one or more common underlying factor(s).

Cronbach's alpha measure of internal consistency of 0.94 and the KMO and Bartlett tests on the twelve IO variables in combination confirm that it was appropriate to perform exploratory factor analysis (EFA) on the data to identify factors. Cronbach's alpha is very closely associated with the EFA analysis but it is regarded as a precondition test of adequacy of the data for EFA.

The initial eigenvalues in the Total Variance Explained show that only factor 1 explains significantly more variance among the twelve IO variables than a single IO variable. The scree plot confirms that there is a single underlying factor explaining the 12 IO variables.

The Communalities results show that the single factor is collectively explaining a good proportion (>0.6) of the variance of eight of the twelve IO variables. Only the 'InnovFail' variable ("Some of my innovations fail from time-to-time") is poorly explained by the single factor.

High inter-item correlations could suggest that items are measuring the same thing. However, the reproduced correlations demonstrate that the single factor is doing a good job of explaining the twelve IO variables by showing that for the majority, there are only modest differences between the correlation among the twelve IO variables and the correlation among the twelve IO variables when reconstructed from the single factor.

Overall the EFA identifies a single factor which describes the majority of the variability in the twelve IO variables.

The Factor Score Coefficients Matrix provide the coefficients with which factor scores for each survey respondent can be computed. The computed factor scores provide an alternative, data-derived (i.e. from the raw data not from the threshold data) Individual Intrapreneurial Outcome Index independent of the hypothesised measurement model where the index is calculated on threshold values.

InnovFail stands out as being poorly explained by the index based on the 12-item factor analysis. The wording of the question for the InnovFail intrapreneurial outcome - "Some of my innovations fail from time to time" - carries some negative connotations that may provoke some respondents to answer the question in an atypical way. To investigate this a second EFA is carried out using eleven of the twelve IO variables excluding InnovFail. The purpose of the 11-item EFA is to see if the presence of InnovFail is unduly influencing the 12-item EFA index and to identify whether a more refined index could be developed.

As with the 12-item EFA, the eigenvalues and scree plot of the 11-item EFA point to a single factor solution, so only one factor is retained. The following table presents the factor matrices for the 11- and 12-item EFA derived intrapreneurial indices. The figures represent the correlation between indices and the IO variables upon which the indices are based. For context, the table also reports the correlation coefficients for the hypothesised Threshold Index against the twelve IO variables.

Table 36: Factor matrices for the 11- and 12-item EFA derived intrapreneurial indices

	Threshold-I	12ItemFA-1F	11ItemFA-1F
Reputation	0.825	0.847	0.844
CustSat	0.750	0.776	0.776
NewProducts	0.782	0.824	0.827
NewCusts	0.778	0.813	0.815
NewBusiness	0.757	0.795	0.799
InnovAdopt	0.829	0.854	0.856
InnovRep	0.816	0.856	0.857
OrgInnov	0.737	0.762	0.759
InnovFail	0.405	0.363	
LearnFail	0.674	0.655	0.643
OwnsInnovtn	0.611	0.637	0.640
InfBusiness	0.762	0.778	0.779

The results for both the 12- and 11-item based indices are very similar to the hypothesised Threshold based index. This demonstrates that, as expected due to use of the same dataset, the hypothesised threshold measure is closely aligned with both data-driven measure derived from 12- and 11-item EFA. The similarity in the correlation coefficients for 12- and 11-item derived indices suggest that there is very little improvement on the 12-item index when InnovFail is excluded. Rather than demonstrating a refinement in the 12-item index, the results for 11-item index

illustrates the redundancy of InnovFail in informing the Intrapreneurial Outcome Index.

Chapter 13 explores the relationship between the EFA derived indices and the Hypothesised Threshold index in more detail, but first the sensitivity analyses conducted on the dataset for both the SEM and EFA are described in the next chapter (Chapter 12).

Chapter 12

RESEARCH METHODOLOGY – SENSITIVITY ANALYSIS

Developing a New Measure of Intrapreneurial Outcomes – Sample Size

As presented in Chapter 9, 248 working adults participated in this research.

This section presents the findings of sensitivity test analyses that explore the effects of sample size and sample selection on results for the SEM and EFA analyses on the twelve Intrapreneurial Outcomes (IO) items.

The following details the sample subsets being contrasted to investigate the effects of sample size:

SI_248 - The whole sample of 248 respondents in the final dataset;

SI_140 - A random sample of 140 respondents selected from the final 248 dataset above.

To investigate the effects of sample selection on the consistency of results, the dataset was randomly split into three nearly equal sized chunks of 83, 83 and 82 respondents.

The results for the three chunks are reported as **SD1_83, SD2_83 and SD3_82** and collectively referred to as the 'SD samples'.

The SEM and EFA analyses carried out on the five samples were specified in the same way as each other and have been carried out previously:

- SEM analysis used the SEM3 model specification.
- EFA was a factor analysis of all twelve Intrapreneurial Outcome measures, retaining a single factor.

As a reminder, Table 37 details the questions corresponding to the twelve Intrapreneurial Outcome variables and a 'short name' being used to represent the Intrapreneurial Outcomes in the commentary and presentation of results for the remainder this Chapter.

Table 37: Short Name and Question Text

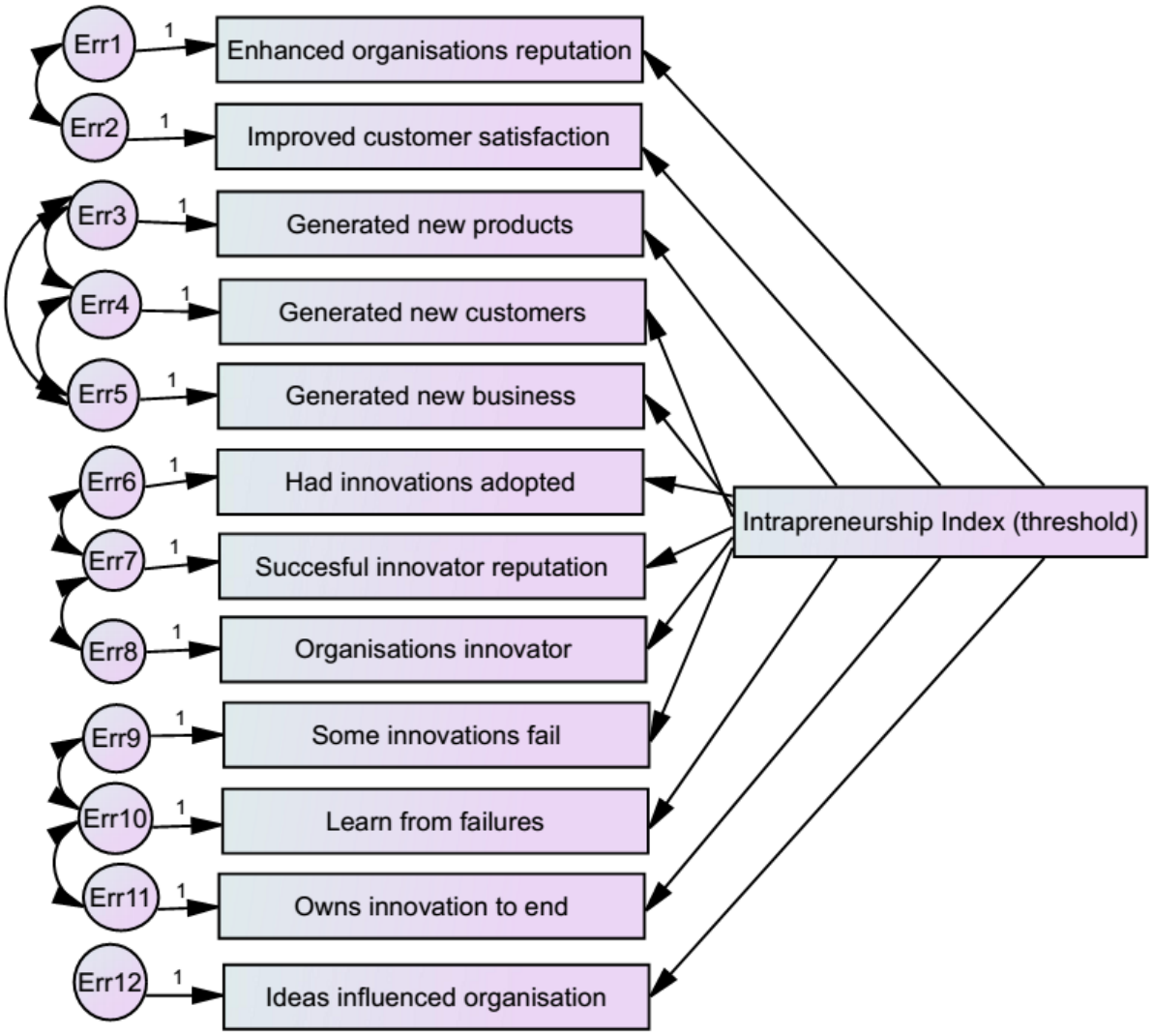
Short name	**Question text**
Reputation	My new ideas have enhanced the reputation of my organisation
CustSat	My new ideas have contributed to improved customer satisfaction for my organisation
NewProducts	My new ideas have led to new products or services being developed by my organisation
NewCusts	My new ideas have generated new customers for my organisation
NewBusiness	My new ideas have generated additional business from existing customers
InnovAdopt	My innovations have been successfully adopted by my organisation on more than three occasions
InnovRep	I have a reputation as a successful innovator within my organisation
OrgInnov	People in my organisation often turn to me when there is a need for a new approach
InnovFail	Some of my innovations fail from time to time
LearnFail	When my innovations fail, I learn from them and try to improve next time
OwnsInnovtn	Once my ideas have been accepted by the organisation and moved to the development and implementation stages, I stay closely involved throughout the process, right up to launch
InfBusiness	My new ideas have influenced the way my organisation does business

SEM Sensitivity Analysis

The literature indicates that SEM "usually requires sample sizes from 100 to 200" (Antoncic, 2007; p. 320).

SEM sensitivity analysis uses the SEM3 model specification that was run on the completed set of 248 responses. Figure 14 presents the path diagram for the SEM3 model which was presented earlier as a reminder:

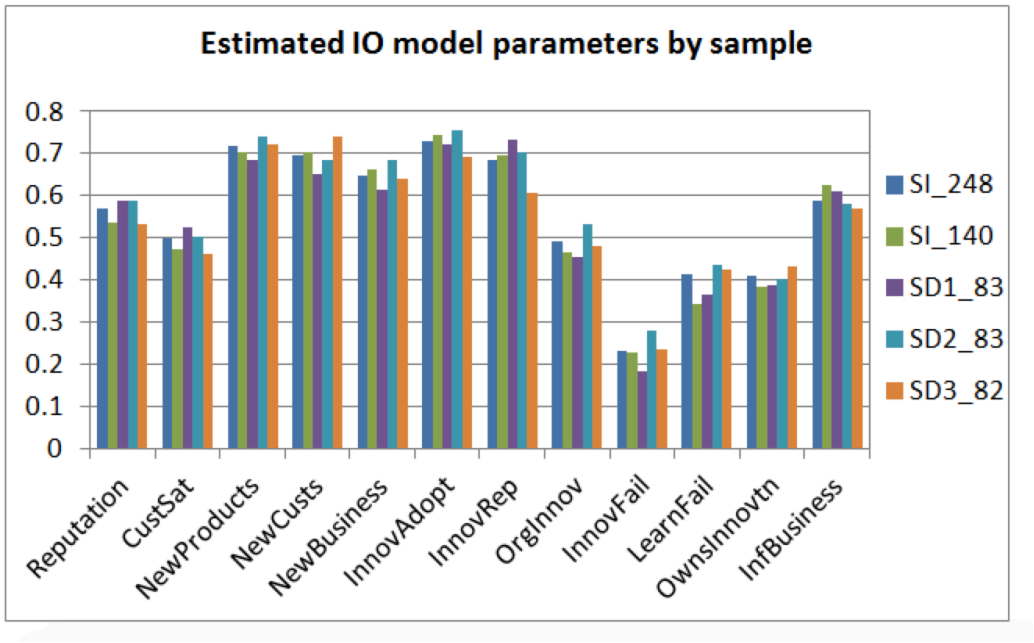
Figure 14: Path diagram for the SEM3 model

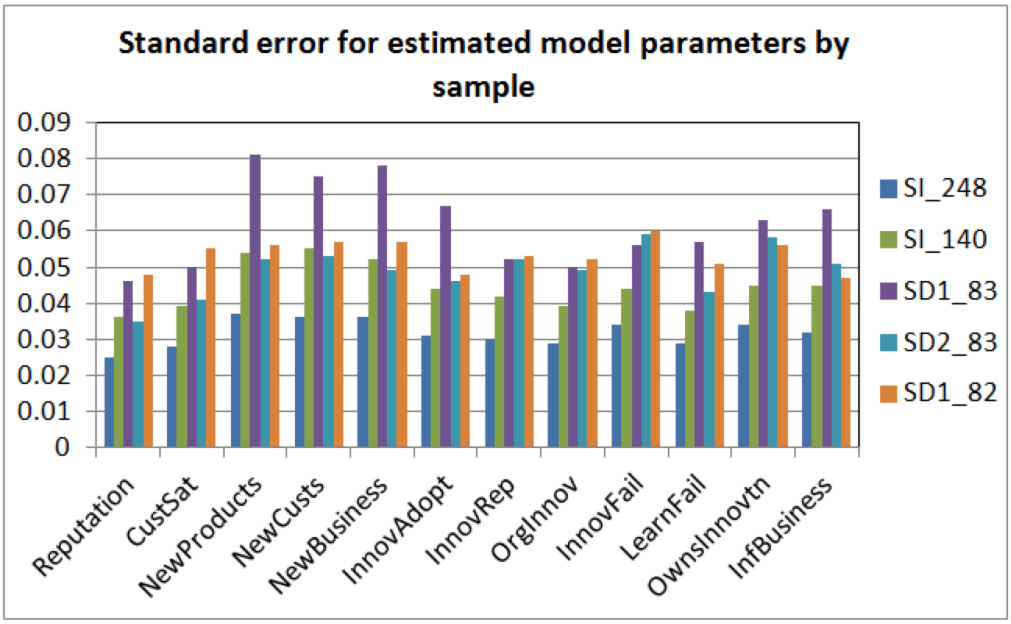


The model was fitted to the full dataset and five sub-samples and the results compared for consistency.

Figure 15 contrasts the estimated model parameters and their standard errors for each sample.

Figure 15: Estimated Model Parameters and Standard Errors





The estimated model parameters for the twelve Intrapreneurial Outcome variables regressed onto the hypothesised threshold Intrapreneurial outcome index show a very high level of consistency across the five samples.

The results for the three SI samples show that decreasing sample size increases the standard error of the model parameter estimates. The three SD samples are much smaller than the SI samples and generally show even larger standard errors, as expected. They also show a great deal of variability, particularly in the results for SD1, which show much higher standard errors than SD2 or SD3. This simply shows that the amount of variation in the SD1 sample chunk is much bigger than that in the other two and is due to the random selection of the sample chunks.

Table 38 contrasts the goodness-of-fit statistics for the five samples.

Table 38: Contrast of Goodness-of-Fit Statistics

Goodness-of-fit statistic	**SI_248**	**SI_140**	**SD1_83**	**SD2_83**	**SD3_82**	**Target value**
χ^2	119.859	96.11	73.55	72.24	86.073	
Df	58	58	58	58	58	
p-value	0	0.001	0.082	0.099	0.01	>0.05
RMSEA*	0.066	0.069	0.057	0.055	0.077	<0.05
CFI	0.978	0.974	73.55	0.987	0.968	>0.95
Hoelter (0.05)	159	112	86	88	73	
Hoelter (0.10)	178	125	96	98	81	

The literature (Byrne, 2010) explains that there are a number of goodness-of-fit statistics which reveal different qualities of model fit. The relative merits of each in

the context of this research are discussed in Chapter 8, so details are not repeated here. However, in the light of the table above which included the smaller 82/83 sample sizes, the following observations are made:

- The Chi-Squared ($\chi 2$) goodness-of-fit statistic decreases as the sample size decreases as expected. The model is not meeting the criteria for the statistic. Byrne (2010) explains it is commonplace for a model to perform well for some goodness-of-fit measures and not for others. Because the aim of this statistical model development is to achieve appropriate model parsimony and without over-fitting the model, $\chi 2$ is not the preferred measure for this study. Over-reliance on $\chi 2$ could lead to increasing parameters just to increase fit, resulting in artificial outcome. However, the measure is used in this assessment to demonstrate how the model performs against it.

- The P-value for the likelihood ratio χ^2 test for two of the three SD samples exceeds the target value of 0.05, despite this being a much smaller sample than the three SI samples which do not meet the target P-value. This reflects the fact that it is easier for the SEM3 model's 33 parameters (12 regression weights and 12 error variances for the 12 IO variables, 8 covariances and variance of the Intrapreneurship variable) to represent/ reproduce 83 data points reasonably well than it is to reproduce 248. For this reason, measures like RMSEA are used because they take into account model complexity - the number of parameters being estimated by the model are used. This is supported by the literature (Byrne, 2010).

- RMSEA and CFI appear to be the fit indices that are the least sensitive to sample size (Fan, Thompson, and Wang, 1999). RMSEA is very consistent across the three SI samples, reflecting the fact that the model specification is the same and the sample is sufficiently consistent to estimate a model of similar explanatory power. For the SD samples RMSEA is quite variable. The variation in RMSEA represents the differences between the three chunks of

data which can be expected to increase as sample size decreases and the fact that the samples do not overlap as they do in the SI samples. The model is reasonably effective at describing the SD2_83 data and achieves a target value of <0.05, but for the other two SD samples, the model specification is less effective (higher RMSEA values). Byrne (2010) stands by RMSEA as a measure. In addition, the literature varies on the target score – some practitioners say that <0.08 is acceptable, <0.05 is very good, for example, MacCallum et al. (1996) use 0.01, 0.05, and 0.08 each to demonstrate excellent, good, and mediocre fit respectively; Steiger's (1990) view is that values less than 0.05 indicate good fit. Hu & Bentler (1995) state that the upper confidence level should not be greater than 0.08.

- CFI is a goodness-of-fit measure that represents how good the model specification is for representing the data independently of how large a sample is available. As such, CFI is reasonably consistent across all samples. The variation seen on the CFI measure for the SD samples reflects modest differences in the relationships between the twelve IO variables and the Intrapreneurship measure that are unique to each sample chunk.

Exploratory Factor Analysis Sensitivity Analysis

Tables 39 and 40 present the reproduced correlation coefficients, based on the single extracted factor, obtained from re-running the same EFA analysis on the five samples. The numbers in the diagonal, the communalities, are the proportion of each variable's variance that can be explained by the factor. The correlation coefficients are colour-coded so that those representing the strongest linear relationships appear in cells shaded bright red and the weakest in pale blue shaded cells. (It should be noted that correlations were produced specifically for EFA rather than for the data more generally.)

Table 39: Reproduced Correlation Coefficients

SI_248	Reputation	CustSat	NewProducts	NewCusts	NewBusiness	InnovAdopt	InnovRep	OrgInnov	InnovFail	LearnFail	OwnsInnovd	InfBusiness
Reputation	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.3	0.6	0.5	0.7
CustSat	0.7	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.3	0.5	0.5	0.6
NewProducts	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.3	0.5	0.5	0.6
NewCusts	0.7	0.6	0.7	0.7	0.6	0.7	0.7	0.6	0.3	0.5	0.5	0.6
NewBusiness	0.7	0.6	0.7	0.6	0.6	0.7	0.7	0.6	0.3	0.5	0.5	0.6
InnovAdopt	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.3	0.6	0.5	0.7
InnovRep	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.3	0.6	0.5	0.7
OrgInnov	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.3	0.5	0.5	0.6
InnovFail	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.1	0.2	0.2	0.3
LearnFail	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.2	0.4	0.4	0.5
OwnsInnovd	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.2	0.4	0.4	0.5
InfBusiness	0.7	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.3	0.5	0.5	0.6

SI_140

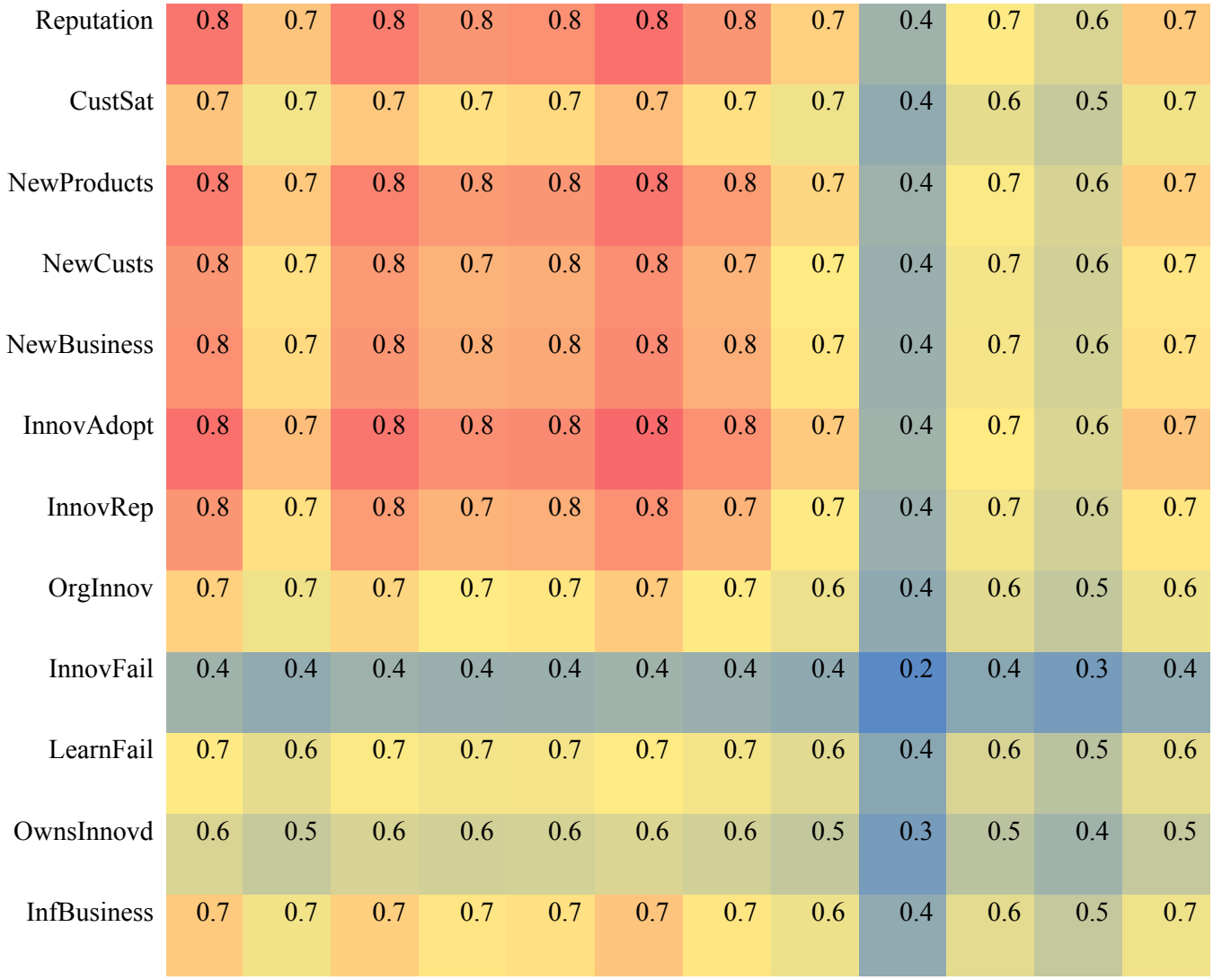
Reputation	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.3	0.4	0.4	0.6
CustSat	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.3	0.4	0.4	0.6
NewProducts	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.3	0.4	0.4	0.6
NewCusts	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.3	0.4	0.4	0.6
NewBusiness	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.3	0.4	0.4	0.6
InnovAdopt	0.7	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.3	0.5	0.5	0.7
InnovRep	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.3	0.5	0.5	0.7
OrgInnov	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.3	0.4	0.4	0.6
InnovFail	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.1	0.2	0.2	0.3
LearnFail	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.2	0.3	0.3	0.4
OwnsInnovd	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.2	0.3	0.3	0.4
InfBusiness	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.3	0.4	0.4	0.6

Contrasting the reproduced correlation coefficients for the samples of 248 and 140 shows very little difference in the nature of the linear relationship between the pairs of IO variables. The largest difference between the three samples is 0.13 and only one in ten reproduced correlation coefficients are different by more than 0.1 between samples. The results show that over this range, the sample size is having very little effect on the measured relationship between IO variables.

Table 40: Reproduced Correlation Coefficients

SD1_83	Reputation	CustSat	NewProducts	NewCusts	NewBusiness	InnovAdopt	InnovRep	OrgInnov	InnovFail	LearnFail	OwnsInnovd	InfBusiness
Reputation	0.7	0.7	0.6	0.6	0.6	0.7	0.7	0.6	0.2	0.4	0.5	0.6
CustSat	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.5	0.2	0.4	0.5	0.6
NewProducts	0.6	0.6	0.5	0.6	0.5	0.6	0.7	0.5	0.2	0.4	0.4	0.6
NewCusts	0.6	0.6	0.6	0.6	0.5	0.6	0.7	0.5	0.2	0.4	0.4	0.6
NewBusiness	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.2	0.3	0.4	0.5
InnovAdopt	0.7	0.6	0.6	0.6	0.5	0.6	0.7	0.5	0.2	0.4	0.5	0.6
InnovRep	0.7	0.7	0.7	0.7	0.6	0.7	0.8	0.6	0.2	0.4	0.5	0.7
OrgInnov	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.2	0.3	0.4	0.5
InnovFail	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2
LearnFail	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.1	0.3	0.3	0.4
OwnsInnovd	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.1	0.3	0.3	0.4
InfBusiness	0.6	0.6	0.6	0.6	0.5	0.6	0.7	0.5	0.2	0.4	0.4	0.6

SD2_83


Reputation 0.8 0.7 0.8 0.8 0.8 0.8 0.8 0.7 0.4 0.7 0.6 0.7
CustSat 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.4 0.6 0.5 0.7
NewProducts 0.8 0.7 0.8 0.8 0.8 0.8 0.8 0.7 0.4 0.7 0.6 0.7
NewCusts 0.8 0.7 0.8 0.7 0.8 0.8 0.7 0.7 0.4 0.7 0.6 0.7
NewBusiness 0.8 0.7 0.8 0.8 0.8 0.8 0.8 0.7 0.4 0.7 0.6 0.7
InnovAdopt 0.8 0.7 0.8 0.8 0.8 0.8 0.8 0.7 0.4 0.7 0.6 0.7
InnovRep 0.8 0.7 0.8 0.7 0.8 0.8 0.7 0.7 0.4 0.7 0.6 0.7
OrgInnov 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.6 0.4 0.6 0.5 0.6
InnovFail 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.2 0.4 0.3 0.4
LearnFail 0.7 0.6 0.7 0.7 0.7 0.7 0.7 0.6 0.4 0.6 0.5 0.6
OwnsInnovd 0.6 0.5 0.6 0.6 0.6 0.6 0.6 0.5 0.3 0.5 0.4 0.5
InfBusiness 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.6 0.4 0.6 0.5 0.7

SD3_82

Reputation	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.3	0.5	0.6	0.6
CustSat	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.3	0.5	0.5	0.6
NewProducts	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.3	0.6	0.6	0.6
NewCusts	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.3	0.6	0.6	0.6
NewBusiness	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.3	0.6	0.6	0.6
InnovAdopt	0.7	0.6	0.7	0.7	0.7	0.8	0.7	0.7	0.3	0.6	0.6	0.7
InnovRep	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.3	0.6	0.6	0.6
OrgInnov	0.6	0.6	0.7	0.6	0.6	0.7	0.7	0.6	0.3	0.5	0.5	0.6
InnovFail	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.1	0.2	0.2	0.3
LearnFail	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.2	0.5	0.5	0.5
OwnsInnovd	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.2	0.5	0.5	0.5
InfBusiness	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.3	0.5	0.5	0.6

Contrasting the correlation coefficients for the three distinct sample chunks of 83, 83 and 82 shows that, although there is some variation between the three samples, they share most of the distinctive features of the correlations in the main sample. These features include weak correlation between InnovFail and the other variables and strongest correlation among the NewProducts, NewCusts and NewBusiness variables.

The differences between the samples of 83, 83 and 82 are summarised in Table 41, which presents the maximum difference between the three samples. The strongest

shades of orange represent the variable pairs where the difference in the correlation is greatest.

Table 41: Maximum Difference

Maximum difference in SD samples	Reputation	CustSat	NewProducts	NewCusts	NewBusiness	InnovAdopt	InnovRep	OrgInnov	InnovFail	LearnFail	OwnsInnovd	InfBusiness
Reputation	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.1	0.1
CustSat	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1
NewProducts	0.2	0.1	0.3	0.2	0.3	0.2	0.1	0.2	0.2	0.3	0.2	0.2
NewCusts	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.1	0.1
NewBusiness	0.2	0.2	0.3	0.2	0.3	0.2	0.1	0.2	0.2	0.3	0.2	0.2
InnovAdopt	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.1	0.1
InnovRep	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1
OrgInnov	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.2	0.1
InnovFail	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
LearnFail	0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.2	0.2
OwnsInnovd	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1
InfBusiness	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1

The intrapreneurial outcome showing the greatest differences in the reproduced communalities and covariances between the three SD samples is LearnFail which in the SD2_83 sample has a variance that is as much as 0.3 higher than the other SD samples and has several correlation coefficients with other IO variables that are as much as 0.3 higher. However, the five differences of 0.3 for LearnFail correlation coefficients represent the tail of a reasonably smooth distribution of differences in reproduced correlations, which includes 10 coefficients differing by 0.3 and many more that differ by 0.2. This relatively smooth distribution suggests that these are the effects of the relatively low sample size, rather than telling us something specific about LearnFail. Indeed, the mean and standard deviation for LearnFail are reasonably consistent across the three samples.

Cronbach's alpha measure of internal consistency for all 12 Intrapreneurial outcomes items is detailed in Table 42 below and shows the items to be highly consistent for all five samples.

Table 42: Internal Consistency

Measure	**SI_248**	**SI_140**	**SD1_83**	**SD2_83**	**SD3_83**
Cronbach's alpha	0.92	0.90	0.90	0.93	0.91

Factor analysis was carried out using the Factor command in SPSS. The remainder of this section presents the main results from this analysis.

Table 43 presents a summary of the responses to the twelve Intrapreneurial Outomes questions for all five samples. The max-diff column shows the magnitude of difference between the SD1, SD2 or SD3 samples, whichever is greatest.

Table 43: Magnitude of Differences

IO	SI_248	SI_140	SD1_83	SD2_83	SD3_82	max-diff
Reputation	5.3	5.4	5.2	5.5	5.3	0.3
CustSat	5.3	5.4	5.2	5.5	5.4	0.3
NewProducts	4.9	4.8	4.6	5.0	4.9	0.4
NewCusts	4.9	4.9	4.7	5.1	4.8	0.4
NewBusiness	5.0	5.0	4.7	5.1	5.0	0.3
InnovAdopt	4.9	4.9	4.5	5.1	5.1	0.6
InnovRep	4.7	4.6	4.4	4.7	4.9	0.4
OrgInnov	5.1	5.1	5.0	5.2	5.1	0.3
InnovFail	4.5	4.5	4.5	4.5	4.4	0.0
LearnFail	5.6	5.7	5.5	5.7	5.6	0.3
OwnsInnovtn	5.2	5.3	5.0	5.4	5.0	0.4
InfBusiness	5.2	5.3	5.0	5.4	5.4	0.3
Sample size	248	140	83	83	82	

The variation present among the three SI samples is very small and shows that even with a sample of just 140, the mean score measures are very consistent with the full samples.

There is a modest amount of variation present in the mean scores for the two SD samples, which is expected for a sample size of just 83/82. Nonetheless, the largest

mean score difference observed - 0.6 InnovAdopt - is well within the standard deviation of 1.8 and demonstrates that the mean scores measured are quite consistent across the three samples.

Table 44 presents the results for the Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity tests for the five samples.

Table 44 KMO and Bartlett

KMO and Bartlett's Test	**SI_248**	**SI_140**	**SD1_83**	**SD2_83**	**SD3_82**
KMO Measure of Sampling Adequacy.	0.934	0.904	0.882	0.942	0.912
Approx. Chi-Square	2281.3	1170.3	676.6	932.1	713.4
Df	66	66	66	66	66
Sig.	0.000	0.000	0.000	0.000	0.000

The smallest KMO measure value of 0.882 for SD1_83 is close to the optimum of 1, well above the recommended minimum of 0.5.

Bartlett's Test of Sphericity test p-values of 0.000 for all samples indicates that the hypothesis that all variables are completely independent of each other can be rejected.

The following Table 45 presents communalities, the proportion of each variable's variance that can be explained by the single retained factor. As before, the max-diff column shows the magnitude of difference between the SD1, SD2 or SD3 samples, whichever is greatest.

Table 45: Communalities - Initial

IO	SI_248	SI_140	SD1_83	SD2_83	SD3_82	max-diff
Reputation	0.710	0.680	0.730	0.796	0.677	0.118
CustSat	0.645	0.661	0.694	0.724	0.620	0.103
NewProducts	0.743	0.723	0.687	0.822	0.767	0.135
NewCusts	0.791	0.792	0.804	0.827	0.794	0.033
NewBusiness	0.770	0.787	0.787	0.821	0.750	0.072
InnovAdopt	0.751	0.744	0.721	0.822	0.788	0.101
InnovRep	0.746	0.745	0.795	0.774	0.720	0.075
OrgInnov	0.588	0.559	0.522	0.679	0.644	0.158
InnovFail	0.229	0.239	0.280	0.353	0.238	0.114
LearnFail	0.529	0.425	0.533	0.707	0.499	0.208
OwnsInnovtn	0.439	0.356	0.426	0.533	0.517	0.107
InfBusiness	0.602	0.650	0.567	0.667	0.626	0.100

The results show that the squared multiple correlation measure of each variable with all other variables is reasonably consistent across all samples. Weak multiple correlation between InnovFail and all other variables is a consistent theme across all samples.

Table 46, Extraction Measures, shows the proportion of each variable's variance that can be explained by the single retained factor.

Table 46: Extraction Measures – Communalities

IO	SI_248	SI_140	SD1_83	SD2_83	SD3_82	max-diff
Reputation	0.718	0.620	0.695	0.811	0.647	0.164
CustSat	0.602	0.564	0.633	0.662	0.508	0.155
NewProducts	0.679	0.614	0.544	0.798	0.700	0.255
NewCusts	0.661	0.603	0.560	0.749	0.666	0.189
NewBusiness	0.632	0.577	0.479	0.760	0.663	0.281
InnovAdopt	0.729	0.686	0.613	0.824	0.758	0.211
InnovRep	0.733	0.733	0.778	0.748	0.688	0.090
OrgInnov	0.581	0.526	0.457	0.640	0.623	0.183
InnovFail	0.132	0.126	0.057	0.214	0.130	0.157
LearnFail	0.430	0.299	0.253	0.583	0.464	0.331
OwnsInnovtn	0.406	0.324	0.332	0.419	0.472	0.140
InfBusiness	0.605	0.617	0.575	0.651	0.597	0.076

The degree of variation explained by the single retained factor in the two SI samples is very similar with reasonably close-matching measures for the twelve IO variables across the three samples. The same is evident among the three SD samples although the differences in the measures across the samples tends to be greater due to the modest sample size. The greatest difference is found in LearnFail.

Table 47 details the amount of variation in the twelve IO variables that is explained by each factor. Factor analysis loads as much as possible of the variability into the first

factor. Then as much possible of the remaining (unexplained) variability - is incorporated into the second factor and so on. There is a lot of consistency between the five samples in terms of the amount of variation in the 12 IO variables being explained by the factors - over 60% is being explained by the first factor.

Table 47: Percentage of Total Variance Explained

Factor	**SI_248**	**SI_140**	**SD1_83**	**SD2_83**	**SD3_82**
1	60.7%	55.9%	53.4%	68.0%	60.8%
2	8.8%	10.2%	12.5%	7.8%	7.7%
3	6.5%	7.5%	8.7%	5.9%	5.9%
4	4.4%	5.3%	5.1%	4.2%	5.0%
5	4.2%	4.8%	4.5%	3.6%	4.5%
6	3.7%	3.9%	4.2%	2.2%	4.1%
7	3.0%	3.8%	3.1%	2.1%	3.2%
8	2.6%	2.9%	2.9%	1.6%	2.9%
9	2.1%	1.8%	2.1%	1.6%	2.0%
10	1.5%	1.6%	1.4%	1.2%	1.6%
11	1.4%	1.4%	1.2%	1.1%	1.2%
12	1.1%	1.0%	1.0%	1.0%	1.0%

The scree plots for the EFA on each sample all show a clear elbow in the plot above the second factor and are similar to the scree plot for the full sample shown in Figure 16. The scree plots show only one factor - Factor 1 - is above the elbow in the scree

plot and should be retained for each sub-sample. Only sample SD1_83 shows signs of Factor 2 being a candidate for retaining in the model although the evidence for this is modest given that accounts for 12.5% of the variation in the 12 IO variables in that sub-sample.

Figure 16: Plot contrasting scree plots for all 5 subsamples

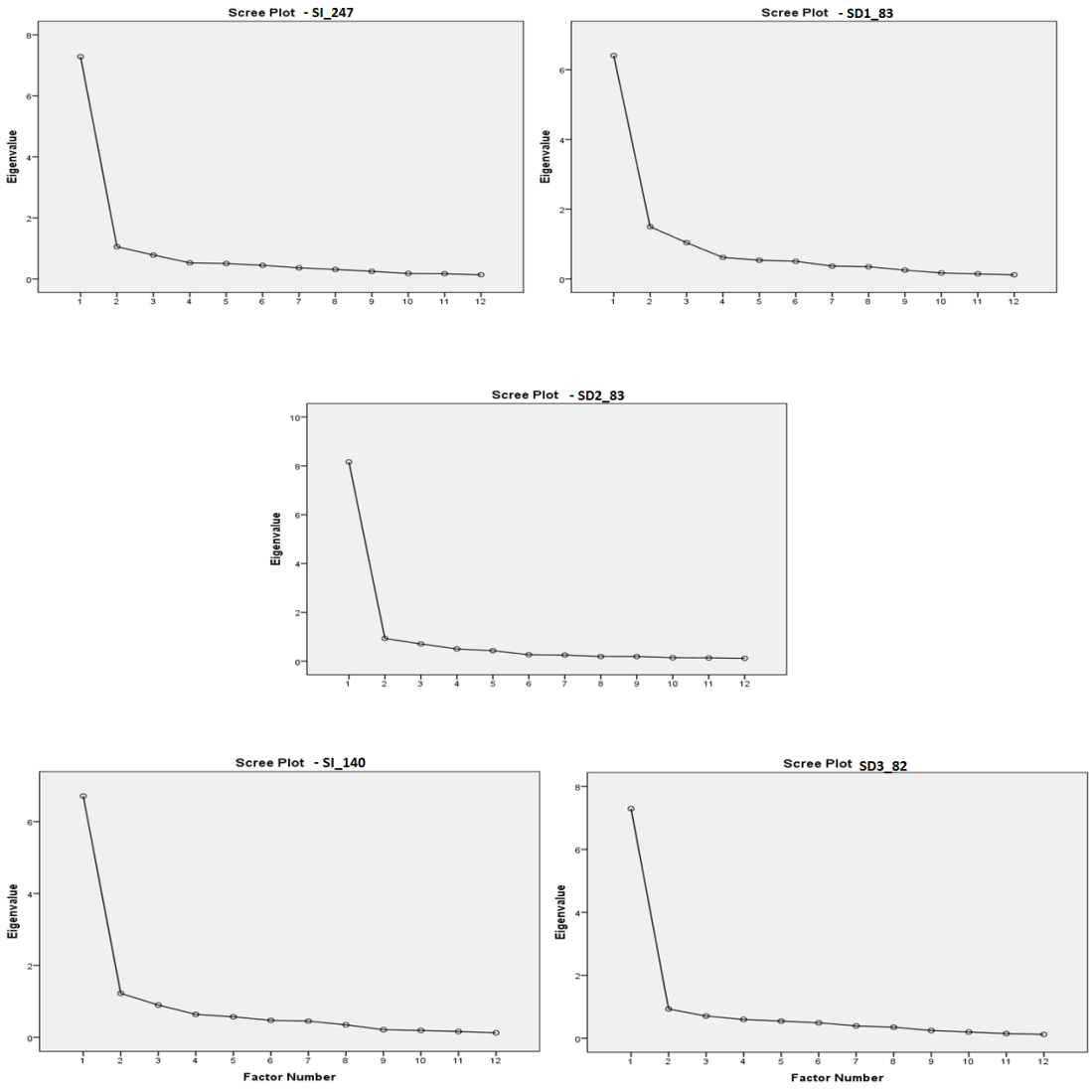


Figure 17 contrasts the factor scores for the five samples. The scores represent the correlations between the variable and the factor.

Figure 17: Factor Scores

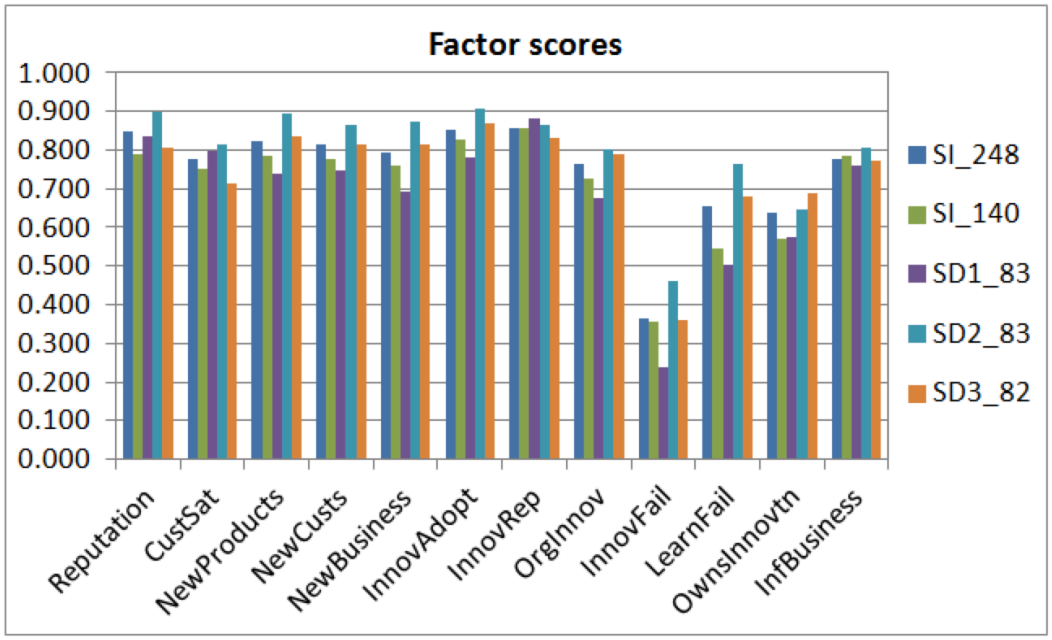


Figure 17 illustrates the similarity between the factor scores for each sample, showing highly consistent factor analysis results across samples.

Figure 18 is a high level summary of the differences between the correlations observed in the data and the reproduced correlations using the derived factors.

Figure 18: Reproduced Correlation Residuals

Measure	**SI_248**	**SI_140**	**SD1_83**	**SD2_83**	**SD3_82**
No. R>0.05, R<-0.05	21	34	34	19	22
% R>0.05, R<-0.05	32%	52%	52%	29%	33%

In the full sample, 21 (32%) of the correlations between the 66 pairs of IO variables were greater than 0.05 (5%). The ability of the single factor to reproduce the correlation coefficients tends to decrease as sample size is reduced although SD2_83 matches the full sample on this measure.

Discussion and Conclusions

SEM

The goodness-of-fit measures assess how well the SEM3 model specification describes the different samples of data. Variations in these measures represent variations in the SEM3 model's ability to represent the relationships in different samples of data and so reflect differences in the data. The consistent RMSEA and CFI goodness-of-fit measures and model parameters for the three SI samples demonstrate that the SEM3 model can produce consistency for a relatively wide range of sample sizes.

There is greater variation in the three SD samples. The variation shows that the three chunks of 82/83 responses are less consistent than the large SI samples. However, the variation in the SEM3 model parameters is modest given that a sample of 83 is a small sample size.

The results of the sensitivity analysis of the SEM3 model across different samples of the data provide a good degree of confidence that the model is unlikely to change drastically if the sample size were to be increased above 248.

EFA

In general, the EFA results for the three SI samples are highly consistent with each other:

- The reproduced correlation coefficients are very similar with a maximum difference between samples of 0.13 and only one-in-ten coefficients with a difference greater than 0.1.

- The mean scores for the 12 IO variables across samples are all within 0.14 of each other.

- The KMO measure of sampling adequacy range from 0.90 to 0.93, and is well above the threshold of 0.5.

- Bartlett's test results are all highly significant at the 99.9% level with p-values of 0.000.

- Communalities for all twelve IO variables across the three samples are also very consistent.

- Well over half of the total variation in the twelve IO variables is being explained by the single factor for all samples and are reasonably consistent, ranging between 53% and 68%

- The factor scores are also quite consistent and within 10% of each other across SI samples except for InnovFail and LearnFail, which have quite distinctly different factor scores.

The findings for the EFA analysis of the three SD samples are less consistent than those for the SI samples. The scale of the differences is in keeping with the small sample size of just 82/83 respondents and the main characteristics of the analysis of the full sample are clearly evident in the SD samples:

- The reproduced correlation coefficients are mostly very similar. The maximum difference between SD samples is 0.33; nearly two fifths of the coefficients have a difference greater than 0.2.

- The difference in the mean scores for the 12 IO variables across samples range from 0.1 for InnovFail to 0.6 for InnovAdopt.

- The KMO measure of sampling adequacy is comfortably above 0.9 and well above the threshold of 0.5. The measure decreases only slightly as the sample size decreases from 248 to 140.

- Bartlett's test results are all highly significant at the 99.9% level with p-values of 0.000.

- Communalities for all twelve IO variables across the three SD samples are reasonably consistent.

- Well over half of the total variation in the twelve IO variables is being explained by the single factor for all SD samples and are quite variable, ranging between 53% and 68%.

The factor scores for the single extracted factor are reasonably consistent across the three SD samples, except for InnovFail and LearnFail which have quite distinctive factor scores for SD1_83 sample.

C h a p t e r 1 3

RELATIONSHIP BETWEEN THE 12- AND 11-ITEM EFA DERIVED INDICES AND THE HYPOTHESISED THRESHOLD INDEX

Comparison of Individual Intrapreneurial Outcome indices

Table 48 presents details of the full set of Individual Intrapreneurial Outcome Indices developed in this study.

Table 48: Details of the full set of Individual Intrapreneurial Outcome Indices

Reference	**Description**	**Role**
Baseline-I	Baseline Intrapreneurial index calculated as the mean of the 12 Intrapreneurial Outcome scores	Reference point
Threshold-I	Hypothesised Intrapreneurial index calculated as the mean of the 12 Intrapreneurial Outcome scores, with a threshold of >4 applied to the scores	Hypothesised index being tested
12ItemFA-1F	Data-driven Intrapreneurial index derived from the 12-item factor analysis of the 12 Intrapreneurial Outcome scores. The index was taken as the single factor derived from the 12-item factor analysis.	Data-driven indices against which to benchmark the hypothesised threshold index
11ItemFA-1F	Data-driven Intrapreneurial index derived from the 11-item factor analysis of 11 of the 12 Intrapreneurial Outcome scores. The index was taken as the single factor derived from the 11-item factor analysis.	

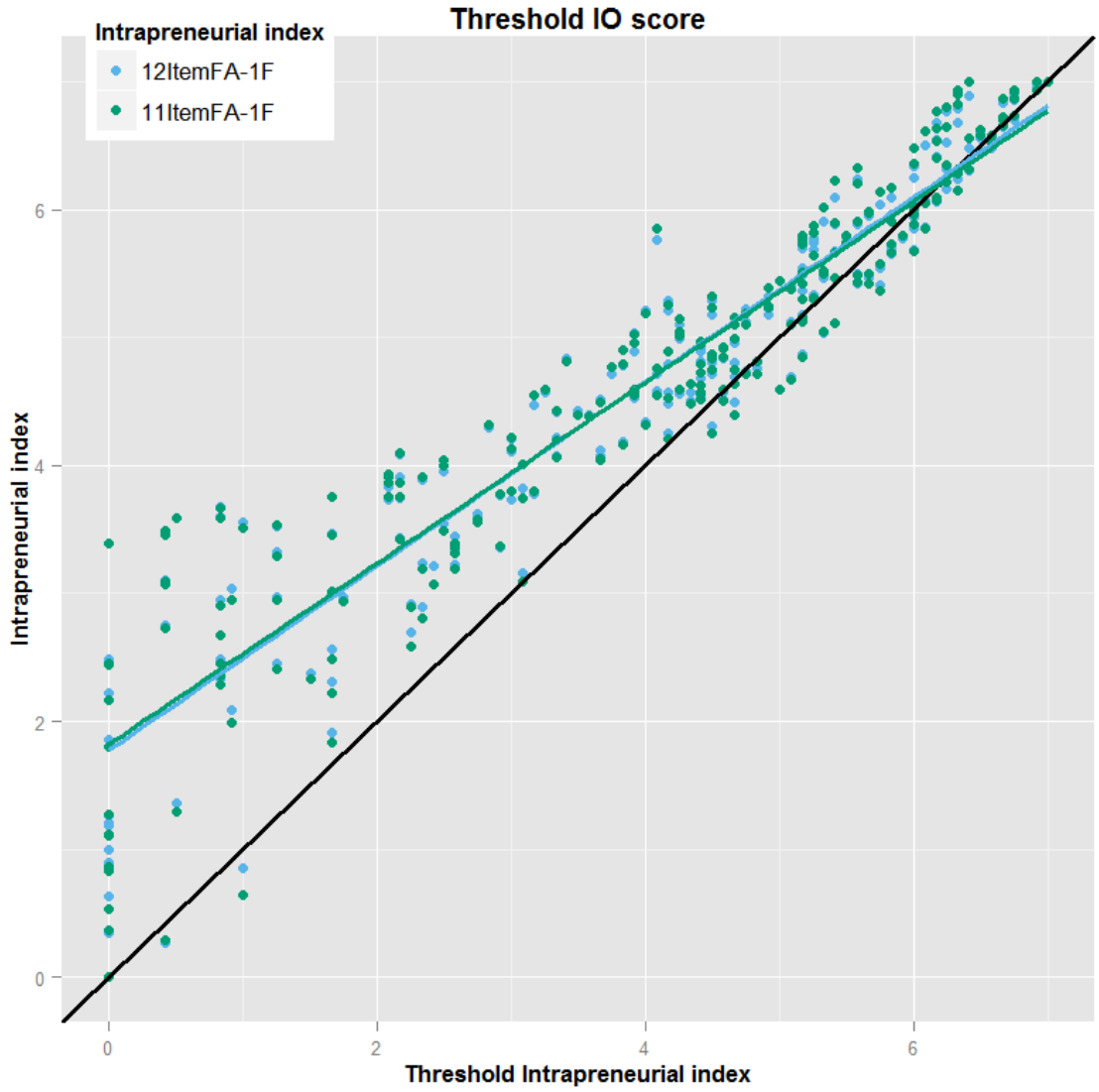
Throughout this section the above indices are referred to by the names listed in the Reference column in the above table.

The Baseline-I index is used as a reference for developing the hypothesised Threshold-I index as reported in Chapter 10. This section compares the Threshold-I, 12ItemFA-1F and 11ItemFA-1F with each other and with the intrapreneurial outcomes from which they are derived.

Figure 19 contrasts the 12ItemFA-1F and 11ItemFA-1F Intrapreneurial Outcome indices (based on the intrapreneurial outcomes data without threshold applied) against the hypothesised threshold measure of Intrapreneurship, Threshold-I. The diagonal line indicates where responses would lie if the 12 and 11-item Factor 1 measures were perfectly correlated with the Threshold Intrapreneurship measure.

The derived indices were rescaled to span the range from 0 to 7 so that they were on the same scale as Threshold-I. A Threshold-I = 0 represents individuals who do not score 4 or higher in any of the intrapreneurial outcomes.

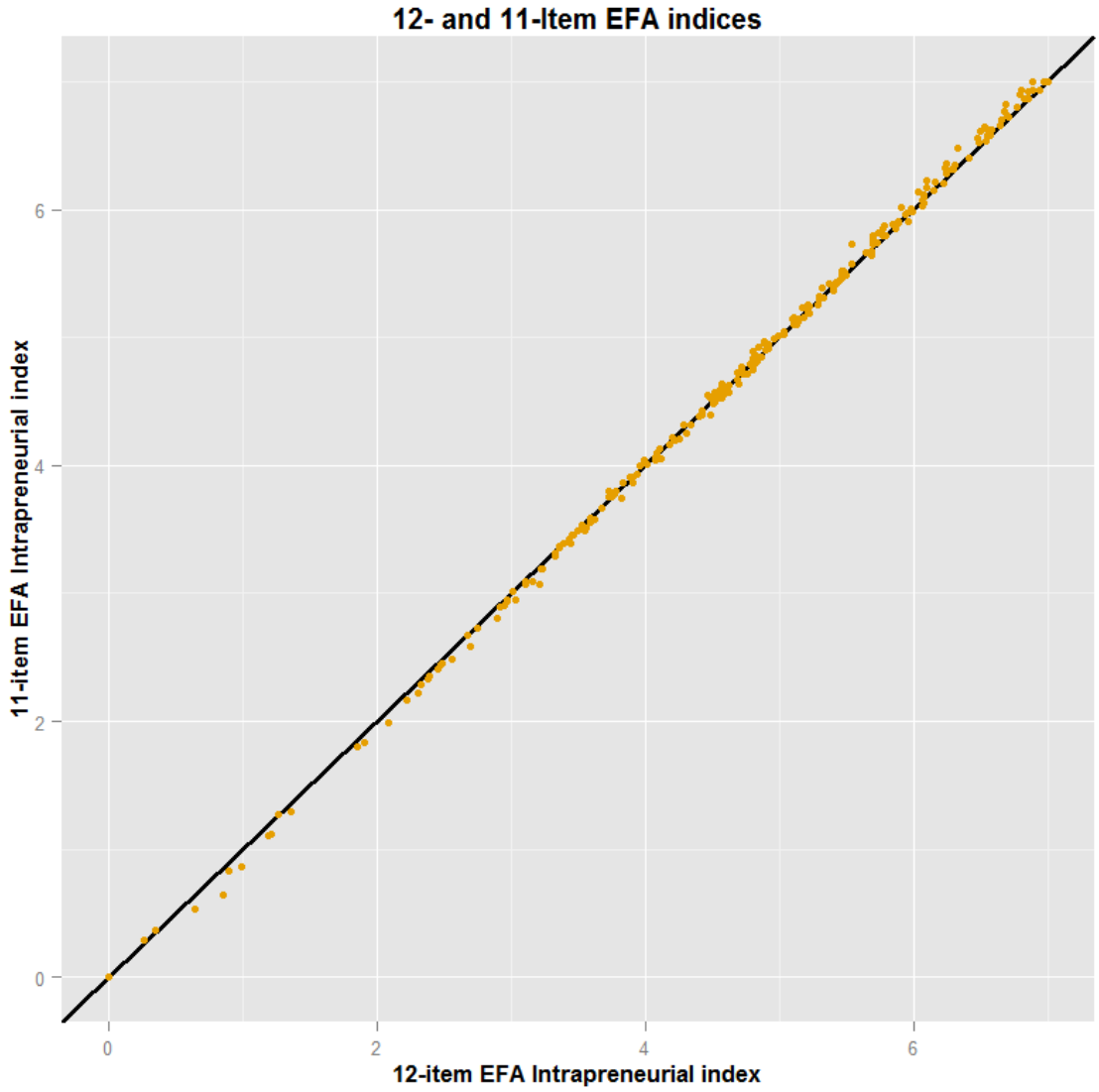
Figure 19: Contrasts



The Figure 19 shows that both the 12- and 11-item Intrapreneurial Outcome indices are closely correlated with the Threshold-I index.

The following Figure 20 compares the 12- and 11-item Intrapreneurial Outcome indices. As was evident in the previous figure, Figure 20 shows how similar the 12- and 11-Item EFA derived indices are.

Figure 20: Comparison of Indices



The following Table 49 presents the Pearson Correlation Coefficients between the hypothesised Threshold-I and the 12ItemFA-1F and 11ItemFA-1F Intrapreneurial Outcome indices along with the 95% confidence intervals.

Table 49: Pearson Correlation Coefficients

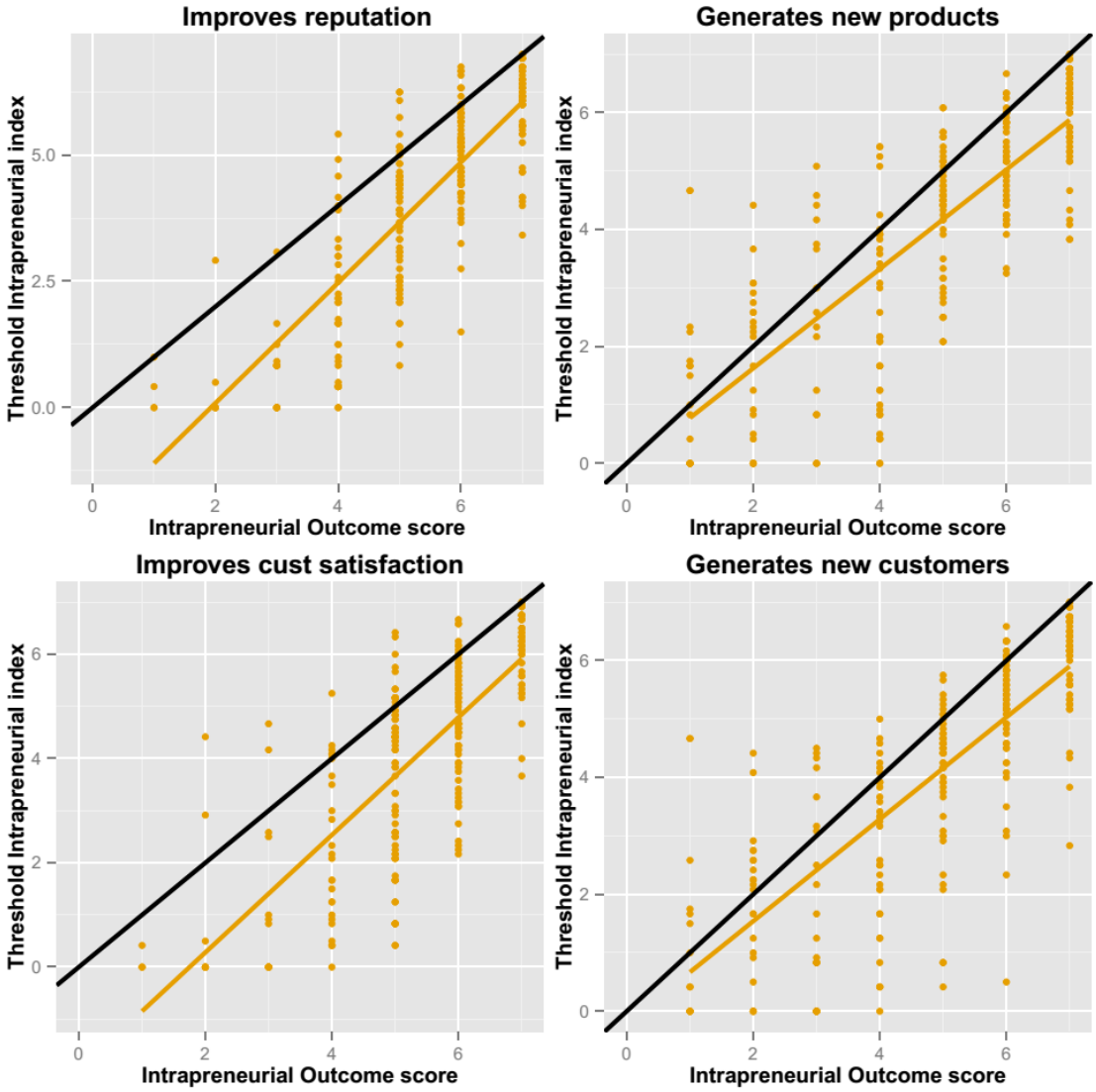
Intrapreneurial Outcome index	Threshold Intrapreneurship
12ItemFA-1F	0.944 (0.928, 0.956)
11ItemFA-1F	0.941 (0.926, 0.954)

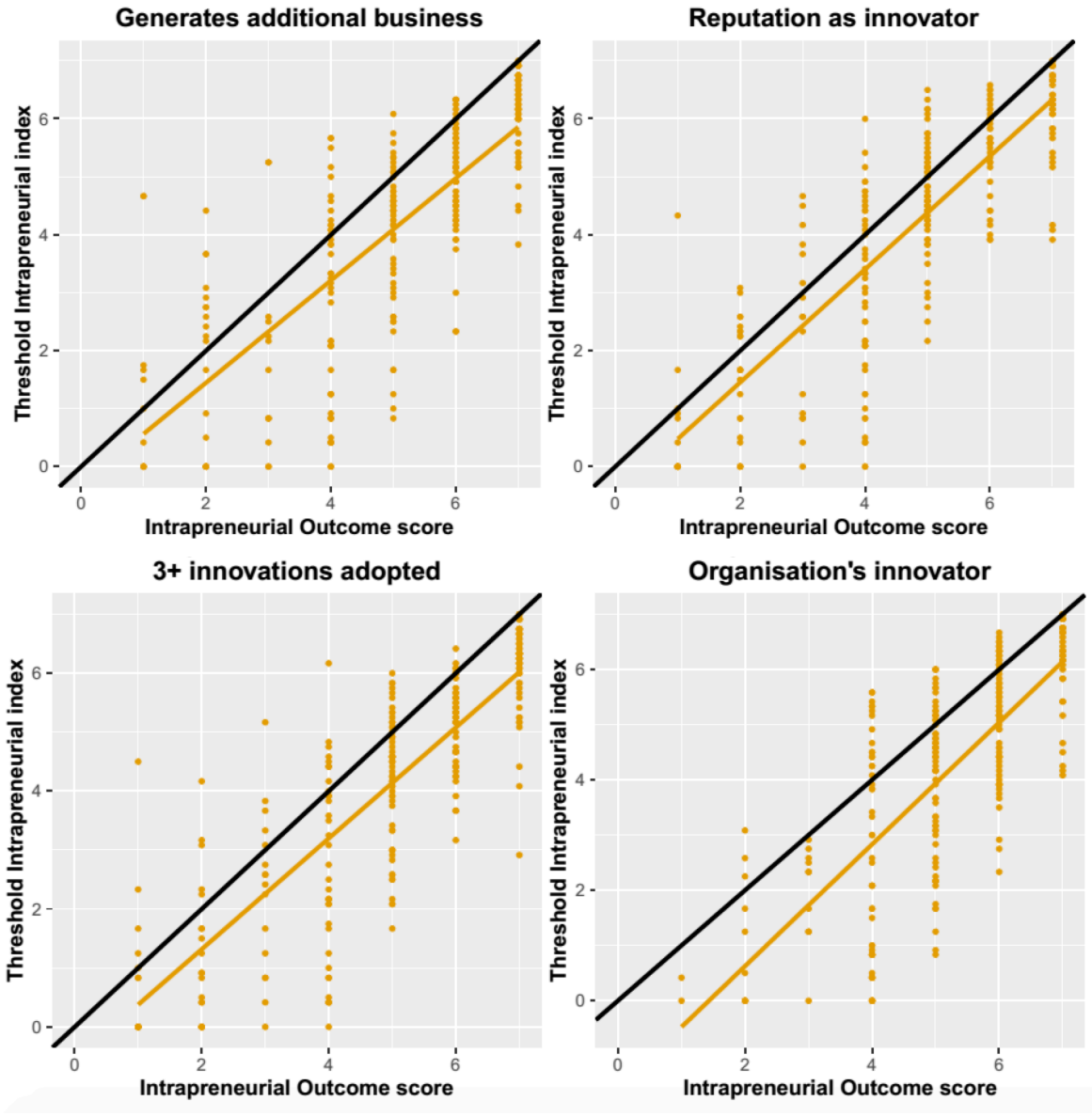
Both the 12- and 11-item Factor Analysis derived indices are very strongly correlated with the Threshold index.

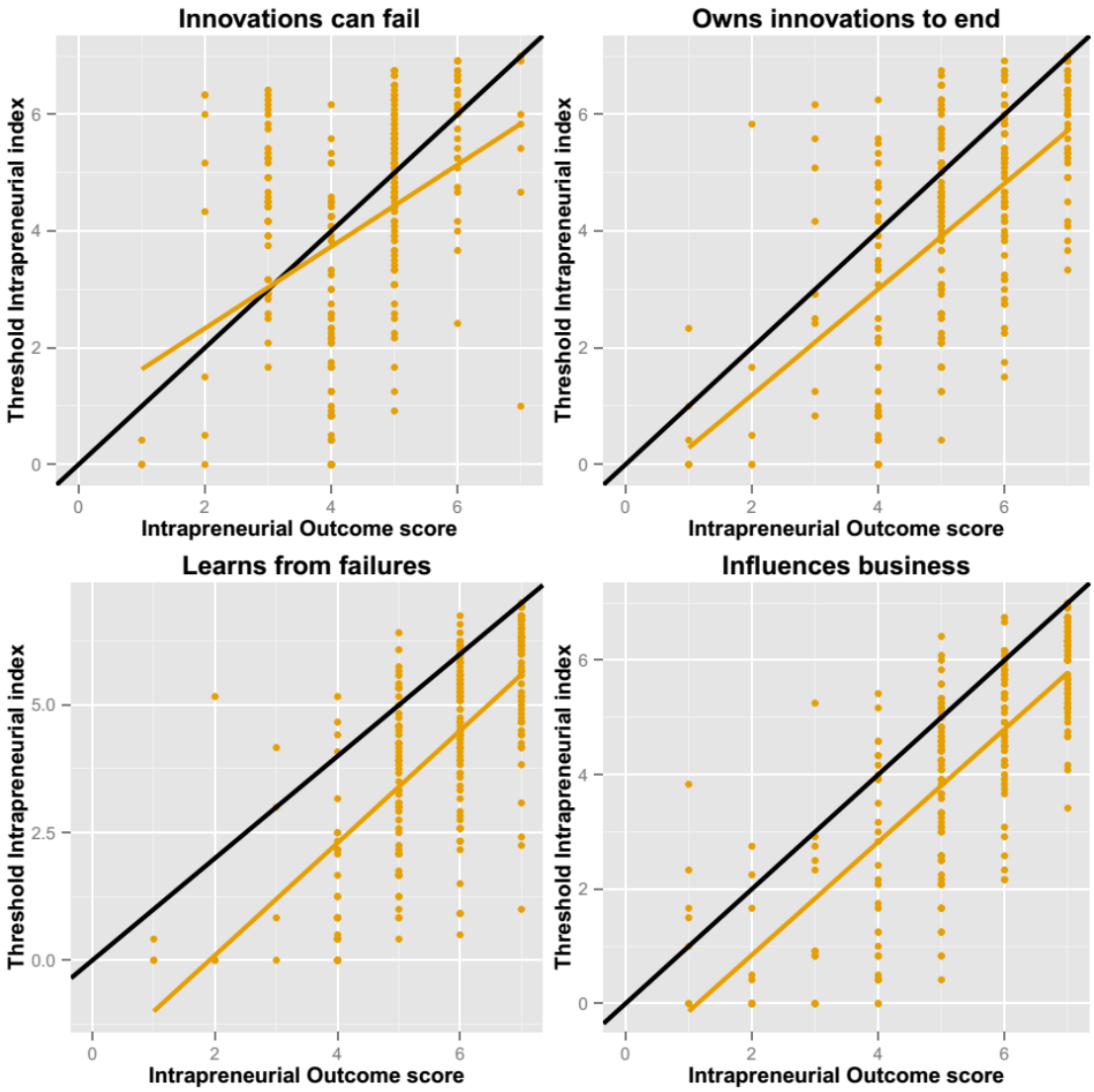
The conclusion from these results is that there is very little difference between the12- and 11- item factor analysis indices and that the remainder of the report should use the 11-item index rather than duplicate findings by reporting results for both 12- and 11-item indices.

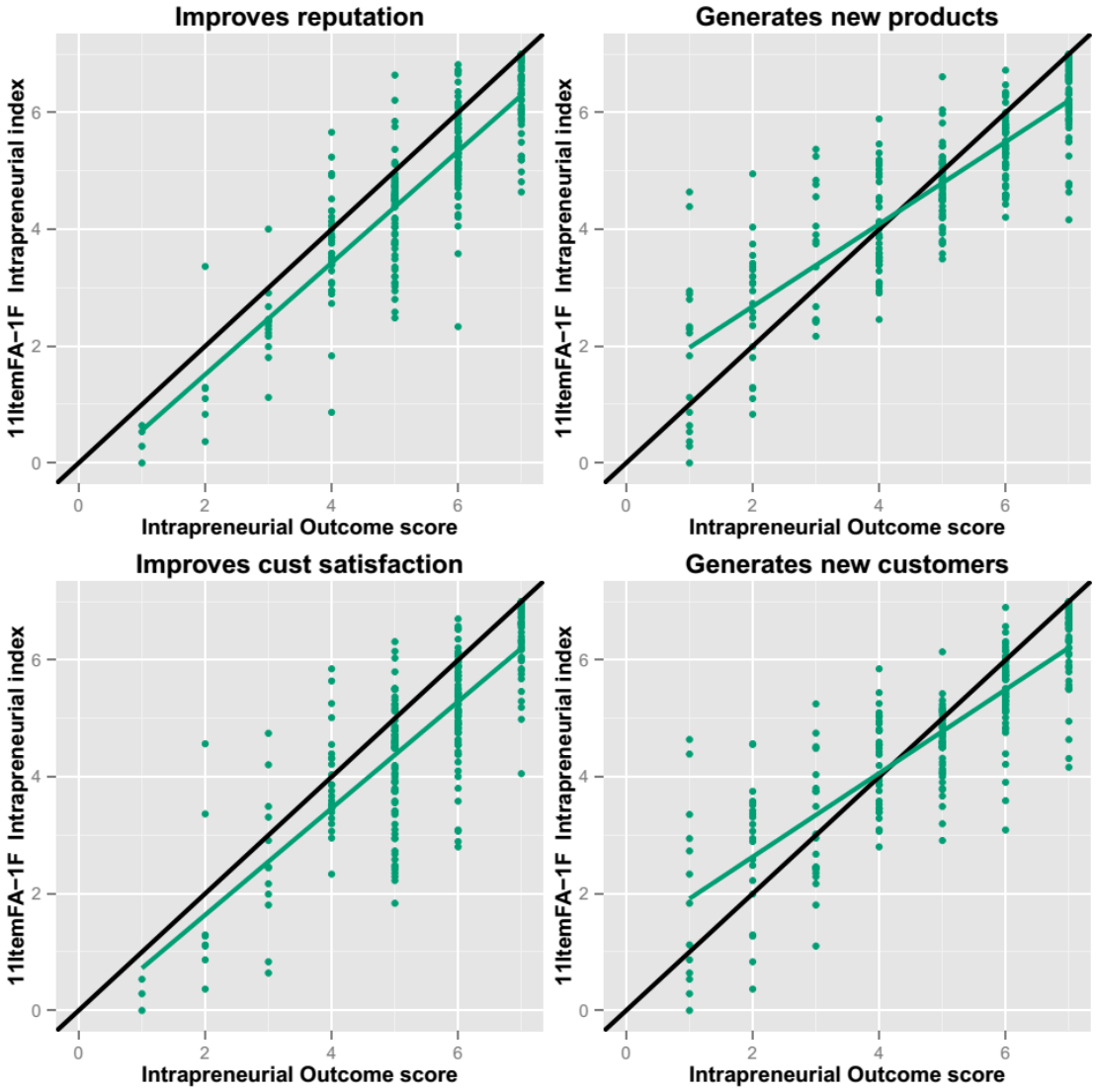
The following series of charts in Figure 21 plot the 12 Intrapreneurial Outcome question responses against the Threshold-I and 11ItemFA-1F indices. The black diagonal line indicates where responses would lie if the IO question responses and Intrapreneurial Outcome indices were perfectly correlated.

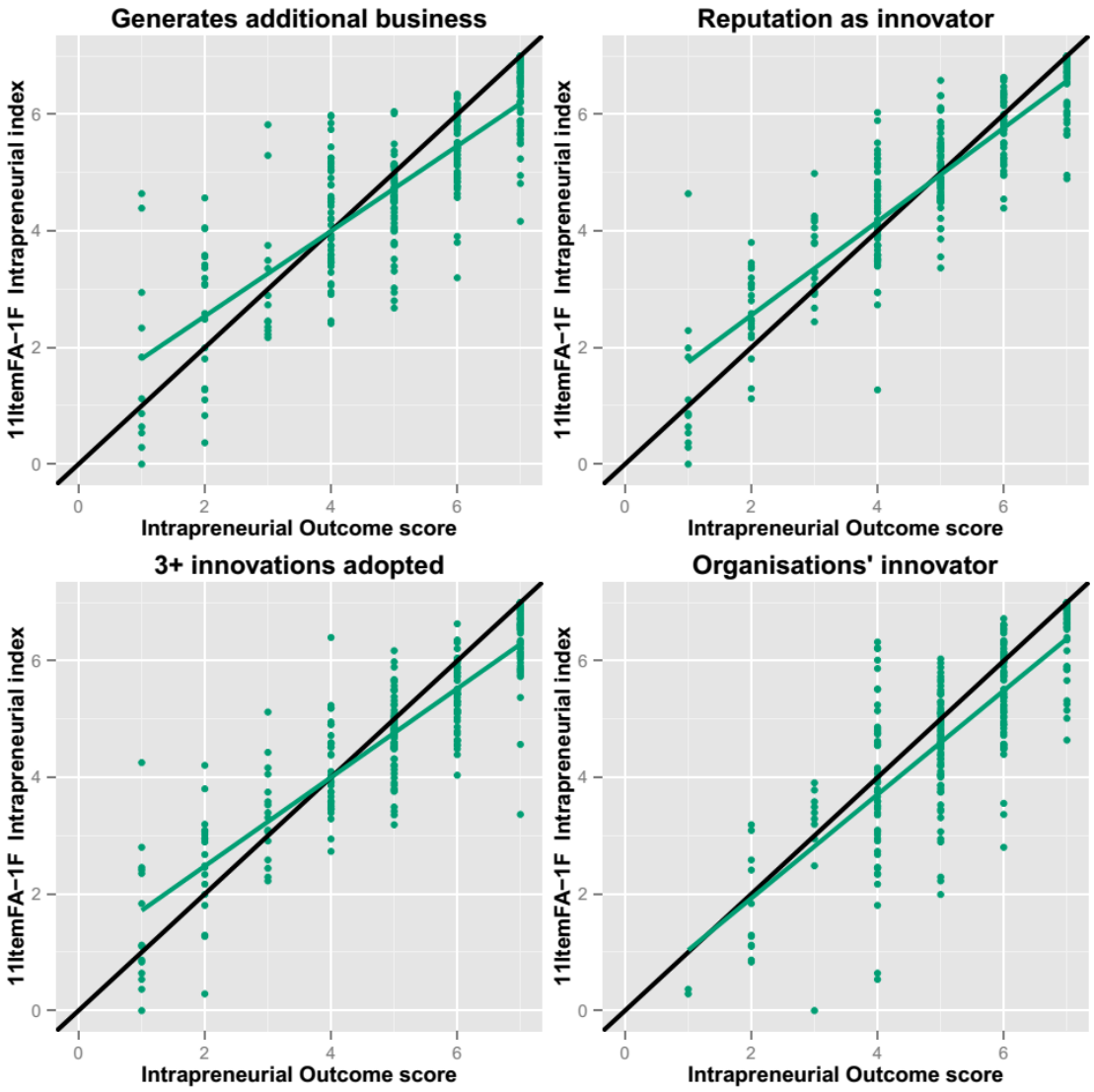
Figure 21: Question Plots

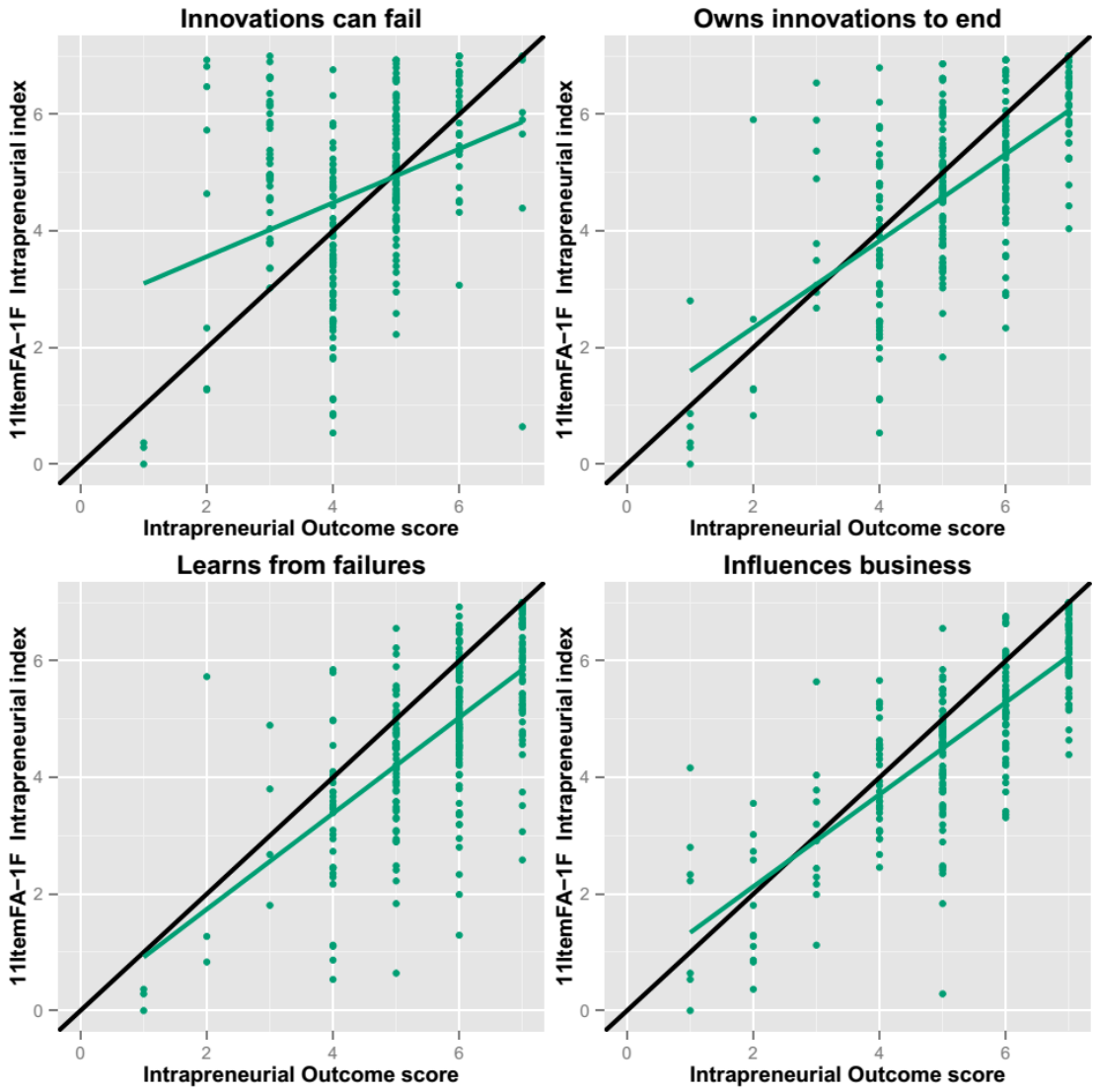



Generates additional business
Reputation as innovator
3+ innovations adopted
Organisation's innovator
Threshold Intrapreneurial index
Intrapreneurial Outcome score
0
2
4
6


Innovations can fail
Owns innovations to end
Learns from failures
Influences business
Threshold Intrapreneurial index
Intrapreneurial Outcome score
0
2
4
6
0.0
2.5
5.0


Improves reputation
Generates new products
Improves cust satisfaction
Generates new customers
11ItemFA−1F Intrapreneurial index
Intrapreneurial Outcome score
0
2
4
6


Generates additional business
Reputation as innovator
3+ innovations adopted
Organisations' innovator
11ItemFA−1F Intrapreneurial index
Intrapreneurial Outcome score
0
2
4
6



The following Table 50 presents the Pearson correlation coefficients for the twelve Intrapreneurial Outcome variables against Factor 1 of the 12-item and 11-item Factor Analysis.

Table 50: Pearson correlation coefficients

Intrapreneurial Outcome	Intrapreneurial Outcome Index		
	Threshold-I	12ItemFA-1F	11ItemFA-1F
Reputation	0.825**	0.869**	0.865**
CustSat	0.750**	0.795**	0.795**
NewProducts	0.782**	0.845**	0.848**
NewCusts	0.778**	0.834**	0.836**
NewBusiness	0.757**	0.815**	0.819**
InnovAdopt	0.829**	0.875**	0.878**
InnovRep	0.816**	0.877**	0.879**
OrgInnov	0.737**	0.781**	0.779**
InnovFail	0.405**	0.372**	0.349**
LearnFail	0.674**	0.672**	0.659**
OwnsInnovtn	0.611**	0.653**	0.656**
InfBusiness	0.762**	0.797**	0.799**

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation coefficients between the 12 Intrapreneurial Outcomes and the three Intrapreneurial Outcome Indices are all very similar. All correlation coefficients for the 12ItemFA-1F index are slightly higher than the Threshold Index except for just two intrapreneurial outcomes: InnovFail and LearnFail. The correlation coefficients for the 11ItemFA-1F are within 3% of the 12ItemFA-1F index with the exception, again of InnovFail and LearnFail which differ by 4.6% and 6.5% respectively.

Discussion and Conclusions

SEM has been applied and demonstrates that the hypothesised intrapreneurial outcomes measure has statistical integrity. In addition, Exploratory Factor analysis is an effective means of deriving a data-driven index of Intrapreneurship from the Intrapreneurial Outcomes measured in the questionnaire. The similarity between the three Intrapreneurial indices demonstrates:

- The hypothesised Threshold Intrapreneurial Outcome Index conforms well to the data implying that it is a realistic measure.

- The 11ItemFA-1F index is nearly identical to 12ItemFA-1F, despite dropping one of the Intrapreneurial Outcome responses. Therefore, 11ItemFA-1F offers a slightly simplified alternative index of Intrapreneurship in terms of its derivation.

- The largest deviations between the indices and the Intrapreneurial Outcomes are observed in InnovFail and LearnFail. Given that both outcomes are references to failure in one way or another, this suggests that there might be something problematic with measuring these kinds of intrapreneurial outcomes in the Intrapreneurship questionnaire.

Given the similarity between the indices, no one single index stands out as providing a superior measurement of intrapreneurship above the others. However, from a practical perspective there are advantages to the Threshold index: it is very simple to calculate compared with the single factor EFA and it is easy to conceptualise, which facilitates understanding and making it accessible to a wide range of practitioners. The indices based on the results of the factor analysis are harder to calculate and the relationship between the intrapreneurial outcomes a little harder to understand. Nonetheless, using the coefficients in the factor score matrix derived from this study

and the 12 intrapreneurship questions, it is possible for other studies to calculate Intrapreneurship scores on the same index developed in this study.

Chapter 14

INTRAPRENEURIAL OUTCOMES INDEX AND OTHER QUESTIONNAIRES

Contrasts in the Intrapreneurial Outcomes Index for attributes measured in Other Questionnaires in this Research

In addition to completing the questionnaire designed to create the new intrapreneurial outcomes measure, participants in this research also completed three published inventories – the Big Five, SSEIT and the Dolphin Index. The items in each of these inventories were unchanged from the published versions, also the methodology used to derive scores follows that of the original inventories. The data from these provide insight into personality traits, self-perception of emotional intelligence and innovation climate respectively, attributes which the literature shows as being important to successful individual intrapreneurship. The three published inventories were selected following a review of tools available based on the literature (in Chapters 5, 6 and 7).

This section compares the 11ItemFA-1F Intrapreneurial Outcome index against a range of personal behavioural scores measured against three external questionnaires. The purpose of this is to check that the data-driven measures of the Intrapreneurial Outcomes Index correlate as expected with other external and well-established measures. If the Intrapreneurial Outcomes Index does not correlate in ways that can be expected, this may need further investigation, however the results for each external measure are consistent across each of the three indices. The external questionnaires used for this testing are:

- Big Five Inventory (Personality).
- SSEIT (Emotional Intelligence).
- Dolphin Index (Innovation Climate).

Following the use of these inventories as external validation for the proposed new intrapreneurial outcomes measure, the results for each are then analysed against the derived measure with the specific objective of developing an enhanced understanding of how personality, self-perception of emotional intelligence and perception of innovation climate correlate to intrapreneurial performance outcomes.

External Validation of the Intrapreneurial Outcomes Measure Using the Big Five Inventory, SSEIT and the Dolphin Index

The following Table 51 presents the full list of scores covered in this analysis:

Table 51: List of Scores

Short name	Description of score
DI_COMMIT	Dolphin Index: Commitment
DI_FREE	Dolphin Index: Freedom
DI_IDEASUP	Dolphin Index: Idea Support
DI_POSREL	Dolphin Index: Positive Relationships
DI_DYNA	Dolphin Index: Dynamism
DI_PLAY	Dolphin Index: Playfulness
DI_IDEAPRO	Dolphin Index: Idea Proliferation
DI_STRESS	Dolphin Index: Stress
DI_RISK	Dolphin Index: Risk Taking
DI_IDEATIME	Dolphin Index: Idea time
DI_SHAREDVIEW	Dolphin Index: Shared view

DI_PAY	Dolphin Index: Pay Recognition
DI_WORK	Dolphin Index: Work Recognition
SSEIT	Emotional intelligence
B5_EXTRAV	Extraversion
B5_AGREE	Agreeableness
B5_CONSC	Conscientiousness
B5_NEURO	Neuroticism
B5_OPEN	Openness

The following three sections summarise, in turn, the correlation between 11ItemFA-1F Intrapreneurial index and the personal behaviour scores for the three questionnaires.

Analysis of Personality trait Responses to the Big Five inventory

Findings from the literature review led to the following hypothesis: H2 – Successful individual intrapreneurs share similar personality characteristics.

Figure 22 presents the five Big Five Inventory scores the 11-item single-factor Factor Analysis measures of Intrapreneurship.

Figure 22: Big Five Score Plots

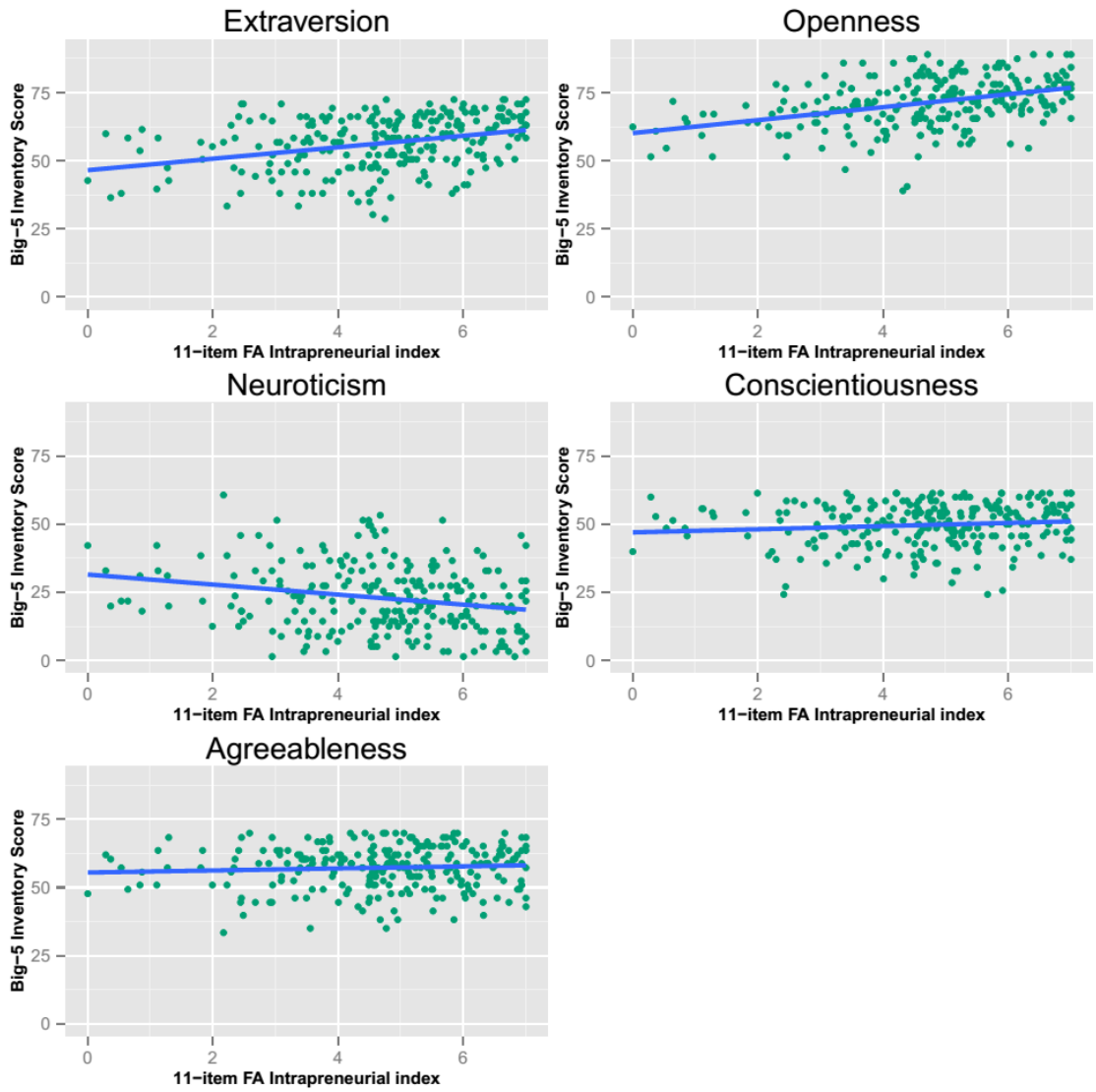


Table 52 presents the Pearson correlation coefficients for the five scores against the 11-item single-factor Factor Analysis measure of intrapreneurship.

Table 52: Correlations for Big Five Personality Dimensions

Big Five inventory	**11ItemFA-1F**
Openness	0.397**
Extraversion	0.342**
Neuroticism	-0.225**
Conscientiousness	0.108
Agreeableness	0.072

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Three of the Big Five inventory personality traits - Neuroticism, Extraversion and Openness – are statistically significant at the 99% level, whilst Agreeableness and Conscientiousness have very little association with intrapreneurship. The negative correlation coefficient for Neuroticism, suggests perhaps that the higher the level of intrapreneurship a person has, the more emotionally stable and less reactive to stress they are likely to be.

Analysis of Emotional Intelligence Responses to Schutte et al.'s (1998) SSEIT 33-item Scale

The findings from the literature led to hypothesis H3: Individual intrapreneurial outcome positively correlates with a positive self-perception of emotional intelligence.

Figure 23 presents the Emotional intelligence score against the 11ItemFA-1F Intrapreneurial Outcome index.

Figure 23 Emotional intelligence

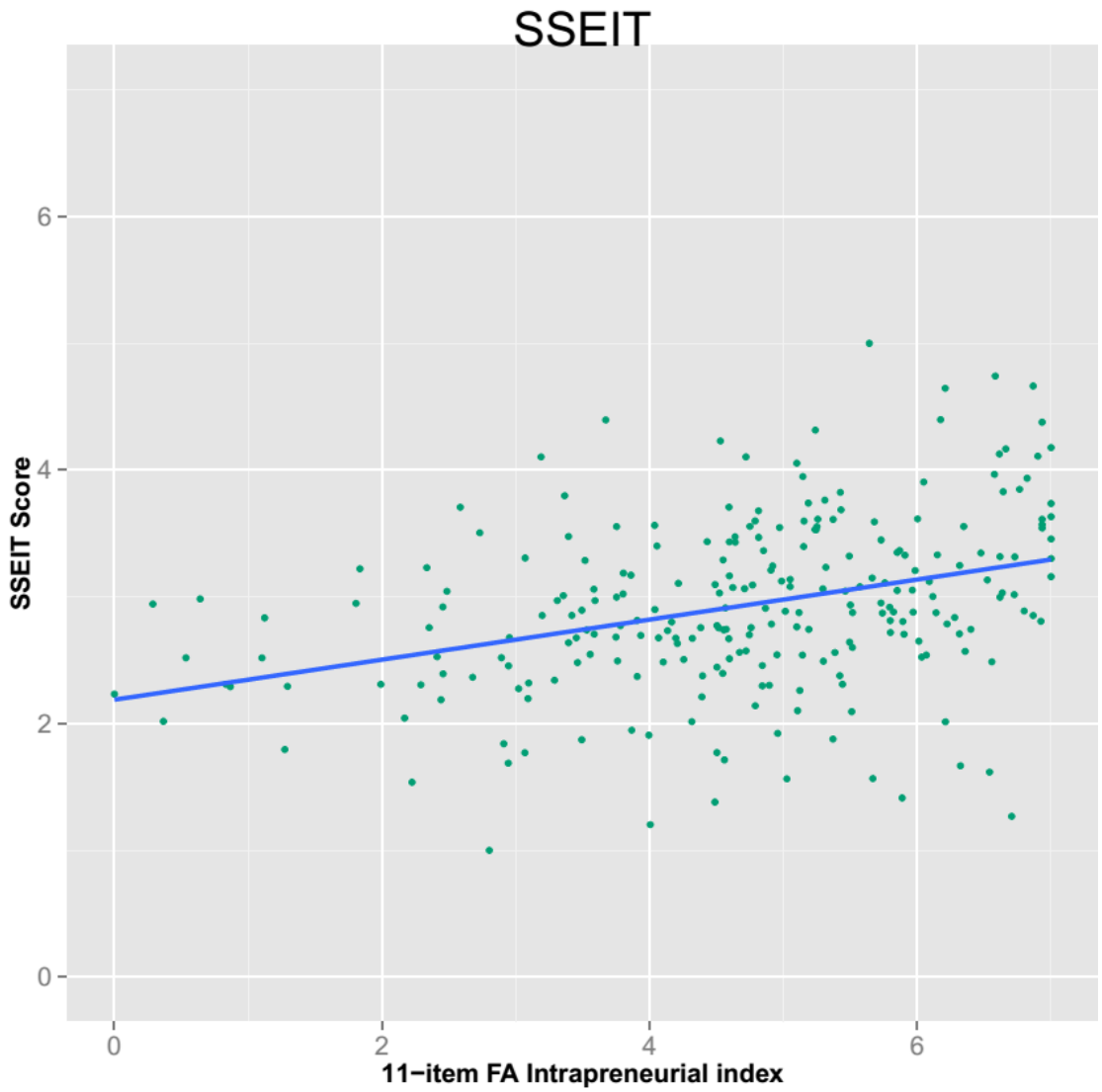


Table 53 shows the Pearson correlation coefficients for the Emotional Intelligence score against the 11ItemFA-1F Individual Intrapreneurial Outcome index.

Table 53: Correlation for Emotional Intelligence Score

	Emotional Intelligence	**11ItemFA-1F**
SSEIT:		0.351**

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Emotional intelligence, as measured by SSEIT, is positively and statistically significantly correlated with all three Individual Intrapreneurial Outcome measures, which supports the hypothesis that greater self-perception of emotional intelligence correlates with the greater Individual Intrapreneurial Outcome scores.

Derivation of SSEIT measure

In deriving the SSEIT measure for this study, a factor analysis was carried out on the 33 items. The main 33-item factor analysis results extracting factor 1 below is shown in Table 54 below.

The principal components, orthogonal rotation, factor analysis of SSEIT (which uses the dataset collated for this study and applies the original, prescribed methodology as published for the SSEIT inventory) identifies 4 factors from the scree plots. The first factor has an eigenvalue of 10.79 and 33 (of the 62) items loaded at 0.4 and above. The analysis finds that the 33 items loading on factor 1 represents all portions of the model. The items loading on factors 2-4 are not recognisable as conceptually distinct from items loading on factor 1.

Table 54: Descriptive Statistics

	Mean	Std. Deviation	Analysis N
I know when to speak about my personal problems to others	3.98	.895	248
When I am faced with obstacles_ I remember times I faced similar obstacles and overcame them	4.14	.659	248
I expect that I will do well on most things I try	3.91	.774	248
Other people find it easy to confide in me	4.06	.670	248
I find it hard to understand the non-verbal messages of other people	2.14	.921	248
Some of the major events of my life have led me to re-evaluate what is important and not important	4.20	.853	248
When my mood changes_ I see new possibilities	3.70	.826	248
Emotions are one of the things that make my life worth living	3.79	.850	248
I am aware of my emotions as I experience them	4.02	.714	248
I expect good things to happen	3.81	.852	248
I like to share my emotions with others	3.24	1.055	248
When I experience a positive emotion_ I know how to make it last	3.46	.799	248
I arrange events others enjoy	3.77	.871	248
I seek out activities that make me happy	4.16	.600	248
I am aware of the non-verbal messages I send to others	3.70	.775	248
I present myself in a way that makes a good impression on others	3.89	.694	248

When I am in a positive mood_ solving problems is easy for me	4.10	.654	248
By looking at their facial expressions_ I recognize the emotions people are experiencing	4.00	.688	248
I know why my emotions change	3.83	.757	248
When I am in a positive mood_ I am able to come up with new ideas	4.07	.687	248
I have control over my emotions	3.42	.949	248
I easily recognise my emotions as I experience them	3.82	.662	248
I motivate myself by imagining a good outcome to tasks I take on	3.77	.853	248
I compliment others when they have done something well	4.45	.545	248
I am aware of the non-verbal messages other people send	3.94	.729	248
When another person tells me about an important event in his or her life_ I almost feel as though I have experienced this event myself	3.15	.883	248
When I feel a change in emotions_ I tend to come up with new ideas	3.24	.700	248
When I am faced with a challenge_ I give up because I believe I will fail	1.65	.840	248
I know what other people are feeling just by looking at them	3.32	.820	248
I help other people feel better when they are down	3.95	.522	248
I use good moods to help myself keep trying in the face of obstacles	3.69	.761	248

I can tell how people are feeling by listening to the tone of their voice	3.81	.695	248
It is difficult for me to understand why people feel the way they do	2.08	.828	248

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.848
Bartlett's Test of Sphericity	Approx. Chi-Square	2631.139
	Df	528
	Sig.	.000

Cronbach's Alpha measure of internal consistency for the 33-items is 0.831, well above the threshold of 0.7 where the items are considered to be consistent.

Communalities

	Initial	Extraction
I know when to speak about my personal problems to others	.326	.278
When I am faced with obstacles_ I remember times I faced similar obstacles and overcame them	.361	.344
I expect that I will do well on most things I try	.392	.397
Other people find it easy to confide in me	.304	.267
I find it hard to understand the non-verbal messages of other people	.463	.554
Some of the major events of my life have led me to re-evaluate what is important and not important	.242	.326
When my mood changes_ I see new possibilities	.345	.536

Emotions are one of the things that make my life worth living	.478	.536
I am aware of my emotions as I experience them	.405	.574
I expect good things to happen	.493	.547
I like to share my emotions with others	.390	.457
When I experience a positive emotion_ I know how to make it last	.411	.482
I arrange events others enjoy	.353	.366
I seek out activities that make me happy	.351	.427
I am aware of the non-verbal messages I send to others	.536	.512
I present myself in a way that makes a good impression on others	.374	.392
When I am in a positive mood_ solving problems is easy for me	.439	.804
By looking at their facial expressions_ I recognize the emotions people are experiencing	.653	.708
I know why my emotions change	.396	.391
When I am in a positive mood_ I am able to come up with new ideas	.496	.499
I have control over my emotions	.413	.510
I easily recognise my emotions as I experience them	.445	.679
I motivate myself by imagining a good outcome to tasks I take on	.360	.303
I compliment others when they have done something well	.340	.383
I am aware of the non-verbal messages other people send	.711	.780
When another person tells me about an important event in his or her life_ I almost feel as though I have experienced this event myself	.240	.269
When I feel a change in emotions_ I tend to come up with new ideas	.257	.280
When I am faced with a challenge_ I give up because I believe I will fail	.269	.234

I know what other people are feeling just by looking at them	.426	.420
I help other people feel better when they are down	.369	.336
I use good moods to help myself keep trying in the face of obstacles	.419	.393
I can tell how people are feeling by listening to the tone of their voice	.473	.573
It is difficult for me to understand why people feel the way they do	.377	.407

Extraction Method: Principal Axis Factoring.

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.634	23.132	23.132	7.118	21.569	21.569	3.307	10.020	10.020
2	2.502	7.583	30.715	2.035	6.167	27.736	2.406	7.290	17.311
3	2.032	6.156	36.871	1.518	4.601	32.337	1.819	5.511	22.822
4	1.550	4.696	41.568	1.019	3.087	35.424	1.806	5.474	28.295
5	1.481	4.488	46.056	.946	2.867	38.291	1.320	4.000	32.296
6	1.190	3.607	49.663	.645	1.954	40.245	1.200	3.637	35.932
7	1.126	3.413	53.076	.605	1.832	42.078	1.055	3.196	39.128
8	1.084	3.285	56.361	.567	1.719	43.797	1.035	3.138	42.266
9	1.025	3.106	59.467	.511	1.550	45.346	1.016	3.080	45.346
10	.984	2.981	62.449						
11	.919	2.786	65.234						
12	.898	2.721	67.956						
13	.820	2.485	70.441						
14	.772	2.341	72.781						
15	.739	2.240	75.021						
16	.725	2.197	77.218						
17	.668	2.024	79.242						
18	.633	1.920	81.161						
19	.608	1.842	83.003						

20	.587	1.778	84.781						
21	.569	1.723	86.504						
22	.544	1.647	88.151						
23	.497	1.507	89.658						
24	.468	1.417	91.076						
25	.416	1.259	92.335						
26	.397	1.202	93.537						
27	.372	1.127	94.664						
28	.358	1.084	95.748						
29	.343	1.038	96.786						
30	.325	.986	97.773						
31	.277	.841	98.613						
32	.260	.788	99.401						
33	.198	.599	100.000						

Extraction Method: Principal Axis Factoring.

Factor Matrix[a]

	Factor								
	1	2	3	4	5	6	7	8	9
I know when to speak about my personal problems to others	.427								
When I am faced with obstacles_ I remember times I faced similar obstacles and overcame them	.469								
I expect that I will do well on most things I try	.370		-.346						
Other people find it easy to confide in me	.419								
I find it hard to understand the non-verbal messages of other people	-.421	.482							
Some of the major events of my life have led me to re-evaluate what is important and not important					-.365				
When my mood changes_ I see new possibilities	.355		.408					.425	
Emotions are one of the things that make my life worth living	.534		.379						
I am aware of my emotions as I experience them	.452				-.430				
I expect good things to happen	.564	.401							
I like to share my emotions with others	.442		.332						
When I experience a positive emotion_ I know how to make it last	.490								
I arrange events others enjoy	.388			-.423					
I seek out activities that make me happy	.409			-.368					
I am aware of the non-verbal messages I send to others	.594	-.308							
I present myself in a way that makes a good impression on others	.449								
When I am in a positive mood_ solving problems is easy for me	.464		.359	.306		-.439			
By looking at their facial expressions_ I recognize the emotions people are experiencing	.649	-.491							

I know why my emotions change	.521								
When I am in a positive mood_ I am able to come up with new ideas	.466		.342						
I have control over my emotions		.312	-.492						
I easily recognise my emotions as I experience them	.483			.386					
I motivate myself by imagining a good outcome to tasks I take on	.440								
I compliment others when they have done something well	.482								.349
I am aware of the non-verbal messages other people send	.686	-.519							
When another person tells me about an important event in his or her life_ I almost feel as though I have experienced this event myself	.327								
When I feel a change in emotions_ I tend to come up with new ideas	.413								
When I am faced with a challenge_ I give up because I believe I will fail	-.318								
I know what other people are feeling just by looking at them	.521								
I help other people feel better when they are down	.493								
I use good moods to help myself keep trying in the face of obstacles	.401	.399							
I can tell how people are feeling by listening to the tone of their voice	.549				.390				
It is difficult for me to understand why people feel the way they do	-.485								

Extraction Method: Principal Axis Factoring.

a. Attempted to extract 9 factors. More than 25 iterations required. (Convergence=.007). Extraction was terminated.

25 of the 33-items had factor loadings on factor-1 of 0.4 and above.

Schutte et al.'s SSEIT provides a reliable and valid method of testing the relationship between the intrapreneur's self-perception of EI and intrapreneurial outcomes. Self-perception of emotional intelligence, as measured by SSEIT, is positively and

statistically significantly correlated with all three Intrapreneurial Outcome measures which supports the hypothesis that the greater the individual's self-perceptions of emotional intelligence, the greater the Intrapreneurial Outcome.

Analysis of Innovation Climate Responses to the Dolphin Index

The findings from the literature led to hypothesis **H4: Successful individual intrapreneurship positively correlates with a positive perception of organisation innovation climate by the individual intrapreneur.**

Figure 24 presents the Dolphin Index scores against the 11ItemFA-1F Intrapreneurship index. The lines on the graphs are the linear regression line fit to the data. The slope of the line is analogous to the correlation coefficient between the Dolphin Index score and the IO index. Generally, plots that show responses close to this line have correlation coefficients that are statistically more significant.

Figure 24: Dolphin Index Correlations

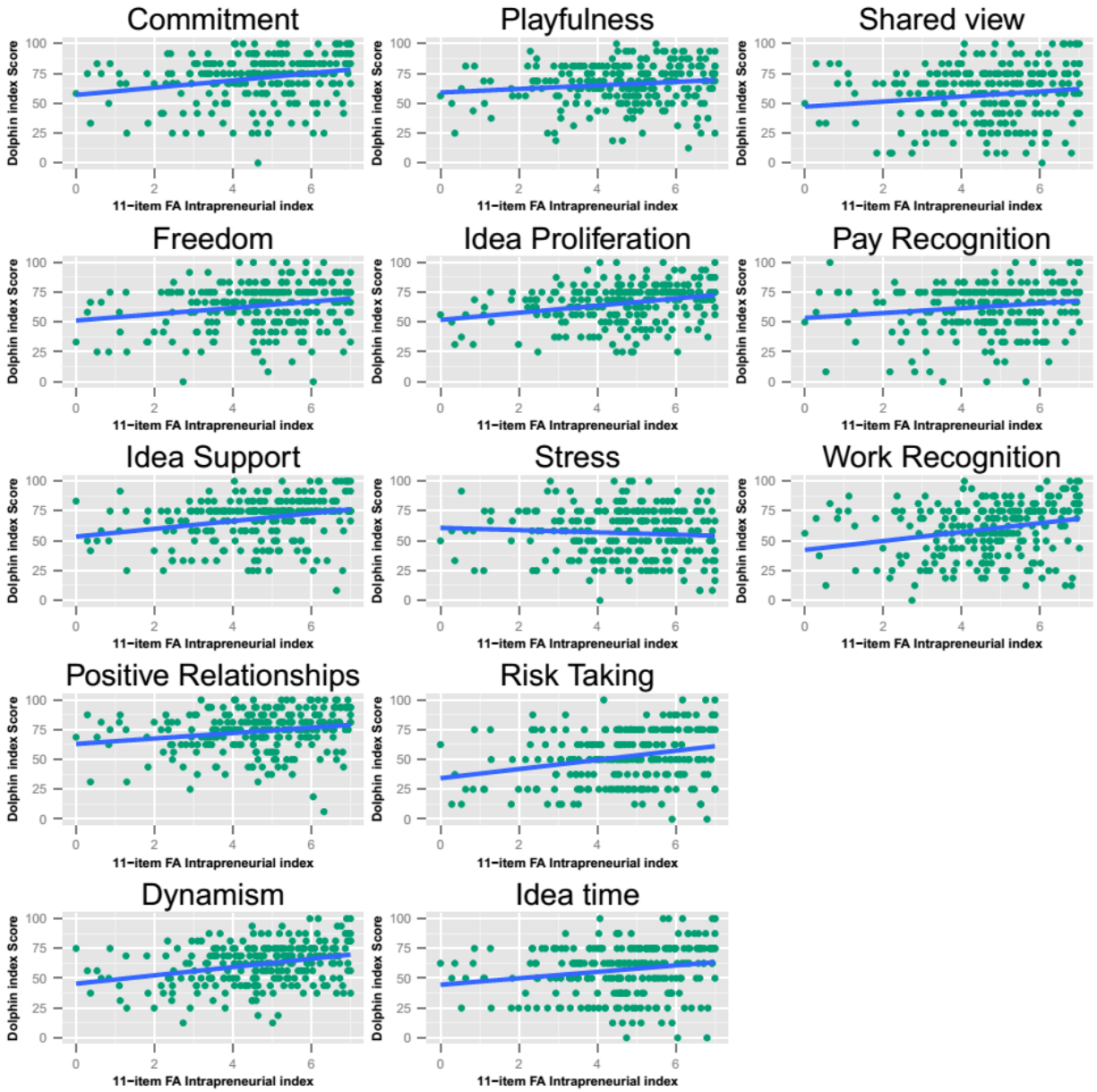


Table 55 presents the Pearson correlation coefficients for the thirteen Dolphin Index scores against the 11ItemFA-1F Intrapreneurial Outcome index.

Table 55: Correlation Scores for Measures of Intrapreneurship

Dolphin index	**11ItemFA-1F**
Dynamism	0.308**
Idea Proliferation	0.283**
Idea Support	0.272**
Risk Taking	0.262**
Work Recognition	0.255**
Commitment	0.246**
Freedom	0.211**
Positive Relationships	0.204**
Idea time	0.192**
Pay Recognition	0.159*
Shared view	0.139*
Playfulness	0.130*
Stress	-0.067

All but one of the Dolphin Index scores – Stress – have statistically significant correlation coefficients with one or more Intrapreneurial Outcome measures at the 95% level. Dynamism, Risk taking, Idea Proliferation and Idea Support scores have the highest level of correlation with Intrapreneurial Outcome measure.

The coefficients, with the exception of Stress, are positive and relatively small (<0.25), suggesting that a large increase in Individual Intrapreneurial Outcomes is associated with a relatively small increase in Dolphin Index (innovation climate) scores. This is encouraging for organisations because it suggests that modest improvements to innovation climate dimensions correlate to a positive, asymmetrical improvement in intrapreneurial outcomes.

The analysis identifies characteristics of innovation climate dimensions that are most associated with positive Individual Intrapreneurial Outcomes (including Dynamism, Risk taking, Idea proliferation and Idea support) and those that are less so (Playfulness and Stress). These findings are in line with what could be expected within the Intrapreneurship context. Playfulness, for instance, is potentially most visible at the creativity stage of the Intrapreneurship Process, and is especially associated with the idea generation stage in the literature (e.g. Rajah, 2007; Shneiderman, 2007; Sternberg et al., 1997). Perhaps as ideas become converted into commercial, actionable projects playfulness becomes less acceptable or important to intrapreneurs due to the important business of making projects work, unless development and implementation are handed over to somebody else in the organisation. Stress is potentially the most problematic dimension proposed by the Dolphin Index. In organisations, there needs to be enough stress in the form of positive pressure to motivate action and make things happen, whereas too much stress in the form of unrealistic demands or expectations, workload that is too high and so on, is likely to negatively impact individual and organisational performance. Judgements on acceptable levels of stress and responses to it are highly subjective and personal, depending on individual resilience – the same circumstances can be interpreted by one individual as energising, positive challenge and by another as overwhelming and counter-productive (e.g. Quick et al., 1997).

The distinctly positive correlations for Dynamism, Risk taking, Idea Proliferation and Idea Support are aligned with the Intrapreneurship Process proposed in Chapter 3. To achieve successful intrapreneurial outcomes for the employing organisation, the

individual intrapreneur needs the organisation to be willing and able to change, interested in new idea generation, open to taking risks on new initiatives and providing support for its intrapreneurs' ideas. A low presence in any of these four dimensions is likely to create an obstacle that would not only impede intrapreneurial progress but also potentially frustrate individual intrapreneurial employees.

Chapter 15

DISCUSSION OF RESEARCH RESULTS

The early part of this Chapter provides a descriptive summary of the research results. Following this, the Chapter then proceeds to provide reflections on how the research findings are informing practice.

The motivation for this study is to surface a new perspective of intrapreneurship that will add value to organisations and their intrapreneur employees by demonstrating a measurable correlation between some of the key attributes of individual intrapreneurs from the literature and outcome benefits for the organisation. The purpose of so doing is to begin the early stages of a process of wider academic debate on the commercial impact of intrapreneurship, so that organisations will become better informed, based on evidence, of the importance of individual intrapreneurs to overall organisational success.

Having established a definition of intrapreneurship and proposed an Intrapreneurial Process Model, the problem statement identified for this research is:

How can the positive organisational outcomes of individual intrapreneurship be measured on a scale, so that the attributes often associated with successful individual intrapreneurs in the literature can be explored?

In order to investigate this problem statement, the following research questions were tested:

- H1: Individual intrapreneurship contribution can be quantified on a scale.
- H2: Individual intrapreneurial outcome positively correlates with personality traits as defined and measured by the Big Five, specifically:

a) Individual intrapreneurial outcome positively correlates with Openness.

b) Individual intrapreneurial outcome negatively correlates with Conscientiousness.

c) Individual intrapreneurial outcome negatively correlates with Agreeableness.

d) Individual intrapreneurial outcome positively correlates with Extraversion.

e) Individual intrapreneurial outcome negatively correlates with Neuroticism.

- H3: Individual intrapreneurial outcome positively correlates with a positive self-perception of emotional intelligence.

- H4: Successful individual intrapreneurship positively correlates with a positive perception of organisation innovation climate by the individual intrapreneur.

H1: Individual intrapreneurship contribution can be quantified on a scale.

In Chapter 4 it was established that measuring the impact of human performance on organisational outcomes can be problematic for a number of reasons, such as the differences in size, age, sector and location of organisations (Rauch et al., 2009; Lumpkin & Dess, 1996; Combs et al., 2005; Ventkatraman & Ramanujam, 1986; Jimenez-Jimenez and Sanz-Valle, 2011) that reduce the comparability of results. This leads to the development in this study of a generically-applicable scale based on the individual's perceived contribution to intrapreneurial outcomes for their employing organisation. Self-reporting of individual performamce is also problematic of course due to its inherent subjectivity, however the results from this study do show that individuals score themselves along a scale.

Using the hypothesised model for measuring individual intrapreneurial outcomes a 'threshold' index was calculated for each respondent in the survey. When compared against a baseline index calculated as the arithmetic mean of the twelve IO variable the threshold index provides a more evenly spread distribution of individuals across the range of the index that offers greater differentiation between individuals with high and low level of intrapreneurship.

A Structural Equation Model (SEM3) was developed to test the validity of the relationships between the twelve intrapreneurial outcomes and the hypothesised 'threshold' individual intrapreneurial outcome index. Before undertaking the model development, the twelve intrapreneurial outcome variables were assessed for normality whilst acknowledging that the ordinal nature of the data captured by the intrapreneurial outcome questions mean that the responses can only be very approximately normal at best. Measures of skew and kurtosis show the responses for all twelve outcomes to be asymmetrically distributed but not kurtotic. The analysis identifies that the responses are indeed not normally distributed so Bayesian methods were used to fit the final SEM model specification to test that the significance of the fitted model parameters is not being overstated.

The final SEM model was developed incrementally from an initial model (SEM0) that regressed the twelve intrapreneurial outcomes against the hypothesised threshold index. SEM0 model parameters for the twelve intrapreneurial outcomes are highly significant and confirm the strong relationship between the intrapreneurial outcomes and the hypothesised index. The RMSEA, CMIN and Chi-squared statistics measuring the goodness-of-fit of the SEM0 model overall show that the model is not adequately fully describing the relationships between the twelve intrapreneurial outcomes and the index.

To improve model fit, modification indices were examined to identify aspects of the model that were least well explained. These were reconciled with the individual intrapreneurship measurement model and identified that most of modification indices

offering the greatest impact on reducing the goodness of fit of the model related to those error covariances between intrapreneurial outcomes that sat within the six dimensions of intrapreneurship measurement model upon which the SEM specification was based. This was used to specify a refined SEM model specification - SEM1 - that incorporated these 'within intrapreneurship dimension' error covariances.

This led to a substantial improvement in the overall model fit that was sufficient for SEM1 to qualify as a good fitting model for the CMIN statistic (the Chi-Squared value in AMOS) but below target for the RMSEA. Two further increments of the model development process described above resulted in SEM2 and SEM3 which collectively incorporated error covariances between the intrapreneurial outcomes in the product development and market development intrapreneurship dimensions. The final model - SEM3 - qualifies as a good fit with a CMIN goodness-of-fit statistics of 0.978 and as a reasonable fit in terms of the RMSEA measure with a statistic of 0.066. The target p-value for the Chi-squared statistic is not met which is interpreted as a reflection of the modest sample size available for the study and is not considered sufficient evidence to invalidate the conclusions of the model.

The SEM3 model provides evidence to support the hypothesis presented in Chapter 4 - ***H1: Individual intrapreneurship contribution can be quantified on a scale*** and confirm that the structural relationship between the intrepreneurial outcomes and the threshold index specified in the proposed intrapreneurship measurement model is evident in study data.

Exploratory Factor Analysis was carried out as a complement to the SEM to develop data-driven indices of individual intrapreneurial outcome based on the twelve intrapreneurial outcomes. The analysis began with an assessment of the correlations between the twelve intrapreneurial outcomes which found strong correlations between all item except for InnovFail which was very weakly correlated with all eleven other items and LearnFail and OwnsInnov which were weakly correlated with the other items. Cronbach’s alpha measure of internal consistency for all twelve intrapreneurial

outcomes items is 0.94 - well above the target of 0.7 for conducting analyses of this kind.

The first factor analysis was carried out on all twelve intrapreneurial outcome items. The eigenvalues and scree plots point to a single factor solution that explains just over three-fifths (60.1%) of the total variation among the twelve items. The single factor EFA solution suggests the individual intrapreneurial outcomes have a much stronger association with a single intrapreneurship factor than multiple components of intrapreneurship, such as the six dimensions proposed in the hypothesised measurement model for the Individual Intrapreneurial Outcome index. The reproduced correlation matrix calculated from the single retained factor is closely aligned with the correlation matrix observed directly from the 12-items with over two thirds (68%) of the 66 reproduced correlations being within 0.05 of the observed matrix.

A second factor analysis was carried out on 11 of the 12 items; excluding InnovFail which had very weak correlation with the eleven other items and was by far the weakest represent item in terms of the reproduced correlation matrix. The eigenvalues and scree plots again point to a single factor solution that explains nearly two-thirds (64.9%) of the total variation among the eleven items. The factor score matrices were used to calculate two individual intrapreneurial outcome indices based on the 12- and 11-item factor analyses respectively for each of the 248 study participants. The 12- and 11-item single factor analysis derived intrapreneurship indices were then compared with each other to assess the differences. The comparison reveals that all three indices are very similar to each other.

From this it can be seen that the hypothesised threshold intrapreneurship index presents the data extremely well given how closely the correlation coefficients match the two data-driven EFA derived indices.

To assess the robustness of the analysis work undertaken a sensitivity analysis exploring the effects of sample size and sample selection on results for the EFA and

SEM analyses on the twelve Intrapreneurial Outcomes (IO) items was undertaken. The analysis found high levels of consistency between the results of the Factor Analysis and SEM3 model analysis carried out on the full dataset and five sub-samples as listed below:

SI_248 - The whole sample of 248 respondents in the final dataset

SI_140 - A random sample of 140 respondents

SD1_83, SD2_83 and SD3_82 - Three mutually exclusive subsamples of 248 respondent dataset

The analysis demonstrates greater variability in results the lower the sample size. The goodness-of-fit statistics for SEM3 indicate weakly fitted models when fitted to the smaller sub-samples. Despite that the conclusions drawn from the statistical analysis aspects of the study are unchanged even for the very small sample sizes of less than 100.

The key findings of the analysis presented in this chapter concern the three intrapreneurship indices - the proposed threshold Intrapreneurship index and the 12- and 11-item EFA derived indices - and the associated SEM and EFA analyses. SEM (confirmatory factor analysis) was not used develop or derive a measure, it was used to test the validity of the proposed/ hypothesised measurement model (i.e. sum of threshold scores) for intrapreneurship.

SEM3 confirms that the structural relationship between the intrapreneurial outcomes and the threshold index specified in the proposed intrapreneurship measurement model are evident in study data. EFA was used to develop two alternative intrapreneurial indices that were derived purely from the data and independently of the hypothesised measurement model for the proposed intrapreneurship index previously tested by SEM. Both EFA-derived indices are very closely correlated with the proposed threshold Intrapreneurial index providing further evidence (in addition to the SEM)

that the proposed threshold Intrapreneurial index is a sound measure that adequately represents the 12 intrapreneurial outcomes.

The high level of consistency between the proposed intrapreneurship index (tested by SEM) and the two EFA-derived indices suggest that any of the three measures provide a robust measure of intrapreneurship. To an extent this is to be expected as the two methods for deriving the indices are closely related and use the same data set, however by taking both approaches additional granularity of understanding and confidence is generated.

The negatively-oriented item 'InnovFail' in the Individual Intrapreneurship Outcomes questionnaire generated interesting results. This item is:

- Some of my innovations fail from time to time.

InnovFail in particular stands out as describing an aspect of intrapreneurship that is quite distinct to those collectively described by the intrapreneurial outcomes in the 11-item factor analysis and in the presence of the eleven more descriptively homogenous items was not contributing much to the solution. On that basis InnovFail is excluded from the derivation of the intrapreneurial outcome index and the index based on 11-item factor analysis is adopted as the preferred index.

The research has not been designed to explore why this is the case and it is only possible to speculate, although the literature is clear that failure is an inherent element of intrapreneurship (e.g. Dubey et al., 2014). Perhaps it is because intrapreneurs have levels of self-efficacy that enable them not to perceive sub-optimal results as failure, rather as a bump in the road or a learning point. Combined with the responses to the SSEIT, which demonstrate that intrapreneurs have a positive outlook that is a key component of emotional intelligence (e.g. the item 'I expect that I will do well on most things I try' and the reverse-scored 'When I am faced with a challenge, I give up because I believe I will fail'), the results could suggest that the InovFail responses may

be explained by optimism. It could also be that successful intrapreneurs are future-facing and opportunity-focused, rather than backwards-looking. It is interesting to note that the response to the item in the Individual Intrapreneurial Outcomes questionnaire about learning from mistakes received higher scores (i.e. When my innovations fail, I learn from them and try to improve next time') than did Innovfail, so evidently failure does indeed occur. Individual intrapreneurs' perceptions of failure would be an interesting area for future research.

Key Attributes of Successful Intrapreneurs

Using the 11-item intrapreneurial outcome index, the relationships between the intrapreneurial index and dimensions of personal behaviour as measured by the Big Five index, SSEIT emotional intelligence index and Dolphin Index, were assessed.

The analysis of the Pearson correlation coefficients reveals the following, which provide an additional, external form of validation for the Intrapreneurial Outcomes measure.

For the Big Five inventory behaviours, Openness and Extraversion rank highest in terms of the strength of relationship with intrapreneurship with modest correlation coefficents of 0.397 and 0.342 respectively. Neuroticism is the only behaviour with a statistically significant negative relationship with intrapreneurship, whilst Conscientiousness and Agreeableness have very weak and not statistically significant associations with intrapreneurship. **The results support three of the five componenets of H2: Individual intrapreneurial outcome positively correlates with personality traits as defined and measured by the Big Five**, specifically:

a) Individual intrapreneurial outcome positively correlates with Openness.

b) Individual intrapreneurial outcome positively correlates with Extraversion.

c) Individual intrapreneurial outcome negatively correlates with Neuroticism.

These findings support those from the literature review in Chapter 5:

d) A positive correlation with Openess – in order to be creative and to innovate:Wunderer (2001; p.197) “conceptual competencies”;

- Patterson et al. (2009; p.13) “openness”;
- Davis (1999; p.316) “creative and innovative”;
- Vandermerwe & Birtey (1997; p.346) “openness to change and to new approaches”;
- Lau et al. (2012; p.673) “innovativeness” and “change orientation”.

e) A positive correlation with Extraversion – also to influence, lead and dive through change:

- Wunderer (2001; p.197) “social competencies”;
- Patterson et al. (2009; p.13) “extraversion is likely to be domain / context dependent”;
- De Jong et al. (2011; p.12), intrapreneurs are “more externally focused and have diverse networks”.

f) A negative correlation with Neuroticism – to have the personal resilience to deal with the risk and uncertainty that are inherent in significant innovation projects:

- De Jong et al. (2011; p.7) and Lau et al. (2012; p.673) “risk taking”;
- Davis (1996; p.316) and Vandermerwe & Birtey (1997; p.347) “resilient”;

- Sinha & Srivistava (2013; p.105) “neuroticism was significantly but negatively correlated to intrapreneurial orientation”.

The identification of these findings indicates that similarities that may indeed exist within the personality trait profiles of individual intrapreneurs who generate positive outcomes for their employing organisations and provides the following benefits:

- Presentation of a perspective that complements and supports the existing literature by relating personality traits from the Big Five with a measure of individual intrapreneurial performance.

- Presentation of insights that may assist academic researchers, individual intrapreneurs and organisations in beginning to develop further understanding of the personality traits that are seen in successful intrapreneurs. This means that over time interventions may be developed to better support the achievement of individual intrapreneurial outcomes in organisations.

The findings from this study support the themes found in the literature by showing that there are correlations between individual intrapreneurial outcome and aspects of personality as defined by the Big Five. These results reinforce the picture of the successful intrapreneur as an individual who is highly driven when it comes to pushing boundaries to make things happen, who gets energy from external sources and who does enough to get along with others and play closely enough to the organisation’s rules. They are open to new thinking but also have a clear vision of their own for what should be done and how to achieve success. The intrapreneur is also aware of the risks that are inherent to driving innovation, which makes them vigilant, focused and assertive to avoid failure and optimise the chances of success for their project.

SSEIT emotional intelligence is also modestly but statistically significantly positively associated with intrapreneurship, with a correlation coefficient of 0.351. **The results support H3: Individual intrapreneurial outcome positively correlates with a**

positive self-perception of emotional intelligence. The findings are consistent with the literature regarding the importance of EI in successful intrapreneurship, e.g. Chakravarthy & Lorange, (2008); Kanter, (1983); Lewis, (2011); Allan et al., (2002); Patterson et al., (2009).

From this combined analysis of personality and EI emerges a profile of the successful intrapreneur who potentially uses the low Neuroticism trait positively to keep their eye on the ball and drive their initiatives through, who is not too concerned about getting along with everybody involved in the process (Agreeableness), who does not pay too much attention to rules and structure, but will work within them as necessary (Conscientiousness), and who has a reasonably open view about what they want to happen and how (Openness). Also the high Extraversion, using the definition from the Big Five Inventory (BBC, 2014) suggests the successful intrapreneur is a positive, optimistic and sociable person (which probably means they are forgiven for being only somewhat concerned with Agreeableness and Conscientiousness at times!).

This research does not profess to explain why intrapreneurs might demonstrate such a trait profile, or indeed whether people with this trait profile have a greater propensity to be intrapreneurial. The results show correlation, not cause and effect. What is does indicate, however, is that successful intrapreneurs as identified using the derived Individual Intrapreneurial Outcomes measure appear to share similarities with regard to their personality traits. It also demonstrates how the Intrapreneurial Outcomes measure can be used in combination with a personality inventory to identify similarities that can then be explored further through additional research.

There are modest but statistically significant positive relationships between the intrapreneurship outcome index and twelve of the thirteen Dolphin Index scores. Dynamism, Idea Proliferation and Idea Support are the three Dolphin Index behaviours that are most strongly associated with intrapreneurship with correlation coefficients ranging from 0.272 to 0.308. Stress, Playfulness and shared view are the weakest associated behaviours with correlation coefficients ranging from -0.067 to 0.139. The

analysis identifies characteristics of innovation climate dimensions that are most associated with Intrapreneurship (including Dynamism, Risk taking, Idea proliferation and Idea support) and those that are less so (Playfulness and Stress). These findings are in line with what could be expected within the Intrapreneurship context. Playfulness, for instance, is potentially most visible at the creativity stage of the Intrapreneurship Process, and is especially associated with the idea generation stage in the literature (e.g. Rajah, (2007); Shneiderman, (2007); Sternberg et al., (1997)). Perhaps as ideas become converted into commercial, actionable projects playfulness becomes less acceptable or important to intrapreneurs due to the important business of making projects work, unless development and implementation are handed over to somebody else in the organisation. Stress is potentially the most problematic dimension proposed by the Dolphin Index. In organisations, there needs to be enough stress in the form of positive pressure to motivate action and make things happen, whereas too much stress in the form of unrealistic demands or expectations, workload that is too high and so on, is likely to negatively impact individual and organisational performance. Judgements on acceptable levels of stress and responses to it are highly subjective and personal, depending on individual resilience – the same circumstances can be interpreted by one individual as energising, positive challenge and by another as overwhelming and counter-productive (e.g. Quick et al., (1997)).

The distinctly positive correlations for Dynamism, Risk taking, Idea Proliferation and Idea Support are aligned with the Intrapreneurship Process proposed in Chapter 3. To achieve successful intrapreneurial outcomes for the employing organisation, the individual intrapreneur needs the organisation to be willing and able to change, interested in new idea generation, open to taking risks on new initiatives and providing support for its intrapreneurs' ideas. A low presence in any of these four dimensions is likely to create an obstacle that would not only impede intrapreneurial progress but also potentially frustrate individual intrapreneurial employees.

The results support **H4: Successful individual intrapreneurship positively correlates with a positive perception of organisation innovation climate by the individual intrapreneur.** They also concur with the literature regarding the importance of innovation climate on individual creativity and innovation, e.g. Kanter, (1983); Hunter et al., (2007); Ekvall, (1996), (2005); Manimala et al., (2006); Kuratko et al., (1990); Amabile, (1996); Krueger, (2000)).

The implications of this study are that the new measure of intrapreneurial outcomes is a useful tool that can be used to correlate other behavioural, trait and perception inventories to begin to create an enhanced understanding of the key attributes of successful individual intrapreneurship linked to business performance outcomes.

The findings from this study provide evidence to support the argument that the development and nurturing of individual intrapreneurship in organisations has performance benefits for the organisation at the individual level. If the role of key attributes, such as personality and EI, in successful intrapreneurship are better understood, both employing organisation and employee can begin to understand the dynamics of their interaction and work to make it still more effective. The findings with regard to perception of innovation climate provide reassurance to organisations and researchers that efforts made to improve this area in practice are likely to have a positive impact on individual intrapreneurial outcomes, this being an actionable insight from this research.

Limitations of the Study

The limitations of this research are acknowledged. For example, because the intention is to propose a generically applicable measure of outcomes, granularity is lost in terms of actual values or scale of the benefits generated. Also, individuals who have taken part in the study have self-reported the organisational outcomes that they have generated. There is a need for self-reporting because many intrapreneurial outcomes

at the individual level may not, on their own, be material enough to register on corporate level results such as published accounts.

In this study participation is limited to people who are actively working and have deliberately excluded options such as inviting full-time, non-working students to take part. It has been challenging with the resources available to acquire a representative sample composition in terms of make-up from people who have busy working lives at different levels within a range of organisations, which means that the sample content is not representative of the working population as a whole. However, as this research aims to be a demonstration of concept at this stage, and the sample size is sufficient for the measure that is presented, confidence can be taken that the study does provide a meaningful and useful new measure of Individual Intrapreneurial Outcomes.

Some limitations of the research design are that:

- The outcomes are self-reported and therefore subjective.

- The sample size is valid, however the make-up of respondents is not directly representative of UK industry.

- The economic climate and levels of innovation appropriate to the industry sector in which the respondents operate may be exogenous factors that influence the results of the study (Smart and Conant, (1994)).

- Important aspects of the individual Intrapreneurship Process, such as intrapreneurial intent (such as Ajzen, (1991); Guerrero et al., (2008)), self-efficacy (e.g. Lucas et al., (2009); Koellinger, (2008)) and motivation (e.g. Vroom, (1964)) have not been included as they are outside the scope of this study. However, future research into how to motivate action to generate successful organisational outcomes by individual intrapreneurs could provide insight into how to inspire and mobilise employees with latent intrapreneurial potential.

- The theme of innovation failure is an item that this research study is not specifically designed to explore, but is a potentially interesting area for further research to better understand how individual intrapreneurs' perceptions of failure correlate to successful generation of intrapreneurial outcomes for the organisation by individuals. This is an area that is sparsely covered by the literature other than generically, i.e. that intrapreneurship intrinsically involves risk and therefore at least occasional failure (e.g. Dubey et al., (2014)).

Aims and Contribution of the Study

On a theoretical level, this study's aims are to develop a scale that allows investigation of the correlations between key attributes of individual intrapreneurship from the literature – namely the role of personality, self-perceptions of emotional intelligence and perceptions of innovation climate – and intrapreneurial outcomes for the organisation measured on the scale. Another intended aim of this study on a practical level is to begin to build an evidence-based, conceptual argument for business focus on developing and supporting individual intrapreneurs. It is also to help individual intrapreneurs better understand how they can develop and use their capability more effectively within their organisations through better awareness of their modus operandi. This study achieves its aims, making the following contributions to the intrapreneurship literature:

- The benefits of correlating key attributes of successful individual intrapreneurs to positive organisational outcomes are identified, and measurement of these outcomes by individuals is shown to be a gap in the literature.

- A derived, generically applicable measure of individual intrapreneurial outcomes on a scale is proposed, correlations are identified between positive intrapreneurial outcomes at the organisational level and specific elements of personality, self-perception of emotional intelligence and perception of

innovation climate. These resonate with some of the key themes within the intrapreneurship literature.

It is the long-term ambition for this thesis to be the beginning of a potentially lifelong study and communication of how individual intrapreneurs and their employing organisations can identify and leverage key attributes for positive and beneficial intrapreneurial outcomes creating more sustainably robust and competitive organisations.

How the Findings are Informing Practice

The Intrapreneurial Process proposed in Chapter 3 has been shared with approximately 500 working professionals in the UK and Ireland at a number of professional presentation events. Qualitative feedback in discussions with participants at these events is that the Intrapreneurial Process resonates with them, especially its non-linear, iterative nature. Whilst the Intrapreneurial Process appears to be a useful model for illustrating the different activities undertaken by intrapreneurs, the researcher's view is that this could be enriched further in future research by integrating consideration of the intrapreneur's cognitive processes with these activity processes – for example, comparing and contrasting effectuation and emergent intrapreneurial thinking with causal reasoning.

The findings from this study are also useful in informing practice as follows:

Organisations and individual employees could use the individual Intrapreneurial Outcomes Measure presented in this study as a way of tracking progress and assessing the effectiveness of interventions designed to improved intrapreneurship success. More longitudinal work will be required to properly assess the temporal stability of the instrument. However, some organisations, large and small, who participated in this study have expressed an interest in using the Intrapreneurial Outcomes Measure in this way, particularly for innovation and intrapreneurship

training programmes.

This study is also at the early stages of helping to demonstrate to organisations and individuals that there is a correlation between some of the 'softer' attributes (such as Emotional Intelligence and Innovation Climate) that are often a feature of training programmes or organisational culture initiatives with real, beneficial outcomes for the organisation. When budget challenges loom in organisations, it is often training expenditure that is one of the first categories to be negatively affected, because there is so often a lack of a clear link between the investment and the return. The Intrapreneurial Outcomes Measure aims to begin to assist organisations by providing a way of assessing the attributes and interventions that make a positive difference to their performance.

There has been interest in the potential for this research to contribute to improved intrapreneurial outcomes in a wide variety of organisations. Large, established organisations who continuously strive to keep their offer and approaches relevant and contemporary are coming forward to understand how they can achieve more and better intrapreneurship; SMEs that began as successful entrepreneurial ventures are also expressing strong interest in how they move from being entrepreneurial to intrapreneurial after a number of years, to keep growing and performing sustainably and successfully.

There is also great potential to use the Individual Intrapreneurial Outcomes Measure in intrapreneurship training programmes to both provoke and inform discussion and specific interventions aimed at better equipping delegates to intrapreneur in their own organisations. An example is its use in a public sector organisation aiming to become more commercial in its approach. Discussion of delegates' individual scores with them revealed a lack of confidence in challenging the status quo and influencing upwards and sideways. A specially tailored advanced influencing skills training intervention was designed to help address this.

Chapter 16

CONCLUSION

The major deliverable of this study is the design of a new measure of individual intrapreneurial outcomes. SEM is applied and demonstrates that the hypothesised intrapreneurial outcomes measure has statistical integrity. In addition, Exploratory Factor analysis is an effective means of deriving a data-driven index of Intrapreneurship from the Intrapreneurial Outcomes measured in the questionnaire. Given the similarity between the indices, no one single index stands out as providing a superior measurement of intrapreneurship above the others, however an index based on an 11-item factor analysis is presented as the proposed measure of Individual Intrapreneurial Outcomes. H1: Individual intrapreneurship contribution can be quantified on a scale is confirmed.

The measure presented is then used to show how attributes often associated with successful individual intrapreneurs in the literature correlate with positive organisational outcomes. These attributes are personality, tested via the Big Five Personality Questionnaire, self-perception of emotional intelligence, assessed by the SSEIT Inventory and perceptions of innovation climate, measured via the Dolphin Index. Three of the Big Five inventory personality traits – Neuroticism, Extraversion and Openness – are statistically significant at the 99% level, whilst Agreeableness and Conscientiousness have little association with intrapreneurship. For three of the big five components of the following hypothesis is confirmed - H2: Individual intrapreneurial outcome positively correlates with personality traits as defined and measured by the Big Five, specifically:

a) Individual intrapreneurial outcome positively correlates with Openness.

b) Individual intrapreneurial outcome positively correlates with Extraversion.

c) Individual intrapreneurial outcome negatively correlates with Neuroticism.

Self-perception of emotional intelligence, as measured by SSEIT, is positively and statistically significantly correlated with all three Intrapreneurial Outcome measures which supports the hypothesis that the greater the individual's self-perceptions of emotional intelligence, the greater the Intrapreneurial Outcome. H3: Individual intrapreneurial outcome positively correlates with a positive self-perception of emotional intelligence.

Innovation climate dimensions that are most associated with individual intrapreneurial outcomes are Dynamism, Risk Taking, Idea Proliferation and Idea Support, and those that are less so are Playfulness and Stress. The results of the analysis support H4: Successful individual intrapreneurship positively correlates with a positive perception of organisation innovation climate by the individual intrapreneur.

The implications of this study are that the new measure of intrapreneurial outcomes is a useful tool that can be used to correlate other behavioural, trait and perception inventories to begin to create an enhanced understanding of the key attributes of successful individual intrapreneurship linked to business performance outcomes. The literature does not link intrapreneurial behaviour at the individual level and measurable positive outcomes for the employing organisation, so the findings from this study are important. The study contributes a new perspective of intrapreneurship that adds value to organisations and their intrapreneur employees by demonstrating a measurable correlation between some of the key attributes for intrapreneurship at the individual level and outcome benefits for the organisation. The purpose of so doing is to begin the early stages of a process of wider academic debate on the commercial impact of intrapreneurship, so that organisations will become better informed, based on evidence, of the importance of individual intrapreneurs to overall organisational success. Because organisations are often budget-constrained and highly conscious of return-on-investment for any activities, the case can be made more persuasively to the

corporate audience if potential commercial benefits of better understanding and developing individual intrapreneurs are considered.

On a theoretical level, this study identifies the correlations between some key attributes of individual intrapreneurship from the literature – namely the role of personality, self-perceptions of emotional intelligence and perceptions of innovation climate – and intrapreneurial outcomes for the organisation generated by the individual measured on a generically-applicable scale. On a practical level this study also begins to build an evidence-based, conceptual argument for organisational focus on developing and supporting individual intrapreneurs. It also begins to help individual intrapreneurs better understand how they can develop and use their capability more effectively within their organisations through better awareness of their modus operandi.

Appendix 1: Big Five Inventory

The Big Five Inventory (BFI)

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please select a number next to each statement to indicate the extent to which you agree or disagree with that statement.

	I see myself as someone who...	Disagree strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree strongly
1	Is talkative	1	2	3	4	5
2	Tends to find fault with others	1	2	3	4	5
3	Does a thorough job	1	2	3	4	5
4	Is depressed, blue	1	2	3	4	5
5	Is original, comes up with new ideas	1	2	3	4	5
6	Is reserved	1	2	3	4	5
7	Is helpful and unselfish with others	1	2	3	4	5
8	Can be somewhat careless	1	2	3	4	5
9	Is relaxed, handles stress well	1	2	3	4	5
10	Is curious about many different things	1	2	3	4	5
11	Is full of energy	1	2	3	4	5
12	Starts quarrels with others	1	2	3	4	5
13	Is a reliable worker	1	2	3	4	5
14	Can be tense	1	2	3	4	5
15	Is ingenious, a deep thinker	1	2	3	4	5
16	Generates a lot of enthusiasm	1	2	3	4	5
17	Has a forgiving nature	1	2	3	4	5
18	Tends to be disorganized	1	2	3	4	5
19	Worries a lot	1	2	3	4	5
20	Has an active imagination	1	2	3	4	5
21	Tends to be quiet	1	2	3	4	5
22	Is generally trusting	1	2	3	4	5
23	Tends to be lazy	1	2	3	4	5
24	Is emotionally stable, not easily upset	1	2	3	4	5
25	Is inventive	1	2	3	4	5
26	Has an assertive personality	1	2	3	4	5
27	Can be cold and aloof	1	2	3	4	5
28	Perseveres until the task is finished	1	2	3	4	5
29	Can be moody	1	2	3	4	5
30	Values artistic, aesthetic experiences	1	2	3	4	5
31	Is sometimes shy, inhibited	1	2	3	4	5
32	Is considerate and kind to almost everyone	1	2	3	4	5
33	Does things efficiently	1	2	3	4	5
34	Remains calm in tense situations	1	2	3	4	5
35	Prefers work that is routine	1	2	3	4	5
36	Is outgoing, sociable	1	2	3	4	5
37	Is sometimes rude to others	1	2	3	4	5
38	Makes plans and follows through with them	1	2	3	4	5
39	Gets nervous easily	1	2	3	4	5
40	Likes to reflect, play with ideas	1	2	3	4	5
41	Has few artistic interests	1	2	3	4	5
42	Likes to co-operate with others	1	2	3	4	5
43	Is easily distracted	1	2	3	4	5
44	Is sophisticated in art, music, or literature	1	2	3	4	5

Appendix 2: Schutte et al.'s (1998) SSEIT 33-item scale

(1) I know when to speak about my personal problems to others

(2) When I am faced with obstacles, I remember times I faced similar obstacles and overcame them

(3) I expect that I will do well on most things I try

(4) Other people find it easy to confide in me

(5) I find it hard to understand the non-verbal messages of other people*

(6) Some of the major events of my life have led me to re-evaluate what is important and not important

(7) When my mood changes, I see new possibilities

(8) Emotions are one of the things that make my life worth living

(9) I am aware of my emotions as I experience them

(10) I expect good things to happen

(11) I like to share my emotions with others

(12) When I experience a positive emotion, I know how to make it last

(13) I arrange events others enjoy

(14) I seek out activities that make me happy

(15) I am aware of the non-verbal messages I send to others

(16) I present myself in a way that makes a good impression on others

(17) When I am in a positive mood, solving problems is easy for me

(18) By looking at their facial expressions, I recognize the emotions people are experiencing

(19) I know why my emotions change

(20) When I am in a positive mood, I am able to come up with new ideas

(21) I have control over my emotions

(22) I easily recognize my emotions as I experience them

(23) I motivate myself by imagining a good outcome to tasks I take on

(24) I compliment others when they have done something well

(25) I am aware of the non-verbal messages other people send

(26) When another person tells me about an important event in his or her life, I almost feel as though I have experienced this event myself

(27) When I feel a change in emotions, I tend to come up with new ideas

(28) When I am faced with a challenge, I give up because I believe I will fail*

(29) I know what other people are feeling just by looking at them

(30) I help other people feel better when they are down

(31) I use good moods to help myself keep trying in the face of obstacles

(32) I can tell how people are feeling by listening to the tone of their voice

(33) It is difficult for me to understand why people feel the way they do*

Note: The authors permit free use of the scale for research and clinical purposes.

*These items are reverse scored.

Appendix 3 – Questionnaire Resources

1. Background information provided to respondents on the research website portal, CfIE.

Jo North is currently studying for a PhD in Corporate Innovation at The University of York. The CfIE site has been developed to support Jo's research into Identifying and Nurturing Latent Intrapreneurship in Business. Her core hypothesis is that potential intrapreneurship within organisations can be identified and developed at an individual level, and that the individual and his/her environment are each able to influence the generation of more positive intrapreneurial outcomes that benefit both the intrapreneur and his/her environment. The research is being conducted using business people from a wide cross-section of sectors and industries. The finished paper will propose a research model that will enable organisations and individuals to identify and develop latent intrapreneurship, which in this increasingly uncertain world is a vital business competence.

2. Example invitation email sent to survey respondents.

Dear (insert name),

I am currently working towards a PhD at The University of York.

My research is based on the hypothesis that potential intrapreneurship (entrepreneurial activity within an organisation) can be identified, developed and measured at an individual level, and can be used to benefit both the individual and the organisation they work in.

To support my research, I have created The Centre for Intrapreneurial Excellence online portal at the University of York. This is a facility that gives individuals the

opportunity to participate in this research project through a series of short questionnaires.

Your input would be invaluable and I would be very grateful if you could spare some time to take part.

If you would like to participate, please reply to me at jjn503@york.ac.uk and I will send you a link to the survey website.

Completing the surveys is a very simple process. Once you have registered on The Centre for Intrapreneurial Excellence site you will be able to access your online account, where you can click on *My Surveys* to start. There is a short series of questionnaires to complete, each taking between between 5 and 30 minutes.

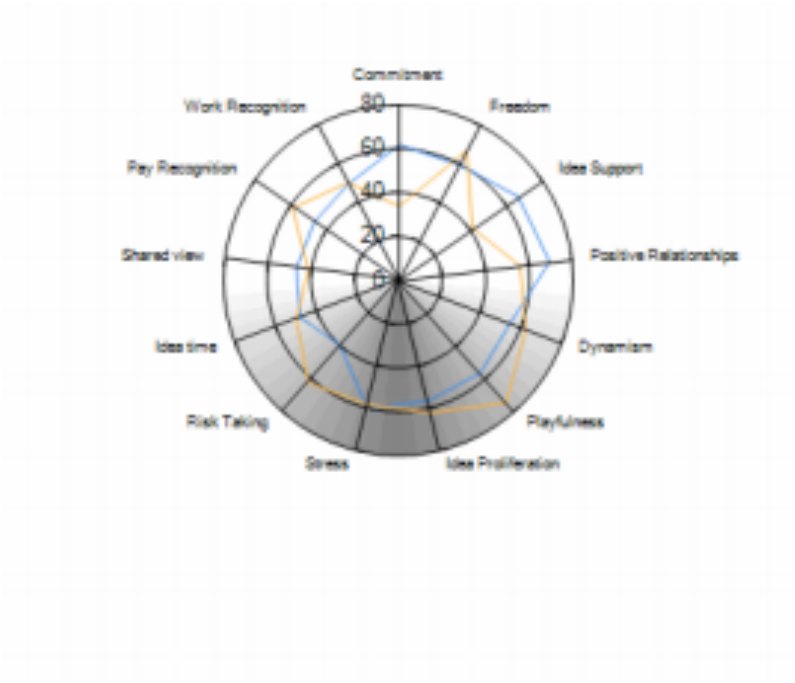
Once a questionnaire has been completed, you will receive either feedback on your results or a reward in the form of a short learning resource, which I hope you will find interesting.

Please rest assured that your anonymity is paramount and responses will not be shared in any way that identifies a particular organisation or individual.

I thank you in advance for your assistance and for your responses, which will help me to learn more about intrapreneurial activity in organisations in the UK and Ireland.

Kind regards
Jo North
PhD Researcher – University of York

3. Example of the Screen Shot Received by Participants on Completion of the Dolphin Index Questionnaire



Key

Normal Your Result

4. Federation of Small Businesses – Email Communication to Members

From: Neville Martin <Neville.Martin@fsb.org.uk>
Sent: 05 December 2013 17:05
To: Neville Martin
Subject: Enterprise Express

Enterprise Express has just gone live online. It contains all the region's news, resources, some great free events, business achievements, burning issues and things to watch out for in future... everything you need to know about what's happening in the business world, all in one place. The kaleidoscopic array of issues addressed in this week's edition include:

- Small Business Saturday
- Making apprenticeships work for your business - free seminar
- Sheffield to be home to Cable's new business bank
- Can you spare a little time to mentor tomorrow's entrepreneurs?
- Workplace health guidance for employers in Barnsley
- Are you aware of new laws concerning commercial competition?
- Help shape the design of a new online service for small businesses
- Applications invited for social enterprise grants
- E-marketing masterclass by Square Orange
- "Intrapreneurship" - help ground-breaking research
- Solutions sought to Sheffield's most pressing challenges
- Sheffield MP backs moves to inspire more girls into engineering
- Small business owners 'frustrated by energy waste'
- Government unveils plans for reformed apprenticeships
- Small firms warned about mass malware campaign

..... and many more.

Enterprise Express is the foremost business e-newsletter and is produced exclusively by the South and East Yorkshire Region of the Federation of Small Businesses.

Enjoy this week's edition, and see it *here*.

Federation of Small Businesses
South and East Yorkshire Region
http://www.fsb.org.uk
Tel: 0114 261 7132
Mobile: 07917 628922

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The UK's Leading Business Organisation

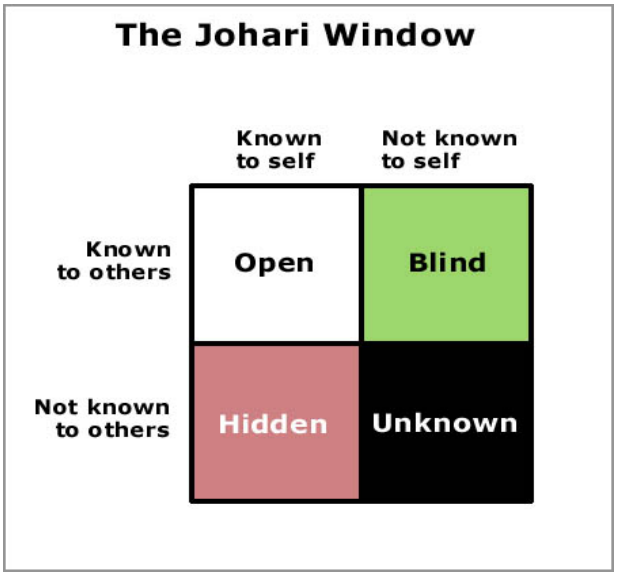
5. Reward Text Received by Participants Completing the SSEIT

INTRODUCTION TO EMOTIONAL INTELLIGENCE

Thank you very much for completing the SSEIT questionnaire. It may be interesting for you to reflect on how easy / challenging it was for you to answer some of the questions and which questions may have provoked you to think and reflect about your answers the most as these may be the most revealing for you in terms of your personal development!

How we see ourselves and how others see us

You may be familiar with a self-development model called 'The Johari Window' (Luft and Ingham, (1955)) which I think is still as useful today as it was when it was first created. One of the most useful aspects of this model is the core framework that can be really insightful and thought-provoking.



As you can see from the diagram above, there are aspects of each of us that are:

- Known to others and ourselves – open;
- Known to others but not known by ourselves – e.g. some we may have some mannerisms when we give presentations for others that we are not aware of but that are noticed by our audience. These aspects are our 'blind spots' and by working on our self-awareness by better understanding the perceptions of others our emotional intelligence will improve as will our effectiveness both socially and at work;
- Known to ourselves, but is hidden from others. These are the things we choose to keep private, either consciously or unconsciously, e.g. our innermost thoughts; and

- Neither known by others nor by ourselves – this may be due to lack of opportunity / exposure.

By seeking feedback from the people who report to you, your peers, boss, customers and key contacts and actively taking on board their observations, perhaps through feedback questionnaires, performance reviews, informal conversations and so on, you will be able to identify those areas where your own self-perception is aligned or not with the way others see you and develop your own emotional intelligence.

I've used the term 'emotional intelligence' a couple of times now, so here's some information on what it is and why it is important.

Different types of intelligence

In 1983, Howard Gardner, proposed that people are intelligent in different ways – i.e. that we have different types of intelligence which he called 'Multiple Intelligences'. The thinking has been developed since then and it is now generally accepted that there are eight kinds of intelligence. These are:

- Spatial;
- Linguistic;
- Logical-mathematical;
- Bodily-kinesthetic;
- Musical;
- Interpersonal;
- Intrapersonal; and
- Naturalistic (being in tune with and able to nurture our natural surroundings).

There are also some proponents of a ninth intelligence, Existential, which is concerned with spiritual or religious and the ability to deal with concepts such as infinity, the cosmos and abstract thinking.

These intelligences are developed differently in each of us – we are each likely to be stronger in some than we are in others.

What is emotional intelligence?

Emotional Intelligence is the ability or skill to be able to identify and manage our own emotions and also to identify and influence the emotions of other individuals and groups of people.

Emotional intelligence is sometimes abbreviated to 'EQ', to contrast with the commonly used 'IQ' (Intelligence Quotient), which is usually expressed as a number. It combines in particular the Interpersonal and Intrapersonal intelligences above. It is also sometimes shortened to 'EI'.

The term 'emotional intelligence' was used in 1990 by Salovey and Mayer. They identified three key areas, which I have summarised below:

1. Being able to assess, interpret and express emotions. This includes not just what we say and how we say it, but also the non-verbal communication that we all engage in, whether knowingly or not.
2. Being able to control and manage these emotions effectively, how we relate to others and are able to understand their perspectives and pick up on and empathise with others' emotional states.
3. Being able to leverage emotions to solve problems or deal with challenge – the areas of motivation, creativity and resilience are really key aspects here.

Building on Salovey and Mayer's work, it was Daniel Goleman who took the concept of EQ and propelled it to the next level of business and academic awareness. His book, *Emotional Intelligence* is a very approachable and worthwhile read if this is an area that you would like to explore further.

Why is EQ important?

There is evidence that having strong emotional intelligence is a key success factor in career and business success. Malcolm Gladwell, in his book *Outliers*, suggests that it is more important to have a high EQ than it is to have a high IQ, using some really interesting case studies. The book is well worth a read and it's thought-provoking and enjoyable too.

Some of the key benefits of developing your EQ are that:

- You will be able to manage yourself and present yourself more effectively, and leverage your emotions positively rather than allowing your emotions to adversely influence your behaviour and decision-making;

- You will be a better boss / manager / colleague because you will be more tuned in to those around you and more able to positively impact others;

- You will contribute more to the success of your organisation as you will not only become a stronger performer and team player, but you will also have a greater ability to influence your organisation to support your ideas and initiatives for improved results. There are numerous academic articles that make a clear link between intrapreneurial and entrepreneurial success and high levels of emotional intelligence. Although it's reality t.v. to some extent, you can see this in action by watching just one episode of *The Apprentice* or *Dragon's Den*!

- Decisions are often made based on some degree of emotion that we retrospectively 'justify' through rational argument! By improving your EQ you will be more attuned to this.

Top tips for developing your own EQ

- Now that you are even more aware of the concept and importance of EQ, reflect on your own weaknesses and maybe have a go at a mini SWOT (strengths, weaknesses, opportunities and threats) for yourself. You could ask others for their views on your SWOT and then work on making a conscious effort to improve where you 'd like to and also build on your strengths.

- If you get the opportunity to undergo a 360 degree feedback exercise, embrace it and, although some feedback might be uncomfortable you will also learn more about the positive view that your colleagues have of you too. You might wish to use the Johari framework shown earlier in the article to plot your feedback.

- Read and observe! The books recommended in this article will give you some more insight into EQ and the factors of success and are accessible, approachable and interesting reads. When you get chance, observe others in action and reflect on how well their EQ is working and what you can learn, e.g. in meetings, presentations and so on. Do the same on your own performance. Where did you struggle to influence, why was that do you think? Where did you make a really positive impact and why?

- Reflect on your answers to Schutte et al's (1998) questionnaire that you have just completed online. If you think about them honestly, your responses may reveal some really interesting areas for development. I have included the same questions at the end of this article for your reference. The authors developed the questionnaire to provide value to individuals who want what they call " a valid appraisal of their emotional intelligence...because they (a) wish to understand one of their own important characteristics so that they can better set goals and work toward these goals; (b) experience problems in areas related to emotional intelligence, such as difficulties in impulse control or (c) are

considering entering settings or careers in which emotional intelligence is important." Many thanks to the authors for allowing their questionnaire to be freely used for research purposes.

I hope that this *Introduction to Emotional Intelligence* has been useful and interesting. If you have any questions or comments, I would love to hear from you. Please email me at jjn503@york.ac.uk.

Thank you,

Jo North
PhD Researcher – University of York

Recommended reading

Malcolm Gladwell's *Outliers* - http://www.amazon.co.uk/Outliers-Story-Success-Malcolm-Gladwell/dp/0141036257/ref=sr_1_1?s=books&ie=UTF8&qid=1305369479&sr=1-1

Daniel Goleman's *Emotional Intelligence* - http://www.amazon.co.uk/Emotional-Intelligence-Daniel-Goleman/dp/055384007X/ref=sr_1_4?s=books&ie=UTF8&qid=1305369527&sr=1-4

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