

**Going Beyond Individual Differences: Exploring the Impact
of Social Networks, Work Environment and Cross-Cultural
Differences on Entrepreneurial Achievement.**

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Declaration

I, Reece Akhtar, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

A handwritten signature in black ink, appearing to read 'Reece', with a long, sweeping horizontal stroke extending to the right.

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Abstract

In academia and business, entrepreneurship has received considerable interest given its allure of autonomy, innovation and ability to produce considerable amounts of wealth and value (Hisrich, Langan-Fox & Grant, 2007). In essence, the start-up is the new 'garage rock band' with its promises of fame and fortune. Yet, this analogy is sobered by the fact that the majority of start-ups fail to grow and become sustainable businesses (Shane, 2008). In light of this, the question of which entrepreneurial ventures do go on to achieve success and grow, and in what contexts, becomes of primary interest. Given that entrepreneurship is a key driver of economic, technological and social progress, understanding the antecedents of entrepreneurial achievement has important theoretical and practical implications (Kuratko, 2007).

Psychologists have conducted much research into the role of individual differences in the attainment of entrepreneurial achievements (e.g. organisational growth, innovation & value creation), alongside situational theorists who have identified the various ways in which contextual factors aid achievement. There remains however a significant lack of research that has attempted to integrate the two approaches. It is argued that doing so will extend both academic and practitioner understanding of how entrepreneurial talent is expressed, developed, and produces achievement. Using an interactionist approach (Tett & Burnett, 2003), this thesis sets forth the hypothesis that although an individual's entrepreneurial talent is important, its relationship with achievement is influenced by relevant contextual factors that are expressed at the *micro*, *meso* and *macro* levels of the environment. Appreciating the wealth of situational entrepreneurship research, the current thesis explores this hypothesis across multiple levels of analysis. Particular attention is paid to the

influences of social capital, organisational culture, and cross-cultural differences between developing economies.

This thesis begins with a review of the psychological and contextual determinants of entrepreneurial achievement, and outlines key gaps in the literature. Based on this, a series of hypotheses were proposed that sought to explain how contextual factors influence the relationship between individual differences and entrepreneurial achievement. Together, this served as the theoretical foundation for subsequent empirical chapters. The first empirical chapter of this thesis integrated both personality and social capital theory (Burt, 2004), by using social network analysis to demonstrate the influence of social capital as a moderator in the relationship between personality traits and achievement. These results not only demonstrated the indirect effect individual differences holds with achievement, via social and relational factors, it also integrated two distinct research methodologies: psychometrics and social network analysis.

There is much research that has explored what constitutes an organisation's culture to be creative or innovative (Anderson, Potočnik & Zhou, 2014), yet, this is not the case when discussing entrepreneurship. Accordingly, the second empirical chapter describes the development and validation of such a psychometric measure. In particular, this measure assesses the extent to which an organisation's culture supports and encourages entrepreneurial activity and achievement. This measure consists of four dimensions: *Leadership Style, Employee Values, Empowerment & Team Behaviour*. This *Entrepreneurial Culture Inventory* was found to hold concurrent and incremental validity in the prediction of entrepreneurial achievement, self-efficacy work engagement and employee's intention to quit their jobs. Furthermore, it was found to positively moderate the relationship between entrepreneurial talent and

achievement. These findings address a lack of understanding in how organisations can encourage entrepreneurial practices and achievements amongst their employees.

The final empirical chapter sought to explore the stability of the entrepreneurial talent and achievement relationship across emerging market economies, and also whether differences in gender, socioeconomic and financial factors (e.g. *macro* contextual influences) mediated this relationship. Collecting data from a sample of over 18,000 microfinance loan applicants, across seven emerging market economies, a multi-group structural equation model revealed that the relationship between entrepreneurial talent and achievement is stable across a variety of countries. These analyses also found no gender differences in entrepreneurial talent between male and female entrepreneurs. In fact, it was found that the reason for gender differences in achievement is the result of external factors, namely, the type of business ventures males and females pursue, and the amount of funding each gender receives. These results demonstrated macro contextual factors to have a significant impact on achievement, irrespective of an individual's level of entrepreneurial talent. These findings have implications for leaders and organisations that are responsible for growing a nation's economy and promoting gender equality.

Reviewing the discussed literature, and the results presented within each chapter, this thesis has successfully extended individual difference theories of entrepreneurship by integrating contextual factors. Specifically, the impact of context on this relationship was empirically demonstrated across micro, meso and macro levels of analysis. This suggests that although individual differences are important antecedents of entrepreneurial achievement, context plays a significant role in activating and enabling an individual's entrepreneurial talent. More so, this research was carried out using a mixture of research methodologies and techniques, some of

which are new to the study of individual differences and entrepreneurship. Together, it can be concluded that this thesis has addressed key gaps in current understanding, and contributed towards a growing body of psychological research. Recommendations for future research and practice are discussed.

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1 Introduction

Entrepreneurship is widely regarded as being the primary driver of economic, technological and social progress, with entrepreneurs widely viewed to be the ‘agents of change’ (Van Praag & Versloot, 2007). Given this, and the fact that the majority of entrepreneurial ventures fail within the first 5 years (Shane, 2008), the academic study of entrepreneurship seeks to understand the antecedents of successful and unsuccessful ventures. Although the field is only 20 years old (Frese & Gielnik, 2014), there is a wealth of literature spanning a plethora of disciplines including economics, philosophy, sociology and psychology. Despite the different approaches to understanding the antecedents of entrepreneurial achievement, the commonality shared across each discipline is in its agreement and appreciation of the individual, the entrepreneur (Baum, Frese, Baron & Katz, 2007). As such, the field of psychology has much to offer when attempting to understand how an entrepreneur innovates and exploits valuable opportunities.

The psychological study of entrepreneurship has typically centred on the entrepreneur’s behavioural dispositions and tendencies, in other words, their personality traits. Trait theory (Rauch & Frese, 2007) seeks to explain how individual differences contributes towards an individual’s tendency to engage in entrepreneurship and succeed at it. Although this has proved fruitful (for an excellent review on the psychological antecedents of entrepreneurial achievement, see Frese & Gielnik, 2014), many still maintain a situational philosophy whereby contextual factors are viewed to be the primary source of opportunity recognition and exploitation, due to the fact that individuals occupy an advantageous location within a social network, exposed to specific work environments, or subjected to particular

social and economic factors (De Carolis & Saporito, 2006; De Vita, Mari, & Poggesi, 2014; Miller & Friesen, 1983). It is argued that such contextual factors affect the likelihood of entrepreneurial achievement due to variation in access to novel resources and non-redundant information, cultural norms and values, and socioeconomic support.

Although both trait and situational theories of entrepreneurship have received support in the literature (Frese & Gielnik, 2014), there remains a significant lack of research that integrates both streams of research. Given that both approaches are empirically valid in explaining and predicting entrepreneurial processes, activities and achievements, they are lacking given their under appreciation of each other. Based on this, the current thesis adopts an interactionist approach to personality and environment (Tett & Burnett, 2003). It is argued that in order to fully understand the antecedents of entrepreneurial achievement, it is important to view them as complementary and interconnected. Put simply, while individual differences are influential in whether a person engages in entrepreneurial activities, and succeeds at them, context plays a moderating role that can either inhibit or facilitate their dispositions and likelihood for success. Such a hypothesis has theoretical and practical implications surrounding entrepreneurial behaviours and practices: it minimises the mysticism and “superhero” status that is often attached to entrepreneurs (Radu & Redien-Collot, 2008), and orientates discussion towards enabling and developing the skills and talents needed so that individuals from all corners of society can positively contribute towards economic growth, technological development and social progress.

Of the various ways an individual’s *entrepreneurial talent* may be developed, there are three gaps in the academic literature. Firstly, a better understanding of the

antecedents of entrepreneurial achievement can inform and develop strategies to not only stimulate change and progress, but also reduce the high incidence of entrepreneurial failure (Shane, 2008). It has been suggested that one way this can be achieved is to understand *how* entrepreneurs use their social network to identify and exploit valuable opportunities (Ng & Rieple, 2014). Understanding how both individual differences and social capital contribute towards achievement would allow for a better integration of individual and contextual theories, alongside the development of practical interventions so that entrepreneurs can identify the skills and resources needed to succeed.

Secondly, empirical evidence suggests that organisations that hire entrepreneurial individuals are more likely to gain and sustain a competitive advantage (Lumpkin, 2007). Conversely, a recent field report by Accenture (2013) highlighted that 80% of employees claimed that management does not support entrepreneurial behaviour, and as such organisations are struggling to retain top entrepreneurial talent. In light of this, there is an opportunity for leaders to gain and sustain a competitive advantage by supporting and engaging entrepreneurial employees. It can therefore be argued that this can be best achieved by having a thorough understanding of the impact of both the individual and organisational culture on entrepreneurial achievement so that evidence-based talent management strategies can be developed.

Lastly, an underutilization of entrepreneurial resources, results in a missed opportunity for growth, thus restricting a nation's economic, technological and social growth (Ács & Szerb, 2012). In this context, promoting female entrepreneurship is especially relevant. For instance, research shows that fewer women engage in entrepreneurship than men (OECD, 2012), and that the success of women led

businesses is often below that of men in several measured criteria. Coupled with the fact that entrepreneurship is driving economic and social progress within developing nations (Reynolds et al., 2005), promoting equality, and facilitating entrepreneurial talent, is of real importance. It is therefore important to understand how sociocultural and macro-economic factors shape entrepreneurial talent and achievement. Doing so may lead to the development of policies that not only promote entrepreneurship at a national level, but also improve a female entrepreneur's chances of success.

Accordingly, the objective of this thesis was to close such gaps in understanding and extend trait theories of entrepreneurship by integrating contextual influences. This was achieved by building upon Tett and Burnett's (2003) *trait activation theory* — personality traits are activated as a response to relevant situational cues that are expressed at either the task, social and organisational level. In particular, the theory states that the stronger and more relevant these cues are to a given personality trait, the more readily it will be activated. By testing trait activation theory within the field of entrepreneurship, thereby uniting both individual and situational approaches, it may be possible to identify new ways to develop entrepreneurial talent.

1.1 Structure of this Thesis

The thesis begins with a review of the psychological evidence surrounding the antecedents of entrepreneurial activity and achievements. Particular attention is paid to outlining definitions, alongside discussing the antecedents of entrepreneurial achievement at the individual, group, organisational and cross-cultural level. By doing so, key gaps in the literature were identified and contributed towards the construction of a theoretical framework that served as a foundation to be tested across five empirical studies described in the subsequent chapters. Chapter 3 investigated the role of social capital as a moderator in the relationship between individual differences and

achievement. In order to explore the role of *micro* contextual influences, this chapter integrated psychometric measures and social network analyses as a novel way to test this hypothesis. Chapter 4 sought to understand the role of *meso* contextual influences. Specifically, the role of organisational culture in developing entrepreneurial talent and achievement. In this chapter, a psychometric inventory was developed that seeks to measure the extent to which an organisation's culture is entrepreneurial. This measure was then validated across two studies. Chapter 5 investigated the influence of *macro* contextual influences by exploring the stability of the entrepreneurial talent and achievement relationship across seven emerging economies. Furthermore, the chapter also explored whether differences in socioeconomic and institutional factors both mediated this relationship and explained gender differences in entrepreneurial achievement. The thesis concluded with a discussion of the presented empirical research and whether it has adequately addressed gaps in the literature and significantly contributed towards both entrepreneurship theory and practice.

2 Literature Review & Theory Development

The chapter begins by defining the term entrepreneurship and entrepreneurial achievement, alongside a discussion on what it means to be entrepreneur. Following this, the literature surrounding the antecedents of entrepreneurial achievement is reviewed. Particular attention is paid to individual, group, organisational and cross-cultural factors, alongside highlighting gaps in theoretical understanding. The chapter concludes with the proposition of a theoretical model and set of hypotheses that serve as a framework for following empirical analyses.

2.1 *Defining Entrepreneurship*

Entrepreneurship is most commonly defined as the process of creating and owning a business (Shane, 2008), however, this definition has been criticised for being overly narrow and decontextualizing (McKenzie, Ugbah & Smothers, 2007). Hence, recent developments have seen broader definitions being attributed to the concept. Generally, it is now accepted that entrepreneurship describes any attempt to produce innovation, value creation and growth, and as such, it can be practiced in a variety of ways (Shane & Venkataraman, 2000). For example, *intrapreneurship* and *corporate entrepreneurship* (e.g. entrepreneurship that occurs within an existing organization; Antoncic & Hisrich, 2001), *technological entrepreneurship* (e.g. developing innovative technologies; Venkataraman, 2004) and *social entrepreneurship* (e.g. using the principles of entrepreneurship to improve social welfare; Mair & Martí, 2006) describe different ways the principles of entrepreneurship are used to achieve different goals. Accordingly, entrepreneurship can be defined as the process whereby an individual displays four behaviours:

opportunity recognition, opportunity exploitation, innovation and value creation (Kuratko, 2007; Shane & Venkataraman, 2000). According to this perspective, entrepreneurship requires more than just innovation and creativity, and is not strictly limited to business ownership. Instead, to be an entrepreneur requires the ability to think ahead, spot opportunities that are yet to be exploited by others, and connect various streams of information to identify market gaps and avenues that could lead to the creation of value (Ahmetoglu, Leutner & Chamorro-Premuzic, 2011). With this broad and behavioural definition of entrepreneurship, entrepreneurial achievement can be defined as the identification and exploitation of opportunities that contribute towards an organisation's growth, value creation, innovation output, and competitive effectiveness (Frese & Gielnik, 2014).

2.2 Individual Differences in Entrepreneurial Achievement

The field of individual differences has become an important area of entrepreneurship research in recent years (Brandstätter, 2011), as the relationship between behavioural dispositions, cognitive ability and work related outcomes have become increasingly clear (Judge, Heller, & Mount, 2002). Research attention has moved away from motivational factors under which entrepreneurship occurs to the 'trait' approach (Rauch & Frese, 2007). This approach seeks to identify the psychological characteristics, traits and abilities that distinguish between entrepreneurs and non-entrepreneurs (Zhao & Siebert, 2006). The next section outlines existing research that has sought to identify the psychological profile of the entrepreneur and the implications this has on producing entrepreneurial achievement.

2.2.1 The Role of Personality

Research into the personality profile of entrepreneurs has predominantly featured the use of the Big Five framework (Costa & McCrae, 1985). A meta-analysis

by Zhao and Siebert (2006) demonstrated that entrepreneurs (as opposed to managers) score higher on Openness and Conscientiousness, and lower on Agreeableness and Neuroticism. According to these results, it is suggested that entrepreneurs are methodical, creative, emotionally stable and willing to go against social norms, but more importantly, can be defined by a set of broad personality traits. Although this description is intuitive and matches the stereotype of an entrepreneur, the effect sizes in the study were found to be small to moderate and limited to entrepreneur's being defined as business owners — a definition that, as previously argued, is narrow.

Although the Big Five is a useful framework to measure and understand work-related behaviour, its inability to measure personality in a specific manner can be a source of mixed findings when conducting individual differences research (Hogan & Roberts, 1996). A second meta-analysis by Rauch and Frese's (2007) included narrow traits such as *need for self-achievement*, *self-confidence* and *need for autonomy*, *stress tolerance* and *proactivity*. These traits were found to hold an average correlation of .25 between business creation and success, while accounting for unique variance in the prediction of the entrepreneurial outcomes. Despite this meta-analysis not investigating the incremental validity of narrow traits, over and above broad traits, it can be argued that narrow traits are useful predictors of entrepreneurial outcomes as they are specific and explicit descriptions of the outcome that they are trying to measure (Rauch & Frese, 2007).

In light of the aforementioned meta-analyses, Leutner, Ahmetoglu, Akhtar and Chamorro-Premuzic (2014) not only tested the incremental validity of narrow traits over and above the Big Five, but also adopted a more inclusive definition of entrepreneurial achievement. Using a measure of *entrepreneurial talent* (Ahmetoglu et al., 2011), a psychometric measure that assesses four narrow traits: creativity,

opportunism, proactivity and vision (Kuratko, 2007; Shane & Venkataraman, 2000), and structural equation modelling, Extraversion was found to predict entrepreneurial achievement ($\beta = .26$). Nonetheless, entrepreneurial talent was found to predict overall entrepreneurial achievement with a path weight of .62 and explained 66% of the variance. This study suggests that when trying to identify and predict entrepreneurial achievement at the individual level, researchers may find it more beneficial to deploy measures of narrow personality traits, in particular, a constellation of four traits that can be described as *entrepreneurial talent* (Ahmetoglu et al., 2011).

2.2.2 Psychopathy

If narrow traits are found to be better predictors of entrepreneurial outcomes, is there a similar relationship between ‘dark’ traits and entrepreneurship? In the last two decades, the literature investigating subclinical personality disorders at work has now become a well-established field of research (Babiak, Neumann & Hare, 2011), so much so, that the relationship between dark traits and entrepreneurship has become of interest to the lay media and academic community alike largely due to high profile scandals and counterproductive work behaviour, with some even theorising that corporate psychopathy contributed to the recent global financial crisis (Boddy, 2011). Given this, organisations looking to hire, encourage or invest in entrepreneurs have a legitimate concern in the possible existence of a ‘dark side’ to entrepreneurship.

Given that individuals with high levels of psychopathy are more concerned with getting ahead, rather than getting along, and that a primary objective of an entrepreneurial venture is to be successful, it is plausible to suggest that two phenomena may be related. One of the first attempts to understand this relationship comes from Kets de Vries (1985) who interviewed entrepreneurs and concluded that a

lack of empathy, manipulation, and callousness are necessary for entrepreneurial achievement. Given that the Dark Triad (three maladaptive & highly inter-correlated constructs of psychopathy, narcissism & Machiavellianism) is correlated with Agreeableness (Paulhus & Williams, 2002), there is tentative evidence to support Kets de Vries' psychoanalytic interviews (Zhao & Siebert, 2006). Akhtar, Ahmetoglu and Chamorro-Premuzic (2013) found that while subclinical psychopathy was positively correlated with a measure of entrepreneurial talent (average $r = .30$), it was not a predictor of entrepreneurial achievement. This suggests that while psychopathic traits are associated with entrepreneurial behaviours, they are not required or deterministic of entrepreneurial activity and success.

2.2.3 Risk Propensity

As risk-taking and entrepreneurship are inseparable, are entrepreneurs more likely to rely on their intuition and cognitive heuristics when making decisions? Busenitz and Barney (1997) found that entrepreneurs were more likely to demonstrate overconfidence and representativeness biases compared to managers. A meta-analysis by Stewart and Roth (2001) further supported this finding by showing greater risk-propensity in entrepreneurs. This finding should not be unexpected; the nature of risk taking is inherent to the notion of being an entrepreneur as it involves the pursuit and exploitation of opportunities through innovative solutions, in the face of possible failure.

2.2.4 Emotional Intelligence

Are successful entrepreneurs more emotionally intelligent and resilient? High levels of core-self evaluations (Judge & Bono, 2001) have been found to positively predict the likelihood of an individual being an entrepreneur and possessing entrepreneurial intentions (Chen, Greene & Crick, 1998; Zhao, Siebert & Hills, 2005)

therefore it can be suggested that an entrepreneur's confidence in their own ability produces resilience to negative outcomes such as venture failure. Testing this hypothesis, Ahmetoglu et al. (2011) found entrepreneurial talent, emotional intelligence and self-efficacy to be positively correlated. Yet, in causal models entrepreneurial talent was found to be a better predictor of entrepreneurial achievement.

2.2.5 Expertise

Where the aforementioned research has focused on the role of personality traits, within the entrepreneurship literature it is also important to consider the influence of another individual difference, namely, expertise. Expertise is a skill that aids entrepreneurial achievements as it improves problem solving and opportunity identification (Read & Sarasvathy, 2005). Similarly, it has been also hypothesised that an individual's entrepreneurial talent can be developed by growing their knowledge and modifying cognitive processes, on the basis that it increases expertise and the ability to draw intuitive connections between sources of information that lead to the recognition of opportunities and the creation of new ideas (Bessant, Alexander, Tsekouras, Rush, & Lamming, 2012).

Furthermore, Shane (2000) wrote that entrepreneurs recognise opportunities on the basis of pre-existing knowledge that is triggered by environmental cues, and it is the value attached to the pre-existing knowledge that plays a role in determining whether it is a good or bad opportunity. Shane found support for this theory as he noted the heterogeneity in entrepreneurial ventures — entrepreneurs do not all possess the same information at the same time, thereby influencing their ability and willingness to recognise and exploit a given opportunity (Kirzner, 1997). He goes on to suggest that this pre-existing knowledge can be described as a *knowledge corridor* that influences the way an entrepreneur thinks about the market pressures and how to

best serve them. The concept of a knowledge corridor has both gains and limitations: it is beneficial in that pre-existing knowledge is private and unknown by competitors or other individuals, however it may reduce flexibility and the ability to think about problems in different ways (Ardichvili, Cardozo & Ray, 2003).

Additional support for this “entrepreneurs-as-experts” theory, comes from Sigrist (1999) who stated that entrepreneurs recognise opportunities on the basis of two knowledge domains: one is characterised by expert knowledge acquired through intrinsic fascination, the other is characterised by knowledge acquired over time that has been collected rationally and on the advice of peers and colleagues. Over time the knowledge between the two (usually unrelated) domains becomes connected and results in new opportunities being recognised. With this in mind, practitioners could increase opportunity identification by creating circumstances that enable individuals to acquire more, and participate in practicing, knowledge. One way to achieve this was proposed by Ardichvili et al. (2003; see also Hills, Lumpkin & Singh, 1997), who suggest that opportunities can be more readily identified by building an enriched environment that is conducive to the entrepreneurial process.

Empirical support for the influence of expertise on entrepreneurial achievement has been well documented. A meta-analysis by Unger, Rauch, Frese & Rosenbusch (2011) found that the positive relationship between technical knowledge and skills on entrepreneurial achievement was higher than the relationship between general education and experience on achievement. Furthermore, they also found that the more relevant the skills and knowledge, the more likely they will aid success. Although the effect size between human capital and success varied depending on the context and age of the firm, it demonstrates the importance of expertise in assisting the identification and exploitation of opportunities.

2.3 *Group Antecedents of Entrepreneurial Achievement*

In light of the research reviewed, it is therefore evident that entrepreneurial achievement is a product of stable, internal factors, namely, entrepreneurial talent and expertise (Ahmetoglu et al., 2011; Leutner et al., 2014; Unger et al., 2011).

Nonetheless, entrepreneurs do not act in a vacuum, and individual differences are found to only account for a moderate proportion of the variance in achievement. As such in order to improve theoretical understanding and prediction of entrepreneurial achievement, it is important to also understand the influence of interpersonal and social factors.

2.3.1 *Social Capital*

The ability to identify and exploit opportunities in order to create value is central to behaving as an entrepreneur (Schroeder, Buckman & Cardozo, 1996), yet as Shane and Venkataraman (2000) stated, entrepreneurial achievement is the nexus of two phenomena: the presence of lucrative opportunities and the presence of enterprising individuals. While the previous section described the role of internal factors, Shane and Venkataraman's statement implies that opportunities are an external attribute that must be identified and exploited by the individual. It can therefore be argued that opportunity identification and exploitation is facilitated by an individual's social capital.

According to Adler and Kwon (2002), social capital can be described as the level of reciprocity, trust and willingness to co-operate between two or more individuals. Furthermore, social capital can be manifested in two ways: *bonding* (e.g. building and maintaining strong social ties for cohesion and trust) or *bridging* (e.g. connecting between and with different people in order to acquire non-redundant information). Social capital is therefore argued to be an advantageous resource when

identifying and exploiting opportunities, as increased social capital would reward the individual with increased access to, and combinations of, unique knowledge and resources, alongside acquiring the social influence and support needed to persuade and inspire others (Burt, 1992). Given this definition of social capital, the construct is typically understood through social network analysis. Unlike the psychometric approach that is used to measure an individual's personality, social network analysis attempts to understand how individuals are socially connected and the implications this may have on the ways they interact and work with each other (Wasserman & Faust, 1994). It therefore emphasises external relationships, as opposed to internal attributes such as personality traits, expertise or demographic variables.

2.3.2 *Social Networks*

There are two social network perspectives on the sources of social capital, both of which can explain how opportunities are identified and exploited. First, Granovetter's (1973) *Strength of Weak Ties* theory, states that the strength of the relationship between two individuals brings varying levels of information, trust and reciprocity. The strength of the relationship is described to be a function of the emotional intensity and identification shared between the two individuals. Individuals who hold strong ties with each other are likely to have high levels of trust, which creates a reciprocal flow of information and resources. Weak ties on the other hand, are characterised by a reduction in trust and reciprocity, as they are likely to be held between individuals who are not directly connected (e.g. friends of friends). Despite this, weak ties may be advantageous when seeking out novel ideas and information, due to increased diversity between the two individuals. While Granovetter's theory emphasises the strength of relationships, Burt's (1992; 2004) theory of *Structural Holes* focuses on the structure of an individual's social network and their position

within it. Specifically, whether the individual exists within a constrained network (e.g. all their peers are connected with each other), or whether there are structural holes in their network (e.g. there is a high degree of disconnectedness between their peers). According to Burt (2004), an individual whose network that has many structural holes can enable them to act as a broker or intermediary between two (or more) disconnected individuals and groups. Such individuals are well positioned to acquire new ideas and spot new opportunities, as they are able to extract and synthesise any non-redundant information or resources that is being possessed or circulated amongst the disconnected individuals or parties. Furthermore, they acquire the ability to control, influence or negotiate the flow of information, alongside engage in arbitrage to strengthen their reputation, goodwill and create 'banked favours' that can be recalled upon later.

Taken together, these two theories are both compatible with the dual definition of social capital: the strength of weak ties theory describes how an individual may develop *bonding* social capital, whereas structural hole theory would describe how an individual may develop *bridging* social capital. This is important given the need to both *identify* and *exploit* opportunities for entrepreneurial achievement (Shane & Venkatarman, 2000): opportunity identification is likely to be best facilitated by brokerage, structural holes and weak ties, whereas opportunity exploitation is likely to be best facilitated by building and maintaining strong ties (Martinez & Aldrich, 2011; Perry-Smith & Shalley, 2003).

Support for the importance of social networks in entrepreneurial creativity and opportunity recognition comes from Burt (2004), Hills et al., (1997) and Kratzer, Leenders & Van Engelen (2010). Burt's (2004) seminal study within the social capital literature found that individuals with increased structural holes within their networks

produced significantly more creative ideas and solutions. Hills et al. (1997) found that entrepreneurs that had larger social networks were able to spot new opportunities. Krazter et al (2010) found that product development teams who held more informational connections with other teams throughout the organisation produced more innovative output. They also found evidence to suggest that creative output was better facilitated by direct connections between individuals, rather than an open network that attempts to connect as many people as possible. This is logical given that a network where each member is connected to each other would result in an 'echo chamber' where there is no diversity in ideas and information being shared, nor can any new opportunities be identified given the homogeneity that is likely to arise in an open-network.

Although previous studies have established the positive effect of social capital on creativity and innovation (Burt, 2004; Kratzer et al., 2010; Perry-Smith, 2006; Zhou, Shin, Brass, Choi & Zhang, 2009), and meta-analytic research have found significant relationships between broad personality traits (e.g. the Big Five), network centrality and job performance (Fang, Landis, Zhang, Anderson, Shaw & Kilduff, 2015), entrepreneurship researchers have ignored the role of personality as an antecedent to acquiring and using social capital to innovate, create value and grow an organisation. If personality traits are found to be predictive of robust measures of social capital, this would advance theoretical understanding as it would be known both how and why social capital is obtained. Doing so would further integrate the use of psychometric and social network approaches when studying entrepreneurship. Such findings would also bring practical implications: while previous papers have recommended leaders, investors and business owners to modify their recruitment strategies in order to select individuals with high levels of entrepreneurial talent

(Leutner et al., 2014), understanding how they use their social network may lead to the development of talent management strategies that can enhance an individual's ability to drive organisational growth, innovation and value creation.

2.3.3 *Social Capital & Entrepreneurial Talent*

This thesis is not the first to suggest that personality and social capital interact to produce achievement. Most notably, Ardichvili et al. (2003) argued that that opportunity identification and exploitation was the result of an *alertness threshold* being exceeded due to the interaction between an individual's social network, personality traits and expertise. Furthermore, De Carolis and Saporito (2006) adopted a situational perspective whereby social capital (e.g. structural holes, weak ties and shared values) promotes the use of cognitive biases that in turn, positively or negatively influences the entrepreneur's risk perception and the tendency to exploit entrepreneurial opportunities. Although both theories share a similarity with the arguments made in the current chapter, they are both limited as they were not empirically tested and underappreciate the role of personality.

In order to integrate both trait and social capital theory, Tett and Burnett's (2003) trait activation theory is a particularly relevant framework when attempting to understand the interaction between individual and contextual factors on job performance. The fundamental principle of this theory is the idea that personality traits are *activated* as a response to relevant situational cues expressed at either the task, social and organisational level. The model states that the stronger and more relevant these cues are to a given personality trait, the more readily it will be activated. As detailed in the original paper, Tett and Burnett (2003) carefully explain various hypotheses and mechanisms by which situational cues and factors moderate the relationship with personality and job performance. Although their paper does not

contain any empirical data, its interactionist approach has been influential and has gone on to receive empirical support for its various components with researchers focusing typically investigating one of the three situational cues (Sackett & Lievens, 2008).

Building upon the reviewed research, and the highlighted limitations in social capital theories, it can be hypothesised that individuals who have entrepreneurial talent (e.g. elevated levels of creativity, vision, proactivity and opportunism) are therefore more likely to identify and exploit new opportunities that aid organisational growth and innovation. This is because entrepreneurial behavioural dispositions motivate the entrepreneur to seek out and develop both *bonding* (e.g. strong ties with their peers) and *bridging* (e.g. occupying brokerage positions in their social network) forms of social capital. Elevated social capital rewards the individual with increased access to novel ideas, knowledge and resources (Burt, 2004). Together this increases an individual's level of technical expertise (Ardichvili et al., 2003), thereby facilitating the exploitation of opportunities and entrepreneurial achievement. Similarly, by forming strong ties with their peers, entrepreneurs can acquire the informal leadership, positive peer appraisals and political influence needed to get formal support and peer buy-in for their ideas and projects. Acquiring such support is vital in order to overcome the organisational bureaucracy and politics that can plague innovation and proactivity (Akhtar et al., 2013; Krackhardt, 1990).

While simple, the novelty of this theory is twofold: firstly, entrepreneurial talent is a new construct and has established its validity as a predictor of entrepreneurial achievement. This addresses the limitations of Ardichvili et al.'s (2003) and De Carolis and Saporito's models (2006). Secondly, it extends both Granovetter's (1973) strength of weak ties theory and Burt's (2004) structural holes

theory, by stating that individuals who hold both strong ties and brokerage positions in their social network do so, due to stable behavioural tendencies, motivations and values. As such, this answers Ng and Rieple's (2014) call for more research to investigate how networks are leveraged for entrepreneurial achievement.

2.4 Organisational Antecedents of Entrepreneurial Achievement

In order for organisations to compete in the 21st Century, they must engage in entrepreneurship if they want to remain competitive in both the present and the future (Lumpkin, 2007). Arising from pressures such as technological disruption and innovation (Zahra, 1995), a lack of talent within the workforce (Hayton, 2005), limitations in established management practices (Hornsby, Kuratko & Zahra, 2002), and drastic changes in the global marketplace (Kuratko & Hodgetts, 1998), organisations that adopt an entrepreneurial strategy are more likely to gain and sustain competitive advantages (Kuratko, Hornsby, & Covin, 2013; Lumpkin, 2007; Thornberry, 2001). Accordingly, becoming more entrepreneurial and innovative has become a major goal for most organisations (Accenutre, 2013).

A significant body of research has been conducted to identify the internal organisational factors and conditions needed for organisations to become more entrepreneurial (Rauch, Wiklund, Lumpkin, & Frese, 2009). A number of factors have been proposed over the years (Thornberry, 2001). The domain that has been dedicated to address this question is known as 'corporate entrepreneurship'. Covin & Slevin (1989) define corporate entrepreneurship as the enabling and promotion of workers' abilities to innovatively create value within the organisation. Accordingly, an underlying premise within the field is that for organisations to become more entrepreneurial and prosper, an "innovation friendly" internal environment, or *culture*, that facilitates entrepreneurial behaviour needs to exist (Ireland, Kuratko, & Morris,

2006). That is, employee perception of an innovative environment is critical for corporate entrepreneurship (Hornsby, Kuratko, Shepherd, & Bott, 2009). Indeed, there is a consensus in the literature that organisational culture is the foundation for successfully implementing corporate entrepreneurship (Ireland et al., 2006). Accordingly, the managerial challenge becomes that of designing the workplace in a way that develops an entrepreneurial culture.

Research has made a significant contribution to our understanding of antecedents of an entrepreneurial culture. For instance, Hornsby, Kuratko, Holt and Wales (2013) identified four influences on the development of an organisational climate in which entrepreneurial behaviour could be expected: (1) *management support* (the willingness of managers to facilitate and promote entrepreneurial behaviour, including the championing of innovative ideas and providing the resources people require to behave entrepreneurially), (2) *work discretion/autonomy* (manager's commitment to tolerate failure, provide decision-making latitude, freedom from excessive oversight and to delegate authority and responsibility to middle- and lower-level managers), (3) *rewards* (developing and using systems that reinforce entrepreneurial behaviour, highlight significant achievements and encourage pursuit of challenging work), and (4) *time availability* (evaluating workloads to ensure that individuals and groups have the time needed to pursue innovations and that their jobs are structured in ways that support efforts to achieve short- and long-term organisational goals). According to Hornsby et al. (2013), these dimensions enable organisations to assess, evaluate, and manage the firm's internal work environment in ways that support entrepreneurial behaviour.

The aforementioned research originated from the entrepreneurial orientation construct (EO; Covin & Slevin, 1991), which represents the extent to which an

organisation's formal policies and practices support entrepreneurial strategies, decision-making and actions (Rauch et al., 2009). As proposed by Covin and Slevin (1991), organisations who have high levels of EO can be described as being *innovative* (a tendency to engage in creativity & experimentation), *risk taking* (a tendency to make bold & uncertain decisions) and *proactive* (a tendency to be opportunity seeking & competitive). As enacted by key decision-makers (e.g. senior leaders, executives & business owners), these three tendencies orientate the organisation's strategy towards the identification and exploitation of opportunities to innovate and create value, and thus shape the internal operations and work practices experienced by employees (Lumpkin & Dess, 1996). A recent meta-analysis by Rauch et al. (2009) found that the relationship between EO and firm performance was moderate ($r = .24$; $N = 14, 259$), thereby demonstrating that the extent to which an organisation's work environment is strategically aligned with the firm's pursuit of innovation and growth, is indeed beneficial to organisational performance.

Although these efforts have made a significant contribution to our understanding of antecedents of entrepreneurial achievement within organisations, there remain a number of significant gaps in the literature (e.g. Fayolle, Basso, & Bouchard, 2010; Hornsby et al., 2013). First, the scope of existing corporate entrepreneurship measures has been suggested to be too narrow to capture the complexity of entrepreneurial organisational cultures. For instance, Rauch et al. (2009) criticised existing entrepreneurial culture constructs and measures (e.g. EO) as being overly focused on *formal* organisational factors that pertain to how work is conducted and rewarded (e.g. strategy & work design; Rauch et al., 2009), at the expense of *informal* factors (e.g. collective norms, assumptions & beliefs) that are likely to be of equal importance when motivating and enabling individuals and

organisations to engage in entrepreneurial activities (Kuemmerle, 2008; Licht & Seigel, 2008; West, 2007). Indeed, previous research has demonstrated socio-cognitive factors to have a significant impact on entrepreneurial activity (Frese & Gielnik, 2014) and work-related innovation within organisations (Anderson et al., 2014; Amabile, Conti, Coon, Lazenby & Herron, 1996). Accordingly, it is likely that a broader conceptualisation and operationalisation of organisational culture, that captures both formal *and* informal components, is needed in order to get a more comprehensive understanding of the antecedents of entrepreneurial activity within organisations.

Second, most theory and research in the field of corporate entrepreneurship has focused on establishing the factor structure (e.g. the dimensions) of an entrepreneurial culture (Rauch et al., 2009), and/or the direct link between these dimensions (e.g. processes, strategy, and culture) and organisational outputs (e.g. introduction and transformation of products, services, strategies, alongside financial and non-financial performance metrics). However, few studies have looked at the *mechanisms* by which cultural factors produce such organisational outputs. That is, there is little in the literature to inform us both how and why entrepreneurial cultures produce high performance or innovation. Yet, given that corporate entrepreneurship does not occur in a vacuum, understanding these mechanisms is critical. Processes, strategies, or cultures cannot in themselves affect performance. Rather they do so through the behaviour (and ideas) of people and employees (Hornsby et al., 2009).

Accordingly, understanding how, and the conditions under which, cultural factors influence employee's behaviour to produce organisational outputs is imperative. Such an understanding would be desirable, if not necessary, to allow organisations to a) formulate more precise investment strategies on cultural

interventions, b) make more informed decisions about when and where to introduce or amend cultural factors, and c) have systematic capacity to understand, and therefore avoid, potential failures of cultural interventions. For instance, organisations may want to analyse the relative benefit of cultural interventions aimed at increasing entrepreneurial activity and innovation output, alongside making selective investments in entrepreneurial cultures when, or in places where, the right workforce is in place. Similarly, organisations will want to understand why certain interventions fail, or do not work. Without an understanding of why and how entrepreneurial culture factors influence employee psychology and behaviour (and in turn organisational output) it would be difficult to provide answers to these questions.

In light of these two gaps in the literature, the following sections describe the various socio-cognitive factors that have been previously demonstrated to influence an organisation's level of entrepreneurial achievement, and as such are likely to serve as useful extensions to existing corporate entrepreneurship constructs and literature (Hornsby et al., 2013; Rauch et al., 2009). Continuing this, the various psychological mechanisms by which they may facilitate an employee's entrepreneurial talent are also described. In particular, three mechanisms are hypothesised: *Reinforcement*, *Work Engagement* and *Person-Organisation Fit*.

2.4.1 *Socio-Cognitive Factors of Corporate Entrepreneurship*

In line with Cooke and Rousseau (1988), who outlined the importance of socialisation in shaping employee behaviour, it is proposed that the socio-cognitive factors that are most suitable to extend corporate entrepreneurship constructs (in particular EO), and better describe an entrepreneurial culture are *Leadership Style*, *Employee Values*, *Empowerment* and *Team Behaviour*. In addition to EO, together these four factors represent the extent to which an organisation's culture can be

described as being entrepreneurial. Such an extension of EO may provide an opportunity to better understand how and why organisations are able to support and encourage their employees to engage in entrepreneurial activities.

To clarify the distinction between EO and entrepreneurial culture: EO simply describes the extent to which an organisation aligns its strategy and structures employee's work to encourage entrepreneurial activities, whereas entrepreneurial culture goes beyond this to also describe the various ways organisations socialise their employees to create a culture whereby the shared assumptions, values, and beliefs are orientated towards value creation, innovation and organisational growth (Schneider, Ehrhart & Macey, 2013). Organisations that have an entrepreneurial culture demonstrate support for, and expression of, entrepreneurial achievement through the way it socialises its employees (West, 2007). The following paragraphs outline the justification for why each of the four factors collectively describe an entrepreneurial culture, extend EO, and are likely to increase entrepreneurial achievement at the organisational level.

2.4.2 Leadership Style & Employee Values

Day, Griffin and Louw (2014) argued that senior leadership plays a fundamental and causal role in the definition and promotion of an organisation's cultural values, through what Schein (2004) called 'culture embedding mechanisms'. These are environmental 'artefacts' that come to represent an organisation's culture as a product of what leaders pay attention to, the behaviours they model for others, and the types of behaviours they reward (Schein, 2004). As such, leaders are responsible for setting and defining the cultural values of their organisation (Day et al., 2014).

Accordingly, Hayton (2005) suggested that values which encourage the experimentation of new ideas, learning and knowledge sharing, reward

entrepreneurial behaviours, and promote proactivity and agility, are likely to generate entrepreneurial cultures. In addition, leaders who communicate an entrepreneurial vision for the organisation (e.g. an idealised goal to create value, innovate and grow the organisation; Ruvio, Rosenblatt & Hertz-Lazarowitz, 2010) more effectively demonstrate and instil such values in their followers (Sarros, Cooper & Santora, 2011). From the perspective of social identity theory, together, a leader's values and vision are likely to communicate to employees what is prototypical behaviour. In turn, this promotes a salient in-group identity, group cohesion, loyalty and a willingness to compete with perceived out-groups (e.g. competitors) — all of which may help increase an individual's motivation to pursue entrepreneurial activity and tendency to enact existing entrepreneurial talent (for a review on social identity, see Hogg, van Knippenberg & Rast., 2012). To summarise, it can be argued that senior leadership's vision plays an influential role in setting and defining the organisation's culture and employee's values (Sarros et al., 2011), and in turn, employee's entrepreneurial motivation to pursue entrepreneurial activities (Hogg et al., 2012).

2.4.3 Empowerment

Given that previous research has demonstrated opportunistic and proactive behaviours to be predictive of entrepreneurial activity (Leutner et al., 2014), it can be hypothesised that employees should be empowered to act on their intuition in order to increase the likelihood that valuable opportunities are readily identified and exploited (Hayton, 2005). Given this, it can be said that within an entrepreneurial culture individuals work within flexible systems, are empowered to make their own decisions by leaders, and are to free choose how they complete their tasks. This is because it increases their ability to generate new ideas, remain agile and adapt to changes in the market (Anderson et al., 2014).

In support of the above, Hmieleski and Ensley (2007) found that entrepreneurial teams performed better when led by an empowering leader, as opposed to a directive leader. Similarly, Burgess (2013) found that middle managers who received support and authority from senior leaders were more likely to implement entrepreneurial practices and initiatives. In addition, Schepers and van den Berg (2007) found that when autonomy was practiced throughout an entire organisation, the likelihood of employees intrinsically engaging in creative and innovative behaviours increased. Based on these findings it is therefore plausible to suggest that encouraging employees to act on their intuition would increase entrepreneurial behaviours and the engagement of such activities. This is because employees are empowered, exposed to more opportunities to learn, and pursue intrinsically motivating projects (Gangé & Deci, 2005), all of which are congruent with the entrepreneurial talent construct (Leutner et al., 2014).

2.4.4 Team Behaviour

The workplace is a social setting where nearly all activities are completed in groups or teams, and require some form of collaboration (Schneider et al., 2013). When modelling the antecedents of entrepreneurial activity, the informal relationships held between members of a team or department are likely to be critical. This is because relationships often serve as a primary mechanism for sharing ideas, information and resources, alongside reinforcing organisational values and norms (Krueger & Carsrud, 1993).

Social capital – the type and quality of relationships an individual shares with others (Burt, 1992) – is hypothesised to enhance entrepreneurial talent on the premise that social interaction (e.g. working within a team) enhances the identification and exploitation of opportunities, through the interaction of social, cognitive and personal

factors (De Carolis & Saporito, 2006). Research that has explored the relationship between social networks and entrepreneurial achievement, have found support for this hypothesis. For example, Hills et al. (1997) found that entrepreneurial individuals who had larger social networks spotted significantly more new opportunities to innovate. The relationship between expansive social networks (and thereby social capital; Tsai & Ghoshal, 1998) and entrepreneurial activity can be interpreted as a function of social learning: the more an individual interacts with those who possess different skills and expertise, the more information they gain and reconfigure, which in turn increases their ability to identify and exploit opportunities (De Carolis & Saporito, 2006). Lastly, a meta-analysis by Hülshager, Anderson, & Salgado (2009) found that teams with a clear vision for innovation, who were heterogeneous in skills and abilities, and well networked with other teams (both internally & externally), were more cohesive and innovative. This finding further underlines the importance of socialisation and the development of an entrepreneurial social identity in order to facilitate and enact entrepreneurial talents and achievements (West, 2007).

2.4.5 *Entrepreneurial Culture & Entrepreneurial Talent*

Having reviewed the organisational literature, alongside the aforementioned individual difference research, it is clear that both individual and organisational factors inhibit and facilitate entrepreneurial activities and achievement (Shane & Venkataraman, 2000). As previously argued, the entrepreneurship literature has ignored the psychological mechanisms through which organisational factors influence an employee's cognitions and behaviours. Accordingly, three psychological mechanisms can be hypothesised: *Reinforcement*, *Work Engagement* and *Person-Organisation Fit*.

2.4.5.1 Reinforcement

It can be hypothesised that entrepreneurial cultures will influence employee's outputs (e.g. entrepreneurial activity & achievement) directly, through reinforcement of behaviour, or as behaviourists call it, *operant conditioning*. Operant conditioning principles posit that behaviour is learnt by the behaviour's consequences, that is, through the rewards, or lack thereof, people receive for specific behaviours (Staddon & Cerutti, 2003). For instance, where employee behaviour is in line with an organisation's structures, processes and culture, such behaviour is more likely to be rewarded and therefore reinforced. This increases the likelihood that the employee will behave in a similar way in the future. Similarly, the inverse will happen if the behaviour is not in line with such factors and is punished. Given that larger organisations are likely to be more bureaucratic (Hayton, 2005), entrepreneurial behaviours and activities (which are by definition deviant and divergent; Akhtar et al., 2013; Leutner et al., 2014) are unlikely to be positively reinforced if the organisation's culture does not support or reward such behaviours. Conversely, a culture in which entrepreneurial behaviour is reinforced (e.g. positively rewarded), is likely to strengthen the entrepreneurial behaviour-reward association and therefore increase the occurrence of that behaviour (Kautonen, Van Gelderen & Tornikoski, 2013).

This line of thinking may also be understood through the Theory of Planned Behaviour (TPB; Ajzen, 1991). The TPB suggests that intentions are not only a significant predictor of behaviour, but also a function of certain beliefs that link a given behaviour to certain outcomes (Kautonen et al., 2013; Krueger & Carsud, 1993). Accordingly, it can be hypothesised that an individual's intention to behave entrepreneurially at work will be a function of their belief (or likelihood) of achieving

entrepreneurial success in the particular environment. This belief in turn, is likely to be reinforced by the particular environment that they operate in. Given that organisational culture (e.g. the shared norms & values of the organisation) reinforces attitudes and behaviours, it can be hypothesised that cultures that are perceived to support and reward entrepreneurial behaviours, are likely to increase an individual's attitude towards, and self-efficacy to engage in, such behaviours (West, 2007).

Although this interpretation of TPB has been used to explain why individuals are motivated to create and grow their own business (Hui-Chen, Kuen-Hung, & Chen-Yi, 2014; Kautomen et al., 2013), it is yet to be tested within the context of entrepreneurial cultures and corporate entrepreneurship.

Given the above discussion, reinforcement can be hypothesised to explain how entrepreneurial cultures exert both a direct and indirect effect on entrepreneurial achievement: Operant conditioning will exert a direct effect due to rewarding and punishing specific employee behaviours (Hayton, 2005). TPB, however, explains an indirect effect as it increases an employee's self-efficacy to engage in entrepreneurial and innovative activities (West, 2007).

2.4.5.2 *Work Engagement*

A second mechanism by which an entrepreneurial culture may influence innovation output is through *work engagement*. Work engagement can be defined as the “fulfilling work-related state of mind that is characterised by vigor, dedication and absorption” (p. 702, Schaufeli Bakker, & Salanova, 2006), and has been found to be an important predictor of heightened performance at the individual, group and organisational level (Saks, 2006). Although the literature on the antecedents of engagement stretches back several decades (Crawford, LePine, & Rich, 2010), few studies have directly examined the impact of entrepreneurial cultures on engagement.

However, there is good reason to believe that entrepreneurial cultures significantly impact employee engagement and that engagement, in turn, increases entrepreneurial outputs of employees.

First, meta-analytic research has found that engagement is influenced by a number of work related characteristics; in particular, people tend to be more engaged when they have more control over how they carry out work, have opportunities to learn new skills, are able to make decisions and interact with others in a positive manner (Crawford et al., 2010). Although job characteristics are often more formal dimensions of organisations, they are intimately linked with the informal norms and assumptions held by employees, that is, the culture of the organisation (Schneider et al., 2013). Indeed, informal components of work may arguably be equally, or even more, important than formal processes in engaging employees (Kuemmerle, 2008).

Secondly, there is also good reason to believe that engagement is likely to have a significant influence on the innovation output of employees. For instance, Harter, Schmidt and Hayes (2002) suggested that employee engagement is a construct that fosters positive affect in individuals at work, which, in turn, leads to creativity (the precursor of entrepreneurial achievement). In line, a longitudinal study by Amabile, Barsade, Mueller, and Staw (2005) found that positive affect (a concept related to engagement) was positively and significantly related to creative thinking. Further support for this association is suggested by the positive relationships between job characteristics, engagement (Saks, 2006), and creative output (Bakker & Xanthopoulou, 2013). Similarly, Ahmetoglu, Harding, Akhtar, and Chamorro-Premuzic (2015), found direct evidence for the relationship between engagement and entrepreneurial behaviour. Accordingly, it can be hypothesised that engagement will

be a second mechanism by which entrepreneurial cultures indirectly influences entrepreneurial achievement.

2.4.5.3 Person-Organisation Fit

A final mechanism by which entrepreneurial cultures may influence entrepreneurial output is explained by Person-Organisation fit theory (P-O; Tett & Burnett, 2003; Westerman & Cyr, 2004). P-O fit theory suggests that positive work outcomes arise from a congruence and interaction between an individual's personality traits and skills, and the social norms, values and demands found within the organisation (e.g. its culture). Employees who experience a high level of congruence with the culture are likely to have more positive cognitive and affective reactions, and behavioural approach, which in turn increases their output and productivity (Gregory, Albritton & Osmonbekov, 2010). Given the recent literature demonstrating the positive relationship between entrepreneurial personality traits (e.g. creativity, vision, proactivity and opportunism) and entrepreneurial achievement (Ahmetoglu et al., 2011; Akhtar et al., 2013; Leutner et al., 2014), it can be hypothesised that entrepreneurial cultures have an influence on achievement by having a disproportionate influence on those employees with elevated levels of such personality traits (e.g. entrepreneurial talent; Leutner et al., 2014). The P-O fit theory, therefore, would predict entrepreneurial employees to fare better in entrepreneurial cultures than non-entrepreneurial employees. Such a finding is yet to be tested, but would clearly have important theoretical and practical implications for organisations aiming to become more entrepreneurial.

2.5 Cross-Cultural Differences in Entrepreneurial Achievement

Given that entrepreneurship is a primary driver of economic and technological growth and development, there has been much investigation into the cross-cultural

differences in entrepreneurial behaviour and achievement. In more recent years, both academic and practical attention has turned to the role of entrepreneurs in growing emerging market economies (EMEs). EMEs are those economies that are in transition, increasing in size, activity, or level of sophistication. Furthermore, such economies can be identified by the development and state of their population, gross domestic product, financial institutions, and government policies — all factors that impact an entrepreneur's behaviour, intentions and achievement. Despite EMEs containing of 58% of the world's total population, they only account for 28% of global GDP. Given this, and that entrepreneurial activity is linked to the civil, legal and social development of a nation (Kuratko, 2007), understanding how EME entrepreneurs can be more effective and successful is an important question facing financial and political leaders.

In a recent review on the EME literature, Panthi and Hisrich (In Press) investigated the reasons for differences in EME performance and identified nine challenges entrepreneur's face when starting or doing business in emerging markets:

1. There is a lack of human capital (e.g. technical knowledge & skill) needed to successfully identify and exploit valuable business opportunities.
2. Due to cultural differences in social norms and beliefs, working with foreign businesses and institutions can lead to difficulties.
3. A lack of quality of control in both operations and suppliers negatively affect an entrepreneur's ability to consistently produce high quality produces that yield repeat custom.
4. There is much variation in telecommunication infrastructure, resulting in poor communication and reduced ability to share and acquire information.

5. Government and bureaucratic issues such as red tape, political instability, and unemployment.
6. Undeveloped financial institutions and systems may make it difficult for the entrepreneur to convert currency and move money out of the country.
7. Poorly developed government, business and education infrastructure.
8. Underdeveloped or poorly developed business laws.
9. Issues surrounding ownership of both property and land.

Given these issues and ongoing studies such as the Global Entrepreneurship Monitor that have found consistent cross-cultural differences in a nation's level of entrepreneurial achievement, it is clear that entrepreneurship is the result of contextual and institutional characteristics of a country (Reynolds et al., 2005). Accordingly, at a national level entrepreneurship can be hypothesised to be embedded in a country's economic, sociocultural and legal environment. This perspective is best described by institutional theory — social, political and economic systems have a direct effect on business formation and operation (Scott, 1995). In particular, institutions set rules, policies and laws that not only define, but shape, an actor's behaviour, decisions and attitudes. Furthermore, Scott (1995) states that institutions can take three forms: regulative (e.g. law & economic policies), normative (e.g. social & cultural norms) and cognitive (e.g. the promotion of specific behaviours & skills). As previous sections of this chapter have discussed the influence of *micro* (e.g. group) and *meso* (e.g. organisational culture) influences on the relationship between individual differences and entrepreneurial achievement, it can be argued that *macro* factors may also influence such relationships in a similar manner. In particular, in EMEs where its institutions are supportive of entrepreneurship, individuals are able,

and likely, to display such talent and potential to go on to create economic, technological and social value.

2.5.1 *Cross-Cultural Differences & Entrepreneurial Talent*

There is growing psychological support for the role of institutional theory and entrepreneurial activity. For example, Thomas & Mueller (2000) compared personality differences between collective and individualistic cultures, and found the latter to contain individuals with increased internal locus of control and enterprising sensibilities. This is noteworthy given that these two traits are positively associated with entrepreneurial achievement (Frese & Gielnik, 2014). Based on this line of reasoning, and the wealth of literature that has demonstrated the validity of *entrepreneurial talent* predicting entrepreneurial achievement (Ahmetoglu et al., 2011; Leutner et al., 2014), there are two critical research questions to be addressed.

The first is concerned with the stability of entrepreneurial talent's relationship with success. Despite being the most validated measure of entrepreneurial talent (Suárez-Álvarez & Pedrosa, 2016), all of the published research using META has been conducted within western and developed economies. Therefore, there is an opportunity to test whether its positive relationship holds both within and between EMEs. Establishing such a relationship is likely to be of use to institutions that focused on funding and developing entrepreneurs in such economies. The second question is whether the relationship between entrepreneurial talent and achievement is moderated by a nation's support for entrepreneurial activity. In light of institutional theory, it can be hypothesised that in nations whose institutions have better business practices, infrastructure and compatible social norms, entrepreneurial talent is developed and enacted more readily. This may be the result of macro influences

providing relevant situational cues that activate an entrepreneur's creativity, opportunistic, proactive and visionary dispositions (Tett & Burnett, 2003).

2.5.2 Cross-Cultural Differences & Female Entrepreneurship

Putting the influence of personality aside, there is mounting interest in studying and encouraging female entrepreneurship, especially within EMEs (Ahl, 2006; De Vita et al., 2014). It is argued that an underutilization of entrepreneurial resources results in a missed opportunity for economic growth (Ács & Szerb, 2012), as such, economists, politicians and business leaders are increasingly interested in stimulating female's interest and engagement in entrepreneurship in order to aid the growth of developing and emerging economies (The World Bank, 2012). As institutional theory posits that entrepreneurship is embedded within a nation's economic, legal and social environment, the theory can be used to explain differences between male and female entrepreneur's level achievement due to variation in stereotypes, gender roles and social acceptability of entrepreneurship as a career (Baughn, Chua & Neupert, 2006). Put simply, gender differences in entrepreneurship is increasingly viewed as the result of context, not the result of specific characteristics of female entrepreneurs (De Vita et al., 2014).

The academic study of female entrepreneurship spans over 30 years (DeCarlo & Lyons, 1979), as researchers seek to understand the motivations of female entrepreneurs, and in particular, the ways in which they are similar and differ to male entrepreneurs (Jennings & Brush, 2013). In a review on the topic, Jennings & Brush (2013) summarised the field and concluded that researchers have largely sought to answer four questions over the last 30 years:

1. Are women and men equally likely to engage in entrepreneurship?

2. Do female and male entrepreneurs tend to differ with respect to financial resource acquisition?
3. Do female and male entrepreneurs tend to enact different strategic, organisational and managerial practices within their firms?
4. Do female-led and male-led firms perform equally well?

Their responses to these four questions were as follows: firstly, women are less likely than men to be involved in various forms of entrepreneurial activity. Specifically, females are less likely to be owner-managers, be self-employed, monetizing scientific knowledge, operate “business to business” ventures, and involved in the process of running a nascent business. Secondly, businesses operated by women are financed at a lower level and by different means than those headed by men. This is because they typically launch firms with lower levels of initial financing, are less likely than male entrepreneurs to utilise formal sources of financing when starting the business, and they are significantly less likely to be funded by venture capitalists. Thirdly, there is no conclusive evidence to suggest that there are significant differences in the strategies of female and male-led firms. They did note however that although females are more likely to pursue retail, as opposed to business-to-business ventures, both male and female led businesses were managed using a mix of “feminine” and “masculine” approaches. Lastly, they concluded that female led businesses do not perform as well as male led businesses, yet these differences can disappear depending on what factors are controlled for and what is being measured as performance.

When researching the antecedents of gender differences in entrepreneurship, researchers are increasingly adopting feminist theories. Specifically, Ahl (2006)

explicitly critiqued the existing literature and methodology used to understand and investigate gender differences using such an approach. In particular, Ahl proposed ten “discursive practices” — ways in which a phenomenon is understood and studied — that describe the reason for apparent gender differences. To review all ten discursive practices, would out of the scope of this chapter, however those most relevant to this thesis’ aims shall be discussed.

The first discursive practice is that “the entrepreneur” is male gendered. Specifically, both the typical descriptions of an entrepreneur and engaging in entrepreneurship are stereotypical masculine traits. Specifically, Ahl draws comparisons between the adjectives that are used to describe masculinity and femininity, and what it means (and does not mean) to be an entrepreneur, and found a considerable overlap between masculinity and entrepreneur adjectives, and between femininity and what could be described as the opposite of entrepreneurship (e.g. cautious, dependent, follower, etc.). Ahl concluded that the way we measure and understand entrepreneurship, is inherently gender biased and thus our measurements and empirical findings.

Ahl also discussed the various ways in which the field has operationalised male and female entrepreneurs as being essentially different. For example, she draws upon feminist theories that debate the extent to which male and female entrepreneurs are perceived to be either inherently similar and different. Specifically, Ahl discusses this within the context of the female underperformance hypothesis — without control for what type of business females own, their businesses appear smaller, less profitable and grow slower than males (DuRietz & Henrekson, 2000). She highlights that this is most commonly explained as being the result of a female’s psychological profile being typically incompatible with entrepreneurship (Fagensen & Marcus, 1991). That

is females are less skilled (Boden & Nucci, 2000), less educated (De Vita, et al., 2014) or have lower levels of the behavioural dispositions (e.g. personality traits) that aid entrepreneurial achievement (Del Giudice, Booth & Irwing, 2012). Again, she stresses that the causes for such apparent differences are likely to be the result of gendered measurements. Similarly, she argues that researchers may have in fact become preoccupied with the causes for female entrepreneurship, where there is “overemphasis on a statistically significant (which is not the same as significant) difference, however small, while ignoring the similarities and the overlap” between genders (p. 604, Ahl, 2006). Ahl also notes that female entrepreneurs are also viewed as being inherently different to other females, most often female entrepreneurs are described as ‘the self-selected woman’ (e.g. more masculine) or as being ‘a good mother’ (e.g. female entrepreneurs use their ‘feminine’ qualities to their advantage).

Ahl concludes that no matter what theoretical explanation is used to explain differences, they bias the ways in which female entrepreneurship is measured, understood and explained. In order to overcome, extend and challenge the aforementioned discursive practices, Ahl suggests future research begin to conduct comparative investigations in order to test the both *individual*, *structural* and *cultural* influences on an entrepreneur’s behaviour. In essence, researchers need to take a more holistic view in understanding and measuring both male and female entrepreneur’s behaviours and businesses. To quote her, “instead of using sex as an explanatory variable, one studies how gender is *accomplished* in different contexts. A shift in thought is necessary, from gender as something that *is* to gender as something that is *done* and from gender as something firmly tied to bodies to gender as tied to anything—concepts, jobs, industries, language, disciplines—or to businesses.” (p. 612).

To connect this discussion of female entrepreneurship with the role of EMEs, De Vita et al.'s (2014) systematic review highlights both the differences and similarities between EMEs and the various factors that restrict or facilitate a female entrepreneur's ability to create value. Such factors include a lack of business skills, difficulty in receiving funding, accessing relevant social networks and business support systems, and a lack of societal legitimation of females being an entrepreneur. In light of these findings, De Vita et al. (2014) raise many limitations and opportunities for future research. For instance, they argue that the majority of the published research on the topic lacks a theoretical framework that seeks to explain how female's entrepreneurs are socialised and the effects this has on their behaviour and success. This is important given that feminist theory argues that gender differences are not the result of individual characteristics, rather it is the result of contextual and environmental processes (Ahl, 2006; Scott, 1995). Accordingly, they urge future research to investigate whether the activities pursued by female entrepreneurs will explain the supposed gender differences in entrepreneurial talent. Furthermore, they also criticise the current literature for methodological limitations. In particular, they call for more research to test the influence of, and interaction between, variables across multiple levels of analysis and its impact on achievement. Doing so would help the field move from descriptive to causal models, thereby revealing both how gender is accomplished (Ahl, 2006), and the relative contribution of both individual differences and contextual and institutional factors.

Given these limitations, and the previous discussion on exploring cross-cultural differences in entrepreneurial talent, there is an additional opportunity to reveal insights into the way macro contextual factors interact with an individual's gender, psychological profile and their likelihood and ability to successfully engage in

entrepreneurship. Addressing such limitations, and empirically testing the interaction between psychometric inventories alongside objective business activity and performance variables, may provide empirical support for an institutional theory of female entrepreneurship. Specifically, it is hypothesised that gender differences do not arise because of variation in entrepreneurial talent, rather they are the result of societal (e.g. social support & education) and economic (e.g. business opportunities & funding) factors. Providing empirical support for such a hypothesis may further assist political and financial leaders who seek to remove the barriers female entrepreneurs face, so that they can play a bigger role in growing local economies and promoting gender equality.

2.6 Integrating Individual Differences & Contextual Factors

The preceding sections provided both theoretical and practical insights into how individual differences and contextual factors influence the attainment of entrepreneurial achievement. Indeed, the field of entrepreneurship has been studied by many different disciplines, each applying its own theoretical paradigm and research method, yet given the rise of organisational psychology (both as an academic & professional domain), the relatively young tradition of applying psychological methods to entrepreneurship, and convincing evidence for the validity of both individual differences and contextual factors in the prediction of entrepreneurial achievement (Shane & Venkataraman, 2000), provides a handful of novel research opportunities. Addressing these research opportunities, with the aim of closing gaps in theoretical and practical understanding, is the objective of this thesis. Through the integration of the previously reviewed literature and the adoption of an interactionist approach (where entrepreneurial achievements are the product of a series of interactions between individual and relevant situational factors; Tett & Burnett,

2003), this section outlines a framework that features three theoretical propositions, and serves as foundation for this thesis' empirical investigations.

This framework seeks to both accommodate and integrate the role of individual differences and contextual factors in the attainment of entrepreneurial achievement. It achieves this by appreciating the stable and internally-generated nature of individual differences, while viewing contextual factors (at expanding levels of analyses) as moderating the impact of individual differences on entrepreneurial achievement. As such, this model not only accounts for the importance of individual differences, it explains both how and why such factors produce entrepreneurial achievement. It is hoped that through such an approach, the legendary status the media often attribute to successful entrepreneurs is reduced, and a more inclusive and developmental perspective is adopted. The following section outlines this framework and seek to provide a justification for its theoretical propositions. A graphical representation is displayed in Figure 1.

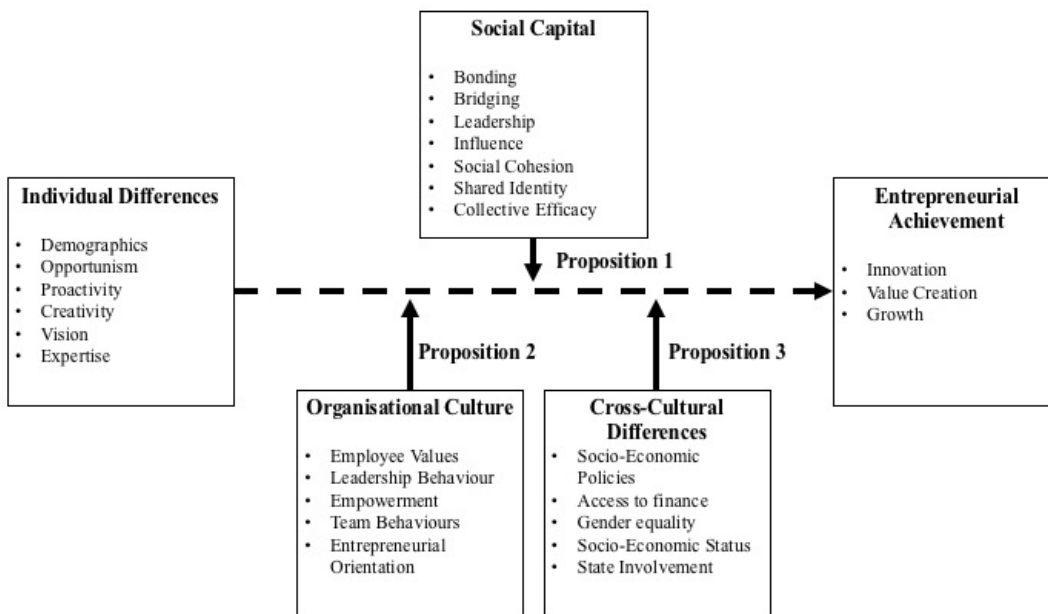


Figure 1: The Proposed Interactionist Framework of Entrepreneurial Achievement.

Proposition 1: *Social Capital moderates the relationship between individual differences and entrepreneurial achievement.*

As demonstrated in Chapter 2.2, there is conclusive evidence to demonstrate the importance of individual differences. In particular, it can be said that individuals who have entrepreneurial talent (e.g. elevated levels of creativity, vision, opportunism & proactivity; Ahmetoglu, et al., 2011) are significantly more likely to succeed and achieve as an entrepreneur. This finding is well-established and remains statistically significant when controlling for relevant constructs such as the Big Five (Leutner et al., 2014). In addition, technical knowledge and expertise is also demonstrated to aid the identification and exploitation of entrepreneurial opportunities due to increased effectiveness when seeking out, and using, resources and information (Unger et al., 2011). Research has also demonstrated the importance of social capital and an entrepreneur's social network in the pursuit of entrepreneurial achievement (Chapter 2.3; Ardichvili et al., 2003). For example, structural advantage theories, as proposed by Granovetter (1973) and Burt (2004), stated the strength of one's relationships and their position within their social network, brings trust, influence and non-redundant information (e.g. social capital; Adler & Kwon, 2002). As explained by De Carolis & Saporito (2004), social capital aids an entrepreneur's ability to succeed as they are more alert to the opportunities that are in their environment, as they have diverse sources of information and resources. Similarly, they are able to exploit such opportunities as social capital affords them increased technical expertise, knowledge and skills (Unger et al., 2011).

Given the above summary of the literature, alongside the utilisation of trait activation theory, this thesis proposes the following:

1. Individuals with an entrepreneurial personality profile are predisposed to identify and exploit opportunities that can lead to organisational innovation and value creation (Leutner et al., 2014).
2. Increased levels of social capital interact with entrepreneurial personality traits, to facilitate the acquisition of information, resources and ideas, alongside the identification of new opportunities (Burt, 2004; Granovetter, 1974).
3. As a result of this interaction between individual dispositions and social capital, the individual acquires increased levels of relevant job expertise, in turn this increases their ability and capability to perform their work (Unger et al., 2011).
4. Job expertise mediates the relationship between the personality and social capital interaction, and the pursuit, and creation, of innovative products, services and systems as they have the technical and relevant skills to successfully identify and exploit valuable entrepreneurial opportunities (Ardichvili et al., 2003).

Proposition 2: *Organisational culture impacts the relationship between individual differences and entrepreneurial achievement.*

As described in Chapter 2.4 there is an opportunity to theoretically and empirically extend existing constructs of entrepreneurial culture to capture *informal*, in addition to formal, components of the construct. Such an objective was inspired by Rauch et al. (2009) who concluded that the strength of the relationship between EO and firm performance may increase if the EO construct is expanded to also describe other critical factors that are likely to influence an organisation's, and its employee's, ability to engage in entrepreneurial activity and produce innovation. In addition to

Cooke and Rousseau (1988) who outlined the importance of socialisation in shaping organisational culture and employee behaviour, it is argued that there is an opportunity to extend the existing corporate entrepreneurship constructs to include informal factors that describe various socio-cognitive factors that play an important role in enabling and motivating employees to be pursue innovation (Kuemmerle, 2008; West, 2007). Four components were hypothesised to be fundamental to this: *Leadership Style, Employee Values, Initiative and Team Behaviour*.

Specifically, when describing *Leadership Style*, the motivational and inspiring influence of a leader's vision is being referenced (e.g. an idealised goal to create value, innovate and grow the organisation; Ruvio et al., 2010). Furthermore, *Employee Values* describes the extent to which employees share an entrepreneurial in-group social identity, in that they view risk-taking, innovation and experimentation as defining features of their organisational identity Hogg et al., 2012). *Empowerment* describes the positive socio-cognitive effect of having increased discretion and autonomy as facilitated through leadership and middle management (Burgess, 2007; Hmieleski & Ensley, 2007). Lastly, *Team Behaviour* describes the extent to which individuals and groups have social capital. That is, they have social connections that provide access to social support and expertise, in addition to novel resources, information and ideas, that can aid the development and implementation of innovation (Burt, 2004; Hülshager et al., 2009). Given this theoretical divergence from existing entrepreneurship constructs, the first step to undertake when exploring this proposition will be to develop an inventory to assess the informal and social components of an entrepreneurial culture.

Continuing this, Chapter 2.4 also outlined the need to identify and test the psychological mechanisms by which an entrepreneurial culture produces

entrepreneurial achievement; that is, to investigate both how and under which conditions entrepreneurial cultures influence employee's innovation output. It was postulated that three psychological mechanisms are likely to be essential to this relationship, namely: *reinforcement*, *engagement* and *person-organisation fit*. Thus, it was hypothesised that entrepreneurial cultures will influence employees' level of entrepreneurial achievement a) directly, through rewarding, or lack thereof, of specific behaviours, consequently 'shaping' entrepreneurial behaviours, b) indirectly, by increasing employee's entrepreneurial intentions and self-efficacy, c) indirectly, by engaging employees, and d) indirectly, by increasing the output of a specific group of individuals within the organisation, namely those with more entrepreneurial talent.

Proposition 3: *Cross-cultural differences moderate the relationship individual differences and entrepreneurial achievement.*

The final proposition concerns the role of cross-cultural differences. In particular, the extent to which such differences in cultural and socioeconomic factors influence the relationship between individual differences and entrepreneurial achievement. Given that an underutilisation of resources can inhibit economic growth (Ács & Szerb, 2012), it is important to investigate how *macro* factors influence an individual's propensity and ability to engage in entrepreneurship. Although there is little research exploring such factors, institutional theory (Scott, 1995) would suggest that macro-level socioeconomic factors have considerable influence on the development and expression of personality traits that are associated with entrepreneurial activity and achievement. Investigating such a research question may yield notable insights that could inform governmental and financial policy. In particular, two research questions must be tested. Firstly, does entrepreneurial talent (Ahmetoglu et al., 2011) continue to hold its positive relationship with achievement

both within and between EMEs? Secondly, is this relationship further moderated by a nation's support for entrepreneurial activity. Answering these questions may reveal how macro contextual factors activate and interact with individual differences (Tett & Burnett, 2003), and provide practical insights surrounding the development of entrepreneurs.

Continuing this theme, such factors may also explain the existence of gender differences in entrepreneurial achievement (De Vita et al., 2014). Despite a growing body of research investigating gender differences in entrepreneurial achievement in EMEs, there remain significant gaps in our understanding. In particular, such research has typically used unreliable psychometric measures of psychological characteristics, relied on descriptive statistics, or used small samples. As such, there is an opportunity to conduct empirical research that has both a sound theoretical framework (e.g. feminist theory & institutional theory; Ahl, 2006; De Vita et al., 2014; Scott, 1995) and an improved methodology that incorporates variables across multiple levels of analysis that are tested using causal and correlational techniques. Conducting such research may inform policies and practices designed to improve both EME performance and female entrepreneur achievement.

2.6.1 Unanswered Questions & Next Steps

This chapter has reviewed the antecedents of entrepreneurial achievement across the individual, group, organisational and cross-cultural level. By doing so, various gaps in the literature have been identified and summarised in an interactionist framework. The testing of this framework is the objective of this thesis, and forms the foundation for the following empirical chapters.

Chapter 3 seeks to test Proposition 1, thereby integrating both individual difference and social capital theories and methodologies. Investigating the role of

social capital in the individual difference-achievement relationship would explain how such behavioural dispositions are expressed and used to identify and exploit opportunities. Chapter 4 seeks to test Proposition 2, by first developing an *entrepreneurial culture inventory* and attempting to validate it across two samples. Such support would contribute to the literature by not only furthering academic understanding regarding how organisations can remain entrepreneurial and competitive, but also highlight how the social and informal factors found in the work environment can facilitate or inhibit an individual's tendency and ability to engage in innovation, growth, and value-creating behaviours. Chapter 5 seeks to test Proposition 3, thereby understanding how cross-cultural differences and institutional factors influence an individual's ability to engage in entrepreneurship. By investigating such a relationship, the literature is extended by investigating how individual differences are affected by macro-level contextual factors. Exploring this question is also an attempt to inform best practice when looking to promote entrepreneurship in emerging market economies, and thereby facilitate a nation's economic, technological and social growth.

By focusing on three different contextual factors, across increasing levels of analysis, it is hoped that this thesis would empirically demonstrate the validity of an interactionist approach to entrepreneurship research and serve as a motivation for future scientific investigation. The thesis concludes with a discussion of the empirical findings, and critically evaluates whether it has achieved the aforementioned ambition.

3 The Role of Social Capital

This chapter focused on *micro* contextual influences and sought to test Proposition 1 — social capital positively moderates the relationship between entrepreneurial talent and entrepreneurial achievement. As stated in Chapter 2.3, individual difference and social capital theories have both received empirical support in the prediction of entrepreneurial and innovative achievements (Ardichvili et al., 2003; Burt, 2004; Leutner et al., 2014), yet are rarely studied simultaneously. This chapter sought to address this limitation.

This empirical investigation sought to test Proposition 1 within the context of corporate entrepreneurship, specifically employee intrapreneurship (Antoncic & Hisrich, 2001). If organisations are to continue to grow, innovate and deliver value, they need to encourage entrepreneurial practices among their staff (Lumpkin, 2007). One way this may be achieved is through recruiting and developing those individuals who can produce intrapreneurial achievements — the development of new products, services, technologies and systems that drive organisational growth. In order to advance both theory and practice, there is a need to identify *who* has the tendency to pursue such achievements and understand *how* they do so (Ng & Rieple, 2014).

Based on trait activation theory (Tett & Burnett, 2003), this chapter hypothesised that intrapreneurs could be defined by their personality profile, which in turn brings them increased levels of social capital that they use to *bond* and *bridge* with their peers. By doing so, this rewards intrapreneurs with non-redundant information, new ideas and social influence. As a result of such an interaction, intrapreneurs have increased levels of expertise, which assist their ability to successfully identify and exploit opportunities that produce intrapreneurial achievement.

3.1 Study 1 — The Social Networks of Intrapreneurs

Based on the above and the literature reviewed in Chapter 2, the following hypotheses were tested:

H1: Individuals with higher levels of entrepreneurial talent, both seek and receive stronger ties within their organisation's social network.

H2: Individuals with higher levels of entrepreneurial talent are perceived to have more expertise.

H3: Entrepreneurial talent, expertise, and intrapreneurial achievement are positively correlated with network brokerage.

H4: Network brokerage moderates the relationship between entrepreneurial talent and expertise.

H5: Expertise mediates the relationship between entrepreneurial talent, network brokerage and intrapreneurial achievement.

3.1.1 Methods

3.1.1.1 Study Design and Participants

Given the aims and hypotheses of this study, it was important that data was collected from working adults that all belong to the same organisations. Furthermore, given that social network data was to be collected, participants also needed to work together. Data was collected through a “reach out” program held between UCL and small businesses. Four companies among them agreed to participate in the study. An overview of each site's participants is found in Table 1.

Table 1: Study 1 - A Breakdown of Each Sample's Demographics.

Samples	N	N Males	Average Age	Average Tenure (Years)	% Subordinates	% Managers	% Senior Managers /Directors /Owners
Hospitality	37	6	25	1.1	60%	30%	10%
Engineers	36	26	41	6.0	61%	28%	11%
Creative Agency	29	18	32	1.8	45%	31%	24%
Lubricants Retailers	17	12	42	5.5	59%	35%	6%
Total	119	62	35	3.5	56%	30%	14%

3.1.1.2 Measures

3.1.1.3 Measure of Entrepreneurial Tendencies and Abilities (Ahmetoglu et al., 2011)

META consists of 20 items and assesses four facets, collectively representing an individual's entrepreneurial talent: *Proactivity* (e.g. "Even when I spot a profitable business opportunity, I rarely act on it"), *Creativity* (e.g. "I am always trying to find new ways of doing things"), *Opportunism* (e.g. "I see business opportunities where others do not"), and *Vision* (e.g. "Great business ideas change the world").

Participants responded to items by rating their agreement via a five-point Likert scale ranging from 'completely disagree' (1) to 'completely agree' (5). An average score across each of the four facets was computed for each participant, thereby suitable for testing H3, H4 and H5. In order to test H1 and H2, the attribute was transformed into

two adjacency matrices representing “sender” and “receiver” effects. This was achieved using UCINET version 6.508 (Borgatti, Everett & Freeman, 2002). Previous studies have demonstrated the scale to have good internal consistency and predictive validity of entrepreneurial and intrapreneurial achievement (Leutner et al., 2014). In this sample, the scales were also found to have good levels of internal consistency (average $\alpha = .73$).

3.1.1.4 *Intrapreneurial Achievement (Leutner et al., 2014)*

A self-report measure of an individual’s past and present intrapreneurial achievements. This was measured via seven items, representing the frequency to which they have developed new products, services, technologies and systems over the past three years. Example items include: “*I have brought in ‘new business’ within the organisation*”, “*I have found a new and better method to accomplish a task or function within the organisation, which the organisation has implemented*”, “*I have made improvements to the organisation’s product or service lines*”, and “*I have invented a new product or service to be sold*”. Participants stated the frequency of their achievements using a five-point Likert scale (0 = Not Applicable/Never; 3 = 6-10; 5 = 16+). This score was found to have excellent levels of internal consistency (average $\alpha = .89$).

3.1.1.5 *Expertise*

Job-related expertise was measured using a peer-rating method. In each site, participants were presented with a roster containing the names of their colleagues, and the following question, “*In your opinion, how knowledgeable are the following people in their job?*”. For each colleague, participants indicate their perceived level of expertise on a five-point Likert scale (0 = Minimal, 5 = Exceptional). Given that the

size of each participating organisation was small and had under 40 members staff, every staff member was included on the roster.

As this data was used in to test multiple different hypotheses, it is important to describe how it was treated. In order to test H2, an adjacency matrix was created containing each participant's perceptions of their colleagues' expertise. In order to test H3 – H5, a single attribute score was computed for each individual. This variable contained the number of times an individual was rated to have an expertise score of 4 and 5. This cut-off point was chosen to identify those individuals that were regarded as having high levels of expertise amongst their peers.

3.1.1.6 *Social Network Measures*

In order to measure the strength of an individual's informal relationships, and position, within their organisation's social network, a roster method was used. Within each site, participants were presented a complete list of colleagues and three questions that were designed to measure a variety of informal networks. Namely, *Friendship* ("who would you consider to be a personal friend?"), *Advice* ("if you have questions or problems related to your specific job, who would you ask for help or advice?"), and *Creativity* ("who helps you come up with new and creative ideas?"). Multiple social networks were measured to increase reliability and to account for potential differences in affective (e.g. *Friendship*) and instrumental (e.g. *Advice* and *Creativity*) social relationships. For each colleague, participants rated the strength of their relationship (0 = Never, 5 = Always). These responses were organised into adjacency matrices, as is standard practice when analysing social network data. This data structure was suitable to test H1. In order to test H3, H4 and H5, UCINET was used to compute a brokerage index for each individual. This brokerage score was computed by first creating binary adjacency matrices for each of the social networks (scores of 3

or greater were marked “1” and scores of 2 or less were marked “0”). After which, a reversed version of Burt’s social network constraint equation could be applied (Burt, 2004). High scores on this measure indicate the individual has high levels of brokerage, whereas low scores suggest the individual has low levels of brokerage. This measure is widely used and found to hold predictive validity with work-related innovation (Burt, 2004) and job performance (Fang et al., 2015). Lastly, in order to test H3, H4 and H5 in a parsimonious fashion, an average brokerage score was also computed based on an individual’s level of brokerage across the three social networks.

3.1.1.7 Procedure

Participants were informed about the study via internal communications that was distributed by their line managers. After which, an invite was distributed that contained a unique survey link for each participant. In this invite, the nature of the survey was described and alongside stating that participation was voluntary and responses would remain anonymous. All participants who were invited to complete the survey, did so. After agreeing to participate, individuals were presented with the battery of questionnaires outlined in the previous section. Upon completion, participants were fully debriefed.

3.1.1.8 Statistical Analysis

Before any analyses were carried out, the data was screened for scoring errors, missing data, outliers, and violations of normality. In order to test H1 and H2, a series of multiple regressions with quadratic assignment procedure (MR-QAP) were used. This technique allows a series of adjacency matrices to be regressed on to another, and as such, this is a suitable technique when predicting dyadic & social network data (Borgatti et al., 2002). Bivariate correlations were used to test H3. H4 was tested

using a multilevel regression model (random intercept with fixed effects). Lastly, H5 was tested using Structural Equation Modelling. In all analysis demographic effects were controlled for.

3.1.2 Results

3.1.2.1 Multiple Regression with Quadratic Assignment Procedure

In order to test the H1, a series of MR-QAP models were tested. This technique was used as unlike standard multiple regression models whereby the unit of analysis is an individual observation, MR-QAP allows researchers to predict the values of a dyadic dependent variable by regressing multiple matrices of relations on to another (Krackhardt, 1988). Given that H1 & H2 both make assumptions about how intrapreneurial people seek out and receive relationships within their social networks, and the extent to which they are perceived to have expertise, MR-QAP was deemed the most suitable technique.

The dependent variable for each of the MR-QAP models were one of the three social networks measured: *friendship*, *advice* & *creativity*. The predictor variables for each model was the same collection of attributes: age, sex, hierarchy, tenure and entrepreneurial talent. Given that these variables provide a measurement for each individual, they were transformed into matrices so that they are suitable for the MR-QAP analyses. Given that the sex attribute was a categorical variable, it was transformed into a single matrix that represented whether i and j share the same sex. This was binary coded, with 0 representing different, and 1 representing same, sexes. For the remaining continuous attributes, they were transformed into two matrices. One matrix represented sender effects (e.g. do individuals seek out relationships with those who have higher levels of a given attribute?) and the other represented receiver effects (e.g. are individuals sought after because they have high levels of a given

attribute?). The sender effects matrices were created by copying the attribute vector $n - 1$ times, whereas the receiver effects matrices were created by transposing the attribute vector so that it became a row vector and then copied $n - 1$ times (Borgatti et al., 2002). Lastly, given that the data was collected from four different samples, matrices were stacked so that there was a single adjacency matrix for each predictor and dependent variable. Furthermore, given that these analyses were carried out using UCINET, a partition variable was used so that the permutation process that is characteristic of MR-QAP, occurred only within each sample and thereby ensured that the estimated parameters and their p -values were both accurate and representative of the data. Such a process is akin to typical OLS multilevel regression. The results of testing H1 are presented in Table 2.

Table 2: Study 1 - A Series of MR-QAPs Testing the Relationship Between Entrepreneurial Talent and the Strength of Social Network Ties.

Predictors	Friendship	Advice	Creativity
	β	β	β
Age	.07 (-.08*)	-.18** (-.16***)	-.12***(-.10***)
Sex	.07***	.03	.05*
Hierarchy	.09 (.03)	.15**(.15***)	.12* (.11***)
Tenure	.08 (.16***)	.05 (.10***)	.10*(.10*)
Entrepreneurial Talent	.33*** (.12***)	.17*** (.06***)	.17**(.03*)
$Adj R^2$.15***	.06*	.05**

Note: Coefficients outside of the parenthesis represent sender effects, while coefficients inside the parenthesis represent receiver effects. Number of permutations = 2000. Predictors are significant at the following levels: * $p < .050$ (two-tailed); ** $p < .010$ (two-tailed); *** $p < .001$ (two-tailed).

As illustrated in Table 2, when controlling for demographic, hierarchical and tenure effects, entrepreneurial talent was positively related to tie strength across all three social networks. In particular, the positive sender effects of entrepreneurial talent, indicate that individuals with elevated levels of such traits seek out stronger relationships with their peers. Similarly, albeit with weaker effects, individuals with elevated levels of entrepreneurial talent traits receive stronger relationships from their peers. It is also important to note that these effects were strongest when predicting friendship ties. The theoretical implications of this will be outlined in the discussion. In light of these results, H1 was supported.

In order to test H2, two MR-QAP models were further tested. Using the same analytic procedure, the dependent variable in both models was a matrix containing participant's perceptions of their colleague's level of expertise. The first MR-QAP model featured the previously used matrix-transformed attributes. The second MR-QAP model included the three social networks. The decision to test two models was made in order to test the extent to which personality and structural factors account for unique variance. The results of these models are illustrated in Table 3.

The results of model 1 show that individuals with increased tenure, hierarchy and levels of entrepreneurial talent are perceived by their colleagues to have increased levels of expertise. These effects are still found, albeit slightly weaker, when the social networks are included in the model. In model 2 stronger friendship and creativity relationships (not advice) were also found to hold positive relationships with increased perceptions of expertise. Given that entrepreneurial talent and social network predictors were both found to be significant predictors of expertise, and both accounted for unique variance, H2 was supported.

Table 3: Study 1 - A Series of MR-QAPs Testing the Relationship Between Entrepreneurial Talent and the Perception of Expertise.

Predictors	Model 1	Model 2
	β	β
Age	-.17**(-.15***)	-.14*(-.09)
Sex	-.02	-.05**
Hierarchy	.04(.11***)	-.03(.06**)
Tenure	.20***(.31***)	.15***(.21***)
Entrepreneurial Talent	.16***(.18***)	.06*(.12**)
Friendship Social Network	-	.27***
Advice Social Network	-	.03
Creativity Social Network	-	.27***
$Adj R^2$.116***	.331***

Note: Coefficients outside of the parenthesis represent sender effects, while coefficients inside the parenthesis represent receiver effects. Number of permutations = 2000. Predictors are significant at the following levels: * $p < .050$ (two-tailed); ** $p < .010$ (two-tailed); *** $p < .001$ (two-tailed).

3.1.2.2 Bivariate Correlations & Multilevel Regressions

In order to test H3, bivariate correlations between all variables was computed. As shown in Table 4, this hypothesis was supported: both entrepreneurial talent, average network brokerage, expertise and intrapreneurial achievement all positively correlated with each other. These findings both provide preliminary support for the theoretical model specified in Chapter 2.6, and they warrant further investigation.

Table 4: Study 1 - Bivariate Correlations Between Talent, Brokerage, Expertise & Intrapreneurial Achievement.

	1	2	3	4	5	6	7	8	9	10
1. Sex	-									
2. Age	-.29**	-								
3. Tenure	-.17	.65**	-							
4. Hierarchy	-.20*	.25**	.20*	-						
5. Entrepreneurial Talent	-.01	-.23*	-.35**	-.02	-					
6. Friendship Brokerage	.34**	.23*	.24**	.27**	.21**	-				
7. Creativity Brokerage	.13	.07	.14	.29**	.12*	.25**	-			
8. Advice Brokerage	.33**	.23*	.13	.38**	.12*	.39**	.41**	-		
9. Average Brokerage	.34**	.14	.08	.41**	.20**	.75**	.78**	.71**	-	
10. Expertise	-.27**	.24**	.14	.55**	.29**	.56**	.42**	.40**	.63**	-
11. Intrapreneurial Achievement	-.24*	.29**	.08	.20*	.33**	.43**	.06	.38**	.37**	.41**

Note: Correlations are significant at the following levels: * $p < .050$ (two-tailed); ** $p < .010$ (two-tailed); *** $p < .001$ (two-tailed).

With H3 supported, a multilevel regression model was specified to test H4 — does brokerage moderate the positive relationship between entrepreneurial talent and expertise? A multilevel regression model was chosen over traditional multiple regression, given that the data was collected from distinctly different samples (e.g. different industries, organisational structures, etc.). As such, it was deemed important to control for any potential between-group differences. Given this, the model was specified to feature a random intercept with fixed effects. This allowed the model to account for any mean group differences in scores, while also attempt to fit a fixed slope for each predictor. Lastly, multiple models were specified whereby key predictors were added incrementally. This was to identify whether predictors continued to account for unique variance when including other relevant predictors, and test for improvements in model fit (e.g. reductions in -2 Log Likelihood indicate improvements in fit; Field, 2013). Model 1 included demographic variables, model 2 added entrepreneurial talent, model 3 added network brokerage,¹ and model 4 included an interaction effect of entrepreneurial talent and brokerage. These models were tested using the “nlme” package in R (version 3.1-122; Pinheiro, Bates, DebRoy, & Sarkar, 2013), and the results are illustrated in Table 5.

As demonstrated in models 2 and 3, both entrepreneurial talent and network brokerage are positively related to expertise. Notably, the effect of brokerage is more than twice as strong as the effect of entrepreneurial talent. Furthermore, across each model the -2 Log Likelihood was reduced, thereby indicating improvements in model fit. In model 4, both entrepreneurial talent, brokerage and the interaction term are significant predictors alongside hierarchy and age. Although the interaction effect is somewhat weaker in terms of effect size and *t*-values, it remained significant

¹ As is best practice when testing moderation effects, the entrepreneurial talent and network centrality predictors were grouped-centred (Dawson, 2014).

suggesting that brokerage was found to moderate the relationship between personality and expertise (H4 supported). In order to further investigate this, the two-way interaction was graphically depicted (Figure 2).

As shown in Figure 2, the interaction effect suggests individuals with high levels of entrepreneurial talent and high levels of brokerage, have significantly higher levels of expertise. Furthermore, individuals with low levels of entrepreneurial talent and high levels of brokerage, have comparatively lower levels of expertise. Conversely, when brokerage is low, the relationship between low and high levels of entrepreneurial talent, and expertise, does not differ.

Table 5: Study 1 - A Multilevel Regression Model Predicting Expertise.

	Model 1		Model 2		Model 3		Model 4	
	β	t	β	t	β	t	β	t
Random Intercept	.58	-	.52	-	.50	-	.47	-
Sex	-.03	-.595	-.02	-.390	-.01	-.215	-.02	-.338
Age	.07	1.220	.08	1.428	.11	1.971*	.09	1.484
Tenure	.10	1.599	.16	2.307*	.18	2.711**	.18	2.842**
Hierarchy	.35	7.320***	.34	7.289***	.25	5.146***	.25	5.311***
Entrepreneurial talent			.15	3.118*	.11	2.287**	.11	2.467**
Brokerage					.23	4.716***	.26	5.175***
E. Personality x Brokerage							.09	2.193*
-2 Log Likelihood	-83.159		-77.118		-66.377		-63.854	

Note: Standardised Coefficients are significant at the following levels * $p < .050$ (two-tailed); ** $p < .010$ (two-tailed); *** $p < .001$ (two-tailed).

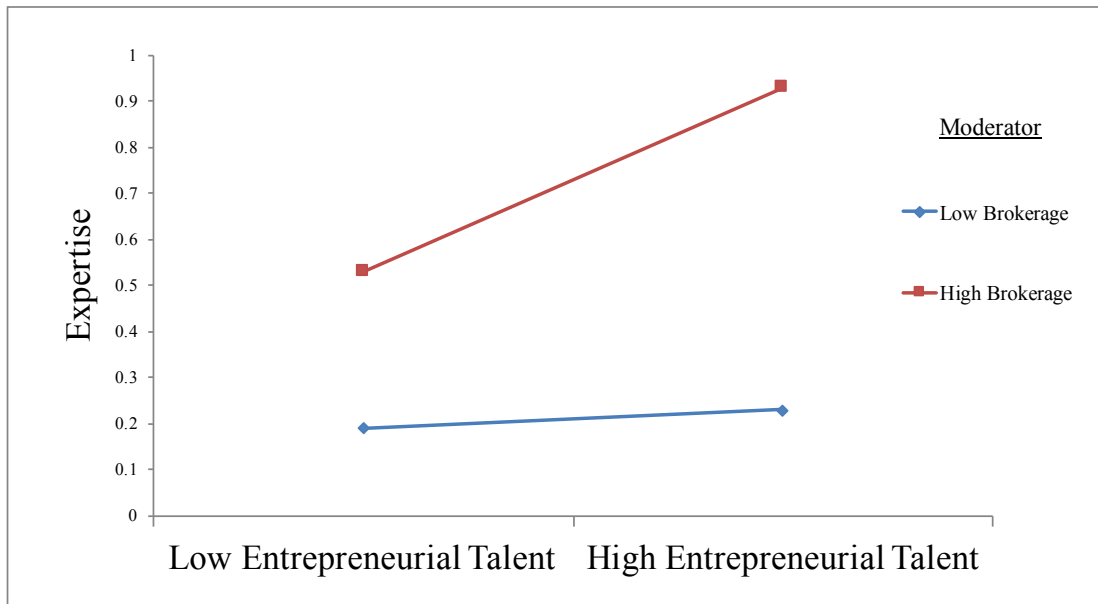


Figure 2: Study 1 - Two-way Interaction Between Entrepreneurial Talent & Brokerage on Expertise.

3.1.2.3 Structural Equation Modelling

With H4 supported, structural equation modelling (SEM) was used to extend the previous findings, and test the role of expertise as a mediator between personality, brokerage and entrepreneurial achievement (H5). Based on the bivariate correlations and the results of the multilevel regression models, a saturated model was tested. In this model, hierarchy, tenure, entrepreneurial talent, network brokerage and personality-brokerage interaction variable were treated as exogenous variables. Expertise was both an exogenous and endogenous variable. Intrapreneurial achievement was treated as an endogenous variable.

The model's fit was assessed via a handful of indices: the χ^2 statistic (Bollen, 1989; which tests the hypothesis that an unconstrained model fits the correlation matrix as well as the given model; $p > .05$ is desired); the goodness of fit index (GFI; Tanaka & Huba, 1985; values above .90 are acceptable); the comparative fit index (CFI; Bentler, 1990; values above .95 are acceptable); and the root mean square

residual (RMSEA; Browne & Cudeck, 1993; values of .06 or below indicate reasonable fit for the model). Subsequently, the hypothesised model did not fit the data: $\chi^2(10) = 51.69, p < .001$; GFI = .89; CFI = .73; RMSEA = .20. In light of this, steps were taken to identify misspecifications. Paths were freed or added and variables removed on the basis of modification indices, expected parameter change statistics, significance levels, standardised residuals and the size of indirect effects (assessed via a bootstrapping method; number of bootstrap samples = 200, bias-corrected confidence intervals = .95). Paths were only added or freed if they made theoretical sense, and after each modification, fit indices were checked to ensure improved model fit.

These modifications resulted in tenure being removed from the model as it held no significant direct or indirect effects with expertise and achievement. Similarly, the direct effects of hierarchy, brokerage and the personality-brokerage interaction on intrapreneurial achievement were non-significant, and thus removed. Lastly, based on modification indices, brokerage and hierarchy, alongside brokerage and entrepreneurial talent, were free to correlate. After these modifications, the model adequately fitted the data ($\chi^2(7) = 9.599, p < .212$; GFI = .97; CFI = .98; RMSEA = .06). Square multiple correlations revealed that a total of 22% of the variance in intrapreneurial achievement scores, and 60% of the variance in expertise scores, was accounted for by the exogenous variables.

Using a bootstrapping method to test for mediation, the effect of all exogenous variables on intrapreneurial achievement were found to be significantly mediated by expertise, aside from entrepreneurial talent, which was found to be partially mediated. Figure 3 illustrates the results of the fitted SEM model. In light of these results, H5 was supported.

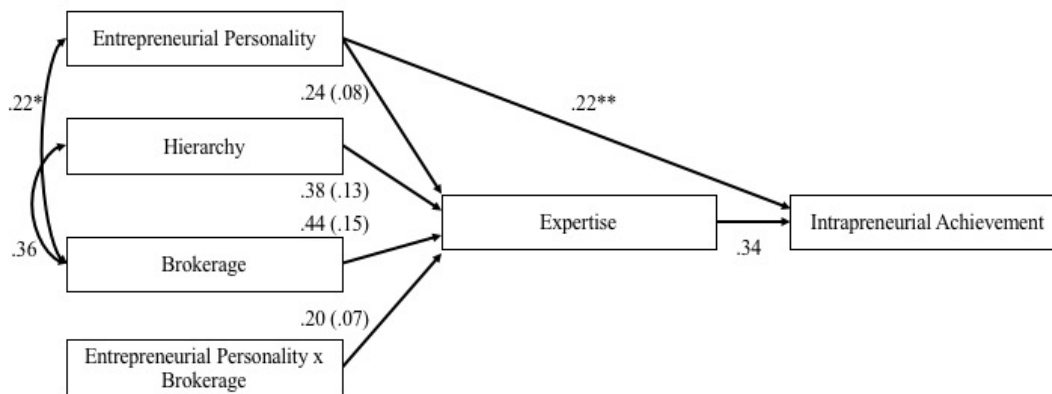


Figure 3: Study 1 - The Fitted SEM. *Note:* Indirect effects are displayed within parentheses. All coefficients are significant at the $p < .001$ level (two-tailed), except those marked * $p < .050$ (two-tailed); ** $p < .010$ (two-tailed).

3.2 Discussion

The current chapter sought to investigate the impact of personality traits, expertise and social capital on intrapreneurial achievement. Although both approaches have found empirical support in previous research, such research has been theoretically and methodologically limited. For example, trait research had ignored the influence of interpersonal dynamics (Leutner et al., 2014; Frese & Gielnik, 2014), while social network research had either overlooked the role of individual differences (Burt, 2004) or failed to explain exactly how individuals leverage their social networks to identify and exploit opportunities (Ng & Rieple, 2014). Given this, the results presented in this chapter addressed these limitations as all hypotheses were supported using robust measurements of both personality and social capital.

As defined by their personality profile, intrapreneurs were found to hold significantly stronger ties with their peers across all three social networks, and that the sender and receiver effect sizes from the entrepreneurial talent variable to tie strength were equal to, or stronger than, those held with demographics, tenure, and place within the organisational hierarchy. The results from the MR-QAP models

demonstrated that intrapreneurs not only seek out relationships with their colleagues, but are also highly sought after as indicated by the positive receiver effects. This finding, reveals that irrespective of whether they have formal authority or not, intrapreneurs are a source of creative inspiration and knowledge amongst their peers. These results are in line with Granovetter's (1973) strength of weak ties theory and Ardichvili et al.'s (2003) model of opportunity identification.

Given that creativity and innovation is largely a social activity, these findings are not necessarily unexpected. Firstly, intrapreneurs build strong ties in order to facilitate trusting and reciprocal relationships. By doing so, they increase the level of incoming information, ideas and knowledge, as most evident within the *Advice* and *Creativity* social networks. By increasing the transfer of knowledge between themselves and their peers, the intrapreneur is more likely to identify valuable opportunities (Ardichvili et al., 2003). Secondly, it has been previously suggested that entrepreneurs inspire and motivate their co-workers by communicating a charismatic and inspirational vision for change and progress, and that such a vision enables them to set agendas and mobilize resources (Coleman, 1988; Ruvio et al., 2010). From the perspective of social identity theory, the communication of such a vision promotes a salient in-group identity which may help build support, engagement and buy-in for their ideas, projects and initiatives (Hogg et al., 2012). Based on this, and given that intrapreneurs were found to have influence within all three social networks, the results suggest that intrapreneurs develop the *bonding* form of social capital in order to aid the exploitation of valuable opportunities (Martinez & Aldrich, 2011). Taking these interpretations into account with the findings presented here, and the fact that a visionary disposition was included in the measure of entrepreneurial talent, it can be said that intrapreneurs develop such relationships so that they are attributed by their

peers with informal leadership. Accordingly, it can be therefore argued that the desire to acquire such leadership is one of the primary motivations for intrapreneurs to develop strong ties with their colleagues.

As hypothesised in Chapter 2.6 (Proposition 1), Figure 3 illustrates how network brokerage moderates the relationship between individual differences and expertise, which in turn predicts intrapreneurial achievement. This suggests that individuals with elevated levels of entrepreneurial talent traits are more likely to hold brokerage positions within their social network. Specifically, as their social network is unconstrained they are able to join otherwise disconnected individuals. By doing so, they increase their level expertise that enables them identify valuable opportunities (Burt, 2004), and eventually their likelihood to produce intrapreneurial achievements (Ardichvili et al., 2003). The positive effect of brokerage can be explained due to its ability to reward the intrapreneur with non-redundant information and resources.

Given that opportunity identification, much like creativity and innovation, is the recombination of ideas, resources and information (Ardichvili et al., 2003), the congruence between having an entrepreneurial talent profile and a high brokerage position, facilitates the intrapreneur's ability to discover new ways of creating value as their behavioural dispositions are readily activated and engaged by their social environment (e.g. trait activation theory; Tett & Burnett, 2003). As such, this maximises their ability to innovate and grow the organisation. For example, curious, opportunistic and proactive tendencies motivate the intrapreneur to connect with different people in the hope that it will reward them with novel ideas, resources and information that they can use to realise their own projects, plans and initiatives. Upon building such relationships, these tendencies are utilised and exaggerated due to an interaction with social cues that evoke a heightened state of alertness to new

opportunities (Ardichvili et al., 2009; Tett & Burnett, 2003). When coupled with strong ties that facilitate trust and acceptance of the intrapreneur's vision, brokerage enables the intrapreneur to more effectively extract value and secure the support needed to exploit the identified opportunities.

The role of brokerage in the relationship between individual differences and achievement can also be interpreted as the individual possessing the political skill needed to secure support from key stakeholders that would have otherwise not been possible. Given that previous research has found entrepreneurial talent traits to be positively related with manipulative, superficial and exploitative tendencies (Akhter et al., 2013), it can be argued that the likelihood of intrapreneurs occupying a brokerage position is evidence that they are either extracting value from two or more parties, or act as an intermediary in order to control the flow of information, evoke competition that they benefit from, or provide favours that can be used as a form of leverage in the future. The literature on the 'dark side' of personality in the workplace notes that such Machiavellian and callous tendencies are usually masked using impression management and charisma to maintain their reputation and trust (Babiak et al., 2010) — behaviours also used by entrepreneurs for similar reasons (Akhtar et al., 2013). Although this is not directly measured in the current study, the positive relationship between the strength of friendship ties and entrepreneurial talent, and the suggested role of vision and charisma in building support and trust, does give some support to this, however, it does require further empirical enquiry. Indeed, network research has demonstrated that an increased awareness of the organisation of a social network is positively correlated with power (Krackhardt, 1990), therefore intrapreneurs who are sensitive to who share ties with whom, and are able to manage

the flow of information by ensuring that they are a broker, are likely to be able to cut through bureaucracy and raise their profile within the organisation.

Given that brokerage was found to moderate the relationship between entrepreneurial talent and intrapreneurial achievement, these findings are noteworthy as previous intrapreneurship research had not identified the psychological antecedents or individual differences of brokerage. For example, while there is literature to demonstrate the relationship between brokerage and creativity (Burt, 2004), there are few studies that have sought to understand and explain ‘who’ the brokers are in terms of their personality profile. The findings presented in this chapter therefore bring theoretical implications for social capital research as it demonstrates the importance of individual differences in the organisation of social networks. In addition, it extends research that has focused solely on the direct effects of personality traits on intrapreneurial achievement (Leutner et al., 2014; Rauch & Frese, 2007), by demonstrating how an individual expresses their personality within groups and the implications this has on their likelihood to develop new products, services and systems that contribute towards organisational growth, innovation and value creation. Furthermore, the methodology of this chapter presents another contribution to the literature. Its combination of robust psychometric and social network measurements offers a research paradigm to intrapreneurship researchers, as a way to model both individual and group processes simultaneously. Doing so enables researchers to theorise and empirically test questions that seek to answer *who* has the potential to contribute towards innovation and growth, and understand *how* do they achieve this.

3.2.1 Limitations and Future Research

There are limitations to the current research that must be addressed. Firstly, the data collected was cross-sectional, therefore the causal direction of the models tested

cannot be assumed. While the justification for such models is based on personality traits being understood as both stable and internally-generated constructs that are independent of the environment, whereas relationships and interpersonal dynamics occur outside of the individual and are likely to be the result of numerous factors (e.g. work environment, organisation structure, geography, etc; Tett & Burnett, 2003), reverse causation with the dependent variables is possible. For instance, it is possible that individuals who have acquired more intrapreneurial achievements may become more active network brokers, similarly individuals with more intrapreneurial achievements may grow to view themselves as being more innovative. This limitation could be overcome using longitudinal survey designs as predictive relationships could be tested, and allow further investigation into how networks change, along with the intrapreneur's network position. Understanding how intrapreneurs use social networks throughout the lifespan of project is important, as it has been theorized that weak ties and brokerage positions are used to first identify new opportunities, though these ties become stronger and more constrained when looking to exploit and realise opportunities (Martinez & Aldrich, 2011).

Secondly, the use of a self-report measure of achievement can be criticised for potentially creating common method bias. Although future research should seek to use more objective or peer-rated measures of intrapreneurial achievement, such data can be difficult to collect. Nonetheless, meta-analytic results do demonstrate a negligible difference between the effect sizes in the prediction of subjective and objective measures of entrepreneurial achievement thereby suggesting that the current study does adhere to standards of validity and reliability (Rauch et al., 2009).

Thirdly, the relationship between entrepreneurial personality, social capital and intrapreneurial achievement could be criticised as being overly simplistic or

reductionist. This is noteworthy given that both entrepreneurship and intrapreneurship is a heterogeneous activity, and it is unlikely that the variables used in this study will facilitate achievement in every job, team and industry (Hmieleski, Carr & Baron, 2015). For example, the current study does not distinguish between the traits that may motivate an individual to engage in intrapreneurial activities and processes, and those traits that may lead to actual intrapreneurial achievement. Nor do organisations view intrapreneurship as simply a matter of talent management, rather there are many processes and strategies organisations pursue in order to encourage such innovation (for more discussion on corporate entrepreneurship, see Thornberry, 2001).

Future research should not only address these limitations, but begin to focus their attention on incorporating other relevant variables. For example, does organisational culture serve as a moderating influence in the relationship between personality, social capital and intrapreneurial achievement? It can be hypothesised that organisations whose leaders, values and internal processes are congruent with that of producing innovation, encouraging opportunism and facilitating proactivity, may possess a workforce that is more readily equipped with the talents and social capital needed to successfully engage in intrapreneurship (Anderson et al., 2014; Leutner et al., 2014). Similarly, future research should extend these findings by moving beyond dyadic relationships and begin to explore how intrapreneurs operate within triads and larger groups. Aside from looking at the structure of these relationships, it would also be noteworthy to test homophily models in order to understand who the intrapreneur is forming connections with and why. Given the focus on personality traits, it could be hypothesised that intrapreneurs may seek to build relationships with individuals who share a similar profile as themselves, however they may also form relationships with those individuals who have

complementary dispositions. For example, a highly creative and visionary intrapreneur may seek to build a relationship with someone who could be described as a pragmatist, so that they can begin to test and refine their ambitious ideas.

3.2.2 Practical Implications

The results presented in this chapter have implications that may be of use to leaders, consultants and practitioners who are looking to increase their organisation's ability to build and sustain a competitive advantage. Firstly, these results demonstrate that personality traits are predictive of intrapreneurial achievements, and therefore, organisations should use psychometric inventories to identify individuals who have creative, visionary, proactive and opportunistic behavioural tendencies. Once identified, these individuals could be placed on training programmes and given more organisational support so that they are able to contribute towards organisational growth and innovation. Additionally, formal leaders may choose to align themselves with intrapreneurs (given their social influence and informal leadership status) in order to improve their communications and acquire support from their subordinates. Lastly, talent management strategies should be developed to encourage employees to build connections with other parties, both internally and externally, in order to increase their social capital and the amount of non-redundant information circulating within the organisation. By doing so, their ability to identify and exploit opportunities may increase, and thereby improve the organisation's competitive stance.

3.3 Conclusion

This chapter sought to address the current gap in the literature surrounding the relationship between entrepreneurial talent, social capital and achievement. Accordingly, entrepreneurial talent was found to be predictive of intrapreneurial achievement. This demonstrates that the individual differences needed to identify and

exploit opportunities, are not context dependent. This extends Leutner et al.'s (2014) research. Furthermore, this study sought to further integrate the role of social capital in this relationship. As hypothesised in Chapter 2.6, using valid and accurate measures (via the use of social network analysis), social capital moderated the relationship between individual differences and achievement. This finding supports Proposition 1, as it explains how and why micro contextual factors influence the relationship between personality traits and achievement. Accordingly, it is argued that the findings presented in this chapter have adequately advanced theoretical understanding. The next step is to increase the level of analysis and explore the influence of wider contextual influences. In this case, organisational culture.

4 The Role of Organisational Culture

This chapter sought to test Proposition 2 — organisational culture impacts the relationship between individual differences and entrepreneurial achievement. In light of the limitations with the existing corporate entrepreneurship literature (see Chapter 2.4), this chapter seeks to extend existing entrepreneurial culture constructs (Covin & Slevin, 1991; Hornsby et al., 2013) to include informal and socio-cognitive constructs. It is hypothesised that by doing so, the antecedents of entrepreneurial achievement at the organisational level will be better understood.

The chapter begins with the development of a psychometric inventory to assess the extent to which an organisation's culture can be described as being entrepreneurial. This inventory was developed using data reduction techniques to identify reliable and theoretically congruent factor structures (Study 2). It was then validated against measures of entrepreneurial orientation in order to demonstrate the role of informal and social factors in the pursuit of entrepreneurial achievement (Study 3 & 4). Emphasis was also placed on identifying the various psychological mechanisms that describe how entrepreneurial cultures directly and indirectly shape employee behaviour, cognitions and entrepreneurial achievement. Particular attention was applied to *reinforcement* (e.g. operant conditioning & theory of planned behaviour; Ajzen, 1991; Kautomen et al., 2013), *work engagement* (Schaufeli et al., 2006) and *person-organisation fit* (Westerman & Cyr, 2004) theories.

4.1 Study 2 — Development of The Entrepreneurial Culture Inventory

In Chapter 2.4, the case was made for organisations to understand and modify its internal social processes in order to successfully engage in corporate

entrepreneurship. Similarly, the opportunity to extend existing entrepreneurial culture constructs, namely entrepreneurial orientation (as measured by Covin & Slevin (1991), and Hornsby et al.'s (2013) four-factor framework), through the inclusion of socio-cognitive factors was highlighted (Rauch et al., 2009). It was argued that by addressing such a gap in the literature, new directions for research and practice will be identified. Accordingly, this thesis defines entrepreneurial cultures as those which are characterised by increased support for, and expression of, entrepreneurial activity and achievement through the way it socialises its employees, namely through the influence of leadership, employee values, team behaviours and empowerment (Burt, 2004; Hogg et al., 2012; Ruvio et al., 2010; West, 2007).

Although Chapter 2.4 explains the theoretical extension of the entrepreneurial culture construct, in order to promote evidence-based practice and future research, a multi-dimensional instrument that can measure the degree to which an organisation's culture is compatible with the pursuit of entrepreneurial achievement would be of practical service given the popularity of survey methods in the applied social sciences (Hinkin, 1998). Influenced by both the literature outlined in Chapter 2.4, the proposed instrument measures six dimensions:

1. *Leadership Style* — The extent to which leadership have a bold and entrepreneurial vision.
2. *Employee Values* — The extent to which employees value creativity, experimentation and opportunism.
3. *Empowerment* — The extent to which leaders and managers encourage freedom and autonomy.
4. *Team Behaviour* — The extent to which teams are interdisciplinary, have social capital and are cohesive.

5. *Knowledge Management* — The extent to which an environment encourages learning new skills, information expertise.
6. *Reward* — The extent to which individuals are supported and rewarded to engage in entrepreneurial behaviour.

Although much has been said about the hypothesised influence of the first four dimensions, it is important to briefly describe the inclusion of the *Knowledge Management* and *Reward* dimensions. In Study 1, expertise was found to be a positive mediator between entrepreneurial talent, social capital and intrapreneurial achievement. In order to extend this research, and supported by the fact that expertise is positively related to entrepreneurial achievement (Unger et al., 2011), it can be hypothesised that organisations which make it easy for individuals and teams to share information, learn new skills and refine expertise (e.g. *Knowledge Management*) are more likely to produce entrepreneurial achievements. Furthermore, the inclusion of the *Reward* dimension is based on the literature exploring the influence of intrinsic and extrinsic rewards on creativity and innovation, in particular, Amabile's (1993) research on the synergistic combination of intrinsic and extrinsic motivation on entrepreneurial creativity and innovation.

It must be said for all of the aforementioned dimensions that although they have been selected and operationalised on the basis of theoretical reasoning and empirical evidence, their selection can always be criticised as being both too narrow or over inclusive. As Petrides and Furnham (2001, p. 428) write, “asking what precisely should be part of a construct is like asking what sports should be in the Olympics; neither question can be answered objectively”. In light of this and to echo the sentiment expressed in previous sections, the listed dimensions are not exhaustive, and instead their selection was determined by a need to create a framework to add

further theoretical understanding. On this framework, dimensions can be added, modified or deleted entirely in future research.

Within the corporate entrepreneurship literature that there are two popular measures that seek to measure an organisation's entrepreneurial orientation (EO; a related construct to entrepreneurial culture, but focused on organisational strategy & technical processes; Rauch et al., 2009): Miller and Friesen's (1983) 12 item scale seeks to measure an organisation's *innovativeness, proactivity, and risk-taking*, and Hornsby et al.'s (2013) *Corporate Entrepreneurship Assessment Instrument (CEAI)*, an 18 item scale that measures EO across four facets: *Work Discretion, Time Availability, Management Support* and *Reward*.

What then warrants the creation of a third? Miller and Friesen's measure, despite its popularity, can be criticised as being too simplistic in that its three dimensions do not capture all the necessary dimensions of the construct. A criticism further supported by the fact that nearly half the studies that have used it, have modified it in some capacity (Rauch et al., 2009). Furthermore, despite the CEAI demonstrating good psychometric properties and it addressing the narrowness of Miller and Friesen's measure (Hornsby et al., 2013), it is limited by its exclusion of socio-cognitive factors. This limitation is noteworthy given recent calls for more inclusive measures (Rauch et al., 2009), and is also in agreement with this thesis' stance on the importance of social factors in promoting achievement at both the individual and organisational level (Anderson et al., 2014; De Carolis & Saporito, 2006). In light of this, the proposed measure would address these limitations by incorporating a wider taxonomy as recommended by Rauch et al. (2009). The creation of a reliable and valid measure, that incorporates both formal and informal influences

of entrepreneurship, would serve as a valuable tool for both researchers and practitioners alike.

The remainder of this chapter details the development of the *Entrepreneurial Culture Inventory* (ECI). The development of the ECI followed the standard process of psychometric development (Hinkin, 1998): the first phase involves the creation of the items, which includes a content analysis by expert judges in the field. The second phase involves using data reduction techniques to identify and validate the measure's factor structure, alongside measuring its internal consistency. Studies 3 and 4 will explore the measure's concurrent validity using the multivariate technique, Structural Equation Modelling (SEM).

4.1.1 Item Selection & Development via Expert Judges

Approximately 200 items were generated based on the literature reviewed in Chapter 2 (approximately 30 items per facet) and interviews with senior leaders from large UK businesses. In order to ensure content validity, and to reduce item count by removing redundant and irrelevant items, three expert judges reviewed (two professors of psychology & one HR practitioner) the items and made recommendations regarding the inclusion of certain items. As a result, 112 items remained and were the focus of subsequent analyses.

4.1.2 Methods

4.1.2.1 Participants

In total, 465 (218 males) participants took part in the study. Their ages ranged from 18 to 72 years ($M = 35.88$, $SD = 12.07$; 69.9% were between 18 & 40; 25.6% were aged between 41 to 60). The majority of participants were in full-time employment (54.6%), with a further 19.8% in part-time employment, 16.1% self-employed and 12.5% students (*note*: participants were allowed to choose more than

one option). Of the sample, 68.6% classed themselves as employees, 18.5% were managers, .6% were managers of managers and 7.5% were a CEO. The participants were mostly from the USA (97.6%).

4.1.2.2 Procedure

The 112 items were hosted on an online survey site, where participants gave their consent to participate and responded by indicating their agreement to each item using a five point Likert scale (Strongly Disagree — Strongly Agree). Participants were recruited through Amazon's Mechanical Turk platform (for a discussion on the platform's research utility & validity, see Buhrmester, Kwang & Gosling, 2011).

After completing the survey, participants were fully debriefed.

4.1.3 Results

Before scale development began the data was checked and cleaned for outliers, missing data and normal distributions in order to ensure that the assumptions of multivariate analyses were not violated (Judd, McClelland & Ryan, 2009).

4.1.3.1 Exploratory Factor Analysis

Given the large amount of items that were hypothesised to represent six dimensions, it was decided to explore the psychometric properties of each dimension in turn, rather than test all 112 items at once. This method was chosen in order to retain statistical power and improve the interpretability of the results. The objective of this approach was to further reduce the number of items before data reduction techniques that simultaneously explored the existence of all six dimensions were carried out. This procedure was as follows: first, a correlation table was produced that contained all items that were hypothesised to belong to a dimension. Any two items that shared a coefficient less than .30 was discarded. The subsequent items were then entered into a Principal Axis Factoring (PAF) with an Oblimin rotated exploratory

factor analysis (EFA) procedure. Likewise, Kaiser-Meyer-Olkin's value was assessed with each procedure to ensure that the data were suitable for factor analyses (scores above .60 are recommended), alongside discarding items that had low item communalities, loading coefficients of less than .40 or crossed-loaded (Hinkin, 1998). Items that loaded on a single dominant factor (e.g. accounting for at least 30% of the variance & indicated by Scree plots) were retained and tested for internal consistency. Repeating this procedure for each of the six hypothesised dimensions resulted in the total number of items being reduced from 112 to 38. A summary of these analyses are presented in Table 6.

Table 6: Study 2 - Summary of Exploratory Factor Analyses.

Dimensions	KMO	Initial Items	Final Items	α	Extracted Sums of Squared Loadings		
					Eigenvalue Of Dominant Factor	Variance Explained By Dominant Factor	Total Variance Explained By Procedure
Leadership Style	.92	10	6	.90	5.49	54.95%	63.17%
Employee Values	.94	15	7	.94	6.58	43.86%	48.77%
Empowerment	.86	11	6	.82	4.05	36.71%	47.90%
Team Behaviour	.91	9	8	.89	4.20	46.69%	46.69%
Knowledge Management	.93	12	7	.88	5.03	41.94%	46.47%
Reward	.74	4	4	.74	1.77	44.28%	44.25%

Note: Kaiser-Meyer-Olkin's value = KMO. Internal Consistency = α .

As illustrated above, each factor analysis produced a dominant factor that accounted for most of the variance explained. Additionally, each scale had excellent levels internal consistency (.70 is deemed satisfactory) despite discarding over half of the initial items. With the number of possible items reduced to 38, further EFA were carried out to explore the item's factor structure. Before doing so however, each pair of items was tested to ensure that they positively and significantly correlated with each other. Any items that did not were discarded. All items correlated in the aforementioned fashion therefore all were retained.

The Scree plot of a factor analysis that contained all 38 items indicated a single dominant factor, while the pattern matrix suggested the existence of five, not six, factors. The KMO statistic and the communality estimates indicated that the items were suitable for factor analysis. Nonetheless, the pattern matrix featured 8 items that crossed loaded. A final factor analysis was carried out whereby cross-loading items were removed. The results of this analysis are presented in Table 7.

In this factor analysis, four distinct factors were revealed. The items that were hypothesised to belong to either a *Reward* or *Knowledge Management* dimension loaded onto two factors that can be conceptualised as *Employee Values* (factor 1) and *Team Behaviour* (factor 2) dimensions. Although factor 1 is the dominant factor, accounting for most of the variance, the items loading onto each of the factors have good levels of internal consistency thereby suggesting that they are reliable constructs. Furthermore, factors 2 and 3 appear to be negatively correlated with factors 1 and 4. This stressed the need to conduct confirmatory factor analysis (CFA) to not only confirm the factor structure of these items and test whether the factors represent a single latent construct, but to also test the directionality of the constructs given that each dimension was hypothesised to be positively correlated.

Table 7: Study 2 - The Results of an Exploratory Factor Analysis.

Hypothesised Dimension	Item	Factor				Communalities	
		1	2	3	4	Initial	Extracted
EV	My organisation encourages people to use their own judgement not follow the rules	.72				.50	.52
EV	People are not afraid to fail	.69				.49	.50
EV	People are not afraid to do things differently	.66				.58	.59
EV	People are encouraged to look for new business opportunities	.59				.40	.40
R	Brave decisions are recognised – even if they prove to be wrong	.59				.55	.54
EV	My organisation values getting things done, rather than following procedures	.58				.31	.29
EV	New ideas are often put to the test	.48				.55	.55
KM	I am encouraged to find new ways of doing things	.42				.61	.61
EV	There is very little office politics	.42				.42	.36
R	Promotion usually follows the development of new and innovative ideas	.39				.45	.41
TB	Each team member brings a unique set of skills		-.79			.57	.60
TB	If there is a problem, I know what team member can best help me		-.72			.44	.46
TB	Feedback from team members helps me spot creative opportunities		-.72			.53	.55
TB	My team has the necessary expertise to discover new opportunities		-.67			.57	.55
TB	My team share the same vision of success		-.66			.57	.56
TB	My team is motivated to bring positive change to the organisation		-.59			.61	.60
TB	I network with other teams and other areas of the business		-.50			.41	.35
KM	There is a diverse range of skills & knowledge in my workplace		-.50			.46	.44
KM	Teams and departments happily share their knowledge and expertise with each other		-.39			.52	.51
LS	Provide opportunities to be creative when things are moving slowly			-.83		.68	.70

LS	Value creativity		-0.81		.64	.65
LS	Have a vision that I believe in		-0.78		.62	.63
LS	Implement strategies by using peoples skills most effectively		-0.75		.63	.62
LS	Are trustworthy		-0.72		.53	.51
LS	Encourage debate and discussion		-0.68		.61	.57
E	I have the freedom to think for myself			.69	.55	.61
E	I have to double-check all of my decisions with someone else			.68	.35	.38
E	I have the freedom to choose how I do my job			.63	.52	.55
E	I am not allowed to make decisions			.63	.47	.50
E	I am allowed to use my initiative when making decisions			.52	.47	.46

Internal Consistency (α)

.88 .89 .90 .82

KMO = .95

Extraction Sums of Squared Loadings

Total Eigenvalue	% Variance Accounted	% Cumulative Variance
11.35	37.84	37.84
1.93	6.42	44.26
1.39	4.62	48.88
.89	2.96	51.842

Note: Dimensions: EV = Employee Values, R = Reward, KM = Knowledge Management, TB = Team Behaviour, LS = Leadership Style, E = Empowerment.

KMO = Kaiser-Meyer-Olkin's value.

4.1.3.2 Confirmatory Factor Analysis

Using AMOS 19.0 (Arbuckle, 2010), two models were tested: an *item model* and a *composite model*. The *item model* replicated the pattern matrix displayed in Table 7 by featuring four covarying latent factors with the respective items loaded on to it. The *composite model* featured a single latent factor with four composite variables, representing the latent factors of the *item model* loading on to it.

Each model's fit was assessed via a handful of indices: the χ^2 statistic (Bollen, 1989; which tests the hypothesis that an unconstrained model fits the correlation matrix as well as the given model; $p > .05$ is desired); the goodness of fit index (GFI; Tanaka & Huba, 1985; values above .90 are acceptable); the comparative fit index (CFI; Bentler, 1990; values above .95 are acceptable); and the root mean square residual (RMSEA; Browne & Cudeck, 1993; values of .06 or below indicate reasonable fit for the model).

The item model only partially fitted the data ($\chi^2(399) = 1045.95, p < .001$; GFI = .87; CFI = .91; RMSEA = .06) despite each item significantly loading on to its respective factor ($p < .001$; average loading = .70), an average of 50% of the variance accounted for in each item and all latent factors positively correlating (average $r = .67, p < .001$). Given this, modification indices were used to identify misspecifications. This resulted in allowing fifteen items to covary with each other. No items needed to be removed or loaded onto another factor. After making these modifications, the model's fit improved ($\chi^2(384) = 726.99, p < .001$; GFI = .91; CFI = .95; RMSEA = .04) and thereby confirmed the latent factor structure indicated by the final EFA in Table 7.

With four factors identified, the composite model was created to test whether the four factors themselves represent a single latent construct, in this case, an entrepreneurial culture. To test this, four composite scores were computed on the basis of the previous CFA and loaded on to a single latent factor. This model only partially fitted the data: $\chi^2(2) = 24.39, p < .001$; GFI = .97; CFI = .99; RMSEA = .15. Similar to the previous model, all loadings were above .80, significant ($p < .001$) and accounting for 88% of the variance in the *Employee Values* dimension, 71% in *Team Behaviour*, 64% in *Leadership Style* and 80% in *Empowerment*. The modification indices were referred to again, and as a result *Team Behaviour* and *Leadership Style* were free to covary. The model now fitted the data: $\chi^2(1) = .123, p = .726$; GFI = 1.00; CFI = 1.00; RMSEA = .00. These results are illustrated Figure 4.

The results of both the EFA and CFA provide preliminary evidence to suggest that the ECI has satisfactory levels of internal reliability and a robust factor structure.

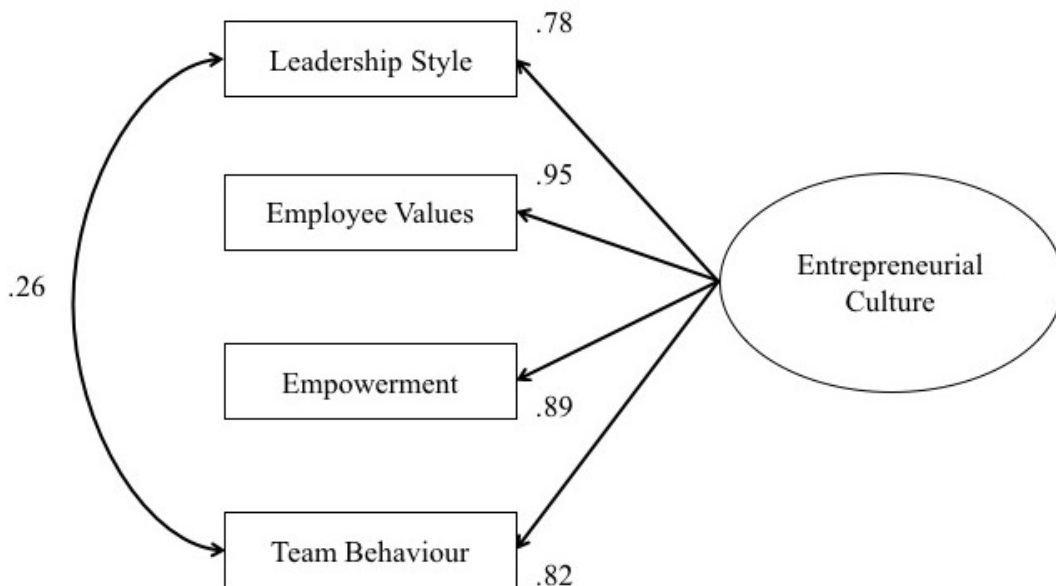


Figure 4: Study 2 - The Fitted Composite Model.

4.1.4 *Summary*

The first objective of this chapter was to establish the psychometric properties of the ECI. This was achieved through the use of exploratory factor analysis as a method to both discard unsuitable items and explore the hypothesised factor structure. As a result, 30 items remained that represent four, not six, factors. The internal consistency of each dimension was found to be excellent. Confirmatory factor analysis was carried out to confirm that the items identified by the EFA correctly loaded onto a given factor, and to then test whether the identified factors represent an underlying latent factor. In both instances of CFA, this was achieved. Although these results are promising, there is a need to further explain the methods used and discuss the limitations of these results.

Firstly, when developing psychometric scales there is much debate as to whether researchers should use Principal Components Analysis (PCA) with orthogonal rotation procedures, or PAF with oblique rotation procedures (Conway & Huffcutt, 2003). Given the exploratory nature of this study, a decision was made to place as few assumptions on the data as possible as to not bias the results, hence why a PAF procedure was used. Likewise, given the confliction between the Scree plot of the final EFA suggesting one factor and the pattern matrix indicating four clear factors, it was decided to subject the data to CFA rather than carry out more EFA whereby the procedure could be constrained to produce one, four or six factor solutions. This decision was made to reduce further assumptions of the data and increase parsimony.

Secondly, as the sample consists of American participants there is the possibility that the findings are 'culture-bound'. Understandably, it is standard practice to continually re-evaluate a measure's factor structure across multiple

samples and in this case, industries, to investigate whether there is consistent homogeneity in the ECI' factor structure. A second limitation is that the measure may not need to be multi-dimensional given the strong factor loadings found when conducting the CFA. This however is an example of the 'bandwidth-fidelity problem' (Hogan & Roberts, 1996), and given that this measure may be of use to academics and practitioners alike, a one dimensional scale has arguably less utility in guiding organisational change and development, and a current limitation of entrepreneurial orientation scales (Rauch et al., 2009).

Despite these criticisms there are some strengths, notably, these initial findings suggest that the ECI has a robust factor structure, with clear content validity and internal consistency. This analysis set a clear objective for remainder of this chapter, in that the ECI's factor structure must be shown to demonstrate concurrent validity (Hinkin, 1998) for it to obtain utility as a tool for worthy of research and practice.

4.2 Study 3 — Exploring The Relationship Between Entrepreneurial Culture, Reinforcement & Achievement

Based on the previous discussion regarding the limitations with entrepreneurial orientation (EO; Rauch et al., 2009), and the potential influence of an entrepreneurial culture on achievement, the aim of Study 3 was to establish the ECI's concurrent validity. In particular, this study had four aims. Firstly, to demonstrate that the popular corporate entrepreneurship construct, EO, can be empirically extended through the addition of socio-cognitive factors (as measured in Study 2). Secondly, to demonstrate that this entrepreneurial culture construct has concurrent validity with entrepreneurial achievement. Demonstrating such a relationship would not only further identify organisational antecedents of achievement, but also provide support

for the direct effect of operant conditioning on employee behaviour and cognition. Thirdly, to demonstrate that employees working within entrepreneurial cultures are less likely to leave their positions, thereby enabling organisations to retain the talent that can contribute towards innovation and growth. This is an important issue that organisations are struggling to resolve (Accenture, 2013). Lastly, this study aimed to establish the role of Theory of Planned Behaviour (TPB) as a key psychological mechanism that mediates the relationship between entrepreneurial culture and achievement (Kautomen et al., 2013). Achieving these aims would begin to close gaps in the entrepreneurship literature, as the influence of socio-cognitive factors, alongside psychological mechanisms, would be better understood.

Given the above, the following hypotheses were tested:

- H1: Measures of *Leadership Style, Employee Values, Empowerment* and *Team Behaviour* positively correlate with a measure of entrepreneurial orientation, and together represent a single latent entrepreneurial culture factor.
- H2: Increased perceptions of an entrepreneurial culture are positively related to an individual's level of entrepreneurial achievement.
- H3: Increased perceptions of an entrepreneurial culture are negatively related to an individual's intention to quit their current job.
- H4: Elevated levels of self-efficacy positively mediate the relationship between an individual's perceptions of an entrepreneurial culture, and increased entrepreneurial achievement.

4.2.1 Method

4.2.1.1 Participants

A sample of 304 participants (165 males) was examined. Their ages ranged from 18 to 67 years ($M = 32.63$, $SD = 9.56$; 81.3% were between 18 & 40; 18.7% were aged between 41 to 67). All participants were in some form of employment, with the majority of participants working in lower-level positions (658%). A further 28.6% of the sample held middle-management positions, 2.3% held senior management positions, and 3.3% were executives/directors. The participants mostly represent American (62%) and Indian (35%) nationalities.

4.2.1.2 Measures

4.2.1.3 Entrepreneurial Achievement (Ahmetoglu et al., 2011)

An individual's past and present entrepreneurial achievements was measured via 16 dichotomous items representing three popular domains of entrepreneurship: *Corporate Entrepreneurship* (e.g. "Have you in your past or current employment invented a new product or service to be sold?"), *Social Entrepreneurship* (e.g. "In the past have you initiated activities aimed at bettering the community), and *Technological Entrepreneurship* (e.g. "Have you in the past sought an investment for one of your inventions"). Estimates of internal consistency are displayed in Table 8.

4.2.1.4 Entrepreneurial Orientation (EO; Miller & Friesen, 1983)

Entrepreneurial Orientation was measured using the 12 item ENT scale. Using a five-point Likert scale, participants rated the extent which they perceived their organisation to behave in an innovative ("My organisation spends to develop new products"), risk-taking ("In my organisation, decisions are not compromises") and proactive ("My organisation continuously introduces new products") manner. Estimates of internal consistency are displayed in Table 8.

4.2.1.5 *Entrepreneurial Culture Inventory (ECI)*

The ECI is a 30-item self-report inventory that measures the extent to which an individual perceives their organisation's culture to support and promote entrepreneurial achievement (for more information see Study 2). A Principal Axis Factoring with Oblimin Rotation procedure revealed four distinct factors — a factor structure replicated using confirmatory factor analysis. Estimates of internal consistency are displayed in Table 8.

4.2.1.6 *Entrepreneurial Self-Efficacy (ESE; Chen et al., 1998)*

ESE was measured using a 12-item scale, that assessed how confident a participant would be to engage in entrepreneurial behaviours and activities. Example items include “I am able to commercialize an idea or new development”, “I can successfully identify new business opportunities”, and “I believe I can succeed at most any endeavour to which I set my mind”. A measure of ESE was included to test the role of TPB as a mediator between work environment and entrepreneurial achievement. It is worth noting that a full measure of TPB (e.g. one that also included a measure of attitudes & subjective norms) was not used, as there would be considerable semantic overlap with the items contained in the ECI. In order to avoid correlation between items that are semantically the same, while still testing the theoretical assumptions of the role of TPB in facilitating entrepreneurial achievement it was deemed appropriate to just explicitly measure ESE as a mediating variable. Estimates of internal consistency are displayed in Table 8.

4.2.1.7 *Intentions to Quit (Bozeman & Perrewé, 2001)*

Intentions to quit the current workplace were measured by a 3-item scale, adapted from previous research (Bozeman & Perrewé, 2001). Items included “I feel like quitting my job”, “I have been looking for another job recently” and “I am

reluctant to change my job”. Participants responded using 5-point Likert scale, ranging from “Total disagreement” (1) to “Total agreement” (5). The 3-item measure of intentions to quit have shown good reliability and validity in the past (Poon, 2004).

4.2.1.8 Procedure

Participants were recruited through Amazon’s Mechanical Turk service, alongside professional social network services such as LinkedIn. The study was hosted on an online research platform. Participants first gave their consent and completed a demographic questionnaire, then completed the battery of psychometric measures. Upon completion participants were fully debriefed.

4.2.2 Results

4.2.2.1 Descriptive Statistics & Bivariate Correlations

Descriptive statistics, bivariate correlations and internal consistency estimates are presented in Table 8. As can be seen, all scales achieved good levels of internal consistency. Of interest were the positive correlations between ECI’s subscales and measures of entrepreneurial orientation, achievement and self-efficacy. In order to further explore the relationships between the aforementioned variables, Structural Equation Modelling (SEM) was carried out.

Table 8: Study 3 - Descriptive Statistics & Bivariate Correlations.

	1	2	3	4	5	6	7	8	9	10	11	M	SD	α
1. Age	—											32.63	9.57	—
2. Sex	.08	—										1.46	.50	—
3. Employee Values	.06	.07	—									3.41	.82	.88
4. Team Behaviour	.05	.05	.64**	—								3.9	.63	.89
5. Leadership Style	.00	.06	.78**	.71**	—							3.86	.85	.91
6. Empowerment	.17**	-.02	.43**	.45**	.49**	—						3.55	.74	.75
7. E Orientation	-.02	.06	.69**	.61**	.68**	.26**	—					3.38	.70	.86
8. E Self-Efficacy	-.02	-.01	.49**	.70**	.57**	.30**	.57**	—				3.92	.60	.91
9. Social E Achievement	-.17**	.11	.39**	.25**	.31**	-.10	.44**	.29**	—			.39	.40	.88
10. Corporate E Achievement	-.02	-.01	.44**	.37**	.35**	.10	.42**	.42**	.65**	—		.54	.35	.85
11. Technological E Achievement	-.13*	.11*	.45**	.26**	.32**	-.07	.42**	.26**	.79**	.69**	—	.30	.39	.90
12. Intentions To Quit	-.08	.02	-.13*	-.22**	-.34**	-.42**	-.09	-.20**	.22**	.16**	.28**	2.82	.89	.50

Note: ** Correlation is significant at the .01 level (2-tailed). * Correlation is significant at the .05 level (2-tailed). E = Entrepreneurship.

4.2.2.3 *Structural Equation Modelling*

In order to test H1 – H4, a saturated SEM model was specified. This model featured an exogenous latent factor that represented an entrepreneurial culture. On this latent factor, the four ECI dimensions and the observed EO score were loaded². This latent factor models the integration of the formal and informal factors hypothesised to influence the attainment of entrepreneurial achievement, and therefore tests H1. Other exogenous variables included in the model were age and sex, in order to control for demographic effects. Entrepreneurial self-efficacy was specified to be both an exogenous and endogenous variable. Finally, the observed measure of participant's intentions to quit, alongside a latent factor titled Total Entrepreneurial Achievement (TEA) were treated as endogenous variables. The TEA factor represented three entrepreneurial achievement variables: technological, social and corporate entrepreneurship.

The model's fit was assessed via a handful of indices: the χ^2 statistic (Bollen, 1989; which tests the hypothesis that an unconstrained model fits the correlation matrix as well as the given model; $p > .05$ is desired); the goodness of fit index (GFI; Tanaka & Huba, 1985; values above .90 are acceptable); the comparative fit index (CFI; Bentler, 1990; values above .95 are acceptable); and the root mean square residual (RMSEA; Browne & Cudeck, 1993; values of .06 or below indicate reasonable fit for the model). Subsequently, the hypothesised model did not fit the data: $\chi^2(45) = 272.99, p < .001$; GFI = .87; CFI = .88; RMSEA = .13.

² Although existing literature commonly explores the influence of the ECI factors individually, the dimensions were loaded onto a latent factor for two reasons. The first is because the current hypothesis is interested in understanding the collective influence of an individual's perceptions of their work environment. The second is that the current data is cross-sectional, and it was not possible to reliably infer the causal relationships regarding the antecedents of an organisation's culture. As such, a single latent factor was decided to be a more conservative approach, as it placed fewer assumptions on the data.

In light of this, steps were taken to identify misspecifications. Paths were freed or added and variables removed on the basis of modification indices, expected parameter change statistics, significance levels, standardised residuals and the size of indirect effects (assessed via a bootstrapping method; number of bootstrap samples = 200, bias-corrected confidence intervals = .95). Paths were only added or freed if they made theoretical sense, and after each modification, fit indices were checked to ensure improved model fit. These modifications resulted in sex being removed from the model completely. Furthermore, the paths from entrepreneurial self-efficacy to TEA and intentions to quit were removed, and replaced with a single path to the observed corporate entrepreneurial achievement variable that was loaded on to the TEA factor. Based on these changes, the model fitted the data: $\chi^2(37) = 138.86, p < .001$; GFI = .92; CFI = .95; RMSEA = .07.

In order to test for the influence of common method bias, Harman's single factor test was carried out: using both exploratory and confirmatory factor analyses, a single factor that accounted for the majority of variance was not found. This suggests that common method variance was not of great concern (Podsakoff & Organ, 1986). As such, the SEM analysis provided support for H1-H4. The fitted model is illustrated in Figure 5.

Square multiple correlations revealed that a total of 22% of the variance in TEA scores was accounted for by entrepreneurial culture and age, 5% of the variance in participant's intention to quit their jobs was accounted for by entrepreneurial culture, 40% of the variance in entrepreneurial self-efficacy was accounted for by entrepreneurial culture, and lastly, the indirect effect of entrepreneurial culture, through self-efficacy, on corporate entrepreneurial achievement accounted for 60% of the variance (indirect effect: $\beta = .44, p < .001$).

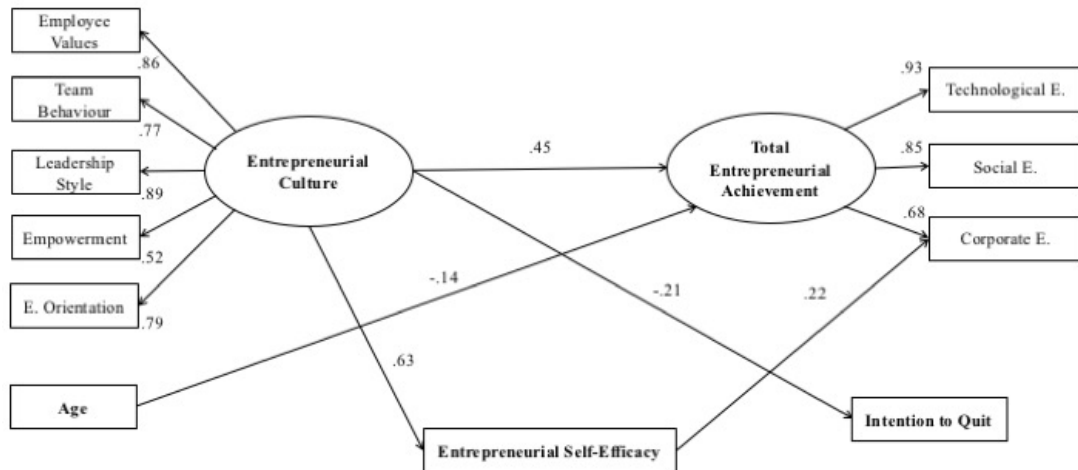


Figure 5: Study 3 - The Fitted SEM. *Note:* All paths are significant ($p < .001$). Correlational paths are not shown for simplicity. E = Entrepreneurial Achievement.

4.2.3 Summary

Study 3 sought to identify the relationship between the ECI and entrepreneurial orientation constructs, and establish its concurrent validity with a variety of entrepreneurial achievements. As hypothesised in chapter 2.4, both the informal and formal organisational factors were found to load on a single latent factor (H1 supported). This provides empirical support for the theoretical framework proposed, in that the entrepreneurial orientation construct can be extended via the addition of social and psychological factors. Furthermore, the data provided support for Accenture’s industry survey (2013), which called for organisations to create work environments that facilitate and pursue entrepreneurial achievements (H2 supported), in order to retain entrepreneurial employees (H3 supported). Lastly, the fitted model demonstrated the effect of entrepreneurial culture on achievement to be partially mediated by entrepreneurial self-efficacy (H4 supported). This finding provides empirical support for *reinforcement* as a psychological mechanism through which culture leads to achievement. In particular, the direct effect provides support for the

role of operant conditioning, while the mediating influence of self-efficacy provides support for the role of Theory of Planned Behaviour.

4.3 Study 4 – Exploring The Relationship Between Entrepreneurial Culture, Work Engagement & Person-Organisation Fit

Study 4 had three aims: first, to replicate Study 3's results. In particular, to empirically extend corporate entrepreneurship constructs using the developed ECI. In order to do this, EO was now measured using Hornsby et al.'s (2013) CEAI framework. This was to test whether the finding still holds with a nuanced operationalisation of EO. Secondly, to again establish a positive relationship between entrepreneurial culture and achievement. Doing so would not only demonstrate the concurrent validity of the ECI, but again provide support for the role of operant conditioning as a reinforcing psychological mechanism. Thirdly, to explore additional indirect effects of culture on achievement, namely, work engagement (Schaufeli et al., 2006) and person-organisation fit (Westerman & Cyr, 2004). In Chapter 2.4 it was hypothesised that work engagement would act as a mediator due to entrepreneurial cultures increasing positive affect that subsequently increases employee motivation and dedication to the pursuit of entrepreneurial achievements. Similarly, entrepreneurial cultures were hypothesised to have an influence on achievement by having a disproportionate influence on those employees with elevated levels of such personality traits (e.g. entrepreneurial talent; Ahmetoglu et al., 2011). Such an interaction is due to a congruence between both the person's personality traits and skills, and the organisation's values and operations (Tett & Burnett, 2003; Westerman & Cyr, 2004). Understanding these relationships may reveal insights into how a workforce's entrepreneurial talent may be developed.

Given the above, the following hypotheses tested in Study 4 were:

- H1: Measures of *Leadership Style, Employee Values, Empowerment* and *Team Behaviour* positively correlate with Hornsby et al.'s (2013) measure of entrepreneurial orientation, and together represent a single latent entrepreneurial culture factor.
- H2: There will be a direct relationship between increased perceptions of an entrepreneurial culture and an employee's level of entrepreneurial achievement.
- H3: Work engagement will positively mediate the relationship between entrepreneurial culture and entrepreneurial achievement.
- H4: In cultures which are entrepreneurial, employees with elevated levels of entrepreneurial talent will have increased levels of entrepreneurial achievement, in comparison to those employees with lower of levels of entrepreneurial talent.

4.3.1 *Method*

4.3.1.1 *Participants*

A sample of 523 participants (260 males) was examined. Their ages ranged from 18 to 72 years ($M = 35.74$, $SD = 12.14$; 70.3% were between 18 to 40; 18.4% were aged between 41 to 60). All participants were in some form of employment, with the majority of participants working in lower-level positions (68%). A further 20% of the sample held middle-management positions, 2% held senior management positions, and 10% were executives/directors. Data from self-employed participants was not collected given the study's focus on those individuals working within, and under the employment of, an existing organisation. The participants were mostly from the USA (83%), with 17% from the European Union.

4.3.1.2 *Measures*

Of the measures used in Study 4, two of which were used in Study 3. These were: the Entrepreneurial Achievement Inventory (Ahmetoglu et al., 2011) and the

Entrepreneurial Culture Inventory (ECI; see Study 2). These scales were used in the same manner as previously used in Study 3. In both instances, a Principal Axis Factoring with Oblimin Rotation procedure was conducted in order to ensure that both measures had same factor structure as used previously. Estimates of internal consistency are displayed in Table 9.

4.3.1.3 *Measure of Entrepreneurial Tendencies and Abilities (META; Ahmetoglu et al., 2011)*

META consists of 40 items and assesses four facets of entrepreneurial talent: *Proactivity* (e.g. “Even when I spot a profitable business opportunity, I rarely act on it”), *Creativity* (e.g. “I am always trying to find new ways of doing things”), *Opportunism* (e.g. “I see business opportunities where others do not”), and *Vision* (e.g. “Great business ideas change the world”). Participants respond to items by rating their agreement via a five-point Likert scale ranging from ‘completely disagree’ (1) to ‘completely agree’ (5). Previous studies have demonstrated the scale to have good internal consistency and predictive validity of entrepreneurial activity (Leutner et al., 2014). Estimates of internal consistency are displayed in Table 9.

4.3.1.4 *The Utrecht Work Engagement Survey - 9 items (UWES; Schaufeli et al., 2006)*

The UWES is a 9-item scale measuring work engagement — the positive motivational and affective states that arise when working. It features three facets: *Vigor* (e.g. “At my work, I feel that I am bursting with energy”), *Dedication* (e.g. “I am enthusiastic about my job”), and *Absorption* (e.g. “I get carried away when I am working”). Participants are instructed to respond to each item by rating the frequency that they experience the feelings described by each item using a seven point Likert

scale (1 = never to 7 = always). Estimates of internal consistency are displayed in Table 9.

4.3.1.5 *Corporate Entrepreneurship Assessment Inventory (CEAI; Hornsby et al., 2013)*

The CEAI is an 18-item scale that is designed to measure the extent to which an organisation is prepared to engage in entrepreneurial activity. It comprised of four facets: *Work Discretion* (e.g. “I seldom have to follow the same work methods or steps for doing my major tasks from day to day”), *Time Availability* (e.g. “I feel that I am always working with time constraints on my job”), *Management Support* (e.g. “My business unit supports many small and experimental projects realizing that some will undoubtedly fail.”), and *Reward* (e.g. “The rewards I receive are dependent upon my work on the job”). For parsimony, a single score was computed by taking the average across each dimension. The scale was found to have good internal consistency (average $\alpha = .77$; Hornsby et al., 2013). Estimates of internal consistency are displayed in Table 9.

4.3.1.6 *Procedure*

Similar to the previous study, participants were recruited through Amazon’s Mechanical Turk service, alongside professional social network services such as LinkedIn. All surveys were hosted on an online research platform. After participants gave their consent, they then completed the battery of psychometric surveys. Upon completion participants were fully debriefed.

4.3.2 *Results*

Before any analyses were carried out, both the independent and dependent variables were computed and then inspected to identify responses with missing data and outliers. Independent variables were also checked to ensure that they were

normally-distributed. No issues were found. As the majority of the participants were from the USA and 17% of the sample were from the European Union and in order to ensure that the following analyses are generalizable to both geographies, three independent samples *t*-tests were conducted to investigate whether there were mean differences in corporate, technological and social entrepreneurial achievements. It was found that across each of dependent variables, European participants had a significantly higher levels of entrepreneurial achievements ($p < .010$). Given this, only participants from the USA were used ($N = 438$) in the following analyses. With the data cleaned, the study's hypotheses were ready to be tested.

4.3.2.1 Descriptive Statistics & Bivariate Correlations

Descriptive statistics, bivariate correlations and internal consistency measures are presented in Table 9. As can be seen, all scales achieved good levels of internal consistency. Of interest were the positive correlations between the ECI subscales and measures of entrepreneurial achievement, work engagement and CEAI. Similarly, an individual's job level (e.g. how senior they are within their organisation) was positively correlated with increased technological and corporate entrepreneurial achievement, alongside the ECI and CEAI measures. Based on these results, additional analyses were conducted to further test this study's hypotheses.

Table 9: Study 4 - Descriptive Statistics & Bivariate Correlations.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	M	SD	α
1. Age	—																			35.75	12.14	—
2. Sex	.09	—																		1.50	.50	—
3. Employee Values	.09	-.10	—																	3.22	.81	.89
4. Team Behaviour	.00 ^a	.00 ^a	.62	—																3.63	.73	.89
5. Leadership Style	.10	.02 ^a	.61	.62	—															3.72	.89	.90
6. Empowerment	.17	-.03 ^a	.63	.55	.52	—														3.51	.84	.90
7. Work Discretion	.19	-.01 ^a	.64	.51	.44	.73	—													3.51	.84	.90
8. Time Availability	-.10	-.02 ^a	.37	.29	.29	.23	.28	—												4.55	1.49	.96
9. Manager Support	.30 ^a	-.14	.76	.55	.50	.50	.62	.40	—											4.05	1.21	.75
10. Rewards	.10	-.30 ^a	.56	.58	.47	.43	.41	.29	.61	—										3.83	1.44	.88
11. Opportunism	-.04 ^a	-.23	.46	.37	.35	.22	.28	.20	.42	0.30	—									3.15	.81	.89
12. Proactivity	.10	.01 ^a	.13	.16	.16	.21	.09	.13	.06	.05	.32	—								3.19	.64	.80
13. Creativity	.09	-.08 ^a	.35	.43	.33	.34	.35	.14	.30	.27	.58	.32	—							3.4	.61	.82
14. Vision	-.08 ^a	-.03 ^a	.23	.44	.32	.25	.21	.11	.15	.24	.48	.21	.53	—						3.67	.62	.82
15. Vigor	.22	-.07 ^a	.47	.53	.43	.47	.51	.20	.47	.40	.31	.21	.38	.35	—					3.43	1.50	.88
16. Dedication	.21	-.02 ^a	.45	.58	.47	.50	.52	.18	.43	.42	.29	.17	.40	.36	.84	—				3.84	1.53	.88
17. Absorption	.15	.00 ^a	.37	.54	.43	.41	.45	.08	.35	.33	.31	.18	.43	.42	.74	.78	—			3.87	1.41	.84
18. Corporate Entrepreneurship	.22	-.09 ^a	.22	.23	.18	.26	.31	-.05 ^a	.15	.08 ^a	.25	.14	.32	.19	.31	.31	.32	—		.58	.35	.81
19. Technological Entrepreneurship	.09	-.10	.23	.08 ^a	.12	.13	.21	-.02 ^a	.22	.07 ^a	.24	.10	.24	.04 ^a	.17	.14	.14	.42	—	.18	.29	.85
20. Social Entrepreneurship	-.07 ^a	-.02 ^a	.13	.14	.10	.17	.16	-.01 ^a	.12	.04	.20	.09 ^a	.25	.16	.13	.14	.16	.37	.37	.29	.32	.77

Note: All correlations significant at .01 level (2-tailed), except for those marked ^a ($p > .05$). *ECI* (3 – 6), *CEAI* (7-10) *META* (15 - 17), *Work Engagement* as measured by the UWES (JE; 11 – 13).

4.3.2.2 *Structural Equation Modelling*

In order to test H1, H2 and H3, a saturated SEM model was specified. In this model, exogenous variables were the latent entrepreneurial culture factor (e.g. both the ECI dimensions & the overall CEAI score that was labelled as entrepreneurial orientation) and a latent entrepreneurial talent factor (e.g. the four dimensions of the META). Additionally, age and sex were treated as exogenous variables, in order to control for demographic effects. Work engagement was also treated as a latent factor, and specified to be both an exogenous and endogenous variable. Finally, a latent factor titled Total Entrepreneurial Achievement (TEA) was treated as an endogenous variable. The TEA factor represented three entrepreneurial achievement variables: technological, social and corporate entrepreneurship.

The model's fit was assessed via a handful of indices: the χ^2 statistic (Bollen, 1989; which tests the hypothesis that an unconstrained model fits the correlation matrix as well as the given model; $p > .05$ is desired); the goodness of fit index (GFI; Tanaka & Huba, 1985; values above .90 are acceptable); the comparative fit index (CFI; Bentler, 1990; values above .95 are acceptable); and the root mean square residual (RMSEA; Browne & Cudeck, 1993; values of .06 or below indicate reasonable fit for the model). Subsequently, the hypothesised model did not fit the data: $\chi^2(114) = 580.09$, $p < .001$; GFI = .87; CFI = .88; RMSEA = .09. In light of this, steps were taken to identify misspecifications. Paths were freed or added and variables removed on the basis of modification indices, expected parameter change statistics, significance levels, standardised residuals and the size of indirect effects (assessed via a bootstrapping method; number of bootstrap samples = 200, bias-corrected confidence intervals = .95). Paths were only added or freed if they made

theoretical sense, and after each modification, fit indices were checked to ensure improved model fit.

These modifications resulted in the direct paths between entrepreneurial culture and TEA to be freed, as it was non-significant. Similarly, the path between entrepreneurial talent and the latent engagement factor was removed as it was non-significant. Lastly, sex was also removed from the model as it held non-significant relationships with endogenous variables. After these modifications, the model adequately fitted the data ($\chi^2(82) = 243.61, p < .001$; GFI = .94; CFI = .96; RMSEA = .06). In the model, the indirect relationship between entrepreneurial culture and achievement through engagement was found to be significant ($\beta = .09, p = .015$). Square multiple correlations revealed that a total of 18% of the variance in TEA scores and age 45% of the variance in engagement scores was accounted for by the exogenous variables.

In order to test for the influence of common method bias, Harman's single factor test was carried out: using both exploratory and confirmatory factor analyses, a single factor that accounted for the majority of variance was not found. This suggests that common method variance was not of concern (Podsakoff & Organ, 1986). As such, the SEM analyses provided support for H1 and H3, but did not support H2. The fitted model is illustrated in Figure 6.

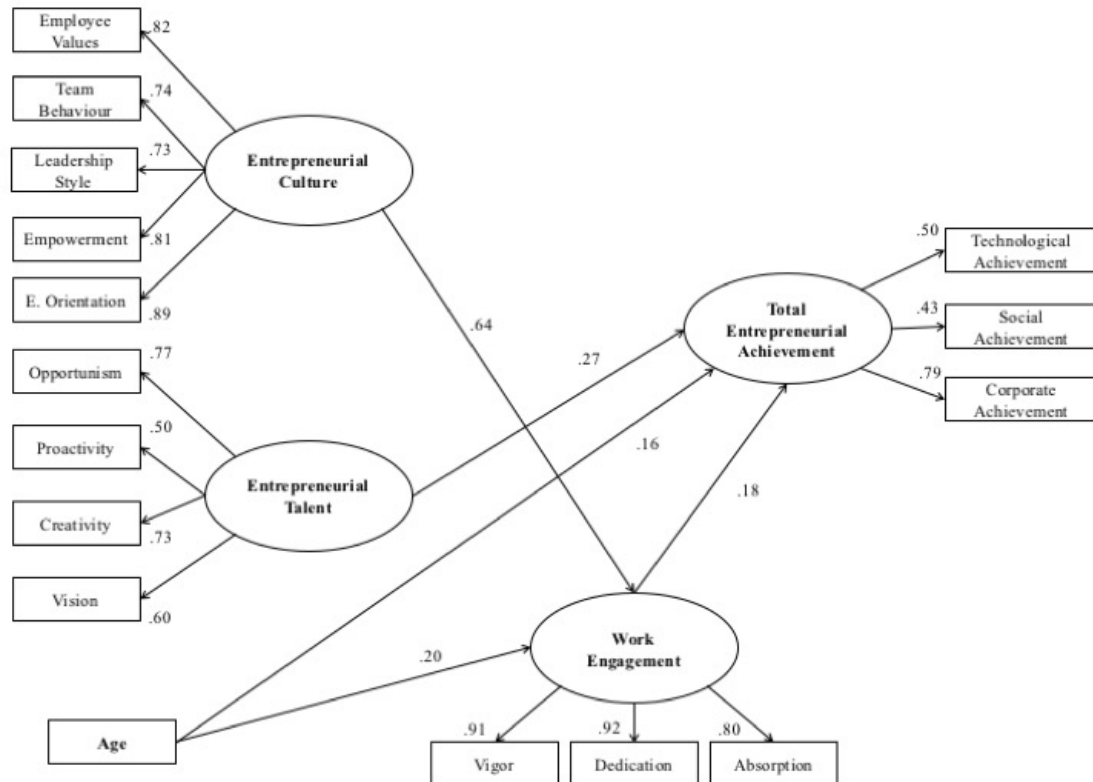


Figure 6: Study 4 - The Fitted SEM. *Note:* All paths are significant ($p < .001$). Correlational paths are not shown for simplicity; most notable is the path between entrepreneurial culture & entrepreneurial talent ($r = .61, p < .001$).

4.3.2.3 Moderation

In order to test the hypothesis that entrepreneurial culture moderates the relationship between an individual's entrepreneurial talent and entrepreneurial achievement (H4), four hierarchical multiple regressions were specified. The dependent variables were a composite TEA score, alongside the individual entrepreneurial achievement scores: corporate, technological and social. In order to test for moderation effects, age and gender were entered into the first model to control for demographic effects, while centred versions of entrepreneurial culture and talent scores, alongside an interaction term, were entered into the second model. The results are presented in Table 10.

Table 10: Study 4 - Results of Four Hierarchical Multiple Regressions Testing the Interaction Between Entrepreneurial Culture & Talent.

		Model 1		Model 2		Model 3		Model 4	
		Total		Corporate		Technological		Social	
Variables		Entrepreneurial Achievement		Entrepreneurial Achievement		Entrepreneurial Achievement		Entrepreneurial Achievement	
		β	t	β	t	β	t	β	t
Model 1	Age	.11	2.55**	.23	5.25***	.10	2.22**	-.07	-1.59
	Gender	-.10	-.10*	-.10	-2.41**	-.11	-2.50**	-.02	-.34
	$F(2, 519) =$	5.35**		15.62***		5.123**		1.38	
	Adj $R^2 =$.02		.05		.02		.01	
Model 2	Age	.09	2.18*	.21	5.05***	.08	1.81	-.08	-1.86
	Gender	-.06	-1.43	-.06	-1.57	-.09	-2.01*	.02	.37
	E. Culture	.11	2.27*	.12	2.60**	.08	1.67	.04	.89
	E. Talent	.28	5.95***	.26	5.53***	.17	3.39***	.23	4.66***
	Culture*Talent	-.04	-1.02	-.09	-2.14*	.04	1.00	-.05	-1.26
	$F(2, 516) =$	16.46***		21.13***		7.51***		7.70***	
	Adj $R^2 =$.13		.16		.06		.06	

Note: E = Entrepreneurial. * $p < .050$ (two-tailed); ** $p < .010$ (two-tailed); *** $p < .001$ (two-tailed).

Of the three regressions tested, a significant interaction effect was only found when regressing the variables on to corporate entrepreneurial achievement. In order to further explore this effect, Gaskin's (2012) "StatsTool" statistics package was used to produce a two-way interaction visualisation. This is illustrated in Figure 7. This significant interaction, suggests that entrepreneurial culture positively moderated the relationship between an individual's entrepreneurial talent and level of corporate entrepreneurial achievement. In fact, the data suggested that if an individual has low levels of entrepreneurial talent, being in an entrepreneurial culture does not increase the tendency to engage in entrepreneurship. Yet, high levels of an entrepreneurial culture can significantly increase the tendency to pursue corporate entrepreneurial

achievements if an individual has high levels of entrepreneurial talent. Together, these findings provide partial support in H4, as the moderation effect was only found for corporate entrepreneurial activities.

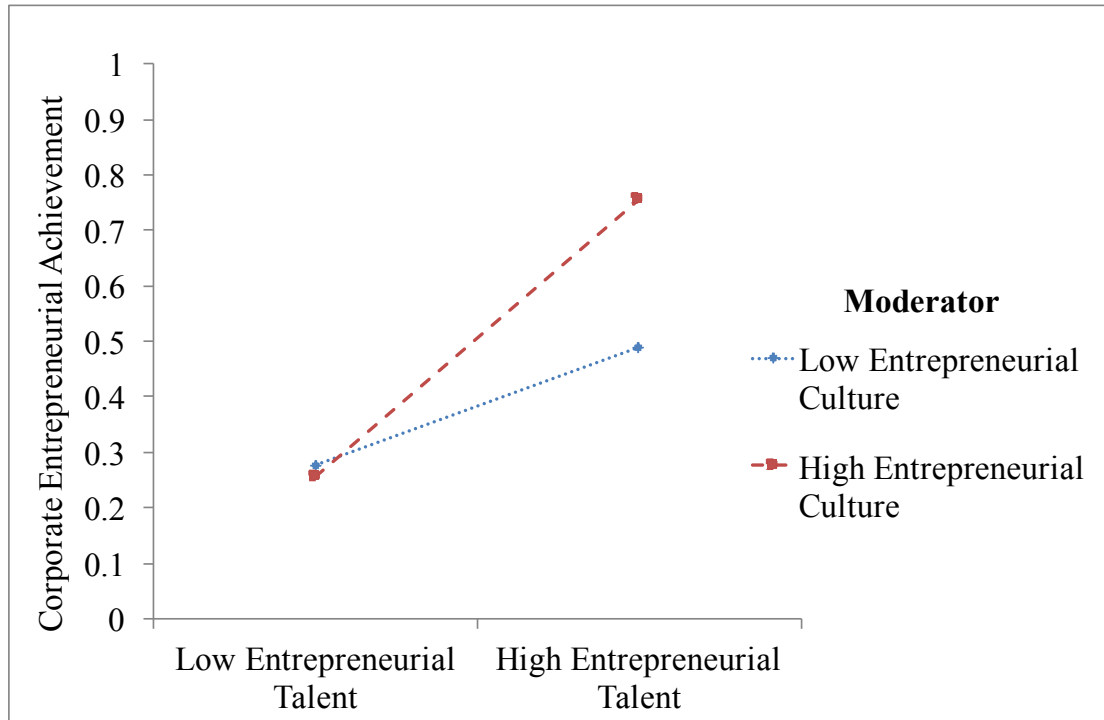


Figure 7: Study 4 - A Two-Way Interaction between Entrepreneurial Culture and Talent on Corporate Entrepreneurial Achievement.

4.3.3 Summary

The objective of Study 4 was to replicate and extend Study 3 using a different operationalisation of EO, and explore the role of work engagement and entrepreneurial talent. H1 was supported: the entrepreneurial culture and the CEAI construct were found to load onto a single latent factor. This again demonstrates that such informal and formal organisational factors are compatible and the EO construct can be extended in such a manner. Unlike Study 1, a direct effect between entrepreneurial culture and achievement was not found, thereby not supporting the role of reinforcement as a psychological mechanism (H2 not supported). However,

the relationship between entrepreneurial culture and achievement was fully mediated by a third construct, work engagement (H3 supported). Lastly, the relationship between entrepreneurial talent and achievement was positively moderated by work environment (H4 supported). This finding highlights the possible influence of environment on strengthening the relationship between individual factors and positive outcomes (Westerman & Cyr, 2004).

4.4 Discussion

Given that organisations are facing increasing technological and economic pressures, engaging in entrepreneurship is becoming a requisite for firms looking to stay innovative, competitive and relevant (Kuratko et al., 2014). Accordingly, there has been much work exploring the way organisations can develop internal environments, or cultures, that are conducive to the pursuit of entrepreneurship and innovation. Yet, as noted by Rauch et al. (2009) such understanding is limited as it ignores other relevant factors that are likely to influence employee's cognitions and behaviours. Given this, a wealth of literature demonstrating the importance of socialisation on employee behaviour (Anderson et al., 2014; Cooke & Rousseau, 1988), and the increasing application of psychological theories to entrepreneurship research (Frese & Gielnik, 2014), it was argued that there is an opportunity to extend existing corporate entrepreneurship constructs (e.g. Covin & Slevin, 1991; Hornsby et al., 2013). In particular, it was argued that such constructs could be extended through the integration of socio-cognitive factors in order to have a better understanding surrounding both how and why entrepreneurial cultures produce high performance and innovation. Similarly, corporate entrepreneurship does not occur in a vacuum, therefore it is important to explore the various mechanisms through which informal and formal factors influence employee's behaviours and tendencies to engage in

innovation. The following section will discuss each of the chapter's findings in order to evaluate its implication for theory and practice.

This first aim of this chapter was to address the current limitations with the corporate entrepreneurship constructs, namely entrepreneurial orientation and Hornsby et al.'s (2013) four factor model (e.g. the CEAI), and answer Rauch et al.'s (2009) call for further investigation into other relevant organisational factors. In order to do so, it was argued that researchers should begin to appreciate the importance of socialisation in shaping an individual's innovation outputs (Cooke & Rousseau, 1988), as opposed to just organisational strategy and work design factors that are characteristic of existing models (Covin & Slevin, 1991; Hornsby et al., 2013). As such, and drawing upon the existing psychological literature that has demonstrated the influence of socio-cognitive processes on innovation (Anderson et al., 2014), four additional factors were found to extend the existing entrepreneurial culture models (H1 of Study 3 and 4 supported). These were leadership's vision (*Leadership Style*; Ruvio et al., 2010), group identity (*Employee Values*; Hogg et al., 2012), social capital (*Team Behaviour*; Burt, 2004) and autonomy (*Empowerment*; Hmieleski & Ensley, 2007).

The second aim of this chapter was to explore the various psychological mechanisms through which an entrepreneurial culture shapes employee's cognitions and behaviours. In particular, three mechanisms were proposed: *reinforcement*, *work engagement* and *person-organisation fit*. Reinforcement was hypothesised to be one psychological mechanism through which entrepreneurial culture (e.g. a combination of both formal and informal factors) influences employee behaviour and their production of innovation. In particular, it was suggested that entrepreneurial cultures reward and encourage employees who behave in an opportunistic, proactive and

innovative manner. Doing so, reinforces and signals what behaviours the organisation expects its employees to display. In turn, this increases the likelihood that such employees will behave in a similar manner in the future and produce innovation (Kautomen et al., 2013). When testing this theory, findings differed between Study 3 and 4. For instance, Study 3 found both a direct effect (thereby supporting the hypothesised role of operant conditioning; Study 3 H2 supported) and an indirect effect via self-efficacy (thereby supporting the hypothesis role of Theory of Planned Behaviour; Study 3 H4 supported). Yet, no direct effect was found in Study 4 after including demographic, entrepreneurial talent, and engagement factors (Study 4 H2 unsupported). Given these differences, it may be concluded that while reinforcement does play a role in the production of entrepreneurial achievements, other psychological mechanisms exert more of an influence on such outcomes.

Continuing this, work engagement was hypothesised to mediate the relationship between entrepreneurial culture and achievement given that the construct is influenced by both formal (e.g. process, structures & strategies) and informal (e.g. social interaction & meaningful work) factors (Crawford et al., 2010). As entrepreneurial cultures can be characterised by such factors, it was thought the motivation, commitment and dedication experienced by employees towards their work would increase, and thereby heighten the willingness to put in the effort to partake in entrepreneurial activity and develop innovation. This hypothesis was supported (Study 4 H3 supported).

This finding suggests that entrepreneurial cultures do not have a direct effect on achievement, rather they indirectly influence such outcomes by influencing employee's state of mind and affectivity. Such a finding is noteworthy as there is a lack of research exploring the relationship between entrepreneurial cultures and

engagement, and it demonstrates the importance of using psychological constructs to understand the various mechanisms that are enacted when organisations engage in corporate entrepreneurship. Similarly, it extends Ahmetoglu et al.'s research (2015) which found a positive relationship between entrepreneurial personality and engagement. Given that 30% of individuals are leaving organisations to start their own ventures due to disengagement (Accenture, 2013), these findings are important as they demonstrate how both formal and socio-cognitive factors are expressed, alongside their effect on employees and the pursuit of innovation.

The last psychological mechanism to be explored was person-organisation fit (Tett & Burnett, 2003; Westerman & Cyr, 2004). Based on this theory it was hypothesised that organisations who have an entrepreneurial culture, are likely to benefit from increased innovation amongst its employees. This is the result of a positive interaction, and congruence, between an employee's entrepreneurial talent and the organisation's values and social norms. Together, this not only activates relevant traits, skills and abilities, but also enables the individual to freely express their behavioural dispositions — in this case, the tendency to behave in a creative, proactive, opportunistic and visionary manner in the pursuit of innovation (Leutner et al., 2014). Testing such a hypothesis sought to build upon recent developments in the field of corporate entrepreneurship and individual differences, by demonstrating how individual and organisational approaches can be integrated and used to help organisations better support and facilitate innovation and value creation (Kautomen et al., 2013; Leutner et al., 2014; Shane & Venkataraman, 2000). This hypothesis was supported only when predicting corporate, not social or technological entrepreneurial achievement (Study 4 H4 partially supported).

These findings are noteworthy as they demonstrate entrepreneurial culture to have a disproportionate effect on those with high levels of entrepreneurial personality. That is, entrepreneurial people are significantly more likely to produce innovation when they are in an entrepreneurial culture. Similarly, while entrepreneurial people are still likely to innovate in non-entrepreneurial cultures (albeit to a lesser degree), this contextual influence has no effect on individuals with low levels of entrepreneurial talent. This has practical implications for organisations looking to increase its capacity for innovation through cultural or training interventions. For instance, it would appear that such efforts and resources would be most effectively spent on those individuals with high levels of entrepreneurial talent. In other words, putting entrepreneurial people in entrepreneurial environments (e.g. teams, departments & divisions) appears to be a highly effective way of fostering and producing innovation. Such insights are likely to be relevant for practitioners looking to build talent management strategies centred around entrepreneurial and innovative activity.

The findings presented in this chapter demonstrate that both formal and informal organisational factors are compatible and both are associated with positive organisational outcomes — employee retention, engagement and entrepreneurial achievement. It can therefore be said, the more an individual perceives the organisation's culture to support and reward entrepreneurial activity and innovation, alongside having compatible formal operations, strategies and structures, the more likely they are to hold positive attitudes towards pursuing innovation, and thereby acquire the ability and motivation to behave in such a manner. As described in Chapter 2.6, these findings presented in this chapter support Proposition 2.

4.4.1 Limitations & Future Research

The foremost limitation with the presented studies is the use of single-source, self-report methods. It would have been ideal to include outcome measures that featured objective measures of achievement. Nonetheless, support for the use of self-report measures of entrepreneurial achievement comes from the meta-analysis by Rauch et al. (2009) who found a negligible difference between the effect sizes of organisational factors on subjective and objective measures of entrepreneurial activity and achievement. A second limitation is that the sample used was primarily from the USA. The findings therefore may be culture bound; previous research has demonstrated that a nation's attitude towards entrepreneurship is related to an organisation's tendency to engage in entrepreneurship (Turró, Urbano, & Peris-Ortiz, 2014).

The final limitation concerns the use of a crowdsourced sample, in particular Amazon's Mechanical Turk. The use of crowdsourced samples in social science is the subject of a lively debate, where their use is either questioned due to potential limitations surrounding such a sample's reliability and external validity (Harms & DeSimone, 2015), or championed as such samples have greater socioeconomic, geographical and ethnic diversity (Landers & Behrend, 2015). Although this debate is far from settled, with both perspectives highlighting important issues, it is important to not only acknowledge the limitations with such a sampling method, but also justify the use of a crowdsourced sample and argue that the findings have external validity. Firstly, although a crowdsourced sample was used for convenience reasons, it is argued that it remains a suitable sample given that participants had to be in full-time employment, more specifically, participants could not work fulltime for Amazon's Mechanical Turk platform. Secondly, this chapter was focused on how individual's

perceive their organisation's work environment, specifically its culture. As such, it can be said that collecting data from, and comparing across, specific organisations is not needed to suitably test the hypotheses (despite being an interesting line of future research). Lastly, additional analyses found no significant differences in average entrepreneurial talent scores (as measured by META) between the participants recruited from Amazon's Mechanical Turk, and those from professional social networking sites such as LinkedIn (a subset of the sample that has arguably more external validity). Although this finding does not guarantee the findings to have external validity, it does suggest that both samples are as entrepreneurial as each other (Leutner et al., 2014).

To address the above limitations, future research should seek to adopt objective data, targeted populations, and a longitudinal design in order to ascertain the predictive validity of the relationships identified in this cross-sectional sample. For instance, collecting such data from a variety of organisations that are based in different industries and countries, would allow multi-level model levels to test within and between group variation in entrepreneurial culture on activity. Such an analysis may also shed more light on whether increased entrepreneurial activities are not necessarily the productive of an entrepreneurial culture, rather effective management (Bakker & Demerouti, 2008). Additionally, given that an individual's job level (e.g. how senior they are within the organisation) was positively correlated to the engagement in entrepreneurial activities, future research should seek to explore how less senior employees can be encouraged and supported to engage in such activities. The most plausible interpretation of this finding is that senior members of staff have more autonomy and opportunities to engage in entrepreneurial activities (Burgess, 2012). Lastly, future research should attempt to replicate the extension of the EO

construct, in order to determine whether the social and contextual factors included in this study are appropriate and suitable in other industries and organisational settings.

4.4.2 *Practical Implications*

Although this research question requires further exploration and validation, practical recommendations can be made to those looking to promote entrepreneurial achievement within their organisation. Firstly, given the direct relationship between entrepreneurial talent and achievement, and the fact that the construct holds incremental validity over the Big Five (Leutner et al., 2014), recruiters would benefit from hiring those individuals that display such a personality profile. Secondly, leaders need to ensure that their vision is not only entrepreneurial, but also aligned with the wider culture and operations of the organisation. This is important for promoting a salient social identity that motivates individuals to behave entrepreneurially. Lastly, organisations may develop the entrepreneurial talent of their employees by creating a compatible environment that not only rewards, but also allows, the exploration and exploitation of new opportunities.

4.5 *Conclusion*

This chapter sought to test Proposition 2 and address the gaps in both theory and practice by extending the entrepreneurial culture construct. In particular, this construct was found to positively predict entrepreneurial achievements. Furthermore, a variety of psychological mechanisms were identified that explain both how and why entrepreneurial cultures lead to increased innovation and value creation. It is hoped that this chapter will stimulate related research to inform evidence-based practice. Given the findings of studies 1 to 4, the influence of *macro* contextual factors remains to be tested. This is the focus of Chapter 5.

5 The Role of Cross-Cultural Differences

This final empirical chapter investigated Proposition 3 — cross-cultural differences moderate the relationship between entrepreneurial talent and achievement. In Chapter 2.5, the literature surrounding emerging market economies and the associated factors that may influence an entrepreneur's behaviour and talent was discussed. In particular, institutional theory was introduced (Scott, 1995). Continuing this thesis' interactionist perspective, institutional theory acts as useful framework when attempting to understand the various ways macro socioeconomic factors, policies and practices impact and shape an entrepreneur's behaviours, skills and attitudes. Accordingly, it was suggested that a fruitful line of research is to first explore the stability of the entrepreneurial talent and achievement relationship, thereby extending Ahmetoglu et al.'s (2011) and Leutner et al.'s (2014) work into EMEs and exploring the moderating influence of macro contextual influences on such a relationship. This line of reasoning was extended to also explain the apparent gender differences in achievement within EMEs. Integrating feminist theory with institutional theory, it was argued that gender differences in entrepreneurial achievement are not the result of individual characteristics, rather they are the result of contextual and environmental factors (Ahl, 2006; De Vita et al., 2014; Scott, 1995).

This chapter sought to empirically test the aforementioned hypotheses, and aimed to address the various limitations with the current literature (De Vita et al., 2014). To do this a large sample of entrepreneurs from seven EMEs was collected, in addition to a variety of objectively verifiable criterion variables to operationalise entrepreneurial achievement, and a collection of psychological, socioeconomic, financial and business variables, so that the influence of contextual factors at varying

levels of analysis on an individual’s level of entrepreneurial talent could be explored using causal and correlational modelling. By addressing these limitations, the factors contributing to gender differences in entrepreneurial achievement can be comparatively explored, and thus understand the influence of, and interaction between, individual and contextual factors simultaneously.

5.1 Study 5 —*The Influence of Cross-Cultural Differences in the Individual Differences & Entrepreneurial Achievement Relationship*

The following sections contain a short review and justification for the variables included in the hypothesised model (Figure 8). The role of individual differences in female entrepreneurship are reviewed, before discussing the role of contextual factors, specifically differences in business operations and financing.

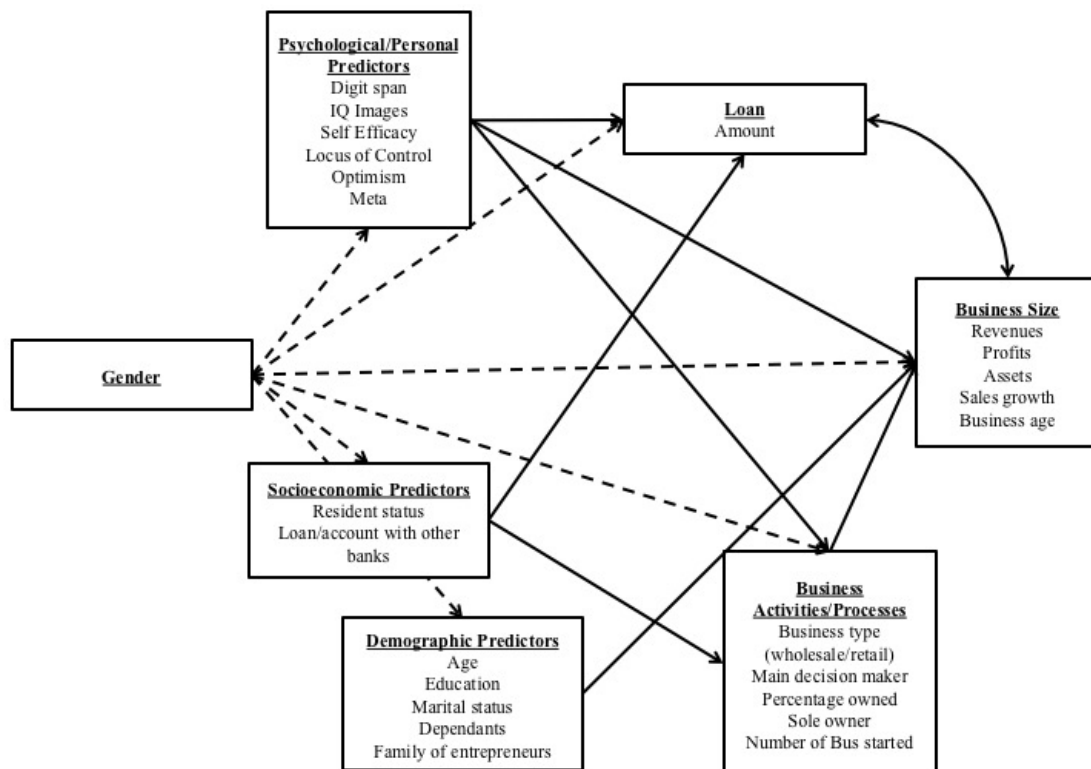


Figure 8: Study 5 - The Hypothesised Model. *Note:* Dotted lines illustrate hypothesised gender differences in the depicted relations.

5.1.1 Individual Differences

5.1.1.1 Gender Differences in Demographic & Socioeconomic Status

A variety of demographic and socioeconomic variables have been identified and used to explain gender differences in entrepreneurial achievement. Most notably, females are typically disadvantaged in that they have lower levels of education and relevant training, traditional familial roles (e.g. household & child caring), and reduced social capital (e.g. access to mentors, role-models & social support; Powers & Magnoni, 2010). Nonetheless, much of the research exploring such variables has been descriptive and have rarely investigated the causal influence on entrepreneurial achievement (Kelley, Brush, Green & Litovsky, 2012). As a result, the relative contribution of each variable in explaining the extent to which it helps or hinders achievement remains unknown.

5.1.1.2 Gender Differences in Psychological Variables

Throughout this thesis, the influence of individual differences (in particular, personality) have been discussed. Yet, whether gender differences in relevant personality traits are the cause for differences in achievement remains a contested issue. For instance, a meta-analysis on gender differences in psychological traits reveal that males and females are generally more similar than different, including on variables such as personality, cognitive ability, creativity, and motivation (Hyde, 2005). Nonetheless, there is research to suggest gender differences in specific narrow personality traits (Del Giudice et al., 2012). Given the empirical support for personality in entrepreneurship, and the lack of consensus concerning gender differences, further empirical research is needed.

5.1.2 *Contextual Factors*

5.1.2.1 *Gender Differences in Business Activity*

The type of businesses created and operated by male and female entrepreneurs are often used to explain differences in achievement. For instance, female entrepreneurs are more likely to enter businesses in less capital-intensive industries (Robb & Wolken, 2002), and more likely to be in consumer-oriented sectors (as opposed to business services; Riding & Swift 2002). The reasoning for such differences are not clear. For instance, one could argue that these decisions are based on a lack of talent and ambition, a lack of socioeconomic support, education (Powers & Magnoni, 2010), or a lack of access to credit and finance (Reynolds et al., 2005).

5.1.2.2 *Gender Differences in Access to Finance*

To continue the above discussion on gender differences in business activity, it is important to consider whether gender differences in achievement is due to females being financially disadvantaged. More specifically, females typically ask for, and receive, less credit than male counterparts. The reasons for this have included women led businesses being perceived as riskier by financial institutions (e.g. institutional factors), gender stereotypes (e.g. social factors), and women being less likely to apply for funding due to higher risk aversion and lower growth intentions (e.g. personality factors; Bardasi, Sabarwal, & Terrell, 2011; Piras, Presbitero, & Rabellotti, 2013; Saporito, Elam & Brush, 2013). Independently these factors have been used to explain the gender differences, yet their relative influence has yet to be tested.

The aforementioned review suggests that a number of factors may influence gender differences in entrepreneurial activity and achievement. Accordingly, several hypotheses were proposed in the attempt to empirical explain differences in

entrepreneurial achievement across EMEs, and between men and women. The hypotheses tested were the following:

- H1: There are significant differences between male and female entrepreneurs in entrepreneurial achievement, where males outperform females.
- H2: There are gender differences in demographic and socioeconomic variables that explain differences in business activity and entrepreneurial achievement.
- H3: There are gender differences in business activities that explain entrepreneurial achievement.
- H4: There are gender differences in access to finance that explain entrepreneurial achievement.
- H5: There are no differences in psychological variables between male and female entrepreneurs that explain differences in business activity and entrepreneurial achievement.
- H6: Of the psychological variables, entrepreneurial talent (as measured by META) would hold a direct and positive relationship with entrepreneurial achievement within each EME.

5.1.3 Method

5.1.3.1 Participants

The sample consisted of 18,119 entrepreneurs who were applying for microfinance loans (males = 10,425; females = 7,694). The data was collected through Harvard's Entrepreneurial Finance Lab (EFL; <https://www.eflglobal.com>), an organisation that works with financial institutions (e.g. Inter-American Development Bank, Multilateral Investment Fund, The World Bank) across Asia, Latin America and Africa to evaluate loan applicants based on psychometric characteristics that reflect willingness and ability to repay loans. By forecasting an applicant's probability

of default through psychometric measurements, EFL aims to increase access to finance for small businesses and consumers in emerging markets (Klinger, Khwaja & LeMonte, 2013). The sample represented eight different groups across seven nations:

- Peru – Commercial Bank (Males = 924 & Females = 821; Age: $M = 38.63$, $SD = 10.65$).
- Peru — Microfinance Institution (Males = 375 & Females = 881; Age: $M = 36.82$, $SD = 11.31$).
- Guatemala (Males = 275 & Females = 487; Age: $M = 36.89$, $SD = 10.78$).
- Costa Rica (Males = 451 & Females = 331; Age: $M = 39.43$, $SD = 12.67$).
- Indonesia (Males = 4,127 & Females = 1,861; Age: $M = 39.20$, $SD = 9.01$).
- India (Males = 2,490 & Females = 2,540; Age: $M = 38.24$, $SD = 8.44$).
- Ghana (Males = 582 & Females = 332; Age: $M = 41.00$, $SD = 8.90$).
- Nigeria (Males = 882 & Females = 259; Age: $M = 39.30$, $SD = 7.80$).

5.1.3.2 Measures

5.1.3.3 Entrepreneurial Achievement

Entrepreneurial achievement was measured by five self-report variables: yearly *Business Profit* (USD \$); *Business Revenue* (USD \$); *Sales Growth*, a single self-report item ranging from a score of 1 (“Business is less than a year old”) to 8 (“Sales have tripled this year”); *Total Assets* (USD \$); and *Business Age*. In order to increase parsimony when analysing the data, the variables were subjected to a *Principal Components Analysis* (PCA). As a result, *Business Profit*, *Business Revenue* and *Total Assets* were found to represent a single factor (accounting for 35.11% of the variance). Their common variance was extracted into a single variable, titled *Business*

Size. Both *Business Age* and *Sales Growth* were found to be distinct constructs, and were accordingly treated as such.

5.1.3.4 *Business Activity*

Business Activity was measured by six variables: *Percentage of Venture Owned*, *Primary Decision Maker* (e.g. the level of authority in decisions related to the business), *Relationship to Venture* (e.g. CEO, Manager, Employee), *Number of Businesses Previously Started*, *Loan Amount Requested* (USD \$)³, and *Business Type* (coded as wholesale – primarily selling to other businesses, or retail – primarily selling to consumers; higher scores indicate wholesale businesses). A PCA revealed that *Percentage of Venture Owned*, *Primary Decision Maker* and *Relationship to Venture* represent a single underlying factor accounting for 76.68% of the variance. Accordingly, a single variable called *Business Ownership* was created by extracting the common variance between these variables.

5.1.3.5 *Demographic & Socioeconomic Status*

Demographic and socioeconomic status constructs were measured by four principle factors: *Education*, *Family of Entrepreneurs* (a PCA solution of four binary variables that measured whether the participant's parents, aunt/uncle, grandparents or other family members were entrepreneurs; 41.28% of the variance was explained), *Family Orientation* (a PCA solution of marital status, e.g. single or married, and how many dependents a person had; 62.34% of the variance was explained), and *Lifestyle*

³ It should be noted that in addition to the data on the size of the loan requested, partial data (N = 1384) on the loan amount an entrepreneur had received was available. The correlation between loan amount requested and received was .33 ($p < .01$) suggesting entrepreneurs were likely to receive the loan they had requested. Furthermore, it is important to also note that the loans requested were unsecured (e.g. no collateral was required). While data on the loan's interest rates was not available for all lenders used in this sample, based on the data that was available, there was no statistically significant difference in the interest rate between males and females when controlling for loan size.

Stability (a PCA solution of two variables, namely, how long an individual had lived in their current residence and how long they had banked with their bank; 51.30% of the variance was explained).

5.1.3.6 *Psychological Variables*

5.1.3.7 *General Self-Efficacy, Locus of Control & Optimism*

EFL developed a collection of self-report measures for their micro-loan application process. Items were developed by reviewing the existing literature on traits that have shown to predict entrepreneurial success (e.g. Rauch & Frese, 2007). Three measures were developed: *General Self-Efficacy* (8 items; Cronbach Alpha = .87) defined as the extent to which an individual believes they are able to achieve their goals; *Locus of Control* (7 items; Cronbach Alpha = .83 defined as the extent to which an individual believes that they can positively influence life events; and *Optimism* (6 items; Cronbach Alpha = .70) defined as a general outlook – positive or negative – of the future. Participants responded to each of the measures via a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). A score for each measure was computed by subjecting its items to a PCA, and then extracting its common variance. In all three cases, a single factor was identified.

5.1.3.8 *Measure of Entrepreneurial Tendencies & Abilities (META; Leutner et al., 2014)*

META is a self-report measure of an individual's entrepreneurial talent, assessing four dimensions: Creativity, Opportunism, Proactivity, and Vision. Participants responded to each of the items via a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). The measure has been found to positively predict entrepreneurial achievement, over and above a number of personality constructs (Leutner et al., 2014). The current study used a shortened 16-item version of META.

A PCA revealed the items to represent a single common factor (Cronbach's alpha = .67).

5.1.3.9 *Cognitive Ability*

EFL developed two measures to assess cognitive ability. The first test was of digit span recall, similar to that of the Wechsler Adult Intelligence Scale. The test taker was shown a string of digits for 5 seconds; the string was then hidden for 5 seconds, after which the test taker had to recall the string. If they did so correctly, the subsequent string was one digit longer, and the test continued until a mistake in recall was made. The same was then repeated, but the test taker had to enter the string in reverse. This variable was titled *Digit Span*. The second test used images for pattern recognition with shapes & colours, akin to other fluid intelligence tests such as Raven's Progressive Matrices. This test produced two variables: *IQ Answered* – the number of questions the participant answered, and *IQ Right* – the number of questions the participant answered correctly.

5.1.3.10 *Procedure*

Participants completed the battery of business activity, demographic and psychological questionnaires when submitting their applications for a small business and microenterprise loan from to one of eight financial institutions. Applicants had the option to apply for other loan products without the psychometric application requirement, so in that sense participation was voluntary. However, everyone wanting to apply for a particular business and microfinance loan was required to complete the application, and they were aware that their answers could influence their chances of approval and the loan terms. In that sense, the context was "high-stakes". Final loan decisions were made in combination with banks' own decision-making process and scoring method, alongside the score provided by psychometric tests. Upon

completion, applicants were given the final loan decision but were not given any psychometric reports or ratings. Furthermore, although the data was self-reported, objective measures of the business, such as sales revenues, inventory, bank balances, and so on, were checked by the banks as a part of their affordability analysis before finalising decisions on loan sizes. Entrepreneurs were aware that these checks would be made before they answered the questions on the test, and therefore had a far bigger incentive to be truthful than in traditional self-reports where lying has little chance of detection or consequence. Accordingly, the entrepreneurial outcomes used in the current study were more objective in nature. This study employed a cross-sectional design; that is, all data including predictors and outcomes was collected at one time period.

5.1.4 Results

Descriptive statistics and bivariate correlations are displayed in Table 11. As can be seen, *Gender* holds many significant correlations with all achievement and business activity variables, with the exception of number of businesses started. Although the strength of these effects varies, males score higher than females on most variables examined. The relationship between *Gender* and psychological and demographic variables, however, is far more mixed. In order to better explore the relationships between gender and the variables in the model, Structural Equation Modelling (SEM) was carried out using SPSS AMOS (Arbuckle, 2008).

Table 11: Study 5 - Bivariate Correlations & Descriptive Statistics.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	<i>M</i>	<i>SD</i>
1. Gender	—																			1.42	.49
2. Age	-.02*	—																		38.70	9.47
3. Education	.00	-.07**	—																	2.80	1.94
4. Lifestyle Stability*	-.01	.08**	.01	—																0.00	1.00
5. Family Orientation*	-.04**	.17**	-.02**	.00	—															0.00	1.00
6. Family of E*	-.03**	-.08**	.06**	.01	.00	—														0.00	1.00
7. META*	.01	-.02**	-.01	.09**	-.05**	-.02**	—													0.00	1.00
8. Locus of Control*	.06**	.01	-.14**	-.01	.04**	-.03**	.07**	—												0.00	1.00
9. Self-Efficacy*	-.01	-.03**	.03**	.01	.01	.06**	.24**	-.03**	—											0.00	1.00
10. Optimism*	.00	-.01	.06**	.01	.00	.07**	.22**	-.19**	.53**	—										0.00	1.00
11. Digit Span*	-.09**	-.11**	.12**	.01	-.05**	.09**	.03**	-.25**	.11**	.13**	—									0.00	1.00

12. IQ Answered	-.03**	.05**	.05**	-.10**	-.01	.03**	-.10**	-.01	.02*	.01	.01*	—							5.89	5.20	
13. IQ Right	.00	.03**	.07**	-.01	.07**	.05**	-.12**	-.05**	.03**	.02*	.04**	-.04**	—						2.92	4.30	
14. Biz. Ownership*	.06**	.03**	-.06**	.01	.03**	-.02**	.02**	.02**	.01	.01	-.04**	.00	-.01	—					0.00	1.00	
15. Biz. Number	.00	.05**	.01	.02**	.03**	.04**	.01	.01	.00	.00	-.01	.00	.00	-.02*	—				1.43	1.25	
16. Loan Amount	-.21**	.09**	.00	.06**	.02**	.03**	.00	-.08**	.05**	.02*	.09**	.01	.01	-.11**	.04**	—			7352.25	10753.04	
17. Biz. Type	-.19**	.02**	.00	.01	.01	.05**	.01	-.04**	.04**	.00	.08**	-.03**	-.03**	-.06**	.02**	.35**	—		1.28	.45	
18. Biz. Age	-.09**	.40**	-.06**	.08**	.08**	.03**	-.02*	.01	.01	.00	-.05**	.08**	.04**	.01	.04**	.10**	.06**	—	8.35	6.88	
19. Sales Growth	-.05**	.07**	-.15**	.23**	-.02**	-.04**	.21**	.03**	.00	-.01	-.02**	-.37**	-.40**	.01	.03**	.18**	.20**	.06**	—	2.72	1.74
20. Business Size*	-.08**	.08**	.05**	.07**	.00	.04**	.00	-.02**	.02*	-.01	.03**	.04**	.03**	-.08**	.03**	.33**	.16**	.14**	.06**	0.00	1.00

Notes: E = Entrepreneurs, Biz = Business. Correlations are significant at $p < .05$ (*) & $p < .01$ (**). * On variable names indicates that the variable is standardised via the use of PCA. Gender was computed 1 = Female, 2 = Male; thus, negative values indicate males are higher on the respective variable. Education: 1 = Elementary, 2 = Junior High, 3 = High School, 4 = Diploma/Technical Education, 5 = Bachelor/University, 6 = Master/Doctorate, 7 = Other; Business Type: 1 = Business to Customer, 2 = Business to Business.

5.1.4.1 Structural Equation Modelling

A multi-group SEM analysis was specified to model each of the eight financial institutions (representing seven nations) where data was collected. The hypothesised model treated *Gender* and *Age* as exogenous variables, demographic, psychological and business activity variables as both exogenous and endogenous (e.g. mediators), and *Business Size*, *Business Age* and *Sales Growth* as endogenous variables. Business activity variables were entered into the model so that they acted as mediators between psychological and demographic variables. Given the cross-sectional nature of the sample, the model structure and paths specified were guided by past research and theory, correlations found in the data, and the premise that sex and age are variables least affected by environmental factors, followed by personality and ability constructs, and finally business activities and success.

The model fit was assessed via the following indices: the χ^2 statistic (Bollen, 1989; which tests the hypothesis that an unconstrained model fits the correlation matrix as well as the given model; $p > .05$ is desired); the goodness of fit index (GFI; Tanaka & Huba, 1985; values above .90 are acceptable); the comparative fit index (CFI; Bentler, 1990; values above .95 are acceptable); and the root mean square residual (RMSEA; Browne & Cudeck, 1993; values of .06 or below indicate reasonable fit for the model). These fit indices and their thresholds are widely used and accepted when conducting SEM (Bryne, 2013). The hypothesised model did not fit the data well: $\chi^2(1064) = 21053.04, p < .001$; GFI = .89; CFI = .53; RMSEA = .03. In light of this, steps were taken to identify misspecifications. Regression paths between variables were freed or added and variables removed on the basis of modification indices, expected parameter change statistics, significance levels and standardised residuals. Paths were only added or freed if they made substantive sense,

and were statistically significant in at least five of the eight groups featured in the model. After each modification, fit indices were checked to ensure improved model fit.

None of the paths from *Gender* to psychological variables remained significant in the multi-group SEM model and were subsequently freed. Of the psychological variables entered into the model, *Self-Efficacy*, *Optimism*, *Locus of Control* and *Digit Span* were removed from the model as all the paths between them and endogenous variables were non-significant. Similarly, none of the paths between *Gender* and demographic variables remained significant in the SEM model. *Family Orientation*, *Education* and *Family of Entrepreneurs*, alongside *Business Ownership* and *Business Number* were, thus removed from the model. After removing redundant variables and non-significant paths, the multi-group model fitted the data: $\chi^2(256) = 1758.84, p < .001$; GFI = .98; CFI = .94; RMSEA = .02. The fitted model is illustrated in Figure 9, with the results of each group displayed in Table 12.

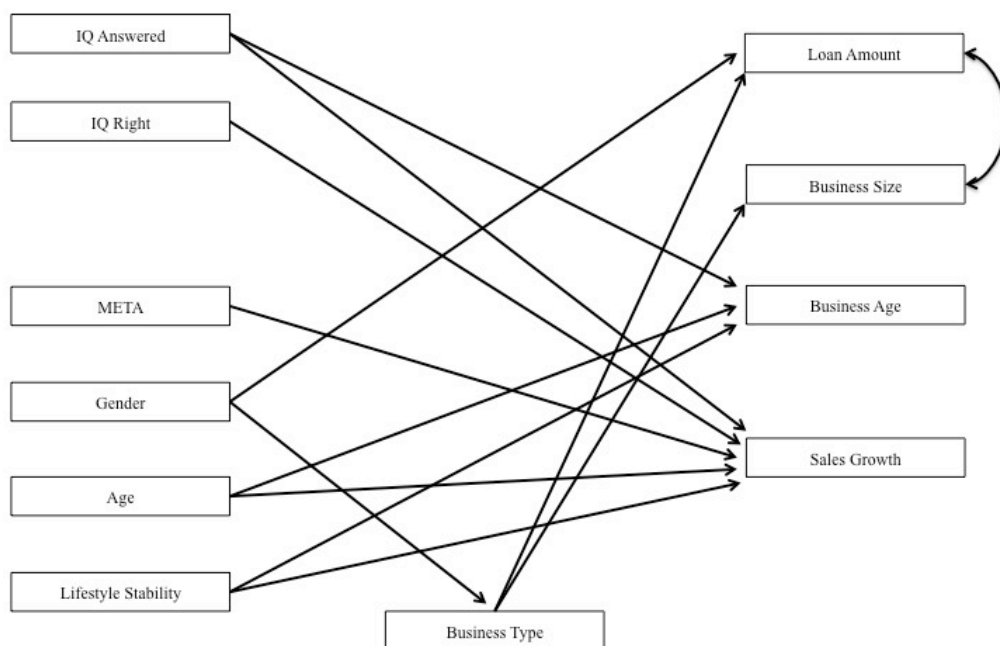


Figure 9: Study 5 - The Fitted Multi-Group SEM.

Table 12: Study 5 - The Results of a Multi-Group SEM.

Exogenous Variables	Endogenous Variables	Indonesia		India		Peru		Guatemala		Costa Rica		Peru - MF		Ghana		Nigeria	
		β	<i>SE</i>	β	<i>SE</i>	β	<i>SE</i>	β	<i>SE</i>	β	<i>SE</i>	β	<i>SE</i>	β	<i>SE</i>	β	<i>SE</i>
	<i>Business Type</i>	1%		13%		1%		1%		1%		3%		0%		0%	
Gender		-08	.01	-36	.01	-08	.02	-10	.02	-10	.03	-16	.02	-.05 ^a	.02	.04 ^a	.03
	<i>Loan Amount</i>	3%		30%		8%		14%		1%		4%		3%		5%	
Gender		-03	315.50	-.23	232.37	-.09	279.10	-.24	193.60	-.08	298.41	-.15	49.30	.01 ^a	370.33	-.08	646.97
Business Type		.17	409.33	.41	287.87	.25	322.68	.27	355.09	.01 ^a	345.49	.09	81.31	.17	539.33	.21	604.08
	<i>Business Size</i>	3%		3%		9%		4%		0%		5%		1%		1%	
Business Type		.18	.03	.19	.03	.29	.05	.20	.13	.02 ^a	.08	.21	.10	.09	.10	.10	.07
	<i>Business Age</i>	14%		13%		23%		26%		19%		18%		24%		19%	
Age		.37	.01	.35	.01	.45	.01	.48	.02	.40	.02	.42	.01	.44	.02	.43	.02
Lifestyle Stability		.05	.08	.04	.10	.11	.14	.04 ^a	.21	.10	.25	.03 ^a	.16	.16	.23	.13	.21
IQ Answered		.06	.02	.00 ^a	.02	.06	.03	.16	.04	.09	.06	.03 ^a	.04	.23	.04	.11	.04
	<i>Sales Growth</i>	34%		41%		52%		34%		40%		26%		71%		57%	
Age		.06	.00	.07	.00	.06	.00	.07	.00	.05 ^a	.00	.16	.00	.02 ^a	.00	-.02 ^a	.00
Lifestyle Stability		.32	.02	-.20	.02	.43	.03	.27	.04	.35	.04	.30	.04	.06	.04	.10	.04
IQ Answered		-.29	.00	-.34	.00	-.23	.01	-.23	.01	-.25	.01	-.18	.01	-.72	.01	-.61	.01

IQ Right	-35	.00	-.41	.00	-.30	.01	-.28	.01	-.36	.01	-.22	.01	-.22	.02	-.17	.04
META	.06	.02	.13	.02	.15	.03	.19	.04	.11	.04	.16	.04	.05	.04	.11	.01
Covariance <i>r</i>																
Loan Amount ~ Business Size	.42		.31		.39		.33		.11		.21		.15		.12	

Notes: The percentage of accounted variance in each endogenous variable is in bold, and was computed using the Squared Multiple Correlations function in Amos. β = Standardised Coefficients. *SE* = Standard Error. All coefficients are significant at $p < .05$, except for those marked ^a ($p > .05$). MF = Microfinance Institution.

5.1.4.2 *Independent Effects of Psychological, Demographic & Socioeconomic Factors on Entrepreneurial Achievement*

Of the psychological factors that remained significant predictors of outcomes, *META* was significantly and positively related to increased *Sales Growth* in each of the eight groups, whereas the remaining two measures of IQ were negatively associated to this outcome variable. When predicting *Business Age*, *IQ Answered* was the only psychological factor found to hold a weak, yet significant, positive relationship in all groups, except in India and Peru.

Of the demographic factors, *Age* was positively related to *Sales Growth* in all groups except in Costa Rica, Ghana and Nigeria. Similarly, the relationship between *Lifestyle Stability* and *Sales Growth* was positive, except in India where the relationship was found to be negative. Furthermore, *Age* was associated with *Business Age* across all groups, while higher levels of *Lifestyle Stability* was weakly associated with *Business Age* in all groups, except Guatemala. The model accounted for an average of 20% of the variance in *Business Age* ($SD = .05$) and 44% in *Sales Growth* ($SD = .15$).

5.1.4.3 *Gender, Business Activity, and Loans*

Across the majority of groups, *Business Type* significantly mediated the relationship between *Gender and Loan Amount*, as well as *Gender and Business Size* (non-significant relationships were found in Ghana, Nigeria & Costa Rica). The negative path between *Gender* and *Business Type* suggests that across countries, males are significantly more likely to operate a wholesale business, that is, sell to businesses rather than consumers, than females. Operating a wholesale business, in turn, relates to having higher business assets, revenues, and profits.

The negative path between *Gender* and *Loan Amount* shows that males are more likely to seek larger loans than females. Entrepreneurs who seek larger loans, in turn, tend to operate larger businesses. It should be noted that given the cross-sectional data, the causal direction of this latter relationship cannot be established. That is, it could not be corroborated whether entrepreneurs operate larger businesses because of the larger loans they seek, or whether they seek larger loans because they operate larger businesses. Finally, a noteworthy result of the current study was that there were no significant differences in *Sales Growth* of the business between male and female entrepreneurs, and that the effects of *Gender* on *Business Age* were not consistent across countries.

5.1.4.4 *Measurement Invariance*

In order to assume that the fitted model suitably represented each group, that is, the relationships were consistent across each sample, measurement invariance was tested. The model fit indices of the hypothesised model suggested that configural measurement invariance was met (see Cheung & Rensvold, 2002); that is, there was a general consistency in the model across groups. However, in order to test for construct metric variance (e.g. that the *strength* of the relationships between observed variables are the same across both groups) it was necessary to compare the difference in model fit between a constrained and unconstrained model. This was tested using a chi-square statistic (where significant results suggest metric variance between groups). The difference between the constrained ($X^2(347) = 6758.07, p < .001$) and the unconstrained ($X^2(256) = 1758.84, p < .001$) models was significant ($\Delta X^2(91) = 4999.23, p < .001$); therefore, metric invariance was not met. This suggests that the groups are significantly different at the structural level — an assumption supported by the variability in the path weights and the varying amount of explained variance in

each model (Table 12). Such variability, however, is expected given the large number of groups and variables represented in the model (Arbuckle, 2010).

5.2 *Discussion*

The current chapter investigated the reasons for observed gender differences in entrepreneurial activity and achievement. Whereas Chapter 3 and 4, explored the interaction between micro and meso contextual factors and individual differences, this chapter sought to investigate the role of macro contextual factors. As described in Chapter 2.5, there is growing interest in EME entrepreneurs and promoting female entrepreneurship within such economies. Nonetheless, there are theoretical and methodological limitations within the literature. Accordingly, this chapter sought to address these limitations. Firstly, institutional and feminist theory was used to explain how regulative and normative institutions shape an actor's behaviour, decisions and attitudes. In this chapter, such factors were hypothesised to influence an individual's development and expression of entrepreneurial talent, alongside explain the apparent gender differences in achievement. Secondly, methodological limitations were addressed by using a large sample of entrepreneurs from seven EMEs, a comprehensive set of psychometric, demographic, and objectively verifiable business related variables were collected, alongside using correlational models to explore the potential causal effects between the aforementioned variables. This section first begins with a discussion of the study's hypotheses and the extent to which the theory outline in Chapter 2 was supported. The methodological and practical limitations are then discussed.

The first hypothesis of the study (H1) stated that there would be gender differences in entrepreneurial achievement, where males outperform females. This hypothesis was partially supported by the results. Male entrepreneurs run businesses

that were significantly larger (e.g. had higher business assets, revenue, and profits) – a finding that is well documented in the existing literature (Kelley et al., 2012; OECD, 2012). However, males did not outperform females in terms of the longevity of the business (e.g. how old the business was) and the sales growth of the business (e.g. how fast their business grew in the past year). These findings are noteworthy because they suggest that the notion that male entrepreneurs are more successful than female entrepreneurs may need to be taken in the context of the variable(s) used to operationalise achievement. That is, although men would be deemed more successful than women when one considers business size, they would not be deemed so when one considers business age or sales growth over the past year. This is in line with previous research, which shows that on some criterion variables, such as innovation levels, women are equal to, or outperform, men in several regions (The World Bank, 2012).

The second hypothesis (H2) of the study stated that there would be differences in demographic and socioeconomic variables between male and female entrepreneurs that explain differences in entrepreneurial achievement and activity. The results of the current research did not support this hypothesis. No gender differences in demographic or socioeconomic variables (e.g. *Age, Education, Family of Entrepreneurs, Family Orientation, and Lifestyle Stability*) were found that could be used to explain differences in entrepreneurial achievement between men and women. It should be noted that some demographic variables – specifically *Lifestyle Stability* and *Age* – did relate to entrepreneurial outcomes; however, these variables were gender-neutral. This finding is in line with studies examining the impact of demographic/socioeconomic variables, such as education, on gender differences in entrepreneurship, where clear and consistent effects are often not found (Kelley et al.,

2012). On the other hand, they do contest other literature that suggests that such differences are important for explaining difference between men and women in entrepreneurial ventures (Ramaswami & Mackiewicz, 2009). Although the presented results could reflect sample particularities (e.g. because the sample consisted of finance seeking entrepreneurs), they nevertheless indicate that hypotheses held in regards to the influence of demographic and socioeconomic variables on gender differences in entrepreneurship should be empirically substantiated.

The third hypothesis (H3) – that gender differences in business activities explain entrepreneurial achievement – was supported by the results of the current study. Replicating previous research (Piras et al., 2013), female entrepreneurs were found to be more likely to sell to consumers rather than other businesses, which in turn related to having lower revenues, profits, and assets of the business (e.g. *Business Size*). Although this discovery is well documented, one cannot understate its importance in light of the non-significant effects of other variables examined in this study. Indeed, the results indicate that differences in the type of businesses men versus women tend to pursue may be one of the most important explanations of the apparent gender differences in entrepreneurial success. This fact, of course, begs the question as to *why* these differences in the choice of business exist. Interestingly, none of the factors examined in the current study could account for this effect. That is, it would appear that variables other than the ones examined in the current research, account for gender differences in choice of business type. Such differences in choices may in fact be evidence of institutional theory, specifically, normative influences (e.g. social legitimation, religion, gender roles) enact differential pressures on both male and female entrepreneur's attitudes, intentions and behaviours (De Vita et al., 2014).

The fourth hypothesis (H4) of the current study stated that there would be differences in access to (or request for) finance between male and female entrepreneurs that relate to differences in entrepreneurial achievement. The results of the current research supported this hypothesis: there were significant differences in the size of the loan males versus females requested (and received), which in turn was positively related to larger *Business Size* (e.g. to higher business revenues, profits, and assets). Although one interpretation of the results could be that women run smaller businesses *because* they seek and receive smaller financing, given the cross-sectional nature of the data, a reversed causality account is equally plausible; that is women requested smaller loans because they were running smaller businesses in the first place. These competing interpretations cannot be verified in the current study. Furthermore, *Business Type* partially accounted for the difference in financing between men and women. Specifically, women requested smaller loans, partially because they were more likely to operate a retail rather than wholesale business.

A noteworthy finding in the results, however, was the fact that there was a significant effect of gender on *Loan Amount* requested, even when all other variables in the study (including *Business Size* and *Business Type*) were taken into account in the model. In other words, women requested and received smaller loans even when they were matched with men on all other variables examined in the study. Given that none of the factors assessed in the current study could fully account for this, it could be that other institutional or normative factors play a role here, in particular, gender stereotypes and perceptions. For instance, some research shows that female-managed firms are perceived to be riskier and pay higher interest rates than those male-managed firms (Muravyev, Talavera & Schäfer, 2009). Given the nature of the

current results and the importance of the issue, future research aimed at resolving this question is certainly warranted.

Perhaps the most noteworthy findings of the current study were the fact that the gender-gap in entrepreneurial success could not be explained by psychological differences between men and women. Specifically, no gender differences in psychological traits that were related to entrepreneurial success were found. It should be noted that some psychological variables – specifically *META* and *IQ* – did relate to entrepreneurial outcomes; however, these variables were nation- and gender-neutral. This finding demonstrates that when contextual factors and cross-cultural/institutional variation is taken into account, individual differences exert a direct effect on entrepreneurial achievement. Thus, the fifth and sixth hypotheses of the study was supported by the results. These findings suggest that the notion that men may be better ‘equipped’ than women to run entrepreneurial businesses, in terms of various personality and ability traits (Shane, 2008), is empirically unfounded. In fact, the results are more consistent with the wider psychological literature on gender differences in psychological traits, which suggest that such differences are relatively small (Hyde, 2005). Given the widespread tendency to anecdotally attribute gender differences in entrepreneurial achievement to differences in psychological characteristics (Shane, 2008), the results of the current study have important practical implications.

5.2.1 *Limitations*

Although this study attempted to uphold best scientific practice, as with any research, it is not without its limitations. The most notable limitation is the use of cross-sectional data. Although SEM is a suitable technique for theory testing, it cannot guarantee that the hypotheses were correct in the first place. Even if most of

the hypothesised paths were based on solid theoretical grounds, some relationships (e.g. between loan amount, business type and size) were more difficult to ascertain. Thus, future research deploying longitudinal designs would be necessary to disentangle some of the results uncovered in the current research.

A second limitation is the generalisability of the current findings. Given that the sample primarily consisted of entrepreneurs requesting loans, it is possible that the results would not generalise to other samples of entrepreneurs. That is, there is the possibility of sample bias, because the current sample leaves open issues of excluded and self-excluded female (and male) entrepreneurs. For instance, some entrepreneurs may not have applied for formal credit because they did not need external financing. Conversely, some entrepreneurs may have needed the financing but had not applied for a loan (for a number of reasons). Thus, one should take into account that the current sample was a self-selected, and potentially non-random sub-sample of the total population of entrepreneurs. This should act as caution in interpreting the results of the current research. On the other hand, given the size of the current sample, and the number of different regions that were investigated, the results are arguably more generalisable compared to many other research studies, where samples are far smaller, and regions examined far fewer. Nevertheless, future research would no doubt be needed in order to replicate these findings with samples of entrepreneurs who have not applied for formal finance.

A further limitation is the fact that a number of other demographic variables that have not been examined in the current study may be important in explaining gender differences in entrepreneurship. For instance, evidence suggests that the amount of time the female versus male entrepreneurs are able to allocate to their businesses and varying responsibilities at home may explain in part the type of

business women choose (Powers & Magnoni, 2010). Although attempts were made to try and control for such factors (e.g. by assessing entrepreneur's marital status, number of dependents, number of entrepreneurs in the family, and how long they have banked with a particular bank), it is likely that the models tested were not able to account for all variables that may be of importance. Nevertheless, it would be desirable for future research to establish empirically exactly which demographic and socioeconomic variables are important for explaining gender differences in entrepreneurship – and which are not. Continuing this, there is an opportunity to widen the generalisability of these findings by including more countries — both EMEs and developed economies. Doing so, would allow for comparative models to be tested. It is possible that such analyses may reveal more nuanced findings surrounding the interaction between individual differences and macro contextual factors.

5.2.2 Practical Implications

A number of practical implications are indicated by the current results. One important implication suggested for policy makers is the need to encourage and help women enter more capital-intensive sectors; another implication is the need for researchers to identify why women do not enter these sectors as often as men in the first place. The result suggests that such investigations may be crucial in understanding and reducing the gender gap in entrepreneurship.

The current findings question the idea that gender differences are due to internal differences as the results show that psychological explanations to be inadequate. Rather differences are the result of institutional factors, namely, access to finance. From a practical perspective, therefore, the results should act as an impetus to institutions providing financing to entrepreneurs, to re-examine their practices to

ensure that gender biases are not present, or are minimized. The results would also justify research investigating social psychological or cultural factors (e.g. gender stereotypes) to try to explain the gender gap in financing.

A final practical implication of the results for financial institutions and policy makers would be to adopt a psychological similarity hypothesis when evaluating the potential of female versus male entrepreneurs. The data indicates that it may be misguided to assume that psychological differences are important causes for gender differences in entrepreneurial success. Indeed, assuming that men are naturally more suited for the task of entrepreneurship than women, could not only negatively affect women in financing and career decisions, but also leads to an underutilisation of women as a resource for economic growth. This exemplifies how the provision of specific environments could help increase entrepreneurial achievement.

5.3 Conclusion

This chapter sought to investigate cross-cultural differences in entrepreneurial achievement. Specifically, it was hypothesised that macro contextual factors may influence the expression of entrepreneurial talent, and account for gender differences. Addressing the literature's theoretical and methodological limitations, it was found that the relationship between entrepreneurial talent and achievement was consistently positive across each of the EMEs. Similarly, gender differences in achievement could not be explained by variation in such talent. Rather, business type and access to finance were found to be the most predictive of gender differences. Together, these findings demonstrate that while personality factors contribute towards the success of a female entrepreneur, contextual factors can disproportionately impact her ability to succeed. Such a conclusion has practical implications for educational, financial and political policies.

6 Discussion

This final chapter contains a discussion of the research presented in this thesis. It begins with a summary of the motivations and objectives of the thesis. The empirical research, as described in Chapters 3 to 5, is then critiqued and evaluated to determine the validity of the model proposed in Chapter 2. Furthermore, the extent to which this thesis has contributed towards current theoretical and practical understanding is debated, alongside its potential to direct future research.

6.1 *Motivations & Objectives of Thesis*

This doctoral research was motivated by the recent developments in the trait theory of entrepreneurship (Ahmetoglu et al., 2011; Frese & Gielnik, 2014). For instance, recent studies have found a constellation of personality traits to be highly predictive of entrepreneurial achievement (Leutner et al., 2014). Yet, the situational determinants of entrepreneurial achievements have been equally studied, and pay much attention to the role of contextual and environmental influences on the identification and exploitation of opportunities (Ardichvili et al., 2003). Although these two theoretical approaches have demonstrated their predictive validity, used separately, they only tell a portion of the story. Inspired by trait activation theory, this thesis adopted an interactionist approach whereby it sought to view entrepreneurial achievement as the result of an interaction between individual differences and contextual factors across multiple levels of analysis (Tett & Burnett, 2003). It was hypothesised that by doing so it will be understood both *who* has the “talent” to become a successful entrepreneur, and *how* they use such talent to enable them to identify and exploit the value opportunities. It was argued that such an approach

would reveal the antecedents of entrepreneurial achievement as it unites two paradigms of research.

In Chapter 2.6, a framework (Figure 1) was proposed that sought to integrate the role of individual differences and contextual factors in the attainment of entrepreneurial achievement. This framework appreciated the stable and internally-generated nature of individual differences, while viewing contextual factors as moderating the impact of individual differences on entrepreneurial achievement across varying levels of analysis. In this case, relational & group factors (e.g. *micro*), organisational culture (e.g. *meso*) and cross-cultural differences (e.g. *macro*). Doing so enabled the interaction between individual differences and context to be explored in a robust way alongside widening the potential influence of context. The ambition of creating such a model was to not only account for the importance of individual differences and contextual factors, but also reduce the mysticism often attributed to entrepreneurs by the popular media. In particular, it was argued that providing empirical support for the model may contribute towards the development of inclusive and supportive practices that are focused on increasing entrepreneurial talent and achievement. The following sections of this chapter seek to evaluate the model's three propositions in light of the empirical research conducted in Chapters 3 to 5, alongside highlight this thesis' key contributions to the academic literature.

6.2 *Summary of Findings & Scientific Contributions*

6.2.1 *Proposition 1 — The Role of Social Capital*

Proposition 1 of the hypothesised model, stated that social capital moderates the relationship between individual differences and entrepreneurial achievement. Such a statement was informed by research that had used the *Measure of Entrepreneurial*

Tendencies (META; Ahmetoglu et al., 2011; Akhtar et al., 2013; Leutner et al., 2014), and demonstrated specific personality traits (e.g. *entrepreneurial talent*) to be predictive of a variety of entrepreneurial achievements. Similarly, it was influenced by the works of Unger et al. (2011) who demonstrated the importance of technical expertise, alongside Burt (2004) who noted the benefits of *bonding* (e.g. social cohesion, collaboration & support) and *bridging* (e.g. influencing others & brokering relationships) social capital in facilitating the access to new ideas and resources. Together these three constructs were hypothesised to interact to facilitate the identification and exploitation of opportunities, and thereby produce entrepreneurial achievement. (Ardichvili et al., 2003). As previously argued, the two theoretical approaches (e.g. individual difference & social capital theory) are compatible and have much value to offer each other due to the integration of psychometric and social network methodologies. By doing so, it would address current gaps in the literature where researchers have called for more investigation into understanding not only who are entrepreneurs, but how do they leverage their network (Ng & Rieple, 2014).

In Chapter 3, Proposition 1 was empirically tested in a sample of small businesses. In Study 1, MR-QAP supported the hypothesis that intrapreneurs (as identified by their personality profile) have increased *bonding* social capital, and moderation analysis supported the hypothesis that intrapreneurs have increased *bridging* social capital. These findings were then extended by using SEM to demonstrate job-related expertise as a positive mediator in the relationship between the entrepreneurial talent-social capital interaction and intrapreneurial achievement.

These findings provide empirical support for Proposition 1, thereby demonstrating how *micro* contextual factors influence the relationship between individual differences and achievement. In response to this thesis' overall objectives,

this finding is encouraging as it demonstrates how trait and situational theorists can begin to align their approaches, in particular through the integration of psychometrics and social network analysis. This has methodological implications for not only entrepreneurship researchers, but all individual difference researchers. Given that both social capital and individual differences have direct and indirect effects, and were positively correlated, demonstrates that ignoring one factor is a detriment to gaining a full perspective on the phenomenon being investigated. It can be argued that individual difference researchers should begin to learn social network theories, and vice versa, in order to better understand the interaction between internal and external factors on work-related behaviours.

6.2.2 *Proposition 2 — The Role of Organisational Culture*

Proposition 2 focused on the *meso* contextual influences on the individual differences and achievement relationship. In particular, it was hypothesised that organisational culture influences this relationship via normative influences that impact the socialisation of individuals within the workplace. Building upon recent industry surveys detailing the incongruence towards organisational culture and strategy concerning entrepreneurship (Accenture, 2013), alongside the recent critique of the entrepreneurial orientation (EO; Rauch et al., 2009) construct, Chapter 4 sought to extend the entrepreneurial culture concept and develop a valid measurement.

Based upon the literature reviewed in Chapter 2.4, an entrepreneurial culture was defined as a work environment that displays a heightened perceived support for, and expression of, entrepreneurial achievement. It was hypothesised that entrepreneurial culture would comprise of six dimensions, yet through exploratory and confirmatory factor analysis four dimensions were identified: *Leadership Style*, *Employee Values*, *Empowerment* and *Team Behaviour* (Study 2). These four factors

were hypothesised to extend the uni-dimensional EO construct to include the role of social norms and beliefs, that subsequently shape behaviour through increasing self-efficacy (as explained by Theory of Planned Behaviour; Kautomen et al., 2013) and motivation (as explained by work engagement; Saks, 2006). Across two validation studies, increased perceptions of entrepreneurial culture were positively correlated with a variety of entrepreneurial achievements. In particular, this relationship was partially mediated by increased entrepreneurial self-efficacy (Study 3) and fully mediated by work engagement (Study 4). Furthermore, Study 4 found that entrepreneurial culture also positively moderated the relationship between entrepreneurial talent and achievement. Thereby extending Chapter 3's conclusions concerning the role of social capital.

Together these studies demonstrate both the validity of the measure and the psychological mechanisms that were hypothesised to be indicative of how *meso* contextual influences can influence employee behaviour so that they more readily engage in entrepreneurial activity. In particular, the chapter addressed Rauch et al.'s (2009) call for further investigation into the dimensionality of the EO construct, by including dimensions that describe the social experiences of employees, not only the work design dimensions as described by Hornsby et al., (2009) and Covin & Slevin (1990). The value of these findings are found in its ability to demonstrate that the more an individual perceives the work environment to support and reward such behaviour, the more likely they are to hold positive attitudes towards pursuing entrepreneurial achievements. Doing so, increases the employee's self-efficacy and thus their motivations to pursue entrepreneurial achievement (Hui-Chen et al., 2014). Similarly, they provide support for person-organisation fit theory (Westerman & Cyr, 2004), as there is a congruence between an individual's skills, characteristics and

values, and the organisation's norms, operations and strategy. In turn this motivates, and enables, the individual to use their entrepreneurial talents. To summarise, the empirical research presented in this chapter not only supported Proposition 2 of the hypothesised model, but contributes towards both theory and practice in illustrating potential ways the work environment not only has an impact on employee's entrepreneurial behaviour, but also the possible ways it could be shaped to have a positive effect on driving entrepreneurial achievement within organisations.

6.2.3 Proposition 3 — *The Role of Cross-Cultural Differences*

The final study sought to test Proposition 3, which hypothesised that *macro* contextual factors both moderate the entrepreneurial talent-achievement relationship, but can also explain gender differences in achievement. As reviewed in Chapter 2.5, there is growing pressure to apply feminist theory to the study of female entrepreneurship. In a seminal paper, Ahl (2006) highlighted several “discursive practices” within the field of female entrepreneurship. In order to overcome these discursive practices, Ahl critiqued both the existing theory and research methodology and highlighted various ways future research should be conducted.

In light of this, Study 5 extended psychological theories for gender differences in entrepreneurial achievement by using institutional theory: social, political and economic systems have a direct effect on business formation and operation, and therefore exerts influence on an actor's behaviours and decisions (Scott, 1995). From this perspective, gender differences in achievement are not the result of inherent psychological differences, but rather socioeconomic institutions exert influence on males and females differently, and therefore produce gender differences in entrepreneurial achievement. In order to address the methodological limitations with the literature (Ahl, 2006; De Vita et al., 2013), a large sample from a number of

developing countries was used, alongside collecting a variety of objective outcomes of entrepreneurial activity and achievement, and a comprehensive battery of validated psychological constructs.

Using a multi-group SEM to compare data across each of the seven nations represented in the sample, it was found that entrepreneurial talent held a positive and direct effect on achievement. This finding is noteworthy as it was found across each of the nations, thereby demonstrating the stability, and importance, of individual differences in producing entrepreneurial achievement. Put plainly, entrepreneurial people are more likely to succeed no matter what nation they are in and its various socioeconomic policies. When exploring the antecedents for gender differences in entrepreneurial activity and achievement, there were no psychological differences. Instead, institutional factors, particularly the amount of funding females receive and therefore the businesses they build were the only factors found to explain gender differences in the majority of the countries. This finding directly supports this thesis' suggestion of integrating individual difference and institutional theory to explain gender differences. It also demonstrates how *macro* contextual factors have a considerable effect on shaping and influencing an entrepreneur's behaviour. This has important implications for not only financial institutions who are responsible for supporting nascent businesses, but also for the way female entrepreneurs are viewed within their respective countries.

6.3 *Limitations & Future Directions*

Although this thesis has achieved its objective by successfully demonstrating the various ways in which context interacts with individual differences and entrepreneurial achievement, it is not without its limitations nor has it answered all conceivable lines of inquiry. Although each study has already been critiqued,

alongside highlighting avenues of future research, there are several issues that are worth revisiting as they apply to the majority of the research presented in this thesis.

Firstly, studies 1-4 have used a self-report measure of achievement.

Understandably this raises concerns surrounding the validity of such a measure given that self-report measures can be subject to bias. Although acquiring objective data for every study was not feasible given the difficulty of obtaining it, Study 5 sought to rectify this with more objective measures of entrepreneurial achievement. In addition, a recent meta-analysis found little difference in objective and subjective measures of entrepreneurial achievement (Rauch et al., 2009). Although this is not ideal, the use of a self-report measure of achievement is not completely unreliable or lacking validity. Nonetheless future research should continue seek to move beyond self-report measures, and instead use peer-rated or objective measures in order to overcome this primary limitation.

Secondly, all research was cross-sectional. This means that the regression models used in these studies demonstrate only concurrent and not predictive validity. This is a particular issue in Study 3 and 4, which sought to validate the *Entrepreneurial Culture Inventory* (ECI). Given that this inventory seeks to measure the extent to which an organisation's culture supports and rewards entrepreneurial behaviour and achievement, and the fact that the data was collected from an opportunity sample, its validity can be questioned. Nonetheless, measure development is an iterative process, and in many ways beyond the scope of this thesis' ambitions (Hinkin, 1998). Given the ECI's novelty, it is hoped that other academics will use the inventory in their own research to continue the development, investigation and critique of the inventory. Future research should collect data from a variety of different organisations to allow for multilevel regression models to test its predictive

validity both within and between different industries, organisations and departments. Doing so would demonstrate the validity of the measure alongside further illustrate the effect of *meso* contextual factors on entrepreneurial achievement.

Limitations aside, the most exciting avenue of future research lies in the extension of Study 1, namely, the integration of individual differences and social network analysis. The findings presented in this thesis demonstrate how both trait and social capital approaches are both theoretically and empirically compatible. The research presented in Study 1 is relatively simple compared to other techniques offered by social network analysis. For example, there is much work investigating the transitivity of entrepreneur's networks, and how this facilitates idea generation and implementation (Batjargal, 2007). Similarly, exponential random graph modelling is a new technique exploring the formation of ties between individuals, and has revealed insights into how individuals cluster together (Hunter, Handcock, Butts, Goodreau, & Morris, 2008). Integrating psychometrics into these analyses is possible and would reveal greater insights into how entrepreneurs are leveraging their social networks beyond brokering relationships. From a broader perspective, integrating social network analysis with psychometrics is likely to be of interest to any individual difference researchers given that both the *who* and the *how* of social interaction can be quantitatively modelled.

6.4 *Practical Implications*

Based on this thesis, several recommendations can be made to practitioners looking to promote entrepreneurial talent and achievements. As such, practitioners are recommended to consider the following points:

1. *Identify entrepreneurial talent.* Given that the direct relationship between entrepreneurial talent and achievement has been identified throughout this

thesis, identifying and recruiting entrepreneurial individuals is perhaps the most effective way to facilitate innovation, organisational growth and value creation. Observing genuine entrepreneurial talent in interviews and on the job may be difficult as such behaviours may be conflated with other positive interpersonal factors, or organisations typically do not allow such talent to be expressed (Hayton, 2005). This can however be rectified by the use of valid psychometric tests that reliably measure and predict entrepreneurial behaviours and achievements. Within the context of EMEs, the use of psychometric inventories has become popular for microfinance loan vendors and applicants who do not have a credit history (Klinger et al., 2013). The data presented in Study 5 further support the use of such tests. Similarly, within the context of existing organisations, entrepreneurial employees can be identified in a similar manner. Such findings (as supported by studies 1 and 4) support the use of psychometric inventories when looking to promote organisational innovation. Nonetheless it must be said that for organisations who are looking to hire entrepreneurial employees, it may be unwise to simply fill positions with a large number of highly entrepreneurial individuals unless one has a defined system as to how to manage these individuals (Miller, 2015). Accordingly, placing entrepreneurial individuals in strategic roles, teams, and departments, is arguably a more effective way to drive innovation (Lumpkin, 2007).

2. *Build social capital.* As empirically demonstrated in Study 1, entrepreneurial achievement is a product of both individual and group behaviours. As argued by De Carolis & Saporito (2006), social capital facilitates the sharing of novel ideas, information and resources (Burt, 2004). As a result, this aids the

identification and exploitation of valuable opportunities. Similarly, increased social capital is positively related to more effective mentoring and knowledge management schemes, both of which improve opportunity recognition (Ozgen & Baron, 2007). Practitioners are therefore encouraged to develop an individual's social network. Using methods such as Social Network Analysis (Wasserman & Faust, 1994) to identify who does and does not have social capital, practitioners can develop interventions to modify communication channels and collaborative practices (Cross & Parker, 2004). By encouraging people to build relationships within and between their teams, workgroups and departments, the number of identified opportunities that can produce entrepreneurial achievements will increase.

3. *Create the right culture.* As demonstrated by Chapter 4's results, organisations can facilitate the entrepreneurial talent of their employees by creating an environment that not only rewards, but also allows, the exploration and exploitation of new opportunities, creative ideas, and inspirational goals. As evident in organisations such as IDEO, aligning both the formal (e.g. job design, reward & allocation of resources) and the informal (e.g. social norms, beliefs & values) environment, produces increased entrepreneurial achievement (Thomke & Nimgade, 2000). This is because the closer these are aligned, and genuinely practiced, the more an employee will perceive their organisation to support them to behave in an entrepreneurial manner (Hayton, 2005). As demonstrated in this study, doing so will increase the confidence and motivation that in turn produces entrepreneurial achievements.
4. *Leaders must communicate a vision.* Continuing the above, the results presented in Study 3 and 4 demonstrate the influence of a leader's behaviour,

in particular their vision, in motivating and engaging employees to behave entrepreneurially. Accordingly, practitioners must work with an organisation's leadership to ensure that they support entrepreneurial practices and regularly communicate a vision for innovation, growth and progress (Ruvio et al., 2011). A leader's vision is more likely to gain buy-in and support if it is meaningful (e.g. it communicates a salient social identity) and rewarding (e.g. it is perceived to be attractive & a worthwhile pursuit; Hogg et al., 2012). It is therefore important that the vision is uniformly shared across all leadership and management (Burgess, 2012). In addition, leaders must act as role models for the rest of the organisation in order to dispel scepticism and doubt.

5. *Invest in teams.* Teams are the engine of entrepreneurial achievement. Based on Study 1, 3 and 4, and the reviewed literature (Hülshager et al., 2009), teams that have a high level of interdependency in its objectives are not only more collaborative, they also produce significantly more innovation output. Practitioners can achieve this by rewarding group behaviour, and not individual performance. The egalitarian nature of this type of reward structure reduces office politics and internal competition. As result, team members are more trusting towards each other and willing to share new ideas and resources that aid the identification and exploitation of opportunities (West, 2007). Furthermore, practitioners can further increase the entrepreneurial talent of a team by ensuring that each of its members have a complementary skill set and expertise (Hülshager et al., 2009).
6. *Institutional reform.* The research discussed and presented in Chapter 2.5 and Study 5, demonstrate the influence of macro level factors on an entrepreneur's behaviour and ability to grow a successful business. Although the ways in

which funding organisations can identify individuals with entrepreneurial talent has already been discussed, more efforts need to be placed into promoting gender equality (De Vita et al., 2013). In particular, encouraging female entrepreneurs to start more enterprising businesses. There are two potential ways to go about this: firstly, increase female entrepreneur's access to funding so that have the resources to invest in more ambitious and expensive ventures. Secondly, increase the social legitimation of female entrepreneurs so that they are perceived as being credible and effective contributors towards growing an EME. This can be achieved through the promotion of relevant role models in the media, and increasing the social capital of female entrepreneurs by developing communities whereby females can offer information, support and advice. It is hoped that by doing so, females may be perceived by financial institutions as less risky, and have the normative support to become an effective entrepreneur.

6.5 *Conclusion*

Entrepreneurship research has received a recent boost in both academic and practical attention, as people increasingly turn to build their own ventures in order to secure flexibility, autonomy and innovation. Nonetheless, the rate at which start-ups fail is extremely high, and academic research remains uninformed while the popular media continues to propagate positive stereotypes of heroic entrepreneurs (Radu & Redien-Collot, 2008). Given that entrepreneurship is a driver of economic, technological and social progress, understanding the antecedents of entrepreneurial achievement can inform practice to minimise failure and maximise society's chances of benefitting from such progress.

This thesis sought to contribute towards this issue by integrating individual difference and situational theories to guide future research efforts, and provide a more holistic understanding of *what* contributes towards entrepreneurial achievement and *how*. Building upon recent developments in trait theory (Ahmetoglu et al., 2011; Frese & Gielnik, 2014), this thesis explored how context interacts with an individual's level of entrepreneurial talent across various levels of analysis: *micro* (e.g. social capital), *meso* (e.g. organisational culture), and *macro* (e.g. cross-cultural variation). Each level of analysis was studied in turn, and found to impact the relationship between individual differences and achievement. Investigating context in an incremental manner using a variety of methodological approaches demonstrated the robustness of this thesis' central hypothesis.

To close, entrepreneurship is an important and developing field of psychological research. It is hoped that the research presented in this thesis inspires further integration of different theoretical approaches in order to secure a more holistic understanding of the antecedents of opportunity identification and exploitation. Doing so may help entrepreneurs become more successful in their attempt to promote change, progress and development.

7 References

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8 Appendix

8.1 Published & Presented Doctoral Research

Journal Publications

Ahmetoglu, G., Klinger, B., **Akhtar, R.**, Leutner, F., & Chamorro-Premzuic, T.

(Submitted). Explaining gender differences in entrepreneurial activity and success: a study of seven developing countries. *Entrepreneurship: Theory & Practice*.

Akhtar, R., & Kang, S. M. (Submitted). The Role of Personality and Social Capital on Intrapreneurial Achievement. *Academy of Management*.

Akhtar, R., Tsivrikos, D., Ahmetoglu, G., & Chamorro-Premuzic, T. (Revised & Resubmitted). The Entrepreneurial Organisation: The Effect of Organisational Culture on Innovation Output. *Consulting Psychology: Practice & Research*.

Invited Book Chapters

Akhtar, R., Ahmetoglu, G., & Chamorro-Premuzic, T. (In Press). The Entrepreneurial Personality: Individual Differences and Social Capital in Work-Related Innovation. In J.C. Kaufman, G. J. Fiest & R. Reiter-Palmon (Eds), *The Cambridge Handbook of Creativity and Personality Research*: 1 – 25. Cambridge, England: Cambridge University Press.

Conference Papers

Akhtar, R., & Kang, S. M. (2015). The Social Networks of Entrepreneurs. *Paper presented at the Sunbelt Social Networks Conference of the International Network for Social Network Analysis, Brighton, UK*.

Akhtar, R., & Kang, S. M. (2016). The Role of Personality and Social Capital on Intrapreneurial Achievement. *Academy of Management. Paper Presentation at*

Academy of Management Annual Meeting, 2016. Anaheim, California.

Akhtar, R, Leutner, F., Thompson, D., & Chamorro-Premuzic, T. (2015). Individual Differences in Intrapreneurial Achievement. *Paper Presented at the International Society For The Study Of Individual Differences Conference, London Canada.*