THE UNIVERSITY OF HULL

A Psychometric Analysis of Nascent Entrepreneurs: Understanding the impact of individual entrepreneurial cognition on the founding and survival of new small businesses.

Being a thesis submitted for the Degree of Doctor of Philosophy in the University of Hull

by

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July 2007
ABSTRACT

This thesis aims to investigate nascent entrepreneurship. Developing a new business is a complex and uncertain process. Different types of individuals react to this uncertainty in different ways. It is argued that cognitive factors play a critical role in the venture creation process and that the cognitive milieu of the individual nascent entrepreneur will impact on the founding process and survival chances of new small businesses. In particular this study investigates how cognitive style impacts on the ability of nascent entrepreneurs to recognise opportunities and develop trading businesses.

The research was conducted assuming a realist ontology and positivist epistemology. A range of validated and reliable psychometric instruments were administered to nascent entrepreneurs from research sites across the UK. A major strength of this research is that it was conducted within the nascent stage reducing the risk of hindsight bias. Following an extensive review of the literature a range of hypotheses were developed and tested. Principally located within the psychological domain the thesis also acknowledges the impact of behavioural dispositions on the founding process.

The findings indicated that cognitive style was not a predictor of nascent entrepreneurship but that it was highly influential on the process of founding new businesses. Both intuitive and analytic nascent entrepreneurs started businesses. There was no difference in the survival rates of the businesses they founded. However the research identified that the process of business formation and survival developed in different ways. Cognitive factors such as self-efficacy and behavioural dispositions such as proactive personality were identified as significant moderators within this process.
Acknowledgements

To all my friends and colleagues at Hull University Business School I acknowledge and thank them for their fabulous support while I have been working on this thesis. I especially wish to acknowledge the kind support and encouragement of my supervisor Prof. Steve Armstrong and also my good friend Sumona Mukhuty for her support when times got tough.

The assistance and guidance of the following people from outside the University of Hull is also gratefully acknowledged.

Chris Allinson
Robert Baron
Robert Blackburn
Tim Clarke
Elizabeth Chell
Micheal Crant
Per Davidsson
George Derbyshire NFEA
Andy Field
Connie Gaglio
John Hayes
Michael Kirton
Gideon Markman
William Pratt Inbiz Ltd
Monder Ram
Neal Roese
Deniz Ucbasaran
David Warner Inbiz Ltd
Paul Westhead

Also gratefully acknowledged is the invaluable assistance of the research sites, New Entrepreneur Scholarship, InBiz Ltd and the business centres without whose time and effort this research would have been impossible.
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1. INTRODUCTION AND BACKGROUND

1.1 Introduction

This thesis is an investigation which endeavours to develop an understanding of the phenomenon of nascent entrepreneurship as a stage in the entrepreneurial life cycle. Specifically the thesis will investigate the impact of entrepreneurial cognition on the nascent entrepreneur and the activities undertaken in the process of business launch. It will attempt to demonstrate how entrepreneurial cognition impacts on the choices that nascent entrepreneurs make and how cognition impacts on the nascent entrepreneur’s identification of opportunities and the development of their business.

Nascent entrepreneurs are distinguished from potential entrepreneurs by a positive action taken by the individual towards initiating an enterprise. In entrepreneurial research nascent entrepreneurship is subject to scrutiny by a relatively small but rigorous body of literature. With the increase of self-employment and freelance working the subject of nascent entrepreneurship is a field ripe for investigation.

However, cognition is not the only influence on the nascent entrepreneur. External, historical and societal influences have all impacted on role and status of the entrepreneur. In order to contextualise the phenomenon of nascent entrepreneurship this background chapter will identify how the concept of entrepreneurship developed. It will identify how culture and politics have shaped our image of entrepreneurship and the entrepreneur. This chapter aims to create a base of knowledge from which the reader can progress into subsequent chapters.
1.2 Background

1.2.1 Historical perspectives

The term 'entrepreneur' is derived from the French word 'entreprendre' to undertake (Redlich, 1949). According to Deeks (1976) the word entrepreneur has had a variety of meanings. In Victorian England the entrepreneur was the manager of a public musical institution, or one who organised or directed entertainments especially musical performance. In France in the fifteenth and sixteenth century champions at arms and the leaders in military expeditions were sometimes referred to as entrepreneurs while in the eighteenth century the term was applied to the undertakers of construction and public works contracts. Bloch and Wartburg (1950) cited in Elkjaer (1991, P805) summarise the history of the word entrepreneur.

"The most general and probably the earliest meaning of the word entrepreneur is celui qui entreprender which means an active person with initiative. The word originates in the verb entreprendre which has a meaning similar to "getting things done".

One of the principle defining traits of entrepreneurship is that of ownership. It was Hawley (1907) who argued that the entrepreneur must be the owner manager in order to obtain an income or profits. Hawley added that without the rights of ownership the entrepreneur would be unable to make the necessary decisions about the allocation and coordination of resources in order to make this possible.

During the nineteenth century Germany produced a number of well respected, influential economic theorists such as J.H von Thunen (1783-1850) and H. K von Mangoldt (1824-1868). They built on the work of the early Physiocrats and contributed to the development of entrepreneurial theory. Their theories were based on the notion that entrepreneurial talent would be scarce and that profit would be a special type of payment. Thunen suggested that the additional return an entrepreneur receives or seeks is based on the
uninsurable risk that they make and that this distinguishes them from the capitalist. Thunen also distinguishes entrepreneurs and managers suggesting that entrepreneurs are likely to feel more responsible for a business than a manager (Chell et al 1991). He also suggested two views of entrepreneurship, one that they were risk takers or bearers and the other that they were innovators. Thunen suggested they could be both. Adolf Riedel (1809-72) extended Cantillon’s theory by suggesting that entrepreneurs reduce uncertainty for others by taking responsibility for it themselves. If they are right they enjoy the profit or surplus, if they are wrong they must bear the loss. Mangoldt cited in Chell et al (1991) was the first economic theorist to make a distinction between goods made to order which would reduce risk and goods made for the market. In this scenario both demand and variable price increase the potential risk of the entrepreneur. He also suggested that the greater the amount of time to the final sale the greater the risk. Chell et al (1991, p19) state:

"Such a distinction may serve to differentiate types of entrepreneur: the former the innovator or inventor, the development of whose product requires a long time scale, the latter the 'opportunistic entrepreneur' who becomes aware of the changes in taste and capitalises on the unforeseen opportunity. He is nevertheless entrepreneurial in that he has to estimate likely demand whereas the innovator or inventor must create demand"

The idea that entrepreneurial activity should include information gathering about the prevalent economic conditions was suggested by Carl Menger (1840-1921), originator of the Austrian school of economics. Menger suggested that it is an individual’s awareness and understanding of the economic situation that gives rise to economic change. Assessments are made to ensure the efficiency of the business process and the likely demand for the products. During this process Menger acknowledges the entrepreneur experiences uncertainty, but does not conclude that risk bearing is an essential function of entrepreneurship.
Following the American civil war Amasa Walker (1799-1875) disassociated the American school of economics from what he saw as confusion between the entrepreneur and the capitalist among British economists. He saw the entrepreneur as a creator of wealth to be distinguished from the capitalist. Francis A Walker (1840-1897) suggested that the conduct of business required special abilities. He argued entrepreneurs would have the power of foresight, abilities of organisation and administration, unusual energy and leadership qualities (Chell et al 1991). Walker argued that profit was the return an entrepreneur expected for the application of their skill, ability and talent. He identified four types of entrepreneur. These were referred to as: the rare gifted person, those with high ordered talent; those who do reasonably well in business and the ne'er-do-well (Chell et al 1991).

"The characteristics he identified with each type are also of interest. The rare, gifted person has the power of foresight, is firm and resolute even in the face of disaster, and is able to motivate and lead others. Persons with a high-ordered talent have a natural mastery; they are wise, prompt and resolute. Those who do reasonably well in business tend to do so through diligence rather than flare or genius, whereas the ne'er-do-wells have perhaps misidentified their vocation and, consequently, they suffer mixed fortunes" (Chell et al, 1991, P20)

It may or may not be true that entrepreneurial inclinations are a part of a person's unique psychological construction. But how in a feudal state these inclinations can be made manifest is a moot point. This section will look at entrepreneurial evolution from the perspective of the immediately pre-industrial and industrial society.

1.2.2 Evolution of entrepreneurial behaviour

Evolution involves change at a societal level. It is a movement from one situation to another and the replacement of the prevailing dominant elite with another (Smith 1967). Thus it was in Britain in the 17th and 18th centuries as the country moved from an agrarian...
stable society to a more mobile industrial one. This created new technologies and new opportunities that challenged the existing holders of power. During this period entrepreneurs and other rising social groups were engaged in a fight for social recognition and acceptance for a position in society. Entrepreneurs deviated from the well ordered society and had to overcome resistance of those people whose personal security were identified with the old methods of production Bendix (1956).

William Cobbett a 19th century author and commentator emphasised the humble origin of many early entrepreneurs. He also attributed their sudden rise to their cruel treatment of those beneath them and their desire to add distance between social classes. Bendix (1956) suggests that it is possible that the extraordinary effort required of the craftsmen or yeoman in developing his business made him ruthless in the treatment of his workers.

Who were the first entrepreneurs? It is true that most of the early manufacturers did come from the working or lower-middle classes. Many of the major industrial developments took place in the textile industry. At this time the industry required comparatively little capital so it was within this industry that entrepreneurs from more modest backgrounds could prosper. Bendix (1956 P24) calls the textile trade one in which “men of determination could establish themselves regardless of the unfavourable circumstances of their early life”. Gaskill (1833 P45) noted “men who did establish themselves were raised by their own efforts- commencing in a very humble way and pushing their advance by a series of unceasing exertions, having very little capital to begin with, or even none at all save that of their own labour”. Bendix (1956) notes that in industries such as iron or coal which required more capital than the textile industry access was more restricted.
Smith suggested that a significant change in society seems typically to involve a moving disequilibrium between an elite group and a deviant marginal class. Smith (1967) continues that although this class is deviant in the sense that it is viewed by many as corrosive of traditional values and marginal in the sense that it is by a miscellaneous array of resistances it nevertheless must possess sufficient resources both to resist annihilation and to exact a continuous pressure for change, Smith (1967).

"alienated from traditional values...creative,...(and) under inner pressure to prove to themselves their own worth,...(found) economic prowess through entrepreneurial ingenuity...a promising...channel" Hagen (1962)

In Britain people who felt marginalized by the mainstream of the ruling society initiated entrepreneurial evolution. In early America, the early industrialists were the same non-conformists that had emigrated from England. In Tsarist Russia, at the time still fundamentally a feudal state, the landed aristocracy were so opposed to the idea of entrepreneurship that central government had to intervene in order that small areas of enterprise exist (Bendix 1956).

Two types of deviance can occur in entrepreneurial evolution. That brought about by the individual and is non governmental. Smith (1967) calls this private entrepreneurship. The other deviance that is encouraged or necessitated by the powerful elite Smith calls political entrepreneurship. Entrepreneurship developing outside the institutions of power must develop slowly and the more marginal the activity the more slowly it must develop. Operating outside what are considered the societal norms the entrepreneur must become unobtrusive and quiet. When opportunities and openings occur, testing the water, being prepared to withdraw and alter plans if the hostilities of the prevailing holders of power begin to assert itself (Smith 1967).

"It is inherent in deviance operating outside the bosom of power that it must move cautiously-on sufferance, as it were. Thus it is constrained to proceed
tentatively, and the greater the marginality of the activities involved the more slowly they must develop.” Smith (1967)

For individual enterprises to develop there needs to be a period in which the holders of power remain outside the evolutionary process. At some point the political urgency of the holders of power always intervenes. However, the extent to which individual enterprise has developed before this happens will affect the relationship the two have. This relationship can still be detected today and still influences the society’s views of entrepreneurship across nations and cultures (Smith 1967).

The tentative development of individual enterprise does not occur when there is an intervention from the holders of power. There is no longer a need to develop subtle strategies and vary plans. The power of the elite is both deliberate and absolute. The power of opponents is decreased and the result is a speeding up of change. This is usually initiated by some political urgency. This political entrepreneurship does not necessarily have a negative effect on private enterprise (Smith 1967).

The attitudes of the political elite will also affect individual entrepreneurship. If the attitude of the political elite is negative and sufficient time has not elapsed to include private businessmen in the power structure then the damage to private initiative will be maximised. If the attitude is that of benign indifference then this is likely to encourage tentative entrepreneurship. If private entrepreneurship enters the power structure then any effects of hostile attitudes can be negated and diluted (Smith 1967).

1.2.3 The modern entrepreneur

Kilby (1971) used an analogy from children’s literature to describe the search for a definition of the entrepreneur. The Heffalump is a mythical creature that appears in the
Winnie the Pooh books by A. A. Milne. The Heffalump is a large important animal that lives in Hundred Acre Wood. Everyone reports having seen it although all describe it differently. “Not having explored his current habitat with sufficient care, some hunters have used as bait their favourite dishes and have tried to persuade people that what they caught was a Heffalump. However, very few are convinced, and the search goes on” (p1). This analogy has become part of the folklore in entrepreneurial research.

In his article Kets de Vries (1977) suggests an almost mythological view of the modern entrepreneur. Kets de Vries (1977) in a slightly tongue-in-cheek way sees entrepreneurs as the modern equivalent of the heroes of ancient Greek legends and fables. He sees Prometheus and Odysseus of Greek legend replaced by the entrepreneur, folk hero of the industrial world. Kets de Vries (1977 P1) appears to suggest that the individualism shown by entrepreneurs and their association with venturing and prospecting makes the entrepreneur an heroic pioneer.

“He has become the last lone ranger, a bold individualist fighting the odds of the environment. He is that individual who after enduring and overcoming many mishaps, trials and business adventures finally seems to have ‘made it’. But frequently there is an epilogue added to these fairy tale endings whereby the ‘and lived happily ever after’ theme is missing. As in Greek myths success may lead to hubris or excessive pride and might come to fall. And as we can see in the case of many entrepreneurs success is a very fragile state, easily followed by failure”

Papanek (1962) suggested five propositions about entrepreneurship.

1. The industrial entrepreneur is a distinct personality type. At the least he must believe that change is possible and can be brought about by individuals and he must be motivated to action bringing it about.

2. Within any society only a limited number of individuals have entrepreneurial attributes in sufficient degree to be actual or potential entrepreneurs.

3. These individuals do not act entirely or even from pecuniary motives, for instance they may try to achieve recognition in the economic sphere because no other areas are open to them.
4. A significant number will turn from potential to actual entrepreneurship only if the non-economic obstacles they face are not too severe. Among such obstacles are a lack of security for person or property.

5. Entrepreneurs must be able to obtain command over resources by obtaining credit or by other means.

As previously discussed entrepreneurship is a phenomenon that can be studied from the perspective of a number of disciplines. It could be argued that Papanek's propositions are very general and that entrepreneurship is more complex than a set of generalities can accommodate.

Papanek concludes that the scarce factor in the development of entrepreneurship is the ability to make decisions. In developing countries change is considered possible either only at the expense of others or only if the whole group changes. In either situation individual ability to make entrepreneurial decisions is surely limited. Papanek makes a compelling argument that to become a nascent entrepreneur you really do need to be able to take that individual risk. It is considerably more difficult for people who have responsibilities to provide for a family or who have greater interdependence with other people. McGrath et al (1992) commented that not all people become entrepreneurs and that a higher proportion of people become entrepreneurs in some countries than in others. They argue that cultural values play an important role in accounting for those differences.

Kets de Vries (1977) argued that students in entrepreneurship usually define the entrepreneur as the individual instrumental in the conception of the idea of the enterprise and instrumental in the implementation of these ideas. In this process the entrepreneur fulfils a number of functions which can be summarised as innovation, management co-ordination and risk taking. Schumpeter (1965) concluded that entrepreneurship essentially
consists in doing things that are not generally done in the ordinary course of business routine.

Deeks (1976) argues that Schumpeter’s entrepreneur is an ideas man and a man of action who possesses the ability to inspire others and who does not accept the boundaries of structured solutions. The entrepreneur is a catalyst of change able to carry out new combinations of work. They are instrumental in discovering new opportunities that makes for the uniqueness of the entrepreneurial function. Schumpeter (1965) argues that an individual is only an entrepreneur if he implements new combinations and variations of work outside the scope of everyday management. When he then continues to manage the founded enterprise systematically he loses this entrepreneurial characteristic. For Schumpeter entrepreneurship is less about ownership and more about pioneering actions. Brockhaus and Horwitz (1986) discuss the theories of Schumpeter when they conclude that Schumpeter recognises that an entrepreneur’s challenge is to find and use new ideas. They suggest the range of possible alternatives include:

1. Developing new products or services.
2. Developing new methods of production.
3. Identifying new markets.
4. Discovering new sources of supply and developing new forms of organisations.

Kirzner (1982) argues that the identification of new market opportunities is the fundamental function of the entrepreneur. Basle (1998) suggested that successful entrepreneurs would display certain traits of personality. Leibenstein (1968) defined the entrepreneur as an individual or group of individuals with four major objectives: he connects different markets, he is capable of making up where the market is deficient (gap
filing) he is an input completer and he creates or expands time-binding, input-transforming entities, (i.e. Firms).

Brandstatter (1997) refers to the concept of the entrepreneur as ‘fuzzy’. He concludes that this is not only the case in terms of ordinary language but also within scientific literature and among the business community. He refers to a study carried out in Austria in which subjects from a random sample of the population were asked who an entrepreneur was, the study characterised entrepreneurs as determined by:

1. Ownership
2. Decision-making power
3. Leadership
4. Size of company
5. Active participation in management.

There was a clear difference in the responses of the general public and in the business community when asked if the employed managing director of a medium sized shoe manufacturer was an entrepreneur. Only 15% of the general population said yes, while 54% of the business community said yes.

1.2.4 Defining entrepreneurship

Defining entrepreneurship has proven to be one of the most difficult tasks the discipline has faced. This has not been helped by taxonomical complications that have sought to define entrepreneurship in broad and narrow terms and have confused the terms enterprise and entrepreneurial (Llewellyn et al, 2003). Shane and Venkataraman (2000) argue that a lack of a definition of the entrepreneur is an obstacle to effective research into the entrepreneur. Bygrave and Hofer (1991) state that the lack of a definition of the
A Pryt'hometrit' AnalYsis ojNast'ent' roners: Understanding the impact of individual entrepreneurial cognition on the founding and survival of new small businesses.

entrepreneur places a responsibility on the researcher to clearly state what they mean when they use the term.

From the earliest days of entrepreneurial study academic researchers have been trying to define entrepreneurship and the entrepreneur notably in an attempt to define what characteristics or what traits differentiate the entrepreneur from other people. Many early studies focused on what characteristics differentiate the entrepreneur from the manager. Mill (1848) suggested the entrepreneur could be defined by the bearing of risk. This view was rejected by Schumpeter (1934) who suggested that risk is a feature of all business activity and that the bearing of risk was insufficient to act as defining characteristic in itself to differentiate the entrepreneur from business owners and managers.

It was Schumpeter's view that innovation was central to the definition and actions of the entrepreneur. Entrepreneurs would always be seeking new solutions and new opportunities. The Schumpeterian view was that an individual becomes an entrepreneur only when engaged in innovation and that defining entrepreneurship in terms of ownership of an enterprise is wrong. Therefore over a cycle of business there will be times when a person is or is not an entrepreneur depending on the work they are doing. However in a similar way to Mill's description of the entrepreneur it could be argued that Schumpeter's definitions could also be attributed to managers and owners and adequately describes the behaviour of the intrapreneur. The intrapreneur assumes many of the characteristics and behaviour of the entrepreneur but does so within the established framework of an existing organisation of which they are not the owner. (Deeks 1976) suggests that the entrepreneur is someone who is good at reacting to changes in the business environment. They will create flexible and innovative responses to situations though a mixture of modification and adaptation of old and new strategies.
Most of the attempts to differentiate between entrepreneurs and small business owners or managers have found no significant differentiating features. Brockhaus and Horwitz (1986 P42) concluded that “the literature appears to support the argument that there is no generic definition of the entrepreneur, or if there is we do not have the psychological instruments to describe it at this time”. Gartner (1988 P11) clearly states that he believes that “entrepreneurship is the creation of organisations” and that asking why do some individuals and not others start businesses is the wrong question. The question why are some people entrepreneurs is being answered with who is an entrepreneur. “I believe the attempt to answer the question who is an entrepreneur, which focuses on the traits and personality characteristics of entrepreneurs will neither lead us to a definition of the entrepreneur nor help us to understand the phenomenon of entrepreneurship.” Gartner (1988 P12).

Deeks (1976) suggests that the search for a general theory of the entrepreneurial function is one that is pursued by psychologists, sociologists, anthropologists as well as economists. All are trying to analyse and predict the behaviour of the entrepreneur, in search of the “genius entrepreneur” (McConnell 1971). There was a school of thought particularly prevalent in the 1980s that entrepreneurial capacity is as a result of personality traits. That being an entrepreneur is who you are, “once an entrepreneur, always an entrepreneur”. Supporters of the personality trait argument suggested that the entrepreneur is distinguishable and can be identified by key personality traits such as need for achievement (McClelland 1967) or locus of control (Rotter 1966). This approach suggests that if you find a person with all these personality traits then that person will be an entrepreneur. Gartner (1988) dismisses this ‘it’s who you are not what you do’ approach. Jenks (1950) and Kilby (1971) encouraged the view that research should move away from the personality approach towards behaviour and activities.
Gartner (1988) acknowledges that it is difficult to break away from a belief that entrepreneurs are special people who are doing extraordinary things. Something within the psyche of researchers and the public alike want entrepreneurs to be special or at least different. Mitchell et al (2002) noted in entrepreneurship research the idea that the entrepreneur as an individual is somehow unique and a member of a homogeneous group has persisted. Despite numerous studies that have all proved inconclusive researchers still strive to discover that key magic ingredient that goes to make an entrepreneur.

Vesper (1982) said he thought the study of “the entrepreneur is actually one step removed from the primary phenomenon of entrepreneurship, the creation of organisations”. In Vesper’s view the entrepreneur is only an intricate and interdependent set of variables that determine if a new organisation will be created. Gartner (1995 P21) stated “The personality characteristics of the entrepreneur are ancillary to the entrepreneur’s behaviours. Research on the entrepreneur should focus on what the entrepreneur does and not on who the entrepreneur is”.

Carland et al, (1984 P 358) give two separate definitions of the entrepreneur and small business owner.

Small business owner: A small business owner is an individual who establishes and manages a business for the principal purpose of furthering personal goals. The business must be the primary source of income and will consume the majority of one’s time and resources. The owner perceives the business as an extension of his or her personality, intricately bound with family needs and desires.

Entrepreneur: An entrepreneur is an individual who establishes and manages a business for the principal purposes of profit and growth. The entrepreneur is characterised principally by innovative behaviour and will employ strategic management practices in the business.

Gartner (1988 P 24) is highly dismissive of these definitions. “When you define small business owners as having a business which is their primary source of income and will consume the majority of their time, do you not thereby imply that entrepreneurs start organisations that will not occupy the majority of their time and resources? (Are we to assume that the entrepreneurs are
off spending the majority of their time pursuing personal goals, which by definition, cannot be related to their organisations?"

Chell et al (1991) also believes that the classifications of entrepreneurial and small business owner behaviour suggested by Carland et al (1984) have many deficiencies but believes that the discussion raised highlights certain behaviours characteristic of entrepreneurs, which are likely to be:

1. A propensity to create business organisations.
2. Proactively scan business environments in search of new business opportunities.
3. Seek innovative solutions to problems and opportunities.
4. Take an autonomous and strategic role in identifying, marshalling, and organising resources to convert opportunities into marketable goods or services.
5. Vigorously strive to achieve profit and business growth.
6. Be willing to bear risks associated with behaviour.

Cromie (2000) suggests that on the basis of a review of the literature and research on the entrepreneurial personality, that entrepreneurs are opportunistic, innovative, creative, imaginative, ideas-people, proactive, restless, adventurous and agents of change. They also adopt a broad financial strategy. Cromie (2000) goes on to suggest that although entrepreneurs and enterprising people will exercise their skills in different contexts and pursue different goals it seems plausible they will have similar attributes.

1.2.5 Synthesis of research on the definitional debate

Table 1.1 (page 19) illustrates the main contributions to the debate on defining the entrepreneur. Schumpeter (1965) maintained that innovation was central to the role of entrepreneurship. He believed that it was the role of the entrepreneur to find and use new ideas. Schumpeter felt that this could be in the sphere of developing new products, new production methods, new markets or sources of supply. Kets de Vries (1977) defines the entrepreneur as the individual instrumental in the conception of the idea of the enterprise and the implementation of these ideas. Collins and Moore (1970) distinguished between builders of organisations and those who perform entrepreneurial functions within
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organisations. Kirzner (1982) however feels that the identification of new market opportunities is the key function of the entrepreneur. Leibenstein (1968) talks about four major objectives of the entrepreneur, connecting different markets, market “gap” filling, input completer and the creation of businesses. Basle (1998) listed a whole string of personality traits ranging from customer-focus, goal driven, to orientation towards the future, all as characteristics of entrepreneurship. Brandsatter (1997) in his study of the perceptions of entrepreneurship defined ownership as, decision-making power, leadership, size of company and active participation in management. Litzinger (1965) made a distinction between entrepreneurs who were action oriented and contrasted this with managers who carry out policies and procedures. Deeks (1976) suggests the entrepreneur is someone who is good at reacting to changes in the business environment, creating flexible innovative responses to situations through a mixture of modification and adaption of old and new strategies. Like Leibenstein, Gartner (1988) believes entrepreneurship is about the creation of organisations, as does Vesper (1982) and Draheim (1972). He refers to the primary phenomenon of entrepreneurship being the creation of organisations. To a greater or lesser extent all these authors see a definition of entrepreneurship from a behavioural perspective. Other authors have concentrated on more personality driven approaches.

Olk and Elvira (2001) argue that because an entrepreneur holds power, they can be defined by their autonomy of action. Brockhaus and Horwitz (1986) suggested that an entrepreneur is self-motivated and that they do not blame external forces for the events in their lives. They believe their destiny can be shaped by their own efforts and abilities. This is locus of control theory first put forward by Rotter (1966). Bateman and Crant (1993) refer to the proactive personality and suggest that it is one that is relatively unconstrained by structural forces and that affects environmental change. Swayne and Tucker (1973) refer to ‘action
orientation.' McClelland (1961) saw the need for achievement as a strong psychological need for the entrepreneur. His research concludes that individuals with a greater need for achievement have a strong desire to be successful. These conclusions were born out by Hornaday & Aboud (1971), Begley and Boyd (1986) and Wainer and Rubin (1969).

McClelland also suggests that risk bearing is also a key psychological trait of the entrepreneur this is supported by Brockhaus (1980). However, more recent research has suggested that risk-bearing is a trait in all business ownership not just entrepreneurship (Carland et al 1984), a view supported by Shultz (1980). For the early authors Cantillon (1755) and Mill (1848) leadership and power, responsibility (Ely and Hess, 1937) and the exercising of those functions were definitions of the entrepreneur.

A complicating issue in the development of a valid measure of entrepreneurship is the absence of an established definition of the term according to Carland et al (2002). These authors argue that “our review of the literature leaves us to conclude that entrepreneurship is primarily a gestalt of four main elements, cognition, preference for innovation, risk-taking propensity and strategic posture. The authors hypothesised that these elements combine in an individual’s psyche to produce a drive to create entrepreneurial ventures”. Timmons (1989) described entrepreneurship as “… the ability to create and build something from practically nothing. It is initiating, doing, achieving and building an enterprise or organisation, rather than just watching, analysing or describing one”. Hebert and Link (1988) defined the entrepreneur as “someone who specialises in taking responsibility for and making judgemental decisions that affect the location, the form and the use of goods, resources or institutions”. Hebert and Link (1988) attempted to produce a taxonomy of entrepreneurial theories, and concluded twelve themes.

1. The entrepreneur is the person who assumes the risk associated with uncertainty
2. The entrepreneur is the person who supplies financial capital
3. The entrepreneur is an innovator
4. The entrepreneur is a decision-maker
5. The entrepreneur is an industrial leader
6. The entrepreneur is a manager or superintendent
7. The entrepreneur is an organiser and co-ordinator of economic resources
8. The entrepreneur is the owner of the enterprise
9. The entrepreneur is an employer of factors of production
10. The entrepreneur is a contractor
11. The entrepreneur is an arbitrageur (a reseller of goods at increased profit)
12. The entrepreneur is an allocator of resources among alternative uses

(Chell 1991)

Shane and Venkataraman (2000) believe that entrepreneurial activity requires two individual phenomena to exist at the same time; lucrative opportunities and the presence of enterprising individuals. Shane and Venkataraman argue that defining the entrepreneur as a person who establishes a new organisation fails to account for the quality of the opportunity the individual identifies. They make a distinction between an opportunity existing and the realisation of opportunity as a differentiator between entrepreneurs and non-entrepreneurs. They see entrepreneurship as the study of how, by whom and with what effect opportunities are created, focusing on the processes of discovery, evaluation and exploitation of opportunities; and the individuals who discover, evaluate and exploit them.
A Psychometric Analysis of Nascent Entrepreneurs: Understanding the impact of individual entrepreneurial cognition on the founding and survival of new small businesses.

Table 1.1 Synthesis of research on the definitional debate

<table>
<thead>
<tr>
<th>Entrepreneurial traits and characteristics</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Innovation</td>
<td>[1], [2], [6], [13], [17], [25]</td>
</tr>
<tr>
<td>2 Internal Locus of Control</td>
<td>[12], [14], [15], [17]</td>
</tr>
<tr>
<td>3 Need for Achievement</td>
<td>[8], [18], [19], [29]</td>
</tr>
<tr>
<td>4 Venture Creation</td>
<td>[3], [13], [7], [11], [9], [26], [28]</td>
</tr>
<tr>
<td>5 Risk-Bearing</td>
<td>[20], [21], [22], [10], [1]</td>
</tr>
<tr>
<td>6 Ownership, Leadership &amp; control</td>
<td>[4], [5], [20], [21], [23], [24], [27], [30]</td>
</tr>
</tbody>
</table>

Key to References:
- [1] Schumpeter (1965)
- [13] Leibenstein (1968)
- [16] Swayne & Tucker (1973)
1.2.6 Entrepreneurial traits and characteristics

The lack of a universally accepted definition of the entrepreneur presents the researcher with a potentially troublesome dilemma. How can the researcher be assured within a myriad of definitions that the samples of the population they choose to research truly are entrepreneurs? A literature search was conducted which developed from the work in the previous section on the definitional debate. In total six categories of traits and characteristics were identified which are supported by a wide range of authors as illustrated in table 1.1. These broad areas of commonality led to the creation of six filtering questions. These were developed for use within the empirical research to ascertain if respondents were entrepreneurs. Venture creation was considered so important in defining the entrepreneur for this thesis it was a requirement that all established entrepreneur respondents had launched their own business. Therefore, five of the six categories can be described as traits or characteristics and a justification for their inclusion is summarized below.

1.2.6.1 Leadership and control

The first category was identified as leadership and control. The ability to offer leadership and control has also been cited as an entrepreneurial trait, (Basle 1998; Brandstatter 1997; Mill 1848; Cantillon 1755; Olk & Elvira 2001). Chell et al (1991) talked about the entrepreneur having an autonomous and strategic role in identifying, marshalling and organising resources. Hornaday and Aboud (1971) talk of entrepreneurs displaying independence and effectiveness in leadership. Bennis and Nanus (1985) identified leadership qualities displayed through vision, communication, trust and positive self-regard. Successful leaders “operate on the emotional and spiritual resources of the organisation, on its values, commitment and aspirations” (Bennis and Nanus 1985 P92). Witt (1998) suggest that entrepreneurial leaders will have a greater tendency towards informal communication.
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systems, using eloquence, persuasiveness patience and persistence to influence a group, which is an important condition for success. Stewart et al (1998) noted that balanced work teams also appear to improve the chances of entrepreneurial success.

1.2.6.2 Risk

Defining entrepreneurship by the propensity to take risk (Mill 1848; Cantillon 1755; Shultz 1980; Carland et al 1984) is a controversial area of study. Although within the synthesis of research it was prominent. Risk taking propensity is an individual's orientation towards taking chances in decision-making (Sexton & Bowman, 1985). Research is inconclusive; Brockhaus (1976) found significant differences between entrepreneurs and the general population. However, Brockhaus & Horwitz (1986) found it did not distinguish successful and unsuccessful entrepreneurs. Begley and Boyd (1987b; Hull et al 1980) identified that founders show higher risk-taking propensity than owners not involved in start-up. Palich and Bagby (1995) contend that entrepreneurs have no greater propensity to bear risk than non-entrepreneurs. Instead they suggest that differences in cognitive style enable entrepreneurs to categorise and frame stimuli differently. Entrepreneurs are more optimistic in their assessments of business situation, Cooper Woo and Dunkelberg (1988). This view is supported by Simon, Houghton and Aquino (2000) who favour the idea of perception of risk rather than propensity for risk. In later sections notions of risk and perceptions will be seen to be important in the recognition of opportunities and in individual self belief.

1.2.6.3 Locus of control

Locus of control is interesting because it is generally seen to be a cognitive trait. McNerny (1994) suggests that entrepreneurs are self-motivated and directed people. Bateman and Crant (1993) refer to the proactive personality and Swayne & Tucker (1973) 'action orientation. McNerny (1994) goes on to suggest that entrepreneurs do not blame external
forces for events in their lives but that they believe they control their destiny based on their own efforts and abilities. Brockhaus and Horowitz (1986) refer to this as locus of control and is an idea given wide attention in entrepreneurial literature, (Shaver and Scott, 1991).

Locus of control theory is most readily associated with the Internal-External Locus of Control Scale promulgated by Rotter (1966). Rotter described internal locus of control as symptomatic of intuitive, entrepreneurial behaviour. People displaying an internal locus of control believe that their future is in their own hands and that their own positive actions will result in positive outcomes. Criticisms have been made of using the broadly based I-E scale on entrepreneurs (Shaver & Scott, 1991; Gatewood et al, 1995).

Brockhaus (1982) calls locus of control and important entrepreneurial dimension. Locus of control is an aspect of cognitive style that illustrates the extent to which individuals feel in charge (Gibb, 2000). Langer (1983) discusses the idea of illusion of control in which the expectancy of personal success was higher than the objective probability would warrant, (Schwenk, 1986). In a similar vein the perceived personal ability to execute a target behaviour or self-efficacy is the attribution of personal competence and control in a given situation, Kruegar & Brazeal (1994). Individuals who demonstrate self-efficacy see setbacks as learning experiences. Kruegar and Brazeal link self-efficacy with reduced threat rigidity, risk perception and behavioural rigidity. The concept of self-efficacy is discussed in greater detail in section 2.5.

1.2.6.4 Need for achievement

Achievement motivation was first defined by Murray (1938). (McClelland 1961) saw the need for achievement as a strong psychological need for the entrepreneur. The stronger the need for achievement the stronger the desire to be successful. McClelland (1961) suggested that the achievement motive should lead individuals to seek moderate challenges to their
skills and to perform better in such situations. They would have a greater confidence in the likelihood of success; be conservative when things are beyond their control and happier when they can influence outcomes. The achievement motive should not lead them to perform better when they are working for themselves than when they are working for a group and that they value money not for itself but as a measure of success. Brockhaus and Horwitz (1985) conclude that although not a unique feature of entrepreneurs alone nevertheless entrepreneurs are high achievers. Shaver & Scott (1991) postulated that need for achievement was the only variable whose association with new venture creation appeared convincing. Hornaday and Aboud (1971) found that compared to men in general entrepreneurs are significantly higher on scales reflecting need for achievement; independence and effectiveness of their leadership. They are low on scales reflecting emphasis on the need for support. Koh (1996) argues that entrepreneurs irrespective of race have a high need for achievement. They will display an internal locus of control. A moderate orientation towards risk taking, a high tolerance of ambiguity, a good deal of self-confidence and are innovative. Stewart et al (1999) believe that achievement motivation may also influence the viability of an organisation.

1.2.6.5 Change, innovation and creativity

Stevenson & Jarillo (1990) contend that entrepreneurship is about the pursuit of opportunity; that entrepreneurial activity is initiated where an unexploited opportunity exists. This is a result of an imbalance between the potential of something new and the realisation of that potential. Brazeal and Herbert (1999) argued that external environmental change can be the impetus for initiating the entrepreneurial process. They continue that important characteristics of the entrepreneurial process include; a unique change of state: dynamism; and human volition. Hisrich and O’Brien (1982), state that potential
entrepreneurs must have an entrepreneurial mindset that enables opportunity recognition. They must perceive entrepreneurial activities as being both desirable and feasible. Brazeal and Herbert (1999) argue that change is generally considered to be a precursor or antecedent to the entrepreneurial event. They identified three stages of change firstly at a macro level in which external or environmental change. It is at this stage that major transformations in the fundamental conditions of organisations and individuals exist. Such transformations will occur as a result of significant technological breakthrough, economic volatility and the imposition of regulation or deregulation on a market. It was the deregulation of the telecommunications market that facilitated the growth of the Internet and the relative slowness of this deregulation in Europe that allowed the United States to dominate the Internet, Waesche (2003). Secondly intermediate change occurs as a result of the impact of an intervention between the individual or organisation and the environment. Thirdly they refer to internal or micro change these changes represent the alterations in organisational operations and individuals behaviours that are needed to react to intermediate or environmental changes. Brazeal and Herbert (1999) suggest that it is the reaction of the individual or organisation to the challenges of these differing levels of change that is fundamental to entrepreneurship. Through the development of alternative products or services that are made potentially useful as a result of changes at the macro level. Cromie (2000) argues that uncertainty is part of the entrepreneurial world. Decisions frequently have to be made with incomplete information. He argues that this lack of clarity creates a tolerance of ambiguity. Sexton and Bowman (1995) suggest that entrepreneurs must have considerable tolerance of ambiguity. The ability to cope with change is also linked with innovation and the notion of risk bearing.

Innovation is seen as a key characteristic of entrepreneurship (Schumpeter 1934; 1965, Hornaday and Aboud, 1971, Kirzner 1982, Deeks 1976, Bateman and Grant, 1993, Carland
et al 2002). Schumpeter (1934) defines entrepreneurship with innovation. He argues that the entrepreneur should always be searching for new solutions and new opportunities. Schumpeter believed that people were only entrepreneurs while they were innovating. Once they ceased innovating they became managers. Swayne & Tucker (1973) suggest that entrepreneurs are orientated towards innovation. A successful entrepreneur will monitor their environment and be open to adopting innovative solutions that are necessary to adapt the organisation, Welsch & Young (1982). They argue that enterprising people develop new ideas, spot market opportunities or combine existing ideas and resources in different ways to create additional value. Schumpeter (1934) rejected this view suggesting that risk is a feature of all business activity and that this was insufficient in itself to differentiate the entrepreneur from business owners and managers. The literature reflects a belief that the nature of the entrepreneur and the small firm produce an environment particularly suitable for innovation to flourish, Hyrsky & Tuunanen, (1999).

Innovation is part of the gestalt of entrepreneurship referred to by Carland et al (2002) and one of the key distinguishing features that differentiate the small business-owner from the entrepreneur, (Carland et al 1984). Herbert & Brazeal (1999) call innovation the successful implementation of creative ideas and that like change innovation can be seen as either an outcome or a process. Innovation is the tangible product, service or knowledge that may be utilized in diverse contexts by differing individuals. Creativity is the process through which innovation occurs.

Woodman, Sawyer & Griffin (1993) consider creativity to be a subset of innovation. Innovation is symptomatic of people displaying an intuitive cognitive style in situations of organisational change some people adapt and others innovate. Innovative people break patterns of accepted modes of thought and actions, Kirton (1976). Herbert and Brazeal
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(1999) view creativity as a process that mediates the potential offered by external or environmental change and the entrepreneur's innovative response to the opportunity. In this view the creative process is the origin of innovation which sets in motion a series of events leading to the entrepreneurial event. Creativity is a variable in its degree of creativeness. This is measured by the degree to which the innovation is a radical departure from its antecedents or predecessors.

The search for entrepreneurial personality traits has proved controversial and at times results have proved disappointing. This has led some authors (e.g. Gartner 1986) to suggest that other approaches for studying the entrepreneur should be considered. By the late 1980's the study of entrepreneurship reached a crossroads. In a seminal work Low and McMillan (1988) identified a range of recommendations for the future of entrepreneurial research. The following section 2.1 entitled current perspectives on entrepreneurial research is a synthesis of published work since the work of Low and McMillan directly related to identifying current trends and approaches in entrepreneurial research. Many of the conclusions from the next section 2.1 will directly influence the content, strategy and design of this thesis.

1.2.7 Chapter conclusions

In chapter one, this thesis has promulgated concepts for the development of entrepreneurship. One of the overriding arguments developed through chapter one is that of entrepreneurs as people who are not content with the status quo, or people who are marginalised to live on the periphery of society (Smith 1967, Bendix, 1956). These people seek or are forced to live outside the societal norm. The entrepreneurs we observe from chapter one are not rebellious people and they operate within the law yet somehow they operate outside conventionality. This chapter demonstrates how the development of
society and changes in political philosophy which led to the creation of the modern industrial world also assisted in developing the notion of entrepreneurship. By the early 18th Century fundamentals had been created and the political and societal changes that would be required to allow entrepreneurship to flourish within the UK had been established. National political and societal differences led to an imbalance in entrepreneurship across nations. In modern entrepreneurship differences occur in entrepreneurial activity among nations and peoples.

Later sections of chapter one discuss modern perspectives on entrepreneurship. In the years since the Second World War interest in entrepreneurship has increased significantly. Academic researchers and governments have become interested in understanding entrepreneurship. Many governments now seek to investigate, understand and support entrepreneurial activities. This has led to a great deal of research to understand the phenomenon and search for a universally accepted definition of the phenomenon.

Modern perspectives on entrepreneurship were also reviewed and definitions suggested in an effort to increase understanding and create a base of knowledge for the reader to take forward into subsequent chapters. In the 1970s and 1980s research focused on the search for the definable traits of the entrepreneur. Contemporary research has moved away from research into traits and the entrepreneurial personality (Gartner 1988, 1989). Although Hisrich (2000) suggests that the study of characteristics and personality from a psychological perspective has furthered entrepreneurial research. Researchers hope (Ucbasaran et al, 2001) that with the introduction of more specific and rigorous instruments research into areas such as cognition can develop further understanding of the discipline. It is to this search that subsequent chapters of this thesis are dedicated.
2.0 REVIEW OF THE LITERATURE

2.1 Current perspectives on entrepreneurship research

In a seminal work that altered the direction of entrepreneurship research Low and McMillan (1988) considered entrepreneurship to be a multifaceted phenomenon cutting across many disciplinary boundaries. They argue this led to research conducted around a wide range of purposes and objectives, different questions, different units of analysis, theoretical perspectives and methodologies. The authors suggested that it is this inconsistency of approach that was reflected in the many and varied definitions of entrepreneurship. They contended that the problem with definitions of entrepreneurial activity is that none of them capture the whole picture. They argued that the phenomenon of entrepreneurship can be intertwined with a set of complex interdependencies such as management of change, innovation, technological and environmental turbulence, new product development, small business management, individualism and industrial evolution. They further argued that the phenomenon can be investigated from a variety of disciplines each operating within their own concepts and own terms of reference.

Low and McMillan (1988) produced a number of recommendations for researchers in entrepreneurship that set a standard in entrepreneurial research for the next ten years:

1. Research must have a clear statement of purpose; this purpose should explain and facilitate the role of new enterprise in furthering economic progress.

2. The research should have a theoretical perspective; theoretical assumptions should be clearly stated and additional theoretical perspectives explored.

3. The research should have focus, be contextual or process orientated not merely a document of the entrepreneurial phenomenon.

4. Conduct multi-level analyses that give a richer understanding of the entrepreneurial phenomenon.
5. Employ a wider time frame in research.

6. Methodology, develop priori hypotheses these assist modelling and experimental research.

The authors state that they understand that it may be unrealistic to incorporate all their recommendations in every research design and they accept that a trade-off is sometimes required in research. They do however suggest that by using these conclusions insightful results will be forthcoming. Low and McMillan’s work has impacted on a great many notable authors within the discipline of entrepreneurship. It can be seen in many ways as a foundation on which subsequent research including this thesis was developed.

Table 2.1 Low & McMillan Future challenges for entrepreneurship research

<table>
<thead>
<tr>
<th>Research Design Decisions</th>
<th>Past Research</th>
<th>Model Researches and Future Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specification of purpose</td>
<td>Little clarity, descriptive, lack of unity.</td>
<td>Clearly stated, explanatory, further economic progress.</td>
</tr>
<tr>
<td>Specification of theoretical perspective</td>
<td>Weak theory development, implicitly assuming strategic choice.</td>
<td>Theory driven, clearly stated assumptions, variety of theoretical perspectives.</td>
</tr>
<tr>
<td>Specification of focus</td>
<td>Focus on personality or cultural determinants</td>
<td>Focus on the entrepreneurial process in social context.</td>
</tr>
<tr>
<td>Specification of level of analysis</td>
<td>Primarily single level analysis</td>
<td>Multiple levels of analysis</td>
</tr>
<tr>
<td>Specification of time frame</td>
<td>Narrow time frame</td>
<td>Wide time frame</td>
</tr>
<tr>
<td>Specification of Methodology</td>
<td>Case studies, cross sectional surveys, single method, descriptive.</td>
<td>Theory driven, a priori hypotheses, multiple methods, explanatory.</td>
</tr>
</tbody>
</table>

Source: Low and McMillan (1988)

Hisrich (2000) describes entrepreneurs as key individuals and states that they play an important, fundamental role within the institutions of the market economy. Hisrich suggested that the study of the entrepreneur should go further than the economist’s viewpoint and concern itself with anthropology, sociology and psychology. Like other authors (Shane and Venkataraman, 2000; Zahra and Dess; 2001) Hisrich argued that an entrepreneurial paradigm or framework be established in order for entrepreneurship to
emerge as a coherent discipline. Hisrich suggests such a paradigm could be the creation and growth of a business entity. Hisrich’s comments provide substantial support for the context of the present research which will investigate nascent entrepreneurship. This stage in the entrepreneurial life cycle is fundamental to understanding the processes associated with venture creation. Furthermore the longitudinal aspect of this research will provide useful insights into the growth of a business.

In discussing psychological approaches Hisrich (2000) suggests that the study of characteristics and personality have furthered entrepreneurial research. Hisrich concludes that despite conflicting results and criticism of the theoretical and empirical foundations of studying the entrepreneurial personality (Gartner 1988, 1989) that the study of entrepreneurship through psychological approaches should continue. However he adds a point of caution that the economic activity of the entrepreneur is too often ascribed to personality. This undermines the numerous and various external structural influences. Hisrich (2000 P96) states “for any meaningful research to result, psychological approaches in the future study of entrepreneurship need to carefully define the personality variables being studied and research these in appropriate situational-structural conditions”. This thesis which is essentially a study of entrepreneurial cognition will seek to do that. The identification of entrepreneurial cognitive style using proven psychometric instruments offers a rigorously testable indication of individual differences of the type the author believes to be highly relevant to the field of entrepreneurship. The context of nascent entrepreneurship produces the appropriate conditions and situations suggested by Hisrich as a definable stage in the entrepreneurial life cycle.
In contrast Robinson et al (1991) are critical of some aspects of the psychological approach. They present the concept of an entrepreneurial attitude as being a better description of entrepreneurs than personality characteristics or demographics. They argue that it is not the lack of psychological characteristics to distinguish entrepreneurs from other individuals but rather the methods and theories that conceptualise these into a theory that are at fault. Carsrud & Johnson (1989) argue for a more progressive psychological paradigm in entrepreneurial research. Carsrud & Johnson argue that it is necessary to account for the dynamic interaction that occurs between the individual entrepreneur and the business environment in which new ventures are created. Robinson et al (1991) argue that psychological research methodologies first promulgated were not specifically designed to measure entrepreneurship. They suggest these early attempts at entrepreneurial research with psychological instruments may have been inappropriate and ineffective. Wortman (1986) concurs, there have been very few instruments developed specifically for research in entrepreneurship. It can however be argued that in the intervening years since Robinson et al (1991) and Wortman (1986) a number of new psychological instruments have been created. However, in light of these criticisms this thesis will also test the proactive personality of nascent entrepreneurs. The construct of proactive personality is located within the behaviouralist paradigm and is argued to be separate from cognitive psychology. Gartner (1988) argued that the behavioural approach should take precedence over the psychological arguing that the primary focus for research should be the actions of the entrepreneur rather than their psychological profile. The use of instruments located within different paradigms will provide an interesting juxtaposition to this research.

Shane and Venkataraman (2000) argue that entrepreneurship is about phenomena such as the discovery and exploitation of profitable opportunities. Shane and Venkataraman believe
that for entrepreneurial activity to be possible it requires the combination of two individual phenomena: lucrative opportunities and the presence of enterprising individuals. However, the authors suggest that defining the entrepreneur simply as a person who establishes a new organisation does not take into account that the quality of the opportunity the individual identifies. These authors see entrepreneurship as the examination of how, by whom and with what effect opportunities are created. Their framework involves focusing on the processes of discovery, evaluation and exploitation of opportunities; and the set of individuals who discover, evaluate and exploit them.

The authors also consider the selling of innovative or entrepreneurial opportunities to other companies by their originators not requiring new venture creation. The framework Shane and Venkataraman suggest (1) focuses on the existence, discovery and exploitation of opportunities; (2) examines the influence of individuals and opportunities rather than environmental antecedents and consequences and (3) considers a framework broader than firm creation.

Davidsson et al (2001) consider the debate that continues regarding the purpose of entrepreneurship research. They ask whether the purpose of this research is to generate knowledge that assists in the creation of new economic activity or the creation of new businesses. They also ask if entrepreneurship research should concentrate on micro issues of the individual and the firm or seek to explain entrepreneurship in terms of more societal developments. Low and MacMillan (1988) and Shane and Venkataraman (2000) suggest that entrepreneurship research should aspire to understand societal level outcomes. Davidsson et al (2001) argue that it is Gartner (1988:1989:2001) and Shane and Venkataraman (2000) that are the prime proponents in developing entrepreneurship into a distinct field. A field of research that predicts a set of empirical phenomena not explained
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by other fields. The authors also assert the claim that there is a growing consensus between researchers that entrepreneurship research needs to become more theory driven and learn from the advances in other fields. However they are unsure if this should lead to a separate domain of 'entrepreneurship'. They are clear in their belief that it is necessary to create a community of scholars that can bring insights into the discipline from a range of other fields.

Low and MacMillan (1988) in the second of their recommendations argue for a greater theoretical background for entrepreneurship research. Davidsson et al (2001) agree with this point, but note that what this theoretical background should be is yet to be agreed upon. Gartner (2001) argues that entrepreneurship researchers should separate into more homogeneous groups or communities of scholars studying specific areas of the 'hodgepodge' that currently exists.

Davidsson et al (2001) argue that ten years on from Low and MacMillan a shift has occurred in studying the individual in entrepreneurship research. Instead of studying entrepreneurial traits the individual is more likely to be studied from a cognitive or behavioural perspective. This lends support to the present research orientation which is designed to study both cognitive style and the behavioural proactive personality. This thesis will study nascent entrepreneurship from both the cognitive and behaviouralist perspectives as they both offer credible approaches to the study of nascent entrepreneurship.

Methodology has also changed. Chandler and Lyon (2001) indicate an increased use of multivariate techniques and greater utilisation of reliability and validity tests. Also the major entrepreneurship journals are increasingly insisting on theory driven developments in
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empirical studies. Davidsson et al (2001) suggest that although discussion of the entrepreneurial individual within the venture will remain dominant that there are ventures that include other parties such as partners and financiers. If entrepreneurship research is to shift focus onto the creation of enterprise then the role of other participants and the role of entrepreneurial teams will become a necessary and fruitful area of research.

Like Low and MacMillan (1988), Davidsson et al (2001) argue for the need for longitudinal research. They do accept that longitudinal research is difficult and that the high attrition rate experienced in new ventures can pose an additional burden on longitudinal research. They further accept that ventures at the early life-cycle stages go through rapid and fundamental change. So much so that the venture at the end of the study can be unrecognisable from the one at the start this provides problems for analysis and comparison. Davidsson et al state that despite the progress they perceive in the decade since Low and MacMillan entrepreneurship as a discipline will remain vulnerable unless a stronger paradigm is developed and that the body of cumulative knowledge about entrepreneurship will grow faster if carried out within a more distinctly defined domain or community.

Low and McMillan (1988) argued that too much entrepreneurial research was conducted from the phenomenological rather than from a positivist perspective. Ucbasaran et al (2001) also concur that too much entrepreneurial research takes place from a phenomenological rather than a positivist approach. They argue that this has produced a fragmented discipline with specialists who make little use of each other's work. They take the approach that the entrepreneurial phenomenon can be discussed with regard to opportunity recognition and exploitation by entrepreneurs; entrepreneurial skills; competencies, knowledge and the ability to obtain and coordinate scarce resources. The
authors developed a five themed approach to the study of the entrepreneur and use this to draw some conclusions that they consider are worthy of additional research. The views of Low and McMillan and Ucbasaran et al support the methodological approach of this thesis. As discussed in chapter 3 this thesis will be researched from the positivist paradigm and it will build on the research of other authors.

Ucbasaran et al (2001) identified research into entrepreneurial cognition as a promising focus for future research.

**Figure 2.1 Current themes in entrepreneurship research**

![Diagram](https://example.com/diagram.png)

Source: Ucbasaran et al, (2001)

Ucbasaran et al (2001) refer to four presently identified types of entrepreneur: nascent, novice, serial and portfolio. The authors state that there is an increased awareness of the need for greater understanding of the processes and strategies selected by different types of entrepreneur to grow their ventures. They suggest that longitudinal studies are needed to
discover the extent to which nascent entrepreneurs actually start businesses and the processes involved. Articles such as Ucbasaran et al (2001) strongly influenced the direction and design of this thesis. They also clearly demonstrate that the research is justified through the literature and that it is being conducted according to the current perspectives within the discipline.

Ucbasaran et al (2001) cite information search and opportunity recognition as the first crucial steps in the entrepreneurial process. However they state that very little research has actually been conducted into where opportunities come from. Why, when and how do certain individuals identify and exploit certain opportunities and not others? Kirzner (1973) promulgated the argument that an entrepreneur identifies opportunities by being “alert” and “noticing” opportunities that the market presents. Search and opportunity recognition is linked with the decision-maker's knowledge of how to process information and influenced by the cognitive behaviours of entrepreneurs.

Entrepreneurship is a young discipline. It is also one that is subject to a range of definitional interpretations and problems. In 1988 Low and McMillan produced a range of recommendations for the future of entrepreneurship research. These recommendations aided the development of the study of entrepreneurship recommending focus and rigour to entrepreneurial research. Despite the advances in entrepreneurship since 1988 the discipline still struggles for academic credibility and acceptance. This section has represented a significant retrospective review of the conclusions of a number of eminent authors discussing the future direction of entrepreneurial research. The future direction of this thesis is fundamentally influenced by their suggestions and conclusions.
There are ten important areas of entrepreneurial research identified by Ucbasaran et al (2001) and synthesised from research since the contribution of Low and McMillan that require the attention of researchers. Among other recommendations they argue that there is a need to better understand the four presently identified types of entrepreneur, portfolio, serial, novice and nascent. They also argue that there is a need to understand and explain the entrepreneurial subgroups heuristics and cognitive behaviours. Greater understanding is also called for to discover how entrepreneurs acquire knowledge; and why when and how certain individuals identify and exploit opportunities. The research direction and even the philosophical orientation of this thesis have been influenced by the findings summarised in this section.
2.2 Classifications of entrepreneurship

2.2.1 Craftsman-entrepreneur

In an attempt to classify different types of entrepreneur (Smith 1967) together with later authors divided entrepreneurs into two basic groups, 'Craftsmen' and 'Opportunists'. Craftsmen more typically came from blue-collar backgrounds and their father was usually a skilled worker within a craft or trade industry such as carpentry printing or plumbing. This vocational direction was often also mirrored in other relatives. The craftsman entrepreneur early in life is therefore brought up in an environment of task orientation and has a father or other close relative as a role model. Smith (1967) identified that this type of entrepreneur had a relatively narrow education limited to work within technical areas. Additional learning is not valued. The craftsman entrepreneur is selective in their learning processes and chooses those things that they see as valuable in a technical career. As for motivation Smith (1967 P15) states “It appears the craftsman-entrepreneur may represent a sub-cultural type which does not take monetary success as the primary goal but rather focuses on attaining mastery over machines as the primary cultural goal. By this mastery he proves his superiority over other individuals working in the same type of job”. Smith (1967) discovered that even when working for an employer prior to the initiation of their own business the craftsman-entrepreneur had the goal of starting their own business. However Smith discovered that the motivation for this initiation was likely to be the chance that self-employment offered for the individual to prove themselves technically rather than any innate desire to become an entrepreneur. Part of the initiation process was seen to be a marginalization of the individual.

The catalyst for the initiation of the business, Smith (1967) discovered, was often a critical event that pushed them into this action the craftsman-entrepreneur would not suddenly
resign from work. Once they had taken the decision to leave their job they often did so with other workers or started their business with friends or family members with similar background or orientations.

Research suggests that these types of entrepreneur preferred the technical aspects of their job, that is ‘the doing’, and found the administrative side more difficult. They were risk averse and likely to have founded the business from only one source of finance. They were less likely to be interested in making lots of money and more interested in a comfortable living. These businesses were less adaptive to change and experienced lower growth (Woo et al 1994). It could be argued that this classification would fit a number of craftsman type operations, builder, joiner, printer, but also that certain types of consultancy could also apply to this classification.

2.2.2 Opportunistic-entrepreneur

Smith (1967) labelled his other classification of an entrepreneur ‘Opportunists’. These entrepreneurs are different from craftsmen in the breadth and diversity of their education. They are more future orientated and happier with managerial/administrative functions. The opportunistic-entrepreneur is predominantly middle-class. The opportunistic-entrepreneur often has a father who owns his own small business. The entrepreneur grows up from an early age in an environment that is middle-class and values business. It is interesting to note the strong influence that role models have on entrepreneurs from a very early age. Their education is well rounded. The opportunistic-entrepreneur is not only likely to have more years formal education than the craftsman-entrepreneur they are likely to study a wider range of subjects. The social aspect of education is also important to the craftsman-entrepreneur. Similarly in terms of work experience the opportunistic entrepreneur is likely to have experienced a greater variety of roles rather than just a strict technical one. This
entrepreneur looked for a wider variety of experiences within management and administration.

They were more willing to change and exhibit greater confidence in their ability to respond to the environment. Smith (1967) discovered that opportunistic entrepreneurs have an ability to change role models when the usefulness of the old role model is gone. This enables them to discover new patterns and new dimensions to their lives and work giving them a greater range and amount of experience. Unlike the craftsman-entrepreneur the opportunistic-entrepreneur is not marginal. They have a very clear identification with top management. The initiation of their business is not as a result of circumstance but of long-term planning. The prior work experience has offered the entrepreneur a wide variety of experience and contacts within industry. This classification of entrepreneur does not necessarily start a business in the field in which they have the most experience. Indeed they may enter an industry in which they have no experience. Smith (1967) discovered that the opportunistic-entrepreneur would have held the dream of venture creation for long time and will have planned and orchestrated their career in order to facilitate this. This entrepreneur is not influenced by external events as they initiate the business they choose when the time is right.

2.2.3 The contribution of other authors

Other classifications have been made, but essentially they follow Smith's Craftsman-Opportunist model. Braden (1977) refers to “caretakers” and “managers” but essentially means the same as Smith. Filley and Aldag (1978) analysed entrepreneurs and their companies along three dimensions, which they called “Craft”, “Promotion” and “Administrative”.

Andrew P Hird

Chapter 2
Table 2.2 Characteristics in Three Organisation Types

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Craft</th>
<th>Promotion</th>
<th>Administrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objectives</td>
<td>Comfort-Survival</td>
<td>Personal Achievement</td>
<td>Market adaptation</td>
</tr>
<tr>
<td>Policy</td>
<td>Traditional</td>
<td>Personal</td>
<td>Rational</td>
</tr>
<tr>
<td>Leadership</td>
<td>Craftsman</td>
<td>Entrepreneur</td>
<td>Professional</td>
</tr>
<tr>
<td>Structure</td>
<td>Power Levels</td>
<td>Field of Force</td>
<td>Rational hierarchy</td>
</tr>
<tr>
<td>Staff</td>
<td>House Keeping</td>
<td>Technical-Personal</td>
<td>Technical-coordinative</td>
</tr>
<tr>
<td>Development</td>
<td>Single</td>
<td>Successive emphasis</td>
<td>Full Development</td>
</tr>
<tr>
<td>Work-group bonds</td>
<td>Fixed roles</td>
<td>Interaction-expectation</td>
<td>Homogeneity</td>
</tr>
<tr>
<td>Innovation</td>
<td>Conventional Methods</td>
<td>Innovation</td>
<td>Development</td>
</tr>
<tr>
<td>Uncertainty-risk</td>
<td>No perceived risk</td>
<td>Uncertainty</td>
<td>Risk</td>
</tr>
<tr>
<td>Basis for success</td>
<td>Benevolent</td>
<td>Innovation exploitation</td>
<td>Planned adaptation to</td>
</tr>
<tr>
<td>Pattern of growth</td>
<td>environment</td>
<td></td>
<td>environment</td>
</tr>
<tr>
<td></td>
<td>Non growth</td>
<td>S-curve</td>
<td>Linear</td>
</tr>
</tbody>
</table>

Source: Filley & Aldag (1978)

Filley and Aldag (1978) present their three strategies for organising and dealing with the environment. The typologies are identified as patterns of structural and leadership characteristics observed to exist together. These characteristics are identified in Table 2.2 above.

Cooper & Dunkelberg (1986) again divided entrepreneurs into three groups, “Craftsmen”, “Growth-orientated” and “Independent”. The first two groups again resembled Smith’s craftsman and opportunist, but the third “Independents” were motivated by autonomy.

Lafuente and Salas (1989) worked on the basis of four classifications of entrepreneur, Craftsmen, Family, Managerial, and Risk. The two variables suggested by Smith (1967) are again similar to two found by Lafuente and Salas. “Craftsmen” were motivated by the nature of the work, “Family”, placed a high priority on family welfare and meeting a challenge, “Managerial” sought prestigious self-development, and “Risk”, demonstrated a strong preference for risk taking (Woo et al, 1991).
A Psychometric Analysis of Nascent Entrepreneurs: Understanding the impact of individual entrepreneurial cognition on the founding and survival of new small businesses.

In an attempt to study if the classifications a number of authors have placed on entrepreneurs were correct, Woo et al (1991) undertook a study of 4,814 members of the Federation of Independent Business. They concluded that the expectation from the literature would find opportunists more motivated by financial success and the chance to build a successful enterprise. The literature also appeared to indicate that craftsmen would be more interested in independence and the chance to work in an area of personal interest. However the results did not bear out this hypothesis, the research “failed to obtain such a differentiation”. It also appeared that financial and personal motivations were simultaneous rather than mutually exclusive driving forces.

Cromie (2000) citing Gibb (1987) suggests that entrepreneurs and enterprising people exercise their skills in different contexts and pursue different goals. He maintains that it seems plausible that they will have similar attributes. Entrepreneurial attributes such as initiative, flexibility, moderate risk-taking, creativity, achievement drive, and imagination. These are “enterprising” people who are skilled at setting up and running projects.

2.2.4 Novice, serial and portfolio entrepreneurs

Just as authors have attempted to classify entrepreneurs by types and by their actions and motivations, so to have they attempted to classify entrepreneurs by the size, nature and type of their holdings. This type of classification has been met with a good deal more clarity. There are recorded to be three types of entrepreneur, in terms of their founding of new businesses. Novice, who as the name suggests have no prior experience as an entrepreneur at all. Portfolio entrepreneurs, who having started one business go on to
found, inherit or buy other businesses while retaining ownership of the first business. Serial entrepreneurs sell an original business but later either start, buy or inherit another business.

Entrepreneurship, whether looking at the individual or the business, is not a single event occurrence. It was suggested by Ronstadt (1982) that entrepreneurs start several businesses before launching a successful business. They argue that there is no evidence to suggest that habitual founders run more successful businesses than novice founders who have established/owned only one business Westhead and Wright (1998).

As a result of analysis Westhead and Wright (1998) were able to conclude the following:

- **Serial founders** were drawn from non-managerial parental backgrounds and they established their first business at a very early age. They had gained experience by working in a large number of organisations on a full time basis. Immediately before the start up of the surveyed business a larger proportion had been self-employed. They were likely to have obtained start-up capital during the launch period from personal savings, family and friends.

- **Portfolio founders’** parents, during childhood mostly held managerial positions. They were young when they started their first business. Because they owned other businesses with employees. Portfolio entrepreneurs generally had not been self-employed immediately before the start of the surveyed business. In addition drawing upon prior experience and contacts, customers and suppliers had been used as a source of start-up capital during the launch period of the business.
• *Novice entrepreneurs* were significantly more likely to have used finance from personal savings, family and friends, up-front orders from customers and lines of credit from suppliers.

Westhead and Wright's analysis found no significant differences in the performance of novice and habitual founders. This evidence suggests to them that owner-managers with prior business owning experience do not establish/own businesses that out perform those established by founders who have no prior business founding experience.

This thesis hypothesises that a distinction in entrepreneurial types generally mirroring that suggested by Smith (1967) and later authors will exist within different groups of nascent entrepreneurs. This thesis further contends that these differences will be observable through an analysis of the individual's cognitive mechanisms.
2.3 Nascent entrepreneurs

2.3.1 Understanding nascent entrepreneurship

The term nascent entrepreneur is applied to individuals engaged in the start-up process of a new venture. These individuals have made a commitment to initiating the entrepreneurial process but have yet to begin trading. Korunka et al (2003) suggest that the start-up process begins with the first actions of the nascent entrepreneur typically speaking to a business advisor and ends with the launch of the product or service. Delmar and Davidsson (2000) call nascent entrepreneurs “people trying to start up an independent business”. As a screening interview guideline for their research Delmar and Davidsson (2000) defined the nascent entrepreneur as an individual who had completed at least one business start-up gestation activity at the time the research was conducted. Delmar and Davidsson (2000) note that the term nascent does not imply the entrepreneur has no previous experience they may have or currently run other businesses. Not all nascent entrepreneurs are novices.

For definitional purposes this thesis will define an individual as a nascent entrepreneur if they have complied with the definition of the term nascent promulgated by Korunka et al (2003). Within the population of nascent entrepreneurs this thesis will study entrepreneurs on assisted training programmes based within the community operated through the New Deal Self-Employment option and the New Entrepreneur Scholarship. Delmar and Davidsson (2000) identified that previous research into nascent entrepreneurship was almost exclusively conducted retrospectively among successful entrepreneurs risking hindsight bias. Their study, like this thesis, had the advantage of occurring in real time.

Delmar & Davidsson’s (2000) study identified a gender imbalance with males representing a significantly greater proportion of the respondents. A typical nascent entrepreneur will be
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quite young and may well have been self-employed before. The unemployed do not show a higher probability of being nascent entrepreneurs. One of the largest differences observed was recorded between respondents who had, or did not have role models with which to identify. Having self-employed parents or a positive role model from within the family was a strong factor in encouraging nascent entrepreneurship. The study also identified that nascent entrepreneurs were more likely to have a degree and have more management experience than the control group. There was also a concentration of activity within large cities.

Carter et al (2002) looked at the variety of career choice reasons that a sample of people gave including the choice to start a business. It had been assumed that individuals choosing an entrepreneurial career ‘Nascent entrepreneurs’ would offer different reasons for starting a business than individuals attracted to other occupations (Dyer 1994; Kolvereid 1996). Carter et al (2003) interviewed nascent entrepreneurs prior to business start-up. Carter et al (2003) found that there were no statistically significant differences between nascent entrepreneurs and other adults making a career choice in terms of their need for financial success, independence, innovation and self-realisation. The research appeared to contradict other research (Thomas & Alderfer, 1989) which had speculated that nascent entrepreneurs would have a greater association with community or family than other subjects. It had been believed that entrepreneurs would want greater financial success, independence, innovation and self-realisation. Overall the Carter et al (2003) study showed that nascent entrepreneurs were not qualitatively different from individuals who pursue other career options.

Arenius and Minnite (2005) contend that nascent entrepreneurs rely to a significant extent on subjective and biased perceptions rather than objective evaluations of success. These subjective perceptions are based on the presence of role models, confidence in their own
skills and ability, risk-taking propensity and alertness to unexploited opportunities. They identified that these factors were highly correlated with an individual’s decision to start a business. Minniti (2004) argues that the presence of role models increases an individual’s confidence through reduction in ambiguity. Arenius and Minniti (2005) identified that a significant and positive relationship exists between an individual being a nascent entrepreneur and knowing another entrepreneur. They argue that this gives access to networks and information. Minniti (2005) argues that both positive and negative examples of entrepreneurship provide direct observations of entrepreneurial activity that reduce ambiguity and uncertainty. These are interesting observations and will influence the research design of this thesis.

Levesque and Minniti (2006) argue that a theoretical relationship exists between age and the likelihood of starting a business. They identified that relatively young people start businesses and the start-up rate reduces with age. This supports findings by Reynolds et al (2003) who identified individuals between 25 and 34 as most likely to be nascent entrepreneurs. Blanchflower (2004) contends that although the probability of being an entrepreneur is higher among older individuals young individuals are more likely to be nascent entrepreneurs.

Birley & Westhead (1994) noted that the influence of the founder as well as business related factors regarding the growth and survival of the business were important. They state that the reasons and motivations leading to start-up have traditionally been regarded as important in influencing start-up and the characteristics, survival and performance of the business. The authors suggest that the overwhelming motivations of entrepreneurship have been a desire for independence or financial betterment. Frustration from previous employment represented only a secondary role. Redundancy and firm closure have also
provided a trigger ‘pushing’ founders to leave their previous jobs. Birley and Westhead ask if it can be assumed that the nascent entrepreneur has the choice of the strategic orientation of the firm they found. Can it be assumed the entrepreneur has the choice to go for growth or a survival policy and that the chosen alternative of the nascent entrepreneur finally adopts depends upon their objectives and reasons for founding the business. These future goals will be influenced by commercial considerations and personal lifestyle. Milne & Thompson (1982) argue that growth cannot just be assigned to the characteristics and personal traits of the founder. They argue that the founder’s ability to adapt and learn within their business environment is also crucial. This is an interesting perspective and one that this thesis with its interest in cognitive style seeks to address.

Rotefoss and Kolvereid (2005) argue that individual and regional/environmental factors could be used to predict an individual’s ability to achieve three entrepreneurial milestones. They contend that the business start-up process requires the achievement of aspiring entrepreneur, nascent entrepreneur and business founder milestones. They argue that a proportion of potential entrepreneurs will fail at each of the three milestones. Successful entrepreneurs pass through these milestones. These include human resources such as education and entrepreneurial experience. Rotefoss and Kolvereid (2005) argue these cannot be wholly internally resourced and are therefore subject to the environment in which they are created. This is supported by Jack and Anderson (2002) who argue that firm creation is more than an economic process it is embedded in a specific environment. Delmar and Davidson (2000) argued that urbanisation creates opportunities of access to customers and resources. Other categories they identified are unemployment change, financial resources and political ethos and industrial specialisations of the region in which the business is founded. Thurik et al (2002) argue that technology; economic development, culture and institutions all encourage nascent entrepreneurship by creating demand for
entrepreneurship by creating business start-up opportunities. Rotefoss and Kolvereid (2005) contend that entrepreneurs become role models and encourage others to follow their example. Areas with high volumes of small businesses become incubators for other entrepreneurial activity.

Wennekers et al (2002) provide an econocentric view of nascent entrepreneurship. They argue that individuals choose between waged-employment and business ownership by assessing and weighing the potential financial and non-pecuniary rewards and risks. They suggest that an individual’s perception of opportunity and their personal capabilities and preferences will influence how these potential rewards and risks are viewed.

Figure 2.2 The Determinants of Nascent Entrepreneurship

<table>
<thead>
<tr>
<th>AGGREGATE CONDITIONS</th>
<th>INTERMEDIARY VARIABLES</th>
<th>OCCUPATIONAL CHOICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology</td>
<td>DEMAND SIDE</td>
<td>Individual assessment of risks and rewards</td>
</tr>
<tr>
<td>Level of economic development</td>
<td>Opportunities</td>
<td>Nascent entrepreneurship</td>
</tr>
<tr>
<td>Demography</td>
<td>SUPPLY SIDE</td>
<td>Capabilities</td>
</tr>
<tr>
<td>Culture</td>
<td></td>
<td>Preferences</td>
</tr>
<tr>
<td>Institutions</td>
<td></td>
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</tbody>
</table>

Source: Wennekers 2002

Wennekers et al (2002) contend that each individual has their own risk-reward profile which guides occupational choice. They equate occupational choice with an “intention to act” for potential entrepreneurs to start a business. In this view the rate of nascent
entrepreneurship is a reflection of the proportion of the adult population displaying both an intention and demonstrable active exploration of the possibility of starting a business.

For Wennekers et al (2002) nascent entrepreneurship is a matter of demand and supply.

**Figure 2.3 Demand and Supply factors influencing nascent entrepreneurship.**

<table>
<thead>
<tr>
<th>DEMAND</th>
<th>SUPPLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPPORTUNITIES</td>
<td>CAPABILITIES</td>
</tr>
<tr>
<td></td>
<td>PREFERENCES</td>
</tr>
</tbody>
</table>

The demand side of nascent entrepreneurship represents the opportunities for setting up a viable business based on the environmental opportunities that exist at a particular time. These can be either encouraged or impeded by demographic, cultural or institutional factors. The supply side of entrepreneurship represents an individual's capabilities and preferences towards entrepreneurship. The supply side is strongly influenced by demographic characteristics, culture, institutions and the availability of financial resources, (Wennekers et al, 2002). They suggest that the level of nascent entrepreneurship is dependent upon the level of economic development of the environment. Wennekers argues that levels of nascent entrepreneurship follow a U-shaped relationship. As economies develop levels of nascent entrepreneurship fall. This decline is reversed at the higher end of economic development. The levels of nascent entrepreneurship are higher in less developed and in highly developed economies but lower in transitional economies.

Entrepreneurship is dynamic and requires linkages and resources between key components of the business (Aldrich and Zimmer 1986). Burt (1983) identified three key resources that he believed an entrepreneur should bring to a business. Firstly that an entrepreneur should
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bring sufficient financial resources be they in cash, credit, or loans. Secondly, that the entrepreneur should bring adequate human resources, natural ability, charm, health and intelligence together with work experience. Thirdly, Burt suggests that the entrepreneur needs to bring social resources, friends, colleagues and contacts that the entrepreneur will need in order to make the most of their financial and human resources. Networking is the process by which an entrepreneur can build and maintain their personal relationships with individuals within their business environment.

2.3.2 Social and co-operative networks and their role in nascent entrepreneurship

There is much talk of the individualism of the entrepreneur. However, in reality the nascent entrepreneur is part of a complex interrelationship of people that includes customers, suppliers, financiers and strategic partners (Aldrich and Zimmer 1986). Entrepreneurial networks can be defined as the sum total of relationships in which the entrepreneur participates. These relationships provide an important resource for their entrepreneurial activities (Dodd & Patra, 2002). Social networks form part of an entrepreneur's social capital (Colman, 1988). Promoting social relationships, social capital increases the return achieved from an individual’s human capital such as intelligence and education (Burt, 1997).

Networking in small firms can be seen to fall into two groups. These are referred to as 'strong ties' and 'weak ties' (Granovetter, 1985). Strong ties will include family and close friends. They are people linked by strong trust. However the usefulness of these contacts in an entrepreneurial setting is limited as they are likely to share the same contacts and information as the entrepreneur. They are also unlikely to bring fresh perspectives to exploit or create new business opportunities (Chell & Baines, 2000). Weak ties are likely to be of short duration and low frequency they will occur with other individuals or
organisations outside the immediate social circle. Weak ties enable entrepreneurs to draw upon information, advice and assistance from a large and diverse pool. Granovetter (1973 P1378) describes weak ties as “indispensable to an individual’s opportunities and to their integration into communities”. Johannisson (1987) argued that entrepreneurial networks could provide a psychological and practical support mechanism. Burt (1992) and Hills et al (1997) identified networks as providing access to opportunities and sources of finance and information (Ostgaard & Birley, 1994). Bruderl and Preisendorfer (1998) argue that strong ties in the form of a family network can increase success. They suggest that access to emotional support, especially during the start-up phase is important to maintain emotional stability during the inevitable difficult times. In terms of venture creation Szarka (1990) suggests that this would hardly be possible without access to an effective network of relationships.

Arenius and Declecq (2005) investigated arguments that surround the importance of the cohesion of the network to which entrepreneurs belong. They argued that differences in an individual’s perception of new opportunities can be explained by the structure of the networks into which the entrepreneur is embedded. They argue that the two pre-eminent theories of entrepreneurial development, Burt’s (1992) structural hole argument, based on Granovettor’s (1973) work and Coleman’s (1990) network closure argument, provide a contrasting perspective on the affect of networks on an individual’s access to information.

Burt (1992) and Granovettor (1973) argue for the strength of weak ties. Burt (1992) argues that networks that are less cohesive contain structural holes and that ‘holes’ in an entrepreneurs knowledge assist individuals to access information by creating access to new experiences and new individuals who open up the possibility for unique combinations to lead to the identification of opportunities. The opposing view is suggested by Coleman
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(1990) who argues that cohesion in networks encourages access to information at the most appropriate time and in a manner that encourages accuracy and information retrieval. Coleman suggests that obligations and mutual understanding among individuals reduces uncertainty and that these strong ties lead to opportunities being recognised.

Butler and Hanson (1988) suggest that growth-orientated small business entrepreneurs will be more outward looking and that this will be evidenced by additional time and resources spent on networking and the depth and breadth of their network. Butler and Hansen (1988) conclude that the ability of an individual to receive and interpret information in the face of uncertainty is central to entrepreneurial behaviour. Aldrich and Whetton (1981) likened an entrepreneur's social network to an 'opportunity set' that can be exploited to provide needed information. The size and the richness of this 'opportunity set' helps to explain why some individuals become aware of entrepreneurial opportunities and others do not (Butler and Hansen, 1988). They also suggest that a social network is extremely important in the pre-startup (nascent) stage as it enables entrepreneurs to draw both intangible information and tangible resources.

Figure 2.4 Model of Entrepreneurial Network Evolution

Source: Butler & Hanson, (1988)
Bruderl and Preisendorfer (1998) argue that disadvantaged groups of entrepreneurs make more efforts and are more successful in activating their private network resources in an attempt to compensate for their unfavourable strategic position. Bruderl and Preisendorfer (1998 P 216) call this a 'network compensation hypothesis'. Their hypothesis concludes that "entrepreneurs with a less favourable human capital profile and with restricted financial resources struggle harder to mobilize their social contacts and receive more support out of their network". The conclusion is therefore that highly developed networks can compensate for shortfalls in human capital. Why such companies do not enjoy greater financial success than companies not enjoying this strength of network is open to question. The authors suggest that these businesses do not have good initial prospects in terms of human capital and start-up capital and that these unfavourable circumstances counteract the favourable circumstances of the network.

2.3.3 Human capital

The theory of human capital is based on the assumption that knowledge provides individuals with improvements or increases in their cognitive abilities that makes them more productive and efficient in conducting an activity (Shultz 1959). It is broadly defined as an asset that exists with the process of social relations and networks (Burt, 1997). Flora (1998) argues that a feature of networks is social capital and that this facilitates co-ordination and co-operation of the network for mutual benefit. It is a central proposition of social capital theory that networks of relationships are a valuable resource for conducting entrepreneurial activity (Nahapiet & Ghoshal, 1998). It is argued that social capital is embedded within networks of mutual acquaintances and based on mutual recognition (Anderson & Jack, 2002).
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Westhead et al (2005) postulate that the ability to identify opportunities may be as a result of differences in the cognition of different entrepreneurs. They suggest that opportunity identification and recognition may be linked to their capacity to handle complex information. They argue as an extension to this view that the ability of an entrepreneur to identify and exploit an opportunity will be a function of their human capital.

Becker (1993) argued that there is a distinction between specific and general knowledge. Human capital has been seen as a hierarchy of skills and knowledge with varying degrees of transferability. In terms of entrepreneurship some skills and knowledge are either firm specific or more general. General human capital consists of elements such as education, age and gender. Cooper et al (1994) suggests that education is related to knowledge, skills, problem-solving and self-confidence. An individual nascent entrepreneur who has the human capital attribute of being highly educated will be able to cope better with problems and have the skills to search for resources. However education on its own is unlikely to provide entrepreneurs with a competitive advantage on its own as education is not unique and it is not inimitable (Ucbasaran et al, 2005).

Specific human capital will include: entrepreneurial experience; attitudes towards entrepreneurship and entrepreneurial, technical or managerial capabilities. Entrepreneurial experience is a key indicator of human capital. It can be seen as valuable, episodic knowledge related to knowledge developed through direct experience. Previous experience may provide entrepreneurs with a variety of resources or assets that can be utilised and identifying and exploiting subsequent ventures. Capabilities give individuals power to act effectively (Westhead et al 2005).
In terms of nascent entrepreneurship the contention is that individuals with more or a higher quality human capital will more easily recognise the economic opportunities that exist within the business environment (Davidsson & Honig, 2003). Once the entrepreneurial process has been initiated these same individuals will have a greater ability to successfully recognise and exploit opportunity. Davidsson and Honig (2003) argue that researchers should not automatically assume that a greater degree of human capital would encourage entrepreneurship. They state that as human capital influences career choice a very high degree of human capital may discourage risk-taking and a lower degree may encourage it. Weick (1969) notes that previous knowledge plays an important role in intellectual performance. The suggestion is that the integration and accumulation of new knowledge as well as integrating and adapting this knowledge to new situations is enhanced by prior experience.

Rotefoss and Kolvereid (2005) identified that higher education was positively associated with becoming a nascent entrepreneur. These findings are supported by Lee et al (2004) who contend that post secondary education may have a positive effect on new business founding in the service sector. However the positive effect of Higher Education was less significant for those who went on to become business founders. Arenius and Declerq (2005) found a positive relationship between an individual's educational level and the likelihood that they will recognise opportunities. It is suggested that despite increased educational attainment increasing the opportunity for individuals to find employed work educational attainment or more properly educational experience increases the exposure to network possibilities. Arenius and Declerq (2005) argue that education provides access to 'knowledgeable others' Burt (1992) and a broader knowledge base in which to relate current knowledge to opportunities. Bandura (1978) argued that this would provide increased confidence and positive new ideas for business creation.
2.3.4 Social capital

Social capital refers to the ability of individuals to extract benefits from social structures and network membership (Lin et al, 1981; Portes, 1998). Social networks supplement the effects of education, experience and social capital and are provided by family, community or organisational relationships. Like financial capital, social capital is an asset that becomes a structural part of the nascent organisation influencing decisions and outcomes. Social capital augments the stock of incomes without being consumed as a result of its use, like most capital it is better to have more than less (Leana and Van Buren, 1999). Fafchamps and Minten (1999) state that strong social capital is a necessary precursor to entrepreneurship.

Figure 2.5 Social capital, human capital and the nascent entrepreneur

Bridging Social Capital

Bonding Social Capital

Human Capital

Discovery Process

Exploitation Process

Successful Nascent Outcomes


It has been argued that one of the ways in which the entrepreneur can overcome any constraints they may have is to acquire knowledge and resources by tapping into an extended pool of information and knowledge. This reservoir of information and knowledge may offer a rich source of explicit and tacit knowledge, experience and privileged access to physical resources (Anderson & Jack, 2002). This is one of the reasons why assisted programmes often stress team building and the creation of a support network between programme participants.
2.3.5 Nascent entrepreneurship and the impact of experience

In considering nascent entrepreneurship the impact of experience, or more crucially the lack of it becomes a consideration. Nascent entrepreneurs are almost by definition seen as having a lack of experience. However Reuber and Fischer (1999) report that reviews of the literature on founder’s experience do not indicate a relationship between experience and the success of the venture.

When looking at experience as a “stock” interest is centred on the founder’s experience as this is hypothesised to have an impact on the performance of the venture through experientially acquired expertise. It is assumed that these will lead to more knowledgeable actions and decisions and improve venture performance Reuber and Fischer (1999).

Chandler and Hanks (1994) found that a founder’s skill influenced the relationship between opportunities within the economic environment and venture performance. Herron and Robinson (1993) found that founder’s current skills could predict the performance of their ventures and that predictive ability varied between economic environments. Experience is thought to influence performance through the development of a “dominant logic”.

Woo, Daellenbach and Nicholls-Nixon (1994) argue that the entrepreneurial process is governed by learning and experimentation and that organisational learning is a continuous process facilitated by sequences of experiences. This perspective focuses on experience as a “stream” rather than a “stock”. Reuber and Fischer (1993) found that the value of this learning was not diminished by time with new and older firms viewing continuing learning experiences as valuable. When looking at experience as a “stream” the value is in the proactive and reactive changes that this “stream” of experience facilitates rather than in their totality.
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Table 2.3 Two Perspectives on Founder's Experience

<table>
<thead>
<tr>
<th>View of Experience</th>
<th>Stock: Experiential background</th>
<th>Stream: Events that occur</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact of Experience</td>
<td>Development of expertise and skills</td>
<td>Changes in the venture</td>
</tr>
<tr>
<td>Primary Level of Analysis</td>
<td>Start-up Characteristics</td>
<td>Founder(s)</td>
</tr>
<tr>
<td>Qualities of Experience</td>
<td>Duration of experience</td>
<td>Changes across business stages</td>
</tr>
<tr>
<td>Timing Issues</td>
<td>Diversity of experience</td>
<td>Changes arising from unforeseen events failure as well as success.</td>
</tr>
<tr>
<td></td>
<td>Linearity of the experiential effect</td>
<td>Frequency of events</td>
</tr>
<tr>
<td></td>
<td>Shelf-life of experience</td>
<td>Lag between event and impact</td>
</tr>
</tbody>
</table>

Source: Reuber and Fischer (1999)

When experience is viewed as a “stock” the nascent entrepreneur is perceived to lack experience. Generally having experience is viewed positively, a lack of a “stock” of experience is perceived negatively. However following a review of the literature this thesis contends that this simple view of a “stock” of experience conceals a more complicated phenomenon that is in reality far less detrimental to the inexperienced nascent entrepreneur. Firstly when considering business start-up a large “stock” of experience is not necessarily as helpful as it might appear. Different types of experience are more valuable than others and only experiences called upon actually add value to the start-up process. Also the value of a “stock” of experiences diminishes over time. Experience is therefore a perishable commodity. The positive value placed on an experienced entrepreneur’s experience and the negative value placed on an inexperienced nascent entrepreneur’s lack of experience should be reassessed. In viewing experience as a “stream” the nascent entrepreneur is significantly less disadvantaged. The ability to learn from experiences quickly and just as importantly to be able to change or produce innovative behaviours becomes more important than the totality of the “stock” although incidentally adding to it.
2.3.6 Conclusions on nascent entrepreneurship

Nascent entrepreneurship is one of the classifications of entrepreneurship Ucbasaran et al (2001) consider to be in need of further in-depth study. Not only is nascent entrepreneurship a suitable subject for study it also has the benefit of not being associated with many of the definitional problems that frequently impede entrepreneurial research.

Delmar and Davidsson (2000) call nascent entrepreneurs 'people trying to start a business'. Korunka et al (2003) link the nascent entrepreneur with the beginning of the start-up process. Recent studies investigating nascent entrepreneurship (Carter et al, 2002; 2003) Delmar and Davidsson (2003) and Davidsson and Honig (2003) have investigated the prevalence and characteristics of nascent entrepreneurship; career choice reasons for starting a business and human and social capital and nascent entrepreneurship. These studies have largely ignored the area of cognition central to this thesis.

This thesis contends that an understanding of the important role of social and cooperative networks, human and social capital and experience has on nascent entrepreneurs is central to understanding the concept of nascent entrepreneurship. It is also important to be aware of their mitigating influences on cognitive style within the research process. The section has demonstrated that despite a perception that deficiencies in these important areas will adversely affect the research population this may not necessarily be the impediment it initially seems. The literature has demonstrated that through a combination of compensating factors involving human capital and social networks any deficiencies can be mitigated. The section also concludes how the perceived lack of experience of nascent entrepreneurs can be alleviated by perceiving experience as a stream rather than a stock and by the adoption of initially simple enterprises working in conjunction with the positive effects of the learning curve.
The literature demonstrates that the start-up environment may not be as hostile to nascent entrepreneurs as at first perceived. This requires researchers to investigate the phenomenon from a different perspective. The study becomes not an investigation of deficiencies but of motivations and competencies of nascent entrepreneurs. The intriguing questions become how inexperienced nascent entrepreneurs compensate for their deficiencies. This leads to a need for further understanding of the concept of opportunity recognition.
2.4. Opportunity Recognition

2.4.1 Theories of opportunity recognition

Within this section of the thesis the terms opportunity identification and opportunity recognition will be used interchangeably.

Contrasting views on the discovery of opportunities exist Hayek (1945) argued that the discovery of opportunity is symptomatic of the distribution of information in society and that people within a society possess different and idiosyncratic knowledge. Shane (2000) argued for opportunity recognition as an individual idiosyncrasy that will allow people to see different opportunities that are not identified by others.

In definitional terms Christensen et al (1989 P3) call opportunity recognition “either a) perceiving a possibility to create new business or b) significantly improving the position of an existing business, in both cases resulting in new profit potential”. Vesper (1980) suggested systematic search as a method of identifying opportunities. Shane (2000) argues that entrepreneurs will identify opportunities without active searching. Rather they identify opportunities through a serendipitous recognition of pre-existing knowledge resulting from idiosyncratic life experiences that produce a “knowledge corridor” allowing opportunity recognition (Venkataraman, 1997). Ardichuili et al (2003) maintain that identification of business opportunities is one of the most important abilities of successful entrepreneurs.

Bhave (1994) argued for two types of opportunity recognition. Firstly, an external perspective where the decision to start a venture preceded the opportunity recognition and opportunities are discovered in a systematic opportunistic way. The alternative perspective
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is an internally stimulated opportunity recognition process where problems and needs are recognised prior to the venture creation decision.

Chandler et al (2003) argues that the literature discusses three primary ways in which opportunities can be discovered; active search, fortuitous discovery and creation of opportunities. The active search model proposes that entrepreneurs identify opportunities through a deliberate conscious search. At an individual level Hills and Shrader (1998) discovered less evidence of active searching. Kaish and Gilad (1991) suggested that as entrepreneurs become more successful they are less likely to use the active search method. Chandler et al (2003) identified two major situations in which active searching may take place. Firstly, firms or individuals may search for opportunities as a result of problems they are encountering. Cyert and March (1963) argue that when dissatisfaction problems occur a relatively narrow search (Levinthal and March, 1981) of the local environment is made until an alternative is identified. Secondly, individuals or firms may search when they can, possibly as a result of formal strategies or sub-group interests. Chandler et al (2003) refer to this as proactive searching. Levinthal and March (1981) argue that this will be a broader search possible with more varied outcomes.

Kirzner (1979) is the main proponent of the idea that opportunities are identified through fortuitous discovery. The model asserts that alert individuals will recognise changes in the business environment and that these alert individuals will have the ability to discover without searching. Kirzner disagrees with the active search model stating, “we cannot search for what we do not know” Kirzner (1997, P71). Kirzner argues that it is the individual’s ability to infer through enhanced perception that makes them better placed to recognise opportunities. There is some evidence to support this hypothesis. Meyer and Skak (2002) identified serendipity as an important component of international venture
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entry. Teach et al (1989) reported that firms achieve breakeven sales faster in fortuitously achieved ideas than in ideas that had resulted from a more systematic search in a similar vein to Kirzner. Ardichvili et al (2003) identified that individuals can engage in passive search, receptive rather than active searching, increasing their likelihood of identifying opportunities through education and resource development.

Schumpeter (1934) argued that the entrepreneur creates opportunities themselves and that the entrepreneur or entrepreneurial firm has to educate the consumer to desire the product.

In the Schumpeterian creationist perspective opportunities are created in five areas.

1. Introduction of a new good
2. Introduction of a new method of production
3. Opening of new markets
4. Scanning of a new source of supply
5. Industrial sector reorganisation

Shackle (1961) argued that opportunities were created in the minds of entrepreneurs or entrepreneurial firms almost from nothing. From this perspective therefore human capability and creativity play a central role with the environment taking a secondary role significant only after the creative act. In this perspective Shackle (1961) argues an individual can create opportunities through imagination. The opportunity therefore only resides in the imagination of the individual prior to exploitation. Instead of alert individuals objectively discovering opportunities from the business environment it is Shackle’s view that the individual is the source of the opportunities.

Hills et al (1997) argue that opportunity recognition may be influenced by an entrepreneur’s use of networks as suggested by Granovetter’s (1973) work on strong and weak ties and Burt’s (1992) work on structural holes. Hills et al (1997) argue that an entrepreneur’s network could act as a screen through which a solid business opportunity can be identified.
They argue that an entrepreneur's network can be important to opportunity recognition.

Hills et al sought to investigate if entrepreneurs with larger networks identified more opportunities than 'solo' entrepreneurs. They concluded that 'network' entrepreneurs identified more opportunities than 'solo' entrepreneurs supporting the assertions of Granovetter (1973) and Burt (1992). Hills et al (1997) argued that people who use their networks may have greater access to information and thus to opportunities.

Ucbasaran et al (2002) studied entrepreneurial opportunity recognition through the impact of human capital. They argued that entrepreneurs can use their human capital to gain access to and accumulate financial and social resources and that these can be used to leverage resource supplies. They conclude that entrepreneurs with wider sources of human capital are able to develop both the skills and contacts needed to access information and resource networks.

Ucbasaran et al (2003) studied novice and habitual entrepreneurs. They identified that the two groups had different attitudes to opportunity identification concluding that opportunity recognition may be an emergent, developmental process. The study identified that both groups searched for information in similar ways. However habitual entrepreneurs were likely to identify opportunities more often than novice entrepreneurs. The researchers concluded that differences may result from their cognitive mindset and that this in turn is influenced by experience and knowledge.

Ucbasaran et al (2003) concluded that human capital, both general and specific, does influence the information search intensity of entrepreneurs and the number of opportunities they identify and pursue. Ucbasaran et al (2003) suggest that time and
experience change search techniques and therefore that entrepreneurial capabilities should be seen as having different levels of importance at different stages of the entrepreneurial process. Importantly entrepreneurs who considered themselves alert were more likely to use an intensive search method which contradicts Kirzner's (1979) assertions. Ucbasaran et al (2003) promulgate that experienced entrepreneurs may be more efficient in their use of information and that they may be more likely to identify and pursue an opportunity by narrowing down the search reducing the quantity of information and increasing the quality.

2.4.2 Cognitive aspects of opportunity recognition

Corbett (2005) argues that the cognitive literature adds to the understanding of entrepreneurship by providing a medium for explaining how an individual’s mental make up is related to their ability to identify and exploit opportunities. Baron (2004) suggests that cognition and perception can provide a significant perspective in understanding how opportunities are identified. What cognitive process or processes allow certain individuals to identify emergent opportunities in a complex and diverse external world? Secondly, once these patterns have been perceived how are the qualities of these patterns assessed? Thirdly, what specific experientially acquired mental structures can be identified that play a role in opportunity recognition?

Baron (2004 P2) made two propositions concerning the nature of opportunities and opportunity recognition.

"Proposition 1: Opportunities emerge from a complex pattern of changing conditions- changes in technology, economic, political, social and demographic conditions. They come into existence at a given point in time because of a juxtaposition or confluence of conditions, which did not exist previously but is now present"

"Proposition 2: recognition of opportunities depends, in part, on cognitive structures possessed by individuals- structures that are the result of their previous life experience. These structures (e.g. concepts, prototypes, exemplars) help specific persons to perceive connections between seemingly unrelated changes or events;"
it is the perception of these connections that constitutes the core of opportunity recognition”

Baron (2004) argues that if the change factors listed in his first proposition are determinants of opportunity recognition then these change perceptions must involve complex patterns of stimuli. Whether or not these patterns are identified by the entrepreneur or not is the fundamental concept of opportunity recognition. Cognitive research (Matlin, 2002) identifies object or pattern recognition as a process in which diverse stimuli from unrelated sources is perceived as recognisable patterns or objects.

Baron (2004) recognises that perception is a problematic process. Individuals can perceive opportunities strongly in which case many people will make the identification and perceive the opportunity. Alternatively other opportunities may be less apparent. Baron argues that sensitivity to perception in an individual varies over time. Some patterns are clear, others are open to interpretation. Signal detection theory (Swets, 1992) is a method by which individuals can identify if a pattern tentatively identified is a pattern or not.

Signal detection theory (Swets, 1992) suggests that four possible outcomes exist where individuals attempt to understand if a stimuli is present or not (Baron, 2004). For every stimulus or potential opportunity four possible outcomes exist.

1) That an opportunity exists and is recognised by an entrepreneur.
2) That the opportunity exists but the entrepreneur fails to recognise the opportunity.
3) That no opportunity exists but the entrepreneur, for whatever reason, fails to recognise this and perceives that an opportunity does exist.
4) That no opportunity exists and the entrepreneur recognises this fact.

Baron (2004) argues that the relative rate at which individuals experience these signals is dependent upon the properties of the stimuli themselves. Together with the capacity of the receiver to respond to stimuli and the subjective criteria applied to the task. Repeat or serial
entrepreneurs who have successful opportunity recognition may possess better developed and higher quality prototypes or draw on a richer store of exemplars than other individuals. Engel et al (1999) suggest that working memory a cognitive mechanism that facilitates the interaction between experience and knowledge with new information may be important in the performance of tasks such as reasoning and pattern identification. Engel (2001) identified that effective working memory leads individuals to focus on what is important and relevant in a given situation.

Gaglio and Katz (2001 P95) state, “an increasing number of scholars are concluding that opportunity identification represents the most distinctive and fundamental entrepreneurial behaviour”. They identified a series of hypotheses of opportunity recognition based on Kirzner’s (1973) ideas of entrepreneurial alertness. Kirzner (1979) argues that an entrepreneur’s mental representations and interpretations differ from other individuals. As a result of distinctive perceptual and cognitive processing skills and that these direct the opportunity identification process. Kirzner’s theory is based on the hypothesis that certain individuals will be entrepreneurially alert while others will be entrepreneurially non-alert. Opportunity identification he argues is “shrewd and wise assessment of realities” (Kirzner, 1980 P7). Which result from the exercise of abilities and behaviours within the individual’s perceptual, reasoning, and information gathering capacity.

Chase and Simon (1973) and Chi et al (1982) identified differences in both the decision-making criteria and the performance characteristics of experts and novices. They argue these can be traced back to differences in cognitive schema content. Cognitive schema are mental short cuts that allow experts to see patterns developing and identify anomalies. Experts have more complex, cross-linking schemas than novices. It could be argued that this will give experienced entrepreneurs an advantage over novice entrepreneurs in

These schema are constant, habitual and pervasive and affect perceptions and interpretations. While being able to be called upon consciously individuals are rarely aware chronic schema are being used. They argue that chronic schemas may increase entrepreneurs’ awareness of innovative commercial opportunities.

Kirzner (1979; 1985; 1992) argues that the differences between entrepreneurially alert people and the non-alert lies in decisions they make about their current circumstances. Non-alert individuals either fail to identify or create opportunities or they misjudge the market environment. In contrast alert individuals consciously or unconsciously employ schema that facilitate objective accurate interpretations of a changing market environment.

Kirzner (1985) identifies a number of potential cognitive errors non-alert individuals including:

1) Failure to recognise and integrate information about market disequilibria
2) Failure to recognise that assumptions were never or are not appropriate
3) Ignorance of new resources
4) Excessive optimism or pessimism about resources
5) Excessive optimism or pessimism about possible results of actions or decisions.

Gaglio and Katz (2001) suggest that psychologists have identified cognitive heuristics for breaking existing schema frameworks; changing category labels; creating new connections between schema through use of analogies, using counter-intuition and counterfactual thinking. Gehiselliee et al (1981) suggest that psychologists argue that skills and abilities of opportunity recognition can be conceptualised and measured along a continuum.

Corbett (2005) argues that experiential learning theory (Kolb, 1984) in which previous knowledge, perception, cognition and experience are integrated provides the opportunity to discover why certain individuals acquire and transform knowledge. How they transform
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this knowledge and existing experience to produce unique behaviours resulting in differing opportunity recognition and exploitation.

Ardichvili et al (2003) argued that certain individuals with certain types of knowledge would have a greater likelihood of recognising opportunities than those who do not possess this knowledge. They argued that the possibilities of successful entrepreneurship through enhanced opportunity recognition would be increased by prior knowledge of industry; markets; customer needs and existing market servicing. Support for this view is provided by Shane (2000) who identified that certain individuals subject to the same external market and technological influences would because of their prior knowledge recognise different opportunities.

2.4.3 Section conclusions

It is argued that an important requirement for the entrepreneur is their ability to recognise opportunities. Indeed it can be argued that it is the recognition of an opportunity that distinguishes the potential entrepreneur from the nascent entrepreneur. Additionally that it is the exploitation of that opportunity that defines the business start-up phase from the preparatory nascent stages. This chapter reviewed a range of theories on the methods of identifying opportunities. One of the most important determinants of opportunity recognition is argued to originate from the cognitive perspective. It has long been recognised that individuals perceive their environment in different ways. They process, store and use sensory information in different and unique ways. Cognitive psychology explores the mental processes that occur in individuals as they interact with other people and their environment. It is the role of cognitive mechanisms on nascent entrepreneurs that will now be explored.
2.5 The role of cognition in nascent entrepreneurship

2.5.1 The cognitive paradigm

Despite the failure of the trait approaches of the 1980s and 1990s in entrepreneurship research the idea that the entrepreneur as an individual is somehow unique and a member of a homogeneous group has persisted. The cognitive perspective provides us with a useful lens with which to explore the phenomenon (Mitchell et al, 2002). Mitchell et al argue that the cognitive perspective of entrepreneurship represents a theoretically and empirically testable approach that explains the role of the individual in the entrepreneurial process. This will help researchers to understand how entrepreneurs think and answer questions about entrepreneurial behaviours. Forbes (1999 P415) states “existing theories of entrepreneurship strongly suggest that cognitive factors such as perception and interpretation play a critical role in the new venture creation process”. Mitchell et al (2002) report that the cognitive viewpoint may be seen to serve well as an effective tool in probing and explaining previously unanswered research questions.

Mitchell et al (2002 P69) define entrepreneurial cognitions as “knowledge structures that people use to make assessments, judgments, or decisions involving opportunity evaluation, venture creation, and growth”.

The study of cognition in the area of entrepreneurial research has primarily focused on the individual. Schneider and Angelmar (1993) categorised this research as focussing on two areas, those of cognitive structure and cognitive process. Busenitz and Lau (1996) argue that it is fruitful for researchers to focus on how entrepreneurs acquire knowledge about their environment and how they process and utilise this knowledge. This thesis concurs with Busenitz and Lau (1996). It is the cognitive factors of an individual’s psychology such
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as perception and interpretation. As well as the ways in which knowledge is received and utilised by the individual nascent entrepreneur that is the principle research aim of this thesis.

The term cognitive schema is defined by Busenitz and Lau (1996 P28) as “a cognitive structure that represents the organised knowledge about a given concept and contains both the attributes of the concept and the relationship among the attributes...a schema is a cognitive structure of beliefs and rules about a certain stimulus domain”. Weick (1979) argued that a schema provides a framework for a person to enact their environment. “A Schema invokes memory, provides knowledge, specifies relationships and produces outputs by making predictions or inferences and initiating behaviour. It can be viewed as one type of social information processing in which the social reality is understood and labels and meanings are assigned to persons and events in the social environment” (Busenitz and Lau, 1996, P29).

It can be argued that the nascent entrepreneur in initiating a new business idea is deficient of experience and also confronting a series of uncertainties. The venture creation process requires nascent entrepreneurs to develop new ideas and make decisions based on inadequate information without the benefit of historical precedent to determine trends or levels of performance. Although these uncertainties can partially be remedied through the compensations discussed in the previous section the acquisition of information and establishment of networks can be expensive and time consuming. However decisions still have to be made if opportunities are going to be recognised within tight time-frames. If nascent entrepreneurs invoke a schema (structure) that is predisposed towards entrepreneurial events this will assist entrepreneurs to identify cause and affect
relationships to help them advance the development of their ideas within an uncertain landscape.

Cognitive heuristics refer to the way in which knowledge is received and utilised. Busenitz and Lau (1996 P29) refer to heuristics as “specific informal rules-of-thumb or intuitive guidelines that yield quick and usually acceptable solutions to problems”. These are linked to cognitive biases and both refer to simplifying strategies that are assumed to be generally efficient mechanisms for making decisions in uncertain environments. Strategic decision-makers (Katz, 1992) and organisational founders (Shaver and Scott, 1991) have been found to use biases and heuristics in their decision-making. Entrepreneurs, especially in the nascent and early novice stages of the development of the organisation do not have the luxury of becoming expert decision-makers in a specific area. They are in a complex environment consisting of inter-related decisions. The use of simplifying biases and heuristics can assist entrepreneurs in this process. Utilizing cognitive heuristic tools enables quick and usually efficient decisions. Without the extensive use of biases and heuristics in opportunity recognition, evaluation and exploitation (Shane and Venkataraman, 2000) decisions would be severely impeded. Opportunities would close before the more complete information becomes available to justify the viability of a venture. Cognitive heuristic tools that simplify and facilitate business launch decision-making will represent a fundamental critical role for cognition in understanding nascent entrepreneurship.

2.5.2 Cognitive biases associated with entrepreneurship

In studying cognition from the perspective of entrepreneurship Baron (1998) argues that some elements of human cognition are of more relevance to entrepreneurial research than others. He argues that entrepreneurs are exposed to such conditions more frequently and more intensely than other people. These conditions are a part of the entrepreneurial
experience. Entrepreneurs are frequently faced with new, unpredictable complex situations and are susceptible to overload. Work levels, fatigue and stress levels can be high and work commitments to ideas and businesses can lead to high emotions that influence their thinking. Baron argues that entrepreneurs more than other people are exposed regularly to situations that test the limits of their cognitive capacities and that this increases their susceptibility to cognitive bias.

**Figure 2.6 Factors influencing differential susceptibility to cognitive errors by entrepreneurs and others.**

<table>
<thead>
<tr>
<th>Conditions That Increase Susceptibility to Cognitive Biases</th>
<th>Faced Regularly by Entrepreneurs</th>
<th>Increased Susceptibility to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Overload</td>
<td>Faced Less Often By Others</td>
<td>Counterfactual Thinking</td>
</tr>
<tr>
<td>High Uncertainty</td>
<td></td>
<td>Affect Infusion</td>
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<tr>
<td>High Novelty</td>
<td></td>
<td>Self-Serving Bias</td>
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<td>Strong Emotions</td>
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<td>Planning Fallacy</td>
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<td>High Time Pressure</td>
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<td>Self-Justification</td>
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<td>Fatigue</td>
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Source: Baron, (1998)

### 2.5.2.1 Counterfactual thinking

Roese (1997) contends that the term counterfactual means 'contrary to the facts'. He argues that a counterfactual thought occurs as a result of the mental mutation of past factual occurrences and the assessment of the consequences of that alteration. Goodman (1987) defines a counterfactual thought as the falsification of the antecedent thought. Wells and Gavanski (1989) argued that people often evaluate the outcome of an event or incident by constructing alternative outcomes. According to Roese (1997 P133) beneficial effects arise from counterfactual thinking as “thoughts of what might have been may suggest paths to what may yet be”. Counterfactual thoughts are argued to focus on extreme or unusual antecedent events and occur in circumstances where corrective thinking would be valuable.
Kahneman and Miller (1986) hypothesised that counterfactual thoughts would occur where alternatives are easy to visualise. Wells and Gavanski (1989) discovered that counterfactual alternatives were more likely to occur where a greater number of possible options were available to the individual. Counterfactual thoughts can occur 'upwards' where the evaluation of the alternative outcome is better than the actual outcome or 'downwards' where the evaluation of the alternative outcome is worse than the reality.

Roese (1997) argues that upwards counterfactual thoughts are beneficial as they allow comparative analysis of contributory elements within a given circumstance to 'illuminate' paths to future success. Counterfactual thoughts can therefore be seen as mental rehearsals of 'what might have been' for 'what might yet be'.

Roese (1997 P145) concludes:

"Thoughts of what might have been are a pervasive feature of mental life. They are often triggered by unpleasant emotional experiences and one of their immediate consequences is to exacerbate that unpleasantness. However, the content of such thoughts may identify causally efficacious variables; the realisation of which may facilitate future performance."

Entrepreneurship research into counterfactual thinking indicates that it might affect venture success. It may have a negative effect when thoughts of regret about actions not performed or performed badly interfere with other task performances. However, counterfactual thinking can be a source of reflective analysis on the way something was done. So long as this is constructive it can be a positive learning experience encouraging entrepreneurs to consider past events from the perspective of more effective strategies (Baron, 1998). Miner et al (2001) identified that the more effectively organisations learn the more successful they tend to be.
2.5.2.2 Regretful Thinking

Regretful thinking can occur as a result of unintended detrimental experiences or situations or from the failure of imagined or expected positive outcomes materialising. It often occurs as a response to information about unfavourable results or unmet expectations (Markham, 2002). Zeelenberg et al (1998) argued that such situations lead to strong reactions such as disappointment and the apportionment of blame. Like counterfactual thinking regretful thinking is the automatically activated cognitive representation of alternative scenarios produced as a result of misfortune or disappointment (Baron, 2000). Strong sentiments may affect an entrepreneur's moods; understanding of cause-effect relationships; decision-making and task performance (Roese, 1997). Creyer & Gurham (1997) concluded that regret and blame were strong when associated with product failure Baron (2000) identified that, compared to students, entrepreneurs experiences fewer regrets. Markham et al (2002) argue that technological entrepreneurs will be especially susceptible to regretful thinking due to the 'potent market and technical obstacles' they experience championing a new venture. The Markham et al (2002) study focused on invention and technological entrepreneurship and suggested that entrepreneurs would experience more regrets more intensely than non-entrepreneurs. These suggestions were supported by empirical findings. However the research concluded that while entrepreneurs and non-entrepreneurs regretted at roughly the same amount, the types of regrets differed.

The degree to which nascent entrepreneurs are susceptible to cognitive biases in the same way as more established entrepreneurs is a moot point. It could be argued that some of the conditions that increase susceptibility to cognitive biases will not yet have influenced the inexperienced nascent entrepreneur. While there is no doubt that nascent entrepreneurs will be as susceptible to cognitive biases as the general population at what stage these develop is unclear. It is possible to hypothesise that the conditions that lead to a
susceptibility occur very quickly. In this case the effect on nascent entrepreneurs would be an important consideration. It may also be the case that susceptibility develops over time. If this is the case the degree to which cognitive biases effect nascent entrepreneurial predilection may be reduced.

2.5.3 Self Efficacy

Self-efficacy is a cognitive mechanism which facilitates the belief in individuals that they can organise and effectively perform actions needed to produce a particular outcome (Markham et al, 2002). Perceived self-efficacy is a significant determinant of performance that operates partially independently of underlying skills (Locke et al, 1994). Self-efficacy is part of social cognitive theory (Bandura, 1986). Social cognitive theory posits that personal history including vicarious experience, mastery experience and personality characteristics and abilities may predispose an individual's level of self-efficacy. According to Markham et al (2002) self-efficacy impacts on perceptions of control, stress and self-blame. It also impacts on the depression individuals experience and accomplishments that individuals experience in trying, taxing or uncertain situations. Bandura (1986) argues that both self-efficacy and skills are needed for competent functioning suggesting that in ambiguous, unpredictable or stressful environments self-efficacy will determine an individual's judgement of their capabilities rather than act as an assessment of their skills. Bandura argues that an ability to make accurate self-assessments of capabilities is of considerable value in successful functioning. Bandura (1986) suggests that self-efficacy is a mechanism for self-directedness that impacts strongly on human thought, feelings, motivation and action. Bandura (1990) argued that an individual's belief in their own efficacy influences their choices, aspirations, motivation and endeavour. That efficacy will influence an individual's perseverance and the degree to which thought patterns are self-hindering or self-aiding. "In pursuit of difficult challenges, people have to override a lot of dissuading
negative feedback if they want to realise what they seek. Resilient belief that one has what it takes to succeed provides the necessary staying power in the face of repeated failures, setbacks and sceptical or even critical social reactions that are inherently discouraging”

Bandura and Locke (2003; P92). Wood and Bandura (1989) refer to self-efficacy as an individual's cognitive estimate of their capabilities to mobilise the motivation, cognitive resources and courses of action needed to exercise control over events in their lives.

Markham et al (2002) asserts that self-efficacy is central to human functioning and a 'potent' precursor to motivation, affective status and actions.

Bandura (1977; 1986) distinguish social learning theory from other psychological theories by the nature of the reciprocal causation that occurs between the model variables.

Traditional unidirectional theories argue that human behaviour is caused by a single variable related to either environmental or internal predisposition events. Social learning theory posits an interdependent model based on three variable factors, behaviour, cognition and environment. Each factor influences and is influenced by the others Chen et al (1998). However Wood and Bandura (1989) argue that the influence of each variable does not remain constant or equal over time nor do reciprocal influences occur simultaneously. They also contend that self-efficacy is the most effective predictor of performance. Encouraging an expansion of effort and persistence in the face of setbacks resulting in more effective performance. This in turn leads to a mutual and positive reinforcement between self-efficacy and performance.

Wood and Bandura (1989 P368) argue that an individual will adopt goals and evaluate their performance in the present to act as guides and motivators for future outcomes. They argue that goals guide and motivate performance and help reinforce self-efficacy and can be distinguished between short-term and long-term achievements. Long-term goals
positively influence motivation. Motivation based on personal goals requires a cognitive process of comparison which affects actions, self-incentives and persistence with satisfaction only achieved when performances match the goals. “Cognitive motivation based on goal intentions is mediated by three types of self-influences; affective self-evaluation; perceived self-efficacy for goal attainment and adjustment for personal standards”.

Drnovsek and Glas (2002) argue that self-efficacy is an appropriate perspective to study entrepreneurship. The mechanism incorporates both internal personality driven factors and external environmental influences. Krueger and Brazeal (1994) proposed that entrepreneurial self-efficacy was one of the key prerequisites of the potential entrepreneur. Chen et al (1998) argues that efficacy is close to action and action intentionality (Bird 1988; Boyd and Vozikis, 1994). Chen et al (1998) argues that it can be used to predict and study the choices, persistence and effectiveness of entrepreneurs. Boyd and Vozikis (1994 P66) argue that entrepreneurial self-efficacy relates to the degree to which an individual believes they are capable of successfully performing the roles and tasks of an entrepreneur and that the concept itself is “an important explanatory variable in determining both the strength of entrepreneurial intentions and the likelihood that those intentions will result in entrepreneurial actions”.

Chen et al (1998) argue that the entrepreneurial decision may be influenced by entrepreneurial self-efficacy (ESE). They argue that ESE levels will influence an individual’s perceptions of opportunity with high ESE individuals seeing opportunities in the same situation where an individual with low ESE will see costs and risks. In situations that are perceived as uncertain people with high ESE will feel more competent to deal with the uncertainty than people with low ESE. The final influence is in the perception of outcome
with high and low ESE individuals. High ESE individuals associate the entrepreneurial decision with positive images of financial reward, fulfilment or recognition. Individuals with low ESE perceive negative images of bankruptcy, financial ruin and loss of esteem.

Research by Chen et al (1989) identified a significant and consistent positive effect of entrepreneurial self-efficacy on the likelihood of being an entrepreneur and concluded that it is a characteristic unique to the potential and actual entrepreneur. This thesis will seek to measure the general self-efficacy of nascent entrepreneurs in order to determine if there is any difference between the self-efficacy of nascent and established entrepreneurs. This review of the literature has indicated the degree to which self-efficacy is a central determinant of nascent entrepreneurship.

2.5.4 Cognition and nascent entrepreneurship

Bird (1988) argues for the idea of entrepreneurial intention as a prerequisite to nascent entrepreneurship. Bird defines intentionality as a state of mind directing a person’s attention towards a specific goal or path in order to achieve something. Entrepreneurial intentions are aimed at either creating a new venture or creating new values in existing ventures. Bird argues that entrepreneurial intention directs critical strategic thinking and decisions and operates as a perceptual screen for viewing relationships, resources and exchanges Boyd & Vozikis (1994). Another dimension of entrepreneurial thinking links the ideas of rationality and intuition. Bird (1988) argues that a person’s psychological process structure (cognitive style) will produce two sets of frames. The first frame includes a person’s rational, analytic and cause and effect-orientation. Bird argues this frame underlies formal business planning, opportunity analysis, resource acquisition, goal-setting and most observable goal-directed behaviour. The second frame structures an entrepreneur’s intuitive, holistic and contextual thinking creating intention and action inspired by vision,
hunch and “feeling” for the potential of an enterprise. This provides a conceptual link between the concepts of the adaptive-innovative in the theory of cognitive style (Kirton 1976) and ideas of rationality and intuition promulgated in Bird’s model of entrepreneurial intentionality.

Cognitive psychology is central to the model of entrepreneurial intentionality developed by Bird (1988). This theory attempts to explain or predict human behaviour. Fishbein & Ajzen (1975) suggest that there is a clear relationship between the intention of an individual to perform a particular behaviour and their actual performance of that behaviour. There are a number of factors that influence the relationship between intention and behaviour. These include the ability of an individual to carry out the intention and the stability of the intention over time; volitional control and the measurement used to identify the relationship. The relationship between intention and behaviour is also influenced by personal factors such as skills, willpower and attainment levels and environmental factors such as time limits, difficulty and the influence of social pressure (Boyd & Vozikis, 1994). Ryan (1970) argued that an individual’s self-perception of the ways in which an individual perceives their abilities and tendencies plays a role in the development of intentions.

2.5.5 Proactive personality

Crant (2000 P436) defines proactive behaviour as “taking the initiative in improving current circumstances or creating new ones; it involves challenging the status quo rather than passively adapting to present conditions”. Crant (2000) argues that proactive people seek information and opportunities. Bateman and Crant (1993) argue that proacti

ity is personal and dispositional while other authors suggest that proactivity cues are triggered by situations (Morrison and Phelps, 1999) or contexts (Miller and Jablin, 1991). Crant (1995) identified a relationship between proactive personality and job performance. He argues that based on Bandura’s (1977) interactionist perspective that behaviour is controlled by
internal (personality) and external (situational) factors and that both variables impact on each other. Therefore an individual’s behaviour is as likely to influence a situation as a situation is to influence behaviour. This means that individuals can influence their situation to make their job performance more successful because they will create situations and affect their environment to make success more likely.

Bateman and Crant (1993 P105) state “The prototypic proactive personality, as we conceive it, is one who is relatively unconstrained by situational forces, and who affects environmental change. Other people, who would not be so classified, are relatively passive - they react to, adapt to, and are shaped by their environments. Proactive people scan for opportunities, show initiative, take action and persevere until they reach closure by bringing about change. They are pathfinders who change their organisations mission or find and solve problems.

Crant (1995) argues that proactive individuals will display discretionary behaviours that will lead them to exhibit higher job performance. Seibert et al (1999) argued that individuals who exert control over their work situations are more likely to have a fuller understanding of the operation of their work environments and anticipate changes as well as be able to change the nature of their tasks, task order or methods of working. They were likely to engage in training, career planning and be persistent in pursuing career success. Crant’s (1995) study was conducted within the real estate industry in the US and Seibert et al (1999) among employees across business sectors. If these findings that proactive personality is associated with success are generalizable to the entrepreneurial community then this could be an important determinant of entrepreneurial success. Crant (2000) states that the proactive personality is also associated with leadership (Bateman and Crant, 1993) organisational innovation (Parker, 1998), team performance (Kirkman and Rosen, 1999) and entrepreneurship (Crant, 1996; Becherer and Maurer, 1999).

The Proactive Personality Scale (Bateman and Crant, 1993) was developed empirically to introduce the concept of proactive behaviour as a construct that identifies the extent to
which individuals take action to influence their environments. A proactive behaviour is considered to be one that directly alters environments. Bateman and Crant (1993) consider proactivity to be a relatively stable behavioural tendency. Crant (1996) undertook a survey of 181 university students using the Proactive Personality Scale (Bateman and Crant, 1993). The purpose was to assess if a proactive personality predicted entrepreneurial intentions. A proactive personality is defined by Bateman and Crant (1993 P43) as “one relatively unconstrained by situational forces and who effects environmental change”. Bateman and Crant (1993) argued that proactive personality will be linked with identification of opportunities; acting on opportunities; initiative, action orientation and perseverance. Crant (1996) argues that proactivity differs from cognitive traits as proactivity involves initiating and maintaining actions that directly alter the surrounding environment. Proactivity is therefore seen as behaviour rather than a mental construct. Bateman and Crant (1993) argued that the Proactive Personality Scale had implications for career choice and entrepreneurship. Crant (1996) identified that after controlling for gender, education and parental role model variables that the proactive personality displayed a positive correlation between proactive personality and business start-up intentions. Bateman and Crant (1993) argue that proactive behaviour differ fundamentally from cognitive or affective traits such as empathy or well being. They argue that the disposition to be proactive is a stable, behavioural tendency to affect change that is general and includes both social and non social behaviour.

Bateman and Crant (1993) developed the Proactive Personality Scale to easily measure the proactivity construct in individuals. They developed the self-report scale to systematically identify the differences in proactivity that occur between different individuals. Bandura (1986) had argued that while activities and circumstances were stable people were variable. Buss (1987) identified that an individual’s manipulation tactics varied across contexts and
that this represented an individual difference. The scale was validated by determining its relationship with five super ordinate personality dimensions (neuroticism, extraversion, openness/intelligence, agreeableness/friendliness, and consciousness/will). It was also assessed in its relationship with three specific personality dimensions: locus of control, need for achievement and need for dominance.

Bateman and Crant (1993) argue that proactive behaviour directly alters environments. Interactionism suggests that individuals create their environments through behaviour that is internally and externally controlled. In the interactionist perspective people influence situations as much as situations influence people. Bandura (1986) argued that people, environment and behaviour continuously influence one another. Bateman and Crant (1993) argue that individuals influence their environments through specific, deliberate processes. Schneider (1983) argued that individuals select situations in which to participate. Buss (1984) argued that proactive behaviour can be demonstrated by intentionally evoking reactions from others and manipulating other people in order to change their social environment.

Becherer and Maurer (1999) used the Proactive Personality Scale and concluded that proactive personality disposition is related to entrepreneurship identifying that a more proactive approach in top management was related to the entrepreneurial posture of the firm. They argue that proactive entrepreneurs use their firms to actively shape the environment. Kickul and Gundry (2002) examined the interrelationships among small firm owner’s personality, strategic orientation and innovation. They identified that a small business owner’s proactive personality is linked to a strategic orientation of the firm that permits flexibility and change in response to surrounding business conditions. It can be argued therefore that the concept of proactive personality could be useful both in terms of
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its impact on entrepreneurial intentions, strategic orientation and as a determinant of success. Becherer and Maurer (1999) argue that proactive personality disposition is related to entrepreneurship. They investigated the relationship between the personality disposition and entrepreneurial behaviours of 215 small business owners. They measured entrepreneurial behaviour by comparing those owners that had formed their own business and those that had acquired their businesses through other means. They also looked at the proactivity of the organisational posture looking at performance and delegation of authority. They identified that the proactivity of business owners was directly related to the entrepreneurial posture of the firm. They also identified that business owners who had founded their own business had higher proactivity scores than those business owners who had bought or inherited their business. They identified that there was a correlation between the proactivity of an entrepreneur and the number of businesses founded. In terms of the performance of the business proactivity was positively correlated with higher company sales but not with profits. Becherer and Maurer (1999) argue that the achievement of profit may require more refined management than the bold and assertive actions of the proactive owner. Additional findings by Becherer and Maurer (1999) may provide some answers to this. They contend that the proactive personality is associated with an externally orientated big-picture approach which does not relate to organisational structure or processes.

Crant (1995) studied behavioural intentions to own a business among students. In contrast to the cognitive approach the interactionist perspective (Bandura 1977) argues that individuals intentionally and directly change their current circumstances by choosing the career for which they are best suited. Crant (1995) argues that individuals with a proactive personality will be drawn to entrepreneurial careers. His study suggests that proactivity was positively associated with entrepreneurial intentions. This supports prior research (Shapero & Sokol, 1982; Kruegar and Brazeal, 1994) that 'propensity to act' is indicative of
entrepreneurial actors. They argue that having a proactive personality may be positively related to propensity to act.

Seibert et al (1999) investigated the role of proactive personality on career success. They argue that the tendency to alter a work environment creates opportunities for career success. The ability to understand the intricacies of the work environment allows proactive people to anticipate and react to change. They argue that proactive people are more likely to engage in career management activities, seek out organisational information and sponsorship and identify and seek opportunities for self improvement. Proactive people may also alter work methods, procedures and task assignments in order to effectively control their work environment. Proactive people therefore alter what they need to change to be successful.

Seibert et al (1999) identified that a proactive personality resulted in greater objective and subjective career success. The authors define objective success in quantifiable terms, salary and promotional history and subjective success in more qualitative terms reflecting feelings of career satisfaction and career accomplishment. Proactive individuals will, they argue, earn more money and enjoy greater promotional prospects. Their study concluded that proactive personality was positively related to salary and promotional history even when variables such as educational and human capital were accounted for. In subjective terms Seibert et al (1999) noted that proactive individuals have a greater sense of satisfaction in their careers. This thesis contends that the decision for an individual to found their own business demonstrates self determination over career decisions. It would be expected therefore that nascent entrepreneurs will have a proactive personality. The Seibert et al (1999) study was conducted among managers. This thesis hypothesises that among
entrepreneurs similar findings would be identified translated into income, number of ventures created and career satisfaction.

Dejong and Ruyter (2004) investigated proactive and adaptive behaviour among self-managed teams. They found that both adaptive and proactive behaviours could be beneficial to an organisation providing different but complementary effects. Their findings implied that it was the employee’s cognitive interpretations of the work environment that determined whether they would implement adaptive or proactive behaviours. Research identified that employee proactive behaviour did have a positive impact on actual customer behaviour they argue that more proactive teams place greater effort, employ extra resources and deliver additional services that are better able to take advantage of market opportunities.

Dejong and Ruyter (2004) contend that adaptive behaviours would include creative problem solving, coping with complexity and unpredictability. They would also include adjusting to new technological innovations and interpersonal adaptivity. In contrast they argue that proactive behaviours seek to improve current work situations or create new ones through the creation of new or unique systems, procedures or interventions rather than adaption of old ones.

2.5.6 Conclusions on entrepreneurial cognitions

Mitchell et al (2002) argues that cognition theory offers researchers a theoretically and empirically testable approach to understand the role of the individual in the entrepreneurial process. Forbes (1999) contends that cognitive factors such as perception and interpretation are fundamental to the venture creation process. Research indicates (Lumpkin et al 2004; Ward, 2004) that there is a correlation between an individual’s
opportunity identification and their creativity and cognition. Ward (2004) examines different cognitive approaches to creativity in opportunity identification to show that novel combinations can be achieved when a cognitive approach allows for creativity. Clearly then entrepreneurial cognition plays an important part in the entrepreneurial process. This section has sought to introduce and review this important body of literature before considering cognitive style in more detail in the final section.

Mitchell et al (2002) argue that expert information processing theory is of interest to researchers in entrepreneurship because it successfully accounts for the ability of entrepreneurs to transform, store, recover and use information that non-entrepreneurs miss. They conclude that entrepreneurs use an expert cognitive knowledge structure or script that enable them to significantly out perform non-entrepreneurs. These expert scripts are highly developed sequentially ordered knowledge applicable to a particular field.

If there truly is a global entrepreneurial cognition and if entrepreneurial cognitions are distinct and definable then this thesis would argue that an underlying construct must unify entrepreneurs. This cognitive construct involves the mental processes that occur within individuals as they interact with other people. The cognitive biases associated with entrepreneurship are caused by an individual difference that makes entrepreneurs susceptible to such influences. They impact on the ability of nascent entrepreneurs to successfully launch a business. Similarly self-efficacy is an individual difference which can be argued to differentiate entrepreneurs from other individuals. These cognitive differences are a result of individual perceptions, memory and thinking. It is the way in which these sensory inputs are transformed, stored and recovered to create a cognitive style that forms the central focus of this thesis.
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It has been suggested (Messick, 1976) that the influence of cognitive style extends to all human activities that require cognitive processes. The concept of cognitive style and its ability to influence people’s thoughts and actions has received increasing attention within entrepreneurial research and literature. For example, studies have investigated the relationship between cognitive style and innovative work settings (Wooten et al., 1994), complexity (Stefout & Nogami, 1989), research and development environments (Taggart et al., 1985), task orientations (Foxall, 1990), managerial creativity (Foxall & Hacket, 1994; Gryskiewicz et al., 1987) entrepreneurship (Allinson et al., 2000; Goldship & Moger, 1994), managerial competence (Schroder, 1994) entrepreneurs' problem solving styles (Buttner & Gryskiewicz, 1993), and comparisons of managers, small business owners, and entrepreneurs (Carland & Carland, 1992).

It has long been recognised that individuals perceive their environment in different ways. They process, store and use sensory information in different and unique ways. Cognitive psychology explores the mental processes that occur in individuals as they interact with other people and their environment. The impact of cognition on nascent entrepreneurs will now be considered in more detail.
2.6 Cognitive Style

2.6.1 The theory of cognitive style

Cognitive style is a term used to describe the mental activities associated with thought processes, knowledge storage and processing. It is based on the possibility that individuals will carry out these processes differently, but in a relatively consistent manner (Kirton, 1976). It was defined by Tennant (1988) as an individual’s characteristic and consistent approach to organising and processing information and experience and by Witkin (1977) as individual differences in how we perceive, think, solve problems, learn and relate to others. Cognitive style is a theoretical construct that attempts to define the way in which people process information. (Wallach 1962) describes cognitive styles as “…broad, systematic characteristics affecting an individual’s reactions to different situations. (Hudson, 1968) attempted a more explanatory definition “cognitive styles are not categories or types, but dimensions of continuous variation; not pigeon holes but signposts for characterising individual propensities; not merely behavioural differences but tendencies or tensions underlying the surface of intellectual life.” Messick (1976; 1984) and Harre and Lamb (1986) all define cognitive style in terms of its constancy over time and as a method in which individuals, differently and uniquely, organise and process information and experience. An alternative definition is provided by Neisser (1967) who defined cognitive style as all the processes by which sensory input is transformed, reduced, elaborated, stored, recovered and used. In terms of human behaviour and differences Riding and Rayner (1998) argue that cognitive style may represent the missing determinant that explains human behaviour, while Tennant (1988) argued that in terms of psychological differences cognitive style was an important variable in an individual’s perceptions of problematical situations or occurrences. The influence of cognitive style is supported by Messick (1976) who contends that cognitive style is implicated in most human activities including social and interpersonal relations. Sadler-Smith and Badger (1998 P248)
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synthesised the literature and contend that five characteristic of cognitive style can be identified: "a) it is concerned with the form rather than the content of information processing; b) it is a pervasive dimension that can be assessed using psychometric techniques; c) it is stable over time; d) it is bi-polar; e) it may be value differentiated (i.e. styles describe 'different' rather than 'better' thinking processes)".

Armstrong (1999) identified 54 separate dimensions and later extended this to over 70 (Armstrong, 2006) in which cognitive style has been differentiated including converger-diverger (Guilford, 1956), field dependence-independence (Witkin et al, 1962), reflective-impulsive (Kagen, 1965), serialist-holist (Pask & Scott, 1972), analyst-holist (Riding, 1991).

There are a great number of cognitive style dimensions that have been developed by researchers over time. Some authors have argued that all these conceptions are merely different manifestations of a super-ordinate dimension, (Miller, 1997; Riding & Sadler-Smith, 1992) which has previously been labelled intuitive-analytic (Agor, 1986; Hammond et al 1987).

Riding and Cheema (1991) and Rayner and Riding (1997) propose two principle cognitive style dimensions. Firstly, the wholist-analytic style, which determines if an individual processes information in a wholistic way or in parts using an analytic style. Secondly, the verbal-imagery style which is a mental process which determines if individuals represent information verbally or using mental pictures while thinking. Rayner and Riding (1997) argue that eight cognitive style models fit within the wholist (intuitive)-analytic cognitive dimension.

Allinson and Hayes (1996) argue for the conceptualisation of the intuitive-analytical dimension of cognitive style as a continuum. Individuals demonstrating very strong...
cognitive preferences are located at the polar ends of the continuum. Individuals can exhibit cognitive styles at any point along the continuum thus all degrees of cognitive style are possible. Allinson and Hayes call these compromise forms of cognitive style.

Hammond (1987) calls them quasi-rationality incorporating properties of both poles of the intuitive-analytic continuum. In learning effectiveness Letteri (1980) calls such people Type 2 learners and their cognitive style fits between the extremes of analytic (Type 1) and intuitive (Type 3). Polar opposites sit at either end of the continuum. An individual’s cognitive style will therefore sit somewhere on the continuum. Different researchers have developed theories which utilise different polar opposite personality traits to define a persons position on the continuum. Streufort and Nogami (1989) suggested that cognitive style accounts for the differences in performance of employees when moved from one job to another. They found some individuals moved effortlessly between different jobs yet other people of equal experience and training performed badly within a new setting. Cognitive style therefore becomes a predictor not of intelligence but of behaviour (Driver, 1987).

Riding (1997) contrasts notions of cognitive style with cognitive ability. He suggests that as cognitive ability increases so will performance in given tasks. However, the effect of style on performance will be either positive or negative depending on the task. Thus, for example, the cognitive ability of an individual to construct ‘flat pack’ furniture from diagrams may well improve with practice however on the verbal-imagery style dimension those who process information using imagery will be at an advantage because it will match their cognitive style. In contrast, when individuals receive travel directions verbally the verbal individual’s cognitive style will assist them whereas individuals with imagery based cognitive style may prefer a map. An individual’s cognitive style is either good or poor at assisting in tasks depending upon the nature of that task.
Riding (1997) argues that cognitive style has a physiological basis and is fixed for an individual. He argues that cognitive strategies are learned and developed responses to meet the requirements of situations or tasks. Strategies are particularly employed where a cognitive style is not ideally suited to a particular task and a cognitive strategy is employed to improve responses. According to Sadler-Smith and Badger (1998) cognitive ability differs from cognitive style. Cognitive Style is bi-polar and used as a description of quantitatively different thinking styles which are different rather than better. Ability is uni-polar, more cognitive ability is ‘better’ than ‘less’. Messick (1984) also described ability as uni-polar and style as bi-polar. A number of studies (Riding and Pearson, 1994; Sadler-Smith, 1997) have supported the view that cognitive style describes ‘different’ rather and ‘better’ ways of thinking.

2.6.2 Malleability of cognitive style

In dynamic situations nascent entrepreneurs will need to process information and demonstrate behaviours that are not representative of their true cognitive style. Hayes and Allinson (1996) argue that a temporary alternative strategy can be employed by individuals by combining styles or aspects of styles to meet the new or unique situation. Hayes and Allinson contend that as cognitive styles are relatively fixed and that they are not easily modified through training but that cognitive strategies possess a flexibility that is able to deal with such situations. Kirton (1989) discusses coping behaviours and distinguishes between these and style. He also argues that problems can be dealt with through a repertoire of behaviours. Kirton argues that some of these will be derived through the preferred style and others required by the situation. Sadler-Smith and Badger (1998) contend that adopting behaviours outside these that are preferred or habitual is symptomatic of versatility. Paske (1976) discusses versatility of learning rather than strategy
arguing that those that are the most versatile learners will be able to employ both analytic and intuitive approaches. Sadler-Smith and Badger (1998) propose that individuals who can employ strategies from both the intuitive or analytic perspectives either have a cognitive style that permits this (between the polar extremes) or have developed cognitive strategies to balance out their deficiencies.

Curry (1983) proposed that cognitive styles could be grouped into three main sequential types. Curry argued that these would be stratified like the layers of an onion. A central personality dimension at the heart is translated into information processing dimensions of the middle layer. The final outer layer represents the interaction with environmental factors. Curry argues that the outermost layer is the most observable style and refers to the choice of environment in which an individual learns. Curry argues that this layer which she calls instructional preference is the least stable and most easily influenced. The middle layer contains the information processing style which represents the individual intellectual approach to assimilating information. Curry suggests that that this does not interact directly with the environment. It is more stable than the outer layer but that it can still be modified by learning strategies. The inner layer is referred to as cognitive personality style. It does not react with the environment. It is the most stable and relatively permanent behaviour and because it is expressed indirectly it is only observable across many learning situations.

Certain individuals have a cognitive style that enables them to believe that change is possible and they are motivated into action to bring about change through their processing of information and experience. Within a society only certain people will have this desire in a sufficient degree to become actual entrepreneurs. As established by the literature we know that many entrepreneurs are not motivated solely by money, but that achievement and recognition are also important (Brockhaus & Horowitz, 1985). Important factors such
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as these are affected by cognitive style which has a considerable impact on the entrepreneurial predilection of the nascent entrepreneur.

2.6.3 Influence of cognitive style in work settings

With regard to work settings, Lynch (1986) suggested that intuitive people would be nonconformists and seek solutions outside existing structures and procedures. They would prefer a rapid open ended, random approach to decision-making and prefer to tackle problems using a holist approach. Drucker (1959) noted a dichotomy between managers who do things better and those who do things differently. Carland et al (1996) state that an individual’s decision to engage in all or any entrepreneurial actions is based on the decision to take that action and that the decision is rooted in personality and cognition. Their study clearly demonstrated that intuition formed the basis for understanding the entrepreneur’s behaviour patterns. Those entrepreneurs with a stronger cognitive inclination towards intuition translated their vision into innovative action, whereas they suggest that entrepreneurs with less intuition in their cognitive style would prefer a more concrete approach to the entrepreneurial process. Lynch (1986) suggests that such individuals will prefer a structured approach to decision-making and apply systematic, step-by-step methods of investigation. Sadler-Smith (2004) highlights the interest of management researchers in determining how the effectiveness of managerial action is served by the differing dimensions of cognitive style. He also cites the increased interest in the nature and significance of cognitive styles for understanding and predicting differences in managerial behaviour and in understanding ways in which individuals identify or exploit opportunities.

Simonton (1980) developed a personality typology based on theories of cognitive style and cognitive ability. Simonton suggests that conscious analytic and preconscious automatic intuitive processing would exist along a single dimension and would facilitate four different
levels of processing along a continuum. He argues that these process levels would be based upon degrees to which conditional probabilities occurred. Conditional probabilities are mental associations that events will rarely or invariably take place together. If events rarely occur together then the association is weak. If events invariably occur together the association is strong. The greater the probability of association the greater the level of consciousness created and indicated along the continuum. Along with levels of consciousness and allied with them are four probability thresholds that also depend upon the association of occurrences. These are defined by Simonton as unconscious (attention); infra-consciousness (behaviour); consciousness (cognition); ultra-consciousness (habituation).

It could be argued that this model has interesting implications for opportunity identification. Thought processing at the unconscious and infra-consciousness levels involves probabilistic relationships that are not open to logical examination because they occur at such an infra-conscious level. Hayes et al (2003) argue that although these are unconscious relationships they are based on realistic scenarios and environmental events and that the unconscious and infra-conscious mind will be open to new possibilities and innovative associations. Simonton (1980) suggests that this can lead to unconscious learning. Individuals will acquire greater competence and improve performance levels as experience and practice increase levels of probabilistic associations. Eventually Hayes et al (2003) suggest infra-consciousness produces such strong associations that then enter the conscious processing levels. Bowers et al (1990) argued that individuals would experience this as a flash of insight.

Hayes et al (2003) contend that at this intuitive level of processing major innovations occur. Simonton (1980) argues that such behavioural adaptations will be unconscious,
ineffable and based on probability. Hayes et al (2003 P272) state that “intuitives are those individuals who have more infra-conscious than conscious associations (knowledge). These infra-conscious associations have relatively weak or ill-defined perceptual expectancies and therefore a stimulus can be more complex, novel, surprising, ambiguous or incongruent without appearing excessively out of line with past experience”.

Riding (1997) argues that it is reasonable to assume that cognitive style will be related to social behaviour as style affects the way individuals internally represent situations in the external world. Witkin et al (1979) considered aspects of personality related to an individual’s perception of ‘self’ and ‘non-self’. Riding and Cheema (1991) argue that on the wholist-analytic dimension style will be reflected through approaches to social behaviour that mirror the bi-polar nature of the construct. Thus social behaviours can be determined on a continuum such as dependent-self reliant, flexible-constrained, and vague-organised. Riding (1997) argues that the verbal-imagery dimension may also affect social behaviour arguing that it influences the focus and type of individual activity with verbalisers being more externally focused and stimulating and imagers more internal and passive. Riding and Wright (1995) conducted a study of undergraduate students and found wholists to be more assertive, humorous and helpful while analysts were shyer. In a work context Borg and Riding (1993) found wholists more open and people orientated while analysts were more structured and organised.

Carland et al (2002) state that entrepreneurship is a gestalt of four factors, cognition, preference for innovation, risk-taking propensity, and strategic posture. They developed the Carland Entrepreneurship Index which was developed using these four factors to measure entrepreneurial drive on a bi-polar continuum. In testing the validity of the index these four factors were individually tested against proven models to ensure accuracy. The cognitive
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factor was measured using the Myers-Briggs Type Indicator (1962). The MBTI is an instrument that was itself derived from the theories of Carl Jung (1923) on psychological types. An individual's preferences are measured to ascertain how that individual uses their perception of people, problems and the environment in a cognitive process. This affects decision-making structures and managerial style.

Myers & Myers (1980) state that the numeric scoring system employed in the MBTI is designed to indicate to what extent an individual subject is either extraverted or introverted. That is whether they come to conclusions through perception or judgement, sensing or intuition or by thinking or feeling. These classifications arise from the subject's relative levels of interest in the outer or inner world. How they perceive the world through either sensation or intuition. How they approach decision-making by thinking through a problem or 'feeling'. Lastly how do they prefer to use a judging or perceptive skill in dealing with situations? According to Myers & Myers (1980) the introvert's main interest is in the world of ideas and concepts. The extravert will be more interested in people or things.

Keirsey & Bates (1984) in a work based on the theories of Jung and moving on from the work of Myers-Briggs suggested that in terms of management style cognitive temperament was more straightforward than the complexities of Jung and Myers-Briggs. Keirsey and Bates (1984) suggested that four 'portraits' of temperament could explain individual behaviour and that they represent the four major cognitive distinctions among people and use similar language to that found in the MBTI. They suggest these are: sensation-perception (SP); Sensation-Judging (SJ); Intuitive-Feeling (NF); and Intuitive-Thinking (NT).
Table 2.4 The four temperaments

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<tr>
<th>THE FOUR TEMPERAMENTS</th>
<th>NF</th>
<th>NT</th>
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<tr>
<td><strong>SP</strong> The SP negotiates well; is good in a crisis; is a trouble-shooter and good in situations where one company takes over another; goes into everything at full speed; has a sharp nose for opportunity and feels that everything is negotiable and nothing sacred; can get cooperation from warring factions, is flexible, excited, open-minded, enthusiastic; is a risk taker; is practical, has acute observation powers; causes things to happen with an economy of motion; is flexible; is a good decision maker; but, does not like theory or routine and lives for the moment.</td>
<td>The NF is personal and personable; draws out the best in people; focuses on individuals; is naturally democratic and participative; has verbal fluency, says the right thing at the right time; can subordinate personal wishes to those of others; is idealistic, empathic, and charismatic; has a silver tongue; sees possibilities; works well with people; can turn liabilities into assets; shows appreciation; but, is generous with time to others so may neglect obligations; makes decisions based on personal likes and dislikes and feels responsible for others.</td>
<td></td>
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<tr>
<td><strong>SJ</strong> The SJ is a traditionalist or stabilizer; likes to establish policies, rules, schedules, and standards and create company rituals; is patient, thorough, steady, reliable, orderly; has a strong sense of social responsibility; has a need to serve, to be needed, to do one's duty; is resistant to change; is decisive; has common sense; is a hard and steady worker; is thorough and loyal; but, is known to be pessimistic, may preserve useless rules and be critical of others.</td>
<td>The NT is a visionary; architect of change; takes pride in technical knowledge; demands a high level of personal performance; is sceptical; hates redundancy and stating the obvious; hungers for knowledge &amp; mastery; sees both long and short term interactions and implications; focuses on possibility, and is technologically ingenious; but, does not communicate well; may lose interest in a task before completion; be insensitive to feelings of others; may be isolated and appear arrogant.</td>
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Reproduced from Carland, Carland & Ensley (2002)

2.6.4 Dimensionality of cognitive style

A debate in the literature surrounds the nature of cognitive style as either a unitary or multi-dimensional construct. Hodgkinson and Sadler-Smith (2003) argue that the notion of a super-ordinate dimension of cognitive style described as intuition-analysis is based on numerous separate dimensions of cognitive style that have emerged from single studies that have failed to be supported by subsequent research. They argue this undermines the credibility of the super-ordinate dimension concept. Hodgkinson and Sadler-Smith (2003) contend that cognitive style is multi-dimensional that should be studied using multi-dimensional instruments. Hodgkinson and Sadler-Smith argue that multi-dimensional instruments have made a significant contribution to management and organisational behaviour research. They argue that in the multi-dimensional approach cognitive styles do not occur along a unitary dimensional bi-polar continuum. Instead they consist of a number of different dimensions all working at the same time but in different ways. Thus, for example, an individual may acquire information using one cognitive style dimension but
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use a different dimension to evaluate the information and make decisions. Leonard et al (1999 P418) stated “our findings indicate that cognitive style is a complex variable with multiple dimensions”. Multi-dimensional instruments can be difficult and time consuming to administer. Hodgkinson & Sadler-Smith (2003) fundamentally disagree with the unitary approach adopted by Allinson & Hayes (1996). They argue that the complexity of the multi-dimensional perspective has led researchers to develop a simpler theory of cognitive style based on a unitary super-ordinate dimension which reduces the complexity of the cognitive style construct by reducing the number of possible dimensions.

Hayes et al (2003) argue that the theoretical underpinnings that support the multiple dimensional cognitive style approach more accurately underpin the unitary perspective. They argue that research cited by Hurst et al (1989) questions the validity of some of the dimensions promulgated in the multi-dimensional approach. Hurst et al argue that the removal of those dimensions that lack validity creates a unitary dimension they argue that individuals are likely to be either analytic or intuitive. Hayes et al (2003) cite a number of authors who suggest that the multi-dimensional approach does not provide reliable results in all the dimensions. This thesis contends after a fundamental review of the literature that cognitive style is most accurately determined as having a unitary structure. Allinson & Hayes (1996) and Kirton (1976) both conceptualise cognitive style as a unitary continuum. The bi-polar nature of cognitive style is also supported by a range of authors (Hammond, 1987; Messick, 1984; Letteri, 1980). While acknowledging the work of authors who do not support the notion of a super-ordinate dimension (Hodgkinson & Sadler-Smith, 2003) this thesis contends that the balance of the arguments favours the unitary perspective. This thesis also supports the notion of the super-ordinate dimension of cognitive style (Miller, 1997; Riding and Sadler-Smith, 1992). This thesis acknowledges that differences will exist between the different measures of cognitive style that measure the construct on a unitary
scale. It is argued that these differences will result from different phrasing of questions and validating studies. However, this thesis contends that these measures will correlate significantly and that this will add further justification to the debate on the super-ordinate dimension.

2.6.5 Measuring cognitive style

This research will be conducted using two measures of cognitive style: the KAI (Kirton, 1976) and the CSI (Allinson & Hayes, 1996). Both have been proven to be reliable and valid. They are simple to complete and suitable for use in a postal questionnaire survey. They were developed for use in organisational studies and have had a rigorous testing in empirical research and in the literature. They have both been used effectively in the study of cognitive aspects of entrepreneurship and the generalised nature of the questions make them appropriate for the study of the nascent entrepreneur. The choice of these particular instruments will now be justified.

2.6.5.1 Adaptors/Innovators

Kirton (1976) identified that different types of people within organisations develop qualitatively different solutions to similar problems. The Kirton Adaptor/Innovator theory is “designed to locate the respondent on a single continuum indicating the style of creativity characteristic of the individual,” Kirton (1978 P695). Kirton identified these differences and defined the people who displayed these differences as adaptors or innovators. Their position on the continuum between the two extremes is scored on an index ranging from 32-160 with the theoretical mean of 96. High scores are innovators and low scores are adaptors. The scores are achieved through the completion of a 32, statement questionnaire known as the KAI (Kirton Innovation-Adaptation Inventory). The KAI is sub divided into three interrelated subscales. These are sufficiency of originality (SO) which measures an individuals style of idea generation, efficiency (E) which identifies styles of
problem solving and rule/group conformity (R) which identifies an individuals relationship with structures and hierarchies.

Criticism was made of the KAI by Taylor (1989a; 1989b). Taylor argued that the 32 item KAI does not provide a unitary measure of adaption-innovation and argues against its use as an independent measure. Taylor presented two shorter sub-set versions of the KAI containing 20 and 13 items. Taylor argued that they contained more comparative factors than the original KAI. Foxall and Hackett (1994) tested Kirton’s original 32 item KAI and the 20 and 13 item versions proposed by Taylor on mid-career managers in the UK, Australia and United States. They found that the sub-scales advocated by Taylor (1989a) added little to their research. They noted reductions in internal reliability in the revised sub-scales and argued that they had little confidence that they should be used in preference to the original 32-item scale. Foxall and Hackett concluded that adaption-innovation is reliably measured by the original 32-item KAI.

According to Kirton (1999) the differences in creativity that individuals display produce distinctive patterns of behaviour. These behaviour patterns influence the way that an individual solves problems. Kirton suggested that individuals possessing an adaptive cognitive style would prefer to work within the scope of existing paradigms in situations requiring problem resolution. This reduces uncertainty and risk, utilises the full benefits of the experience curve and lowers the chances that a solution will cause conflict. The existing knowledge and experience base of the organisation is therefore used as a source of solutions to organisational problems. Solutions to problems will include working harder; working better and being more efficient. Kirton (1999) argues that adaptive individuals have a tendency to become entrenched within their systems. This can lead to a failure to respond to the stimuli of new situations and learning. Whereas adaptors can be seen as seeking solutions that involve working better, innovators seek ways of working differently.
Innovators are capable of breaking out of the existing paradigms and seeking solutions to problems outside the mainstream of the organisations thinking, knowledge or experience. Kirton says innovators produce “less expected and probably less acceptable solutions” (Kirton 1988, P68). Bright (1964) suggests that innovative change must lead to increases in risk, uncertainty and imprecision. Schoen (1960) argues that innovators can become so enthusiastic and so inclined to revolution rather than evolution that they can even accept deviation from accepted notions of good reason. Kirton believes that adaptation/innovation is a basic dimension of personality relevant to the analysis of organisational change. This thesis argues that it is also a basic dimension of entrepreneurship. Kirton himself states that this theory has wider applications and that the adaptor/innovator cognitive styles are common to everyone and are manifest in any situation where creativity, problem-solving and decision-making are applicable (Kirton 1976, P629). Kirton (1978) argues that although adaptors and innovators differ in their perception of problems and in strategies for solving problems there is no difference in the levels of creativity shown. Rather that the size of the cognitive domain distinguishes adaptors and innovators. Kirton argues that adaptors are more constrained by perceived boundaries of the problem with innovators seeing these boundaries in a more elastic and permeable way.

Whichever means of opportunity identification entrepreneurs utilise Gaglio and Katz (2001) refer to the need for an individual flash of creativity. They argue that the ability for an individual to be creative will result in the identification of opportunities not recognised by others. Venkataraman (1997) argues that some entrepreneurs have the ability to identify opportunities through utilizing a knowledge corridor of existing idiosyncratic life experiences. It could be argued that the size of the cognitive domain in which the nascent entrepreneur inhabits will have an impact on their ability to recognise opportunity.
Innovative nascent entrepreneurs will be able to extend the boundary of their creative domain and fully utilize the knowledge of their idiosyncratic experiences.

**Table 2.5 Characteristics of Adaptors & Innovators**

<table>
<thead>
<tr>
<th>Innovators</th>
<th>Adaptors</th>
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<tr>
<td>Capable of routine tasks for short bursts only, quick to delegate these.</td>
<td>Impervious to boredom, able to maintain high accuracy during long spells of detailed work.</td>
</tr>
<tr>
<td>Seen as unsound and impractical, often shocking his opposite</td>
<td>Seen as sound, conforming, safe &amp; dependable.</td>
</tr>
<tr>
<td>Seen as undisciplined, thinking tangentially, approaching tasks from unsuspecting angles.</td>
<td>Seen as precise, reliable, efficient, methodical, prudent, disciplined and conforming.</td>
</tr>
<tr>
<td>Discovers problems and avenues of solutions.</td>
<td>Concerned with resolving problems rather than finding them.</td>
</tr>
<tr>
<td>Takes control in unstructured situations.</td>
<td>Is an authority within given structures?</td>
</tr>
<tr>
<td>Often challenges rules and has little respect for past custom.</td>
<td>Challenges rules rarely, and cautiously when assured of strong support.</td>
</tr>
<tr>
<td>Appears to have low self-doubt when generating ideas, not needing consensus to maintain certitude in the face of opposition.</td>
<td>Tends towards self-doubt, reacts to criticism by closer outward conformity, is compliant and vulnerable to social pressure and authority.</td>
</tr>
<tr>
<td>Is ideal in an unscheduled crisis in the institution - if he can be controlled.</td>
<td>Is essential to the functioning of the institution, but occasionally needs to be “dug out” of his systems.</td>
</tr>
<tr>
<td>Provides the dynamics to bring about periodic radical change, without which institutions tend to ossify.</td>
<td>Provides a safe base for the innovator’s riskier operations.</td>
</tr>
</tbody>
</table>

Source: Armstrong (1999)

According to Buttner and Gryskiewicz (1993) some of the highlights of Kirton’s (1976) theory are:

1. An individual’s problem-solving style is stable, and thus does not change with age or overtime.
2. Adaptors and innovators have different attributes, each of which, depending on the circumstances can be advantageous or disadvantageous.
3. One set of these attributes comes naturally to the individual, the opposing set has to be learned and exercised as a part of the individuals coping strategy.
4. When coping strategies are no longer needed, there is a marked tendency to return to the preferred style.
5. Forms of coping strategy include changing circumstances to suit preferred style or forming part of a team whose assembled preferences cover expected problem situations.
Sadler-Smith & Badger (1998) said that Kirton considers the behavioural characteristics that originate from cognitive style to be expressions of stable personality. They make an assumption that there is a relationship between cognitive style and personality variables and that a number of additional studies support the notion that cognitive style is a correlate of personality.

In 1993 Buttner and Gryskiewicz undertook a study into entrepreneurship and cognitive styles and used the KAI as the model for assessing an entrepreneur’s problem solving style. This research is of interest in this thesis because it was one of the first pieces of research looking at entrepreneurship from the perspective of cognitive style. While Buttner and Gryskiewicz sought to distinguish between the cognitive style of entrepreneurs and general managers this research seeks to distinguish between different types of entrepreneur. Their research was conducted among established entrepreneurs. This thesis will be conducted among nascent entrepreneurs. It will be interesting to compare the findings of this research based on that important difference.

Buttner and Gryskiewicz (1993) developed four hypotheses:

**Hypothesis 1:** Entrepreneurs will be more innovative (as measured by KAI) than general managers of large organisations.

**Hypothesis 2:** More adaptive founders are more likely to continue operating the business as time passes than more innovative founders.

**Hypothesis 3:** Innovative entrepreneurs will have initiated a greater number of new ventures than entrepreneurs who are more adaptive.

**Hypothesis 4:** Entrepreneurs who are more adaptive will spend more time on administrative activities, while more innovative entrepreneurs will spend more time developing products or services.

The result of this study of 112 returned questionnaires was to support hypotheses 1, 2 and 3 completely and to partially support hypothesis 4. The results showed that entrepreneurs
tend to be more innovative than their managerial colleagues in large organisations.

Innovative entrepreneurs start more ventures while their more adaptive counterparts are likely to be more actively operating their business long-term. Adaptive entrepreneurs spend more time than innovators in administrative activities that fit their preferred problem-solving style. (Buttner and Gryskiewicz 1993)

2.6.5.2 Cognitive Style Index (CSI)

The Cognitive Style Index (CSI), Allinson & Hayes (1996) was designed as an attempt to produce a reliable cognitive style measure that could be used within large-scale organisational studies. They wanted to develop a convenient simple to use, psychometrically sound instrument to measure cognitive style. Additionally they wanted to develop the instrument to ascertain whether the myriad of cognitive style dimensions highlighted by researchers over the years could in fact be reduced down to a single superordinate cognitive style dimension (Miller, 1997; Riding & Sadler-Smith, 1992). It has long been hypothesised that the great number of dimensions are in fact merely different definitions of the same dimension, with certain definitions having a greater resonance or impact in certain disciplines than others. (Allinson & Hayes 1996) cite a number of authors in order to support the claim that the various styles identified are simply different conceptions of the same dimension.

Since the index was designed in 1996 a critique and empirical re-assessment of the CSI has been undertaken by Hodgkinson and Sadler-Smith (2003). Hodgkinson and Sadler-Smith praise the CSI for its reliability but contend that there are unanswered questions concerning the construct validity. They suggest that a relatively simple unidimensional structure of cognitive style as suggested by Allinson and Hayes is not supported by a considerable amount of literature which sees cognitive style as more complex and multidimensional.
Hodgkinson and Sadler-Smith (2003) argue that conceptualising cognitive style as a single dimension would produce an inflexibility of cognitive style. They suggest that the multiple dimension perspective that is indicative of the richness and adaptability of cognitive processing. Within the multiple dimensions model individuals can process information intuitively and analytically at the same time. Hodgkinson and Sadler-Smith argue that this will reduce cognitive biases. They argue that the potential for cognitive biases is increased by the single processing dimension of the unitary perspective because individuals can only be either analytic or intuitive. In response Hayes et al. (2003) cite a number of authors including Kirton (1989) who argue that individuals will have a preferred cognitive style but can adapt their learning style to meet the requirements of special situations over a short period. When this period is over they will return to their preferred style. Hayes et al. (2003) argue that cognitive flexibility may differ among individuals with some people more able to adapt their preferred style in the face of circumstances. But that this does not mean that intuition and analysis need to coexist as different processing styles.

As discussed briefly in 2.6.4, Hodgkinson and Sadler-Smith (2003) state that they believe there are sound theoretical reasons why the CSI might be considered to be a two-dimensional instrument with analytic and intuitive configured on separate unipolar scales. They suggest that analysis and intuition are likely to be separate modes of information processing served by independent cognitive systems. The Coffield report (2004) argues that the CSI is a basically sound psychometric scale but influenced by the work of Hodgkinson and Sadler-Smith it suggests that a revised two-factor scoring system be used. A vehement defence of the CSI, (Hayes et al, 2003) has been made to defend the instrument and counter the points made by Hodgkinson and Sadler-Smith. Hayes et al (2003) argue that a number of cognitive style conceptualisations have been predicated on a single dimension. Hayes et al (2003) also cite the contribution of Simonton (1980) who proposed that
intuition and analysis were indicative of conscious and unconscious thought processing. At present, as previously justified the balance of the arguments fall in favour of the Allinson and Hayes (1996) original argument for a single unitary dimension.

The CSI is a self-report questionnaire and consists of thirty-eight statements. Typical examples being:

- “I find that to adopt a careful, analytical approach to making decisions takes too long”
- “My approach to solving a problem is to focus on one part at a time”
- “I prefer chaotic action to orderly inaction”
- “Given enough time I would consider every situation from all angles”

Each statement can be answered in only one of three ways, true/uncertain/false. The respondents are scored in a range from 0-76. The scores can then be assessed on a bi-polar continuum with scores for the analyst near a theoretical maximum of 76 and scores for the intuitive nearer the theoretical minimum of 0.

**Figure 2.7 Cognitive Style Index Scale**

![Cognitive Style Index Scale](image)

Source: Armstrong (1999)

Highly Intuitive individuals have been described in the following terms,

- Impulsive, creative, see the whole picture, scan data quickly looking for relationships, open-minded and enthusiastic, involve themselves fully in new experiences, try anything once, thrive on change, constantly involve themselves with others, prefer interpersonal and group to intrapersonal circumstances, know many people and are often known to many. Days are...
Highly Analytic individuals on the other hand have been described as follows:

- Reflective, logical, analytical, see things serially, look for alternative solutions to problems,
- Careful to leave no stone unturned, thoughtful and consider all angles, observe other
- People's action, prefer stability to change, adopt a low profile, take a back seat in
- Meetings, prefer solitary activities, concerned with ideas and principles rather than with
- People, are task oriented, value precision and attention to detail, tend to delay reaching
- Definite conclusions, are task orientated, prefer structured situations.

(As cited in Armstrong, 1999)

Sadler-Smith and Badger (1998) argue that it is entirely feasible for individuals to process information and behave in ways that are not consistent with their habitual approach. As a reaction to circumstances individuals may be placed in the position of needing to adopt a role contrary to that which they would normally prefer. They continue by suggesting that style may be thought of as largely a function of the individual and more specifically her or his personality. Whereas a strategy is the interaction of the individual and the situation. (Kirton, 1997, p33) suggested that one way of dealing with problems is to have a repertoire of behaviours. Some derived from preferred style and other from the behaviour required by situations. Kirton refers to these as the bridge between what is preferred and what is perceived as necessary.

Allinson, Chell & Hayes (2000) argue that a crucial distinguishing characteristic of entrepreneurship of high growth firms is cognitive style. Their viewpoint is supported by Carland et al (2002) who refer to the study of cognitive style within the entrepreneurship debate as a relatively new, yet promising perspective. Allinson et al (2000) suggest that the cognitive style of the entrepreneur will be intuitive because of the characteristics of the
environment in which they exist. They state these as incomplete information, time pressure, ambiguity and uncertainty.

In the definitional debate the idea of cognitive style for so long neglected has in recent literature been taking a greater prominence. Carland et al (2000) citing Carland, et al (1992) concluded that entrepreneurship was best understood as an individual drive. Carland et al (1996) describe the entrepreneurial psyche as a gestalt of multiple personality factors including the need for achievement, the propensity for risk-taking, the preference for innovation and cognitive style. Carland et al (2002) conclude that entrepreneurship is primarily a gestalt of four main elements: cognition, preference for innovation, risk-taking propensity and strategic posture.

Allinson, Chell and Hayes (2000 P35) state that:

“It appears therefore that intuitive approaches to information processing (which tend to be less conformist, involve an open-ended approach to problem-solving, relying on holistic impressions, random methods of exploring, impulsive synthesis, and lateral rather than sequential reasoning) offer the possibility of accommodating many of these critical aspects of entrepreneurial activity more effectively than do rational approaches (which favour a structured approach to problem-solving, working within the rules, using systematic methods of investigation, attending to detail, and using a sequential, step-by-step analysis)”.

2.6.6 The nature of intuition and innovation

2.6.6.1 Intuition and analysis

Intuition has variously been described as ‘a combination of facts and experiences’ (Agor 1989) and ‘a means of complex data processing’ (Payne et al 1988). While Schwenk (1995) argues that intuition plays an important role in decision-making. Agor (1989) contends that decisions based on intuition are made through a combination of facts and experiences that are combined with individual sensitivity and openness to the use of unconscious processes. Agor argues that the utilisation of these abilities will be of most use during uncertain circumstances or where there is a complex set of alternatives. Sadler-Smith and Shefy (2004
describe intuition as "a capacity for attaining direct knowledge or understanding without the apparent intrusion of rational thought or logical inference". Kaheman and Tversky (1982) defined intuition as judgements arrived at by unstructured and informal reasoning without the use of analytical methods or deliberate calculation. Claxton (2001) contends that intuition is centred on experience and judgement combined with sensitivity, feeling, rumination, incubation and creativity. Analytical thought is associated with a high level of conscious control. Information sources are integrated to form a judgement this results in a slow rate of processing. Analytical thinkers may place greater confidence in the process of their thinking than in the answer they formulate (Dunwoody et al, 2000). Clearly analytic thinkers process information in a different way to more intuitive thinkers. It could be argued that slow and deliberate thought processes of analytic thinkers represent the antithesis of the intuitive entrepreneur. Unless the analytic individual can employ a cognitive strategy it could be argued that in highly dynamic environments this will place the analytic entrepreneur at a disadvantage.

Weick (1995) argues that intuition is a complex phenomenon and is described by Showers and Chakrin (1981) as a way of pulling together and simplifying complex patterns. This is supported by Mintzberg (1976) who argues that coping with ambiguity and complexity requires an intuitive approach. In entrepreneurial terms the literature contends that intuition is associated with creativity and innovation (Olson, 1985), discernment of necessary entrepreneurial inputs (Conner, 1991) and opportunity recognition (Allinson et al 2000).

Allinson and Hayes (1996) use the 'right' brain, 'left' brain metaphor to argue that intuition is an 'immediate judgment based on feeling and the adoption of a global perspective'. They argue that intuitive individuals will display a non-conforming, random and holistic
approach combined with an unbounded openness to problem solving. Clarke and Mackaness (2001) identified that intuitive senior managers used greater amounts of non-factual information. They also identified that intuitive managers sought a focus on key elements within decision-making. Parikhe et al (1994) argues that in certain complex and uncertain environments logical and rational approaches cannot cope with the dynamic nature of the complexity and change. If the individual is not to be overwhelmed then they require an internal support system or ‘anchor of simplicity’. This support system includes synthesis and perception. Intuition they contend provides this support.

Sadler-Smith and Shefy (2004) argue that an understanding of the nature of intuition may help to understand how it may help in decision-making. They suggest that there may be two sources of intuition that work together to create an intuitive decision. Sadler-Smith and Shefy (2004 P91) contend that intuition is a combination of expertise and feelings. Expertise they suggest is ‘manifested as subconscious decision heuristics’ and feelings as ‘the affect associated with a particular stimulus’. Thus intuition becomes a dual component cognitive mechanism with expertise acting to make sense of new or novel situations with a stimulus response creating a connection between the mind and the body through ‘feeling’.

Sadler-Smith and Shefy (2004) argue that these two components combine to create a ‘holistic’ intuitive sense and the dual nature of the cognitive mechanism may be indistinguishable to the individual. They contend that the expertise component of intuition may derive from implicit as well as explicit learning. Implicit learning is involuntary and independent of conscious attempts to learn. They argue that it is pervasive and may result in the acquisition of tacit knowledge. This cannot be described or explained but which is stored in the long-term memory as cognitive schemas that an individual can draw upon in times of complexity or uncertainty. The second component that creates the ‘gut feeling’
often associated with intuitive decisions is argued to have a neurological background.

Goleman (1996) argues that intuition can act to warn against certain actions but also serve to highlight opportunities. Mitchell et al (2005) argue that entrepreneurs often cite intuition as an important justification for their achievements and that their understanding of the nature of intuition influences their entrepreneurial thinking and behaviours.

Dunwoody et al (2000) argues that intuition is part of a cognitive continuum that operates with rather than being dichotomous to analysis. They contend that cognitive continuum theory argues that intuition and analysis should be defined by specifying the cognitive attributes of each and considering analysis and intuition as a continuum with a region of quasi-rationality between the two extremes. They contend that quasi-rationality is a robust and adaptive method of reasoning most readily associated with common sense.

### Table 2.6 Characteristics of analysis and intuition

<table>
<thead>
<tr>
<th>Analysis</th>
<th>Intuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>High insight into judgement process, and hence publicly retraceable.</td>
<td>Low insight into judgement proves, and hence difficult to retrace and defend.</td>
</tr>
<tr>
<td>Low confidence in outcome, high confidence in method</td>
<td>High confidence in outcome, low confidence in method.</td>
</tr>
<tr>
<td>Cues are objectively evaluated</td>
<td>Cues are perceptually evaluated</td>
</tr>
<tr>
<td>Slow rate of processing</td>
<td>Fast rate of processing</td>
</tr>
<tr>
<td>Errors few, but large when they occur</td>
<td>Errors normally distributed</td>
</tr>
<tr>
<td>High cognitive consistency</td>
<td>Low cognitive consistency</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Analysis-inducing</th>
<th>Intuition-inducing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than five cues</td>
<td>More than five cues</td>
</tr>
<tr>
<td>Successfully presented cues</td>
<td>Simultaneously presented cues</td>
</tr>
<tr>
<td>Low cue redundancy</td>
<td>High cue redundancy</td>
</tr>
<tr>
<td>Unequal weighting of cues in ecology</td>
<td>Equal weighting of cues in ecology</td>
</tr>
<tr>
<td>Cues objectively measured</td>
<td>Cues perceptually measured</td>
</tr>
<tr>
<td>Nonlinear cue functions</td>
<td>Linear cue functions</td>
</tr>
<tr>
<td>Organising formula available</td>
<td>No organising formula available</td>
</tr>
<tr>
<td>Task outcome available</td>
<td>Task outcome unavailable</td>
</tr>
</tbody>
</table>

A Psychometric Analysis of Nascent Entrepreneurs: Understanding the impact of individual entrepreneurial cognition on the founding and survival of new small businesses.

Scott and Bruce (1994) identified that individuals do not need to be intuitive problem solvers to be innovative but that systematic and rational problem solvers appeared to inhibit innovative behaviour.

Sadler-Smith (2004) identified that intuitive cognitive styles were not affected by instability within the environment. They did not adopt a different style of problem solving dependent upon the environment suggesting that styles operate differently to strategies and are likely to be independent of their control. It was also identified that an intuitive cognitive style displayed a positive relationship between financial and non-financial performance. Sadler-Smith contends that the association between intuition and performance may be ambiguous.

2.6.6.2 The nature of innovation and adaptation

Kirton (1976) contends that innovation is a dimension of personality relevant to the analysis of organisational change. He argues that the capacity to be innovative results from an individual's perception of the relationship of the surrounding structure of a problem to the problem itself. The more the surrounding structure is treated as part of the problem the more likely it is that any solution is likely to be innovative and radical. Kirton argues that innovative change follows unexpected lines but is often associated with memorable precipitating events. According to Kirton the innovative individual will be less conforming to rules, social norms or work rules and compulsively toys with ideas and displays a high need for social recognition. Kirton argues that innovative individual is a loner.

Sadler-Smith and Badger (1998) suggest that cognitive style may influence workplace behaviours with respect to idea initiation and implementation. Goldsmith (1989) argues that the relationship between cognitive style and innovation is not measured by the ability
of the individual to produce innovative ideas but rather the individual’s preference for idea generation.

According to Scott and Bruce (1994) innovation is a process, which consists of a number of elements, and stages that must be negotiated for idea initiation through to implementation. Other authors have suggested that the process of innovation is ideally associated with individuals who display certain characteristics. Roberts and Fusfeld (1981) describe ‘critical functions’ of managers in order to progress innovation. Chaharabaghi & Newman (1996) developed the idea of innovation stereotypes which they called ‘innovating creators’, ‘innovating implementers’, and ‘innovating stabilizers’. Kirton (1998) argues that different types of individuals are associated with different stages of the innovation process. Kirton (1976) argues that innovators are able to develop innovative paradigm shifting thoughts in proliferation. Sadler-Smith and Badger (1998) argue that the innovator’s style suggested by Kirton prefers idea conceptualisation, develops new ideas and generates opportunities is appropriate to the idea generation stage of innovation. Adaptors who are more precise, reliable and disciplined and ensure that administrative procedures are met are more appropriate to the implementer stage of the innovation process. Sadler-Smith and Badger (1998) argue that innovation may therefore be conceptualised as a product of both holistic and analytical thought and that effective innovation may best be achieved through a balanced team approach.

Prevedi and Carli (1987) suggest that the problem-solving strategy of adaptors involves the improvement of a pre-existing known solution. Innovators prefer to develop new answers to meet new problems. Adaptors respect existing rules and the hierarchies of power and complete tasks in an orderly and methodical manner. Conversely innovators prefer risk-taking and prefer to concentrate on the broad theme of a problem rather than the details. This they argue directly affects creativity. Foxall and Hackett (1994) and Buttner et al
(1999) both identify the creativity of innovators and adaptors simply arguing that although both groups are creative this is manifest in different ways. Adaptors they argue search for a relatively small number of solutions to problems championing efficiency improvements. While innovators challenge existing structures, prefer radical change and are more prolific in their idea generation.

Buttner et al (1999) identified that innovators tend to exhibit higher self-confidence and self-esteem than adaptors. They argue that adaptors may be more self-critical and doubtful about their managerial skills. They contend that the ability of the innovator to create ideas leads to greater self-confidence while the ability to generate efficient solutions and follow rules does not create self-confidence.

**Figure 2.8 KAI types**

<table>
<thead>
<tr>
<th>KAI Type</th>
<th>Adaptors</th>
<th>Innovators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problems solving</td>
<td>Take problems as given and generate Ways to develop solutions if immediate high efficiency.</td>
<td>Redefine problems by breaking previously defined restraints; aim solutions at “doing things better.”</td>
</tr>
<tr>
<td>Solutions</td>
<td>Generate well thought-out and to the Point solutions that are sufficient to Solve the stated problem, but sometimes Fail to break the constraints of existing patterns.</td>
<td>Produce multiple ideas that are non-obvious and often unacceptable to others, but often contain approaches to solve previously intractable problems.</td>
</tr>
<tr>
<td>Policies</td>
<td>Prefer well-structured situations and Are best at incorporating new Elements into the existing policy</td>
<td>Prefer unstructured situations to use new data to restructure policies and are willing to accept the greater risk.</td>
</tr>
<tr>
<td>Organizational fit</td>
<td>Enhance ongoing functioning, but have difficulty escaping established role in times of change.</td>
<td>Enhance flexibility in times of change, but have difficulty working with ongoing organizational demands.</td>
</tr>
<tr>
<td>Perceptions by opposites</td>
<td>Seen by innovators as sound, conforming, predictable and constrained by the system.</td>
<td>Seen by adaptors as unsound, impractical, risky, dissonance creating and abrasive.</td>
</tr>
</tbody>
</table>

*Source: Kirton (1987)*
2.6.7 Using Cognitive Style to predict an individual's entrepreneurial intention

Corbett (2002) investigated cognitive style and found that the more intuitive an individual's cognitive style the greater the number of opportunities they would identify.

Brigham and DeCastro (2003) examined cognitive style and identified that an individual's cognitive style may work well during the initial identification of the opportunity. But this may reduce as the venture moves through the exploitation phase. In order to determine if cognitive style can be used as a predictor of entrepreneurial predilection, Armstrong and Hird (2003), attempted to correlate cognitive style with entrepreneurial drive. The chosen instruments were the Cognitive Style Index, Allinson and Hayes (1996) and the Carland Entrepreneurship Index (2002). The CEI was designed to measure an individual's entrepreneurial drive, which is the need or desire to create and grow a business. Like the CSI the CEI operates on a bi-polar continuum and is designed to differentiate between entrepreneurs managing high growth and low growth firms. The CSI contains 33 forced questions evaluating responses to four main elements of entrepreneurship, cognition, preference for innovation, risk-taking propensity and strategic posture. Macro-entrepreneurs at one pole, these people are highly driven to create businesses, seek organisational growth and revolutionise industries. At the opposite pole micro-entrepreneurs are content to run a small business. Individual entrepreneurs occupy a position on the continuum between the two extremes.

**Figure 2.9 Carland Entrepreneurship Index**
A Psychometric Analysis of Nascent Entrepreneurs: Understanding the impact of individual entrepreneurial cognition on the founding and survival of new small businesses.

Following an extensive literature review, Armstrong and Hird (2003) developed four hypotheses.

**Hypothesis 1:** That a statistical relationship will be identified between the CSI scores and the CEI scores, indicating a relationship between cognitive style and entrepreneurial drive.

**Hypothesis 2:** That a statistical correlation will be identified between distinct groups along the bi-polar continuum.

**Hypothesis 3:** That respondents with intuitive CSI scores will demonstrate a greater tendency towards macro-entrepreneurship on the Carland Entrepreneurship Index.

**Hypothesis 4:** That there will be no correlation between the CSI and CEI scores in a control group of the general public.

As part of the study respondents were selected from research sites across the North and Midlands of the UK. They were asked to complete both the CSI and the CEI. In total 131 responses were received from entrepreneurs. An independent samples t-test indicated that a greater number of respondents had intuitive scores on the CSI. The t-test also revealed that when responses from the CSI and the CEI were analysed that the respondents with intuitive CSI scores also demonstrated greater macro-entrepreneurial scores. Analysis revealed that scores correlated not only at the extremes of the continuum but also throughout the length of the continuum. The test supported the hypotheses and the belief of authors and academics, such as Carland, Carland and Ensley (2002), Allinson Chell and Hayes (2000) and Buttner and Gryskiewicz (1993) that cognition is an important element of entrepreneurship and that there is a correlation between cognitive style and entrepreneurial drive, (Armstrong and Hird, 2003).

2.6.8 Conclusions

This thesis represents an investigation into the impact of cognitive style on nascent entrepreneurs. To date, research into nascent entrepreneurship has been characterised by a small number of rigorous studies. Although an increasing amount of research is being conducted into the impact of cognitive style on established entrepreneurs the extant
literature relating to cognitive style and nascent entrepreneurship is negligible. It is anticipated that this thesis will represent the first review of the literature pertaining to cognitive style and nascent entrepreneurship. Furthermore this thesis represents one of the first empirical research studies conducted in real time which investigates the cognitive style of entrepreneurs during the nascent entrepreneurial stage.

The literature review has identified the current nature of entrepreneurship research. This has had a fundamental impact on the nature of the study and the research design chosen. The literature identified the requirements of the discipline’s research community notably a call to investigate the nature of individual differences from psychological or behavioural perspectives. This thesis has accepted the views of the entrepreneurial research community by clearly stating the aims and purpose of the research to be conducted. Other influences from the literature pertain to the ontological perspective of this thesis as a positivist work and the decision to build on pre-existing knowledge in order to deepen the discipline’s knowledge base.

This chapter of the thesis also reviews the literature on classifications of entrepreneurial types leading to a review of the literature on nascent entrepreneur. This section provided a knowledge base in which the nature of nascent entrepreneurship and individual nascent entrepreneurs was discussed. The literature on human and social capital and entrepreneurial networks was also reviewed as it was identified that the nascent entrepreneur like their established counterparts are part of a dynamic environment which can involve networks, linkages and teams. How nascent entrepreneurs use these networks in conjunction with their knowledge and experiences is important to the development of this thesis. Not least because of the impact these individual differences have on the measurement of a nascent entrepreneur’s cognitive style.
Cognitive style is a psychological construct that has been tested over time and across a range of research environments. The construct has been used in organisational studies for many years but its use in studies of entrepreneurship has mainly been confined to the last ten years. It is promulgated that the theory of cognitive style may represent a theoretically robust and testable measure of individual differences. The section on cognitive style contains a full review of the literature as it pertains to entrepreneurship and the notions of intuition and innovation. These are believed to be important in understanding the differences between entrepreneurs and non-entrepreneurs and explaining why some individuals discover opportunities and others do not.

A synthesis of the findings of this review of the literature on nascent entrepreneurship has led to the identification of a number of broad themes that have been derived from the review of the literature. The first pertains to the probable importance of an individual cognitive style. An intuitive cognitive style is argued to be associated with entrepreneurship and business launch. The literature review indicates a more analytic cognitive style is associated with the proper conduct and management of businesses which leads to business success. The second theme has identified cognitive biases that may impact on the nascent entrepreneur. Counterfactual thinking and self-efficacy are argued to be associated with an ability to handle complex ambiguous or stressful situations and may influence how a nascent entrepreneur perceives their environment. The unpredictable new business launch situation would be a suitable environment in which to research both counterfactual thinking and self-efficacy. The third broad theme suggested by the literature review was to investigate nascent entrepreneurship from a contrasting behaviouralist perspective. The literature on proactive personality indicated that it could provide a useful alternative perspective to the cognitive style investigation. The fourth theme was that of opportunity
recognition. Argued to be one of the fundamentals of entrepreneurship the literature indicated that interesting findings may be derived by investigating this process within the nascent entrepreneur community. This includes the process of opportunity recognition and the impact of human and social capital and entrepreneurial networks on this process. These broad themes have led to the conception of a number of hypothetical deductions. It is to the development of these hypotheses that this thesis now turns.
2.7 Hypotheses

2.7.1 Hypotheses relating to entrepreneurial cognition

2.7.1.1 Cognitive style

Developing a new business enterprise is a complex and uncertain process. Different types of individuals react to this uncertainty in different ways. Tennant (1988) argued that cognitive style was an important variable in an individual’s perceptions of problematical situations and occurrences. While Neisser (1967) suggested that cognitive style was the process by which sensory input is transformed, stored recovered and used. Kirton (1976) identified that different types of people develop different solutions to similar problems.

Relating cognitive style to entrepreneurship Allinson et al (2000) argue that the cognitive style of entrepreneurs will be intuitive. This was corroborated by Armstrong & Hird (2003) who identified that established entrepreneurs had a more intuitive cognitive style than the general population as measured by the CSI (Allinson & Hayes, 1996) however it was also identified that the cognitive style of founders in longer established businesses was more analytic. Swayne and Tucker (1973) argued that in venture creation and expansion entrepreneurs would display a greater tendency towards innovation than managers. While Buttner and Gryskiewicz (1993) identified that entrepreneurs are more intuitive than managers in large organisations as measured by the KAI (Kirton, 1976). Previous research and the literature strongly argue that entrepreneurs will have an innovative cognitive style. However there is a lack of research into the cognitive style of nascent entrepreneurs. A hypothesis is presented based on the literature that nascent entrepreneurs will have a more innovative cognitive style than established entrepreneurs and non entrepreneurs.

**Hypothesis 1a:** Nascent entrepreneurs on assisted entrepreneurial programmes will display a greater tendency towards an intuitive cognitive style (as measured by the CSI) than a control group of non-entrepreneurs.

**Hypothesis 1b:** Nascent entrepreneurs on assisted entrepreneurial programmes will display a greater tendency towards an intuitive cognitive style (as measured by the CSI) than a sample of established entrepreneurs.
Hypothesis 1c: Nascent entrepreneurs on assisted entrepreneurial programmes will display a greater tendency towards an innovative cognitive style (as measured by the KAI) than a control group of non-entrepreneurs.

Hypothesis 1d: Nascent entrepreneurs on assisted entrepreneurial programmes will display a greater tendency towards an innovative cognitive style (as measured by the KAI) than a sample of established entrepreneurs.

When studying the influence of cognitive style on business start-up Buttner and Gryskiewicz (1993) identified that innovative entrepreneurs start more ventures than adaptive entrepreneurs. However, Kirton (1976) theorises that more adaptive entrepreneurs will successfully maintain their business over an extended period a view supported by Hambrick and Crozier (1985); Tandon (1987) and Buttner and Gryskiewicz (1993). Birley and Westhead (1994) noted that the influence of the founder as well as business related factors regarding the growth and survival of the business are important. The literature contends that to be successful a range of cognitive styles are required to provide balance within the organisation (Leonard & Strauss, 1997). However this is not always possible due to the temporary nature of problems or lack of human resources.

Hayes and Allinson (1996) argue that it is possible for individuals to employ temporary alternative cognitive strategies by combining cognitive styles or aspects of styles to meet this new or unique situation. Kirton (1989) calls these coping strategies. Sadler-Smith and Badger (1998) argue that adopting these temporary behaviours produces individual versatility. Paske (1976) argues that versatility is derived from learning to employ both analytic and intuitive approaches. Milne and Thompson (1982) argue that a founder's ability to adapt and learn within their business environment is crucial. It is cognitive factors such as perception and interpretation as well as the way in which knowledge is received and utilised by the individual nascent entrepreneur that is the principle research aim of this thesis. Sadler-Smith and Badger (1998) argue that this can be achieved by individuals whose cognitive style fits between the two extremes of the cognitive continuum or who have
developed cognitive strategies to mitigate their deficiencies. A hypothesis is presented that links the existing literature on the impact of cognitive style on venture creation and survival with the nascent entrepreneur.

**Hypothesis 2a:** The cognitive style of nascent entrepreneurs who successfully launch their own business will be more intuitive than those who fail to launch successfully.

**Hypothesis 2b:** Novice entrepreneurs who continue to trade successfully for the subsequent six months after launch will display a more analytic cognitive style than those who fail to sustain trading.

### 2.7.1.2. Self-efficacy

Self-efficacy is the self belief in individuals that they can organise and effectively perform the actions needed to produce a desired outcome. In terms of nascent entrepreneurship this will impact in the nascent entrepreneurs self-assessment of their capabilities to successfully launch a new business. Kruegar and Brazel (1994) proposed that entrepreneurial self-efficacy was one of the key prerequisites of the potential entrepreneur. Chen et al (1998) argues that efficacy is close to action and action intentionality and can be used to predict and study persistence and effectiveness in entrepreneurs. It could be suggested that this will include opportunity recognition argued by Ardichuili (2003) to be one of the most important abilities of successful entrepreneurs. Locke et al (1994) contend that self-efficacy is a significant determinant of performance that operates partially independently of underlying skills. Self-efficacy can assist the nascent entrepreneur in complex or dynamic environments Bandura (1996) suggests that competent functioning within ambiguous, unpredictable or stressful environments will determine an individual's judgement of their capabilities to act. Markham et al (2002) argue that self-efficacy is central to human functioning and a potent precursor to motivation, affective status and actions. While Wood and Bandura (1989) argue that self-efficacy is an effective predictor of performance.
Hypothesis 3a - Nascent entrepreneurs starting a new business will have higher self-efficacy scores than those that do not start their own business.

Hypothesis 3b - There will be a positive correlation between the Self-efficacy scores of an entrepreneur and their self-assessed capabilities towards opportunity identification.

2.7.1.3 Counterfactual thinking

Counterfactual thinking is a cognitive bias that Baron (1998) argues is faced more regularly by entrepreneurs than others. Wells and Gavanski (1989) argued that people often evaluate the outcome of an event or incident by constructing alternative outcomes. Roese (1997) suggests that the instigation of counterfactual thoughts focuses on unusual or extreme events where corrective thinking may be valuable to provide a guide to future success. It could be argued that the period of nascent entrepreneurship meets these criteria. Baron (1998) identified that counterfactual thinking may affect venture success. He suggests that a negative effect may be experienced when mistakes lead to regretful thoughts. However, it is also understood that reflection can be a constructive learning experience. The literature contends that entrepreneurs may engage in less counterfactual thinking than other people living in the here and now (Gilovich and Medvec 1994). Kahneman and Lovallo (1994) argue that one reason may be the optimism associated with the entrepreneur. Baron (1999) argues that future orientation reduces the entrepreneur’s tendency towards counterfactual thoughts about past events.

Hypothesis 4a - Nascent entrepreneurs will engage in counterfactual and regretful thinking less often than a control group of non-entrepreneurs.

Hypothesis 4b - Nascent entrepreneurs will engage in counterfactual and regretful thinking less often than a control group of established entrepreneurs.

2.7.2 Hypotheses relating to proactive personality

An interesting counterpoint to the cognitive research in this thesis is to examine the nascent entrepreneur from a behaviouralist perspective. Bateman and Crant (1993) argue
that proactivity is personal and dispositional. They argue that behaviour is controlled by interaction of internal (personality) and external (situational) factors. A proactive behaviour is a construct that identifies the extent to which individuals take action to influence their environments. According to Crant (2000) proactive people identify opportunities, act on them, show initiative and persevere. While less proactive people are passive and reactive preferring to adapt rather than change. It could be argued therefore that nascent entrepreneurs with higher proactive personalities will be more active in their business preparations. Seibert, Crant and Kraimer (1999) identified that proactive personality resulted in greater objective and subjective career success enjoying greater remuneration and promotional prospects as well as a greater sense of satisfaction. Becherer and Maurer (1999) argue that proactive personality is related to entrepreneurship identifying that proactive personality was related to the entrepreneurial posture of firms. They argue that the proactive business owner reflects their own personality by creating a proactive firm that searches for new opportunities and makes bold assertive approaches in the market. This is supported by Kickul and Gundry (2002) who identified that proactive personality was linked to flexibility and change. Bandura (1977) argues that individuals intentionally and directly change their current circumstances by choosing a career for which they are best suited. Crant (1995) argues that individuals with a proactive personality will be drawn to entrepreneurial careers.

Becherer and Maurer (1999) identified that those business owners who had founded their own business displayed higher proactivity scores than those who had bought or inherited their business. They also identified a correlation between the proactivity of an entrepreneur and the number of businesses they founded. However proactivity is associated with sales orientation and not related to profits. Becherer and Maurer (1999) argue that the achievement of profit requires more refined management and than an externally orientated
big-picture approach which relates poorly to organisational structure and processes. It can be argued therefore that proactive personality can determine entrepreneurial intentions, strategic orientations and success but that this may alter over time.

**Hypothesis 5a**: Nascent entrepreneurs on assisted entrepreneurial programmes will display a greater tendency towards a proactive personality as measured by the PPS than a control group of non-entrepreneurs.

**Hypothesis 5b**: Nascent entrepreneurs on assisted entrepreneurial programmes will display a greater tendency towards proactive personality as measured by the PPS than a sample of established entrepreneurs.

It could be argued that a nascent entrepreneur’s proactive personality will influence their opportunity recognition abilities. Vesper (1980) argued that opportunities would be identified through systematic searching by the entrepreneur. Teach et al (1989) and Shane (2000) argued that entrepreneurs would not actively search for opportunities but accidentally or serendipitously discover them. Long and McMullen (1984) argued that controllable and uncontrollable environmental factors as well as the entrepreneurial alertness of the individual would influence opportunity recognition. Chandler (2003) argued for proactive searching of firms through formal strategies but that individual cognitive or behavioural differences would play a minimal role. However, Shackle (1961) argued that entrepreneurs can create opportunities through creativity and imagination. Ardichvili et al (2003) and Vesper (1980) argue that education and preparation can increase opportunity identification. To what extent can or does an individual entrepreneur alter their environment to identify opportunities? The Proactive Personality Scale (Bateman & Crant, 1993) measures proactive behaviour likely to alter environments. Bateman & Crant (1983) argued that the scale will be linked to identification of opportunities, acting on opportunities, initiative, action orientation and perseverance. Crant (1996) identified a positive correlation between proactive personality and business start-up intentions among MBA students. Crant (1995) and Seibert et al (1999) identified proactive personality with career success. The literature contends that entrepreneurs with proactive personalities will
also consider themselves to be good at opportunity recognition, initiate business ventures and enjoy commercial success.

**Hypothesis 6a:** A positive relationship will be identified between entrepreneurs' self-assessed opportunity recognition capabilities and scores on the proactive personality scale.

**Hypothesis 6b:** Nascent entrepreneurs who successfully launch their own business will have a higher proactive personality score than those who fail to launch.

**Hypothesis 6c:** Once a business is launched entrepreneurs with higher proactive personality scores will continue to trade for longer than those with less proactive personalities.

### 2.7.3 Hypotheses associated with opportunity recognition

Cognitive style impacts on opportunity recognition. Messick (1976) suggested that cognitive style extends to almost all human activities that require a cognitive process. Riding (1997) argues that cognitive style will be related to social behaviour as style affects the way individuals internally represent situations in the external world. This is supported by Baron (2004) who argues that the recognition of opportunities depends upon the cognitive structures possessed by an individual. Baron (2000) discussed problems associated with opportunity recognition and the perceptions of opportunity through the recognition if diverse stimuli into recognisable patterns (Matlin, 2000). Swets (1992) argued that through signal detection theory individuals could identify if a pattern exists or not. Hayes et al (2003) contend that at the intuitive level of processing that major innovations occur, while Kirton (1988) contends that innovators seek ways of working differently breaking out of the existing paradigms and seeking solutions to problems outside the mainstream of the organisation's thinking, knowledge or experience. Allinson et al (2000) argue that a crucial distinguishing characteristic of entrepreneurship of high growth firms is cognitive style. Justified from the literature a relationship is hypothesised between cognitive style and opportunity recognition capabilities.

**Hypothesis 7:** For nascent entrepreneur, an intuitive cognitive style will be positively associated with a high self-assessment of their opportunity identification capacity.
Shultz (1959) suggested that human capital would improve or increase an individual's cognitive ability. Westhead et al (2005) suggest that cognition may explain differences in opportunity recognition and that the ability of an entrepreneur to identify and exploit opportunities will be a function of their human capital. They further argued that entrepreneurs can use their human capital to gain access to financial and social resources to leverage resource supplies. However, Davidsson & Honig (2003) argue that greater levels of human capital do not automatically encourage entrepreneurship. They do conclude that knowledge is critical to discovery and exploitation. Burt (1997) argued that human capital is an asset to an individual derived from social relationships and networks. Johannisson (1987) argues that networks provide a practical and psychological support mechanism. Burt (1992) and Hills et al (1997) talk of networks providing access to opportunities, finance and information, while Szarka (1990) suggest that venture creation would not be possible without an effective network. Butler and Hansen (1988) suggest that a social network is important in the nascent stage enabling access to intangible information and resources. Bruderl and Preisendorfer (1998) argue that disadvantaged groups of entrepreneurs make more efforts and are more successful in activating network resources to compensate for their unfavourable strategic position they argue highly developed networks can compensate for shortfalls in human capital. This thesis therefore argues for some investigation into the relationship between human capital social networks and opportunity recognition.

**Hypothesis 8:** Nascent entrepreneurs displaying high levels of human capital will also demonstrate high self-assessed opportunity recognition capabilities.

Having reviewed the literature and developed hypotheses based on its conclusions it becomes necessary to test these hypotheses through research analysis. Before this can take place it is essential to consider philosophical assumptions about the nature of the research and a research design to assist in the choice of methodology.
3. RESEARCH DESIGN

3.1 Research approaches

3.1.1 Introduction

Research is an investigative, inquisitive science. Undertaking research creates tensions among researchers as assumptions, methods and techniques employed are either commended or criticized. Researchers across and within disciplines can see their role within research and research itself in fundamentally different ways. Within the research environment this has led to the creation of broadly two different camps, positivist and anti-positivist or phenomenological to which different researchers in different fields lay claim. Easterby-Smith, Thorpe, & Lowe (1993) refer to this as “a long standing debate in the social sciences about the most appropriate philosophical position from which methods should be derived.”

3.1.2 Fundamental issues in research design

Burrell and Morgan (1979) argue that social science researchers approach research based on a set of predetermined assumptions based on the nature of the society in which the researcher exists and the way in which the research is to be conducted. Burrell and Morgan (1979) argue that it is convenient to consider social science in terms of four assumptions related to ontology, epistemology, human nature and methodology. Creswell (1994) (table 3.1) make five assumptions about research based on the positivist and phenomenological paradigms. These are ontological, epistemological, axiological, rhetorical and methodological.
Table 3.1 Assumptions of the two main paradigms

<table>
<thead>
<tr>
<th>Assumption</th>
<th>Question</th>
<th>Quantitative // Positivist</th>
<th>Qualitative // Anti-Positivist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ontological</td>
<td>What is the nature of reality?</td>
<td>Reality is objective and singular, apart from the researcher</td>
<td>Reality is subjective and multiple as seen by participants in a study.</td>
</tr>
<tr>
<td>Epistemological</td>
<td>What is the relationship of the researcher to that being researched</td>
<td>Researcher is independent from that being researched</td>
<td>Researcher interacts with that being researched</td>
</tr>
<tr>
<td>Axiological</td>
<td>What is the role of values</td>
<td>Value-free and unbiased</td>
<td>Value-laden and biased</td>
</tr>
<tr>
<td>Rhetorical</td>
<td>What is the language of research</td>
<td>Formal based on set definitions</td>
<td>Informal evolving</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Impersonal voice</td>
<td>Personal voice</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use of accepted quantitative words</td>
<td>Use of accepted qualitative words</td>
</tr>
<tr>
<td>Methodological</td>
<td>What is the process of research</td>
<td>Deductive process</td>
<td>Inductive process</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cause and effect</td>
<td>Mutual simultaneous shaping of factors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Static design</td>
<td>Emerging design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Categories isolated before study</td>
<td>categories identified during the research process.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Context free</td>
<td>context-bound</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Generalisations</td>
<td>Patterns, theories developed for understanding</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leading to Prediction, explanation and understanding</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Accurate and reliable through validity and reliability</td>
<td></td>
</tr>
</tbody>
</table>


Ontological assumptions: Remenyi et al (1998, P268) define ontology as “a branch of philosophy or metaphysics concerned with the nature and relations of being”. Punch (1989 P170) states “Ontology refers to what exists in the world, to the nature of reality: What is the form and nature of reality?”. Burrell and Morgan (1979) suggest that the researcher needs to be aware of the extent to which the ‘reality’ to be observed exists externally to the individual or the extent to which it is a product of the individual’s own consciousness. Reality that can be observed externally can be researched objectively, it exists within the
world. If reality is the subject of an individual's own mental construction then more subjective investigation will be required.

*Epistemological assumptions* - Remenyi et al (1998, P282) define epistemology as “The study or a theory of the nature and grounds of knowledge especially with reference to its limits and validity. Epistemological assumptions underpin any approach to research.” Punch (1989, P170) argues that “epistemology refers to the nature of knowledge claims and to the question of what counts as knowledge: what is the relationship between the knower and the known?” Burrell and Morgan (1979) suggest that assumptions about the grounds of knowledge impact on how a researcher understands the world and communicates this knowledge to the wider community. They argue that assumptions can be made about the forms of knowledge that can be obtained. Is knowledge something that it is possible to identify and communicate as being hard, real, objective and tangible or is it softer, more subjective or spiritual and based on a personal and unique personal insight? Burrell and Morgan (1979) argue that it is such epistemological assumptions that determine the extreme positions of whether knowledge is something that is acquired through learning and teaching or must be personally experienced.

*Assumptions about human nature* - Burrell and Morgan (1979) also state that it is important to make assumptions about human nature as although different in terms of conceptualisation this does influence both ontological and epistemological assumptions. What is the relationship between human beings and their environment? To what extent do human beings respond in either a mechanistic or deterministic way, assuming there are causal laws for behaviours and actions, (Remenyi et al, 1998) to circumstances they come across in their external world? In this view human beings and their experiences are products of and conditioned by their environment. In the contrary argument, that of voluntarism, human beings are regarded as creators of their own environment, the controller not the controlled.
The relationship between the individual and their environment is symptomatic of the philosophical debate between determinism and voluntarism (Burrell and Morgan, 1979).

The fourth of Burrell and Morgan’s (1979) assumptions is based on the methodology chosen by social science researchers. Methodological assumptions are directly impacted by ontological, epistemological and human nature assumptions which have consequences for the type and nature of the investigation and how knowledge is obtained. Different ontologies, epistemologies and reflections of human nature will result in different methodologies.

**Figure 3.1 A scheme for analysing assumptions about the nature of social science**

The subjective-objective dimension

![Diagram showing the subjective-objective dimension with continua for different assumptions: Nominalism, Ontology, Realism; Anti-positivism, Epistemology, Positivism; Voluntarism, Human Nature, Determinism; Ideographic, Methodology, Nomothetic.]

Source: Adapted from Burrell & Morgan (1997)

*Summary*-Two opposing views for the conduct of research have developed; one sees the world as a hard, external and objective reality. In this reality research concentrates on the analysis of associations and interactions between various objects of study, the research consists of the recognition and classification of these objects. At its extreme this outlook of
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research attempts to discover universal laws to describe, explain and direct the reality being studied. The alternative and opposing perspective sees the world as much softer, more personal and stresses the importance of subjective experience in the creation of the social world. Of paramount concern in this perspective is the way in which individuals create, modify and interpret the world. At its most extreme the perspective studies what is unique and particular about an individual rather than what is general and universal.

According to Collis and Hussey (2003) the ontological debate between positivist and anti-positivists or phenomenologist researchers rarely takes place in the extreme pure form. Figure 3.2 indicates a number of alternative classifications that exist along a continuum.

3.1.3 Philosophical debates in research

Figure 3.2 Continuum of core ontological assumptions

<table>
<thead>
<tr>
<th>Positivist</th>
<th>Approach to social sciences</th>
<th>Phenomenological</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reality as a</td>
<td>Reality as a</td>
<td>Reality is a projection</td>
</tr>
<tr>
<td>concrete structure</td>
<td>concrete process</td>
<td>of human imagination</td>
</tr>
<tr>
<td></td>
<td>contextual field of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>reality of symbolic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>information</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Adapted from Morgan and Smircich (1980)

The ontological debate, centres on a dichotomy of views either in support of or against either nominalism or realism. The nominalist viewpoint sees the reality of the external world as fundamentally the creation of an individual’s own internal cognitive conceptualisation of the world. In the nominalist world the structure of an external reality involves names and concepts that are merely labels. The nominalist does not believe that the world is a structured place merely that the application of artificial utilitarian labels is a convenient tool for simplifying the description and negotiation of the external world. Conversely realism sees the external world as separate from an individual’s cognitive conceptualisation independent of an individual’s perception of it. Observers from the perspective of realism
see the world as hard, tangible and constructed of permanent structures. Even if these structures are currently unobservable, imperceptible or yet to be discovered concepts they exist as entities capable of empirical study (Burrell & Morgan, 1979).

**Figure 3.3 Continuum of core epistemological assumptions**

<table>
<thead>
<tr>
<th>Positivist</th>
<th>Approach to social sciences</th>
<th>Phenomenological</th>
</tr>
</thead>
<tbody>
<tr>
<td>To construct a positivist science</td>
<td>To study systems process, change</td>
<td>To understand how social reality is created</td>
</tr>
<tr>
<td>To map contexts</td>
<td>To understand patterns of symbolic discourse</td>
<td>To obtain phenomenological insight, revelation</td>
</tr>
</tbody>
</table>

Source: Adapted from Morgan and Smircich (1980)

The epistemological debate, as figure 3.4 indicates the epistemological debate centres on a dichotomous view of the nature of research anti-positivism and positivism. A researcher from the positivist perspective is looking at the world from a logical observable social reality and that the research will be derived from laws or generalisations similar to those identified through the physical or natural sciences. The researcher is an objective analyst, independent of the subject of the research. There is also an assumption that neither conducting the research nor the researcher will affect the research outcome. Positivism emphasises quantifiable observations that are capable of generalising or modelling, Remenyi et al (1998). For anti-positivists the world does not centre on the search for or application of universal laws. Cohen and Manion (1987) argue that anti-positivist approaches such as phenomenology advocate a reality based on the study of direct experience taken at face value rather than more objective, physically based realities. Remenyi et al (1998) argues that the anti-positivist sees the world in subjective terms with each situation being unique defining meaning as a result of interactions between the circumstances and the individuals involved. In contrast to positivism the researcher is not independent but an intrinsic part of the research conducted.
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Table 3.2 Key features of positivist and phenomenological paradigms

<table>
<thead>
<tr>
<th>Basic beliefs:</th>
<th>Positivist Paradigm</th>
<th>Phenomenological Paradigm</th>
</tr>
</thead>
<tbody>
<tr>
<td>World is external and objective</td>
<td>Focus on facts</td>
<td>World is socially constructed and subjective.</td>
</tr>
<tr>
<td>Observer is independent</td>
<td>Look for causality and fundamental laws</td>
<td>Observer is part of what is observed</td>
</tr>
<tr>
<td>Science is value free</td>
<td>Reduce phenomena to simplest elements</td>
<td>Science is driven by human interest</td>
</tr>
<tr>
<td></td>
<td>Formulate and test hypotheses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Operationalise concepts so they can be measured.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Take large samples</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Use multiple methods to establish different views of phenomena</td>
<td></td>
</tr>
</tbody>
</table>


3.1.4 Nomothetic and ideographic research methods

Researchers also approach research design from two dichotomous perspectives and these are known as deductive and inductive. Neuman (2000) argues that a deductive approach to research design begins in the abstract with the development of a theory or hypothesis derived from logical relationships based on ontological assumptions that causal relationships occur (e.g. the faster people drive the more likely they are to have accidents).

Once this hypothesis has been created the research process moves on to the collection and interpretation of the empirical data based on the epistemological assumption that the data collected will be capable of collection in an objective empirical form. This approach enables the researcher with ideas to test them with data from the real world. In inductive research the researcher begins with the data. This is usually observational data based on a more subjective epistemology and then moves towards ideas and then to hypotheses as the final outcome of the research. Gill & Johnson (1997) state that “the logical ordering of
induction is the reverse of deduction as it involves moving from the plane of observation of the empirical world to the construction of explanations and theories about what has been observed.”

### Table 3.3 Nomothetic and ideographic research methods

<table>
<thead>
<tr>
<th>Nomothetic methods emphasize</th>
<th>Ideographic methods emphasize</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Deduction</td>
<td>Induction</td>
</tr>
<tr>
<td>2. Explanations via analysis of causal relationships and explanation by covering-laws (etic)</td>
<td>Explanation of subjective meaning systems and explanation by understanding (emic)</td>
</tr>
<tr>
<td>3. Generation and use of quantitative data</td>
<td>Generation and use of qualitative data</td>
</tr>
<tr>
<td>4. Use of various controls, physical or statistical, so as to allow the testing of hypotheses.</td>
<td>Commitment to research in everyday settings, to allow access to, minimise reactivity among the subjects of research</td>
</tr>
<tr>
<td>5. Highly structured research methodology to ensure replicability of 1,2,3, and 4</td>
<td>Minimum structure to ensure 2,3, and 4 (and as a result of 1)</td>
</tr>
</tbody>
</table>

Laboratory experiments, quasi-experiments, surveys, action research, ethnography

Source: Gill & Johnson, 1997

Neuman (2000) refers to three approaches to research methodology within the social sciences, positivist, interpretive, and critical. “A positivist approach implies that a researcher begins with a general cause effect relationship, that they logically derive from a possible causal law in general theory. He or she logically links the abstract ideas of the relationships to precise measurements of the social world.” In the positivist approach the researcher remains detached from the subject. Great care is taken within the design to remove the influence of the researcher on the subject. The researcher remains neutral and is objective as they observe, measure and examine evidence. The end result of the process will be empirical data and the proving or disproving of the theory or hypothesis promulgated at the start of the study.
Deductive and inductive methodologies are nomothetic methodologies, Burrell and Morgan (1979). The emphasis in these methodologies is the importance of deduction and explanation looking at the solution of the problem in a systematic way. This approach does not seek to discover more subjective solutions as the assumptions on which deduction is based perceive factors external to the individual’s reasoning as paramount. The deductive process is often referred to as the hypothetico-deductive method. Sekaran (2000) states that it involves the seven steps of observation, preliminary data gathering, theory formulation, hypothesising, data collection, data analysis and deduction.

Interpretive social science is related to hermeneutics, a term derived from Greek mythology. Hermes communicated the desires of the gods to mortals. Interpretive researchers spend a great deal of time with their subjects so that they can get to know them and relate to them, the exact opposite of the deductive approach. Techniques such as field research and participant observation necessarily require close contact between observer and the observed. The interpretive approach is primarily concerned with people and how they interrelate with each other. It is allied to nominalist ontology and an anti-positivist epistemology. Interpretative studies using ideographic methodology reflect the subjectivist approach to social science. The interpretative approach is still systematic, analysing through detailed observation socially meaningful questions, while maintaining the natural setting in order to understand and interpret the social world. Easterby-Smith et al (1993) refer to this as a phenomenological approach. Inductive and phenomenological approaches are ideographic methodologies, Burrell and Morgan, (1979). They see human nature from the perspective of voluntarism. This approach explores the subjective and is an analysis of the accounts that one generates by ‘getting inside’ (Gill & Johnson, 1997) a situation and becoming fully immersed in the everyday flow of the life of the subject. Empirical
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observations take account of the subjects meaning and interpretation, and understanding the subject and their situation then arrives at an explanation.

The third methodology suggested by Neuman is Critical Social Science. This mixes the approaches of deductive/inductive and nomothetic/ideographic methods. Critical social science research is based in the perspective of critical theory. Alvesson and Willmott (1988) argue that critical theory focuses on the inherent connection between politics, values and knowledge. Critical theory demands a consideration of the underlying politics and values that legitimise the authority of scientific knowledge. Critical theory research promotes a radical investigation of issues such as exploitation, power relations, distorted communications and false consciousness, (Johnson and Duberley, 2000).
### Table 3.4 A summary of differences among the three approaches to research

<table>
<thead>
<tr>
<th></th>
<th><strong>Positivism</strong></th>
<th><strong>Interpretive Social Science</strong></th>
<th><strong>Critical Social Science</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reason for research</td>
<td>To discover natural laws so people can predict and control events</td>
<td>To understand and describe meaningful social action</td>
<td>To smash myth and empower people to change society radically</td>
</tr>
<tr>
<td>2. Nature of social reality</td>
<td>Stable pre-existing patterns or order that can be discovered</td>
<td>Fluid definitions of a situation created by human interaction</td>
<td>Conflict filled and governed by hidden underlying structures.</td>
</tr>
<tr>
<td>4. Role of common sense</td>
<td>Clearly distinct from and less valid than science</td>
<td>Powerful everyday theories used by everyday people</td>
<td>False beliefs that hide power and objective conditions</td>
</tr>
<tr>
<td>5. Theory looks like</td>
<td>A logical, deductive system of interconnected definitions, axioms and laws</td>
<td>A description of how a group's meaning system is generated and sustained</td>
<td>A critique that reveals true conditions and Helps people to change the world.</td>
</tr>
<tr>
<td>6. An explanation that is true</td>
<td>Is logically connected to laws and based on facts</td>
<td>Resonates or feels right to those who are being studied</td>
<td>Supplies people with tools needed to change the world.</td>
</tr>
<tr>
<td>7. Good evidence</td>
<td>Is based on precise observations that can repeat.</td>
<td>Is embedded in the context of fluid social interactions</td>
<td>Is informed by the theory that unveils others illusions.</td>
</tr>
<tr>
<td>8. Place for values</td>
<td>Science is value free, and values have no place except when choosing a topic</td>
<td>Values are an integral part of social life: no groups values are wrong, only different</td>
<td>All science must begin with a value position some positions are right, some positions are wrong.</td>
</tr>
</tbody>
</table>

Source: Neuman (2000)
3.1.5 Quantitative and qualitative approaches

Quantitative data is preferred by researchers from the positivist, nomothetic perspective. These researchers place a greater emphasis on design, sampling and measurement issues in their deductive, planning orientated approach, prior to the collection and analysis of data. Punch (1998) argues that quantitative data is data in the form of numbers which helps in making comparisons. Methodologies symptomatic of the positivist, ideographic perspective include cross-sectional studies, experimental studies, longitudinal studies and surveys. At the other end of the research continuum researchers from the phenomenological, ideographic perspective rely on the collection of qualitative data. It measures more subjective, textural issues raised by the raw data. Their inductive methodology is primarily concerned with gaining an insight into a situation and developing generalisations from the data they collect. Methodologies associated with this paradigm include action research, case studies, ethnography, feminist perspective, grounded theory, hermeneutics and participative enquiry.

Figure 3.4 Methods associated with the research paradigms

<table>
<thead>
<tr>
<th>Positivistic</th>
<th>Phenomenological</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associated Methodologies</td>
<td>Associated Methodologies</td>
</tr>
<tr>
<td>Cross-sectional studies</td>
<td>Action research</td>
</tr>
<tr>
<td>Experimental studies</td>
<td>Case Studies</td>
</tr>
<tr>
<td>Longitudinal studies</td>
<td>Ethnography</td>
</tr>
<tr>
<td>Surveys</td>
<td>Feminist perspective</td>
</tr>
<tr>
<td></td>
<td>Grounded theory</td>
</tr>
<tr>
<td></td>
<td>Hermeneutics</td>
</tr>
<tr>
<td></td>
<td>Participative enquiry</td>
</tr>
</tbody>
</table>

Source: Collis and Hussey (2003)

Although the two approaches differ in many ways they can also be used to complement each other. This is because although the differences in the style come from the differences in the data, all social researchers are engaged in the same primary activity of collecting and analysing empirical data, in order to develop patterns to explain social phenomena.
Qualitative data is often referred to as soft data and quantitative, referred to as hard data. This is often in the form of statistics, while soft data is more reliant on the analysis of impressions, words and symbols.

3.1.6 Philosophical orientation of this thesis

This thesis is part of a research project within the sphere of management research. Management research is part of the social sciences which is conducted based on either the subjective approach or an objective approach previously outlined within this thesis. The chosen research stance therefore becomes a matter of choice, belief or conscience of the researcher. This reflects the researcher's view of the external world and an individual's relationship with it.

The conduct of entrepreneurial research takes place from both the subjective and the objective paradigms. The review of the literature conducted as part of this thesis has drawn on literature from both paradigms. Both perspectives have added significantly to the development of entrepreneurial research.

*Ontological assumptions of this thesis.* A central assumption of this thesis maintains that an individual's predilection towards nascent entrepreneurship can be objectively measured. This thesis also contends that an individual's cognitive faculties can be investigated in order to understand entrepreneurial intention in nascent entrepreneurs. It assumes that this is a phenomenon that can be objectively, quantifiably measured using rigorous, validated instruments. The thesis follows a realist ontological assumption (Burrell and Morgan, 1979); an assumption that underpins the entire approach to this research.
The ontology of a research project reflects the researcher's vision of the nature of reality. This thesis contends that 'reality' is based around assumptions from the realist perspective. That reality is objective and exists externally it is real. Concrete and immutable and not subject to the interpretation of an individual’s own cognitive construction. Some researchers from a more nominalist perspective do contend that reality is based more on social construction of an individual's own creation and, at its most extreme, that reality is a projection of imagination. A number of researchers in entrepreneurship (e.g. Chell) do research from a social constructivist perspective and their contribution to the development of entrepreneurship research has been significant. Despite the contribution made in this way the nominalist ontological perspective for this thesis has been rejected. The measurement of cognitive style by psychometric instruments has been introduced in the literature review. Such instruments are symptomatic of the realist ontology adopted by in this research.

The nature of the research population can also influence the choice of the ontological perspective. As previously argued, the decision to choose entrepreneurial cognition as the area of study and the decision to use psychometric instruments to measure cognition has placed this thesis within the realist ontological perspective. However, what appears to be a nominalist-realist dichotomy is in reality a continuum. The ontological perspective of this thesis will be argued from a position along this continuum rather than from the extreme. Figure 3.2 indicates research perspectives along a continuum. This thesis assumes the ontological position less extreme than perceiving reality as a concrete structure and in a more tangible form than seeing it as simply a contextual field of information. This thesis contends that reality is more a process than a structure and that this process is real and tangible.
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As Morgan and Smircich (1980, P495) state “The social world is an evolving process, concrete in nature but ever changing in detailed form. Everything interacts with everything else and it is extremely difficult to find determinate causal relationships between constituent processes. At best, the world expresses itself in terms of general and contingent relationships between its more stable and clear-cut elements. The situation is fluid and creates opportunities for those with appropriate ability to mould and exploit relationships in accordance with their interests. The world is in part what one makes of it: a struggle between various influences, each attempting to move toward achievement of desired ends.”

Epistemological assumptions of this thesis- Like ontology, epistemology forms one of the fundamental foundations of the research orientation of this thesis. Epistemological assumptions are inextricably linked to ontological assumptions and these assumptions exist on a bi-polar continuum. These epistemological assumptions will affect the researcher’s understanding of the world in which the research is being conducted and will impact on how knowledge will be communicated to the wider population. An epistemological stance is required based on a position on a continuum from the objective positivist paradigm to the subjective anti-positivist paradigm. Objectivists believe that knowledge is a tangible, hard, real objective constant. Anti-positivists feel that knowledge is softer, more spiritual and based on an individual’s personal and unique insights. In this perspective each individual is seen to have their own, unique knowledge experience making comparative measurement unachievable. The objectivist perspective regards knowledge as a measurable, comparable creation. Burrell and Morgan (1979) argue that the extreme epistemological positions determine whether knowledge is seen as something that is achieved through learning or something that must be personally experienced.
The nature of this research study and its emphasis on entrepreneurial programmes assisting inexperienced entrepreneurs is predicated on the basis that knowledge is a construct that can be learned. This is not to reject the importance of experience. Indeed studies in entrepreneurship indicate that experience and experientially based learning mechanisms such as role modelling and mentoring have a significant positive effect on entrepreneurial success. The positivist epistemological standpoint sees the value of experience as an aid to cognitive aptitude whereas the phenomenologist sees the value of experience within the context in which it is based. However, there is an assumption that the learning and teaching programmes which form part of the support programme process also positively impact on entrepreneurial success.

This thesis adopts a positivist perspective in which the world is seen as a logical, observable social reality which can be measured. Laws and generalisations can be derived from this vision of reality. This thesis contends that observations derived through the process of data collection can be reduced into quantifiable data capable of analysis that will be suitable to formulate generalisations and models. Furthermore it is contended that cognitive psychometric measurement can be used to make generalisations about the entrepreneurial population and use this data to create a model to aid in understanding of nascent entrepreneurship. The research will focus on facts obtained from respondents which will be objectively studied rather than the more phenomenological interpretation of meanings. As with ontology this thesis does not take the most extreme view of epistemology that emphasises the importance of studying the nature of relationships to map out a social structure through empirical analysis. The epistemological stance of this thesis is more open and adaptive and stresses the importance of monitoring processes, (Morgan and Smircich, 1980). This epistemological view supports Morgan and Smircich’s view of human nature that man is an adaptor. They stress that man is in an interactive relationship with the world.
and that they influence and are influenced by their context or environment. They argue that a competitive process of exchange exists in which individuals seek to interpret and exploit the environment in order to satisfy need and survive, (Morgan and Smircich, 1980).

3.2 Type of investigation

The sections that follow in this thesis are fundamentally influenced by the philosophical decisions that have been taken in the previous section. The decision to use psychometric instruments to measure cognition in order to investigate entrepreneurial predilection has placed this thesis within a realist ontological perspective and within a positivist epistemology. However the research hypothesis suggested at the conclusion of the review of the literature has indicated the need to collect 'softer' data. As discussed in the previous section this thesis is firmly rooted within a positivist paradigm.

3.2.1 Questionnaire

Questionnaires are efficient at collecting data because the researcher knows what is required and how to measure the variables. Questionnaires can be self-administered, mailed to respondents or distributed electronically. The instruments to be used in this thesis will result in a self-administered questionnaire. Put quite simply a self-administered questionnaire is exactly what it sounds like. It is one, completed by respondents without the intervention of the researcher. When a study is confined to a defined group or area Sekaran (2000) concludes that the main advantage to the researcher is that collection of the completed responses can take place in a relatively short period of time. The researcher can be on hand to clear up any doubts of the respondent and motivate them to complete the questionnaire.
However, there are a few limitations generally associated with self-administered questionnaires. These need to be taken into account before a final decision to use this method of data collection was made. There is a considerable expense in postage and printing without any guarantee that the questionnaire will be returned. Response rates are likely to be low and some companies may believe that it is inappropriate for employees to use company time for such an exercise. It is hoped to mitigate this by having the agreement of the research sites to distribute the questionnaires to their participants. It is hoped that by using this method the total number of responses can be significantly higher than in a postal questionnaire.

Sekaran (2000) also states that it is necessary to use language approximate to the understanding of the respondents with the choice of words being dependent upon the level of educational attainment. The divergent nature of the two research populations presents somewhat of a problem. The KAI instrument that was introduced in the literature review is a pre-designed, pre-printed research instrument. It is not possible to alter the wording or style in any way.

Sekaran (2000) also raises the issue of biasing features that can be designed into a self-administered questionnaire. These include double-barrelled questions where the subparts of a question can be answered differently. Other examples are ambiguous questions where the meaning is confused, recall-dependant questions that rely on memory, leading questions where the wording gives some indication of the preferred answer. Similarly loaded questions where the wording appears in an emotive way and social desirability here a question is asked that is likely to elicit a socially acceptable response.
3.2.2 Data analysis

The psychometric questionnaires administered in this study contain a number of nominal variables. These are also referred to as categorical variables and represent observations that are labelled and categorized that cannot be rank ordered (Bryman and Bell, 2003). These variables have names and make qualitative distinctions. They do not measure the size of a response or event and do not provide quantitative distinctions (Gravetter and Wallnau, 1988). Descriptive data will also be collected on an ordinal scale where ranking observations are made. Bryman and Bell (2003) argue that Likert scales such as those that will be administered are ordinal variables although they acknowledge that they can be treated as interval or ratio variables as a result of the number of categories they generate. Granavetter and Wallnau (1988) contend that interval and ratio variables can produce measures of magnitude. The data resulting from the instruments administered in this research represent continuous variables. Granavetter and Wallnau (1998, P15) define continuous data thus "For a continuous variable, there are an infinite number of possible values that fall between any two observed values. A continuous variable is divisible into an infinite number of fractional parts". For example the scores for the KAI are continuous as they can fall at any point between 32 and 160. Gravetter and Wallnau (1988) caution researchers that continuous variables can be interpreted to appear to be discrete data.

Discrete data consists of separate, indivisible categories. When measuring the Cognitive Style Index previously mentioned in the literature review, for example the respondent's scores represent continuous variables but the resulting interpretation may well describe individuals as intuitive or analytic which would appear to be discrete categories.

The research involved a number of measures of central tendency. The purpose of central tendency is to describe the scores of a group of individuals with a single measurement.
These measures of central tendency are the mean, mode and median. The median is the mid-point in the distribution of values. This is an important figure in this research due to a potential skew in the distribution of the data. Within the results section it will be observed that the median is frequently justified as the point at which samples are divided for analysis. Gravetter and Wallnau (1988) argue that the median provides a viable alternative to the mean when skewed distributions occur. The third measure of central tendency is the mean. This figure is frequently used within research as a point at which to divide samples for analysis. Related to the mean is standard deviation this statistic will occur frequently within the results section. The standard deviation is a commonly used and important measure of variability (Saunders et al, 2000). It uses the mean of the distribution measuring the distance between each score and the mean to ascertain whether the scores are clustered towards the mean or more widely distributed. This assists researchers in making predictions about the sample data. Similar to standard deviation is standard error which is the standard deviation of sample means. It measures how representative a sample is likely to be of a population.

Some of the hypotheses required data analysis to be conducted at different periods in time. Questionnaires were administered and were collected from respondents while they satisfied the definition of nascent entrepreneurs adopted by this thesis. However, additional analysis was also conducted on the responses provided by those respondents who successfully launched or failed to launch a business. This information was supplied by the research sites and a cut off date of the 31st of March 2006 was applied. At this time the respondents had completed their business assistance programme and had been given the time provided by the programmes to launch their business. The re-analysis of the CSI and KAI and Proactive Personality Score required by the hypotheses was conducted at this stage. This study also contained a longitudinal dimension. Bryman & Bell (2003) argue that the
difficulties involved in longitudinal research mean that it is little used in business and management studies. Despite these difficulties a further analysis of the CSI, KAI and PPS scores was conducted after a six month period. The information was provided by research sites regarding the trading status of respondents at 31st September 2006.

3.2.3 Tests conducted

A variety of tests were conducted in order to answer the hypotheses. The statistical techniques employed were parametric tests in that they make assumptions about the shape of the population distribution and about other population parameters (Gravetter and Wallnau, 1988). One of the principle methods of analysis was the Pearson correlation. A Pearson correlation is a statistical technique used to measure the degree and direction of a linear relationship between two variables. A Pearson correlation can be used to make predictions where two variables correlate and one variable can be used to predict another. Correlations can also be used to test theory. Correlation statistics were used in both ways in this research. Within the reporting a Pearson correlation is denoted by $r$. The coefficient lays between -1 and 1. The closer the coefficient is to 1 the stronger the relationship, closer to 0 the relationship weakens (Bryman and Bell, 2003). Field (2005) defines the strength of correlations thus $r = 0.1$ is small effect, $r = 0.3$ is medium effect, $r = 0.5$ is large effect.

Another method of statistical analysis employed to test the hypotheses was the independent samples $t$-test. This statistic was used to test the mean of the difference between the two populations. Conducting a $t$-test determined if there was evidence for a mean difference between two populations. The standard deviation ($\sigma$) is used by Gravettor & Wallnau, (1988) to determine how well the mean fits the sample. However, Field (2005) suggests the use of standard error ($SE$) which measures how well the mean fits the population. Field suggests that it allows the confidence interval for the mean to be
computed more easily. The $t$-test assumes a normal distribution in the data and that the two populations have the same variances. This can be tested using a test for the homogeneity of variances (Gravetter & Wallnau, 1988). In this research two tests were considered the Bartletts test and Levene's test. Although Bartletts test is the most commonly used it is argued that this test is sensitive to departures from normality (NIST, 2006). Levene's test it is argued is less likely to reject a true hypothesis of equality of variances just because the distribution of the sample is not normal and was therefore used in this research. The final statistical method of hypothesis testing is analysis of variance ANOVA. This is a procedure which determines if mean differences exist between two or more populations. This is conducted through an analysis of the variance between two components those differences between treatments and those within treatments. As differences between populations increase the $F$-ratio will increase. As variability within populations increases the $F$-ratio will decrease. In situations where the null hypothesis is rejected or there are three or more populations a post hoc test can be conducted after the analysis of variance. This will be conducted so that comparison of the individual populations can be made two at a time. In this thesis the Scheffe post hoc test was chosen over other available tests. Although Gravetter and Wallnau (1988) contend that Tukey's HSD post hoc test is commonly used in psychological research and would therefore be appropriate. For this study for the purposes of this research a Scheffe test could be argued to be more appropriate. It is important that any post hoc test be rigorous in reducing the possibility of any type 1 errors. Gravetter and Wallnau (1988) call a Scheffe post hoc test an 'extremely cautious method of reducing type 1 errors' and conclude that this is one of the 'safest' post hoc tests.
3.2.4 Testing for entrepreneurial characteristics

A test was developed to enable the correct identification of established entrepreneurs. These characteristics are supported by the literature but are not exhaustive and by no means represent the total sum of the elements in the definitional debate. However, the six broadly accepted areas distilled from the literature do have the benefit of coming from both the behavioural and the psychological approach. The six areas are innovation, internal locus of control, need for achievement, venture creation, risk-taking and ownership/leadership/control. These six areas all represent one aspect of the synthesis of the research from the literature already identified in the background section of this thesis.

Two of the questions were dichotomous variables requiring yes - no answers these were ‘have you launched your own business that is currently trading’ and ‘do you have a financial stake in the company where you work’. The remaining four questions ‘to what extent do you believe that individuals are controlled by circumstances and fate’, can you exercise leadership and control over resources without reference to others’, ‘money is more important to me than success’ and finally ‘I am always looking for new opportunities and new solutions’ were measured on a Likert scale. Scores on this Likert scale range from 1 - disagree to 5- agree.

3.3 Target population

The target population for this study are nascent entrepreneurs in the UK. The term nascent entrepreneur is applied to an individual engaged in the start-up process of a new venture that is committed to the process but yet to begin trading.

As identified within the literature review it was decided to seek the assistance of organisations promoting entrepreneurship among the target population to undertake this study. The population frame was therefore drawn from the membership of these
organisations providing assisted programmes to nascent entrepreneurs. Assisted programmes exist within the training and education sectors and both will be studied. A control group of part-time undergraduate students that mirror the target population in terms of age range and experience will act as a control group of non-entrepreneurs.

3.4 Research sites

It has been identified that assisted programmes to support nascent entrepreneurs exist throughout the UK. The providers of business start-up advice and training include commercial training companies, charities and not for profit organisations and governmental agencies who provide business start-up training. Instruments were administered during the nascent stage of entrepreneurship. Secondary data sources were used to track the progress of these individuals over an extended period.

3.4.1 Nascent entrepreneur research sites

The sources of data for young nascent entrepreneurs from the private sector came from InBiz Limited and the New Entrepreneur Scholarship.

3.4.1.1 InBIZ Limited

Inbiz Ltd is a privately owned training provider with 200 staff operating within 41 offices across the UK. They provide business start-up advice and support to qualifying individuals. These programmes are mainly funded through the Jobcentre Plus and local authorities. The principle programme of support for nascent entrepreneurs is delivered through the New Deal. Inbiz centres in Hull, Lincoln, Newcastle-Upon-Tyne, Reading, Ipswich, London, Durham, Cumbria and Southampton participated in the research.
3.4.1.2 The New Entrepreneur Scholarship

The New Entrepreneur Scholarship is a programme of business start-up and on-going support which is funded by the Learning and Skills Councils and managed nationally by the National Federation of Enterprise Agencies (NFEA) the Association of Business Schools (ABS) and the Prince’s Trust. The running of the NES nationally is sub-contracted to NFEA and ABS members. Research was conducted for this thesis involving Teesside University, Norfolk and Waveney Enterprise Services, Furness Enterprise, Manchester Metropolitan University Business School, Tyne and Wear Enterprise Trust and the North East Business Innovation Centre.

3.4.2 Established entrepreneur research sites

Fourteen business incubator unit centres were approached to assist in this study. All agreed to help and many were very interested in the study. Centres varied in size from just 9 units to 170 units. They were chosen at random from the UK Business Incubator web-site. The sites are located across the United Kingdom. Business incubators offer a range of facilities to assist small businesses, such as telephone answering, photocopying, mail sorting and collection. Many also have meeting rooms and communal areas to reduce the sense of isolation many small business entrepreneurs can feel. The business incubators chosen for this study cross the spectrum both in terms of size and function, from science/technology parks, through serviced offices to workshops.
3.5 SAMPLING

3.5.1 Sampling techniques

Sampling is a process of selection, (Sekaran, 2000). The sampling procedure involves selecting a sufficient number of elements from a research population. By studying the characteristics or properties of the sample it is possible to make generalisations about the total population. A research population is the entire group of people who the researcher wishes to investigate. In this thesis the research population is all the nascent entrepreneurs on assisted programmes. Each individual nascent entrepreneur within the population is called an element. This study was conducted by studying a sample of nascent entrepreneurs that was drawn from a population frame. The population frame was participants on assisted programmes operated by the research sites identified in section 3.4. The sample itself was derived from the population frame and represents a subset of the population. By studying the sample certain generalizable assumptions about the population should be able to be made.

Neuman (2003) argues that quantitative and qualitative researchers approach sampling from different perspectives. He argues that in qualitative research the key determinant of a research sample is likely to be how effectively the sample illustrates the object of study rather than the representative nature of the sample. For researchers undertaking quantitative research such as this thesis Neuman argues the primary goal of the sample is that it should be representative of the larger population. Techniques based on mathematical probability have been devised to try to develop methods to improve the accuracy and representative nature of the sample. The purpose of sampling is to reduce time and cost in data collection and to improve the accuracy of the research. This section will also justify the decision to use a sampling technique more readily associated within qualitative research for this quantitative thesis.
There are two main methods of sampling available to the researcher. These are probability sampling and non-probability sampling. In probability sampling every element within the sample has a known probability, however slender, of being used as part of the sample. However, in non-probability sampling the elements of the study do not have a known or predetermined chance of being selected as subjects, Sekaran (2000). Probability sampling is used when the key factor is the importance of the representative nature of the sample in order to ensure the sample contains the generalised characteristics or properties of the population.

There are a number of probability sampling techniques available. According to Neuman (2003) the simple random sample is both the easiest random sample to understand and the one on which all other types are modelled. Every element within the population has a predicted known chance of selection. Stratified sampling is used where it is necessary or desirable to subdivide the population into subgroups or strata. Sekaran (2000) calls stratified sampling an efficient research sampling design. That is: it provides more information with a given sample size. A simple random cluster sample is often used for convenience when there is a lack of a suitable sampling frame for a dispersed population and random selection of the elements of the population cannot be used.

Neuman (2003) argues that non probability sampling is used by qualitative researchers who have a concern to find cases that will enhance what the researchers learn about the object within a specific context. He suggests that qualitative researchers rarely determine their sample size in advance and will have a limited knowledge about the larger group or population. The essence of non-probability sampling designs means that the individual elements in the population do not have probabilities attached to their being chosen as a sample.
Quota sampling involves the identification of relevant categories of people within the population and then ensures that the groups are adequately represented. Deciding how many people represent each group through a quota system. The second type of purposive sampling is judgement sampling, described by Neuman (2003) as an acceptable kind of sampling for special situations. It uses the judgement of an expert in selecting cases or it selects cases with a specific purpose in mind. Neuman continues that it is used in exploratory research or in field research. Purposive sampling may be used to select members of difficult to reach specialised populations. Remenyi et al (1998) refer to judgement sampling occurring where individuals are selected for a specific purpose such as representing best practice. The key aim of the sample is not to be statistically representative rather that it should comprise individuals considered to have knowledge and information. Another situation of purposive sampling occurs when identifying particular cases for an in-depth study. In this scenario the purpose is not to generalise about a larger population but to gain a deeper understanding of the types. Table 3.5 provides a summary of different non-probability sampling techniques available to researchers.
A decision has been taken to use a non-probability sampling technique that would more readily be associated with qualitative research. The decision to choose purposive judgement sampling has been taken. This can be justified on a number of grounds. The target population of this thesis is made up of nascent entrepreneurs launching their businesses through assisted programmes. The population of this thesis is very tightly controlled and defined. Research sites have been recognized where a suitable population frame for research has been identified. Procedures are in place at the research sites to ensure that the population frame is highly accurate. This thesis argues that in a situation where a clearly defined population is combined with a highly accurate population frame the quality of the ‘judgement’ available through judgement sampling is significantly enhanced. This thesis further contends that the very specific nature of the study being conducted requires such a technique. It is necessary to sample nascent entrepreneurs on assisted programmes. Research must therefore take place at research sites where these assisted programmes operate.

<table>
<thead>
<tr>
<th>Type of Sample</th>
<th>Principle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haphazard</td>
<td>Get any cases in any manner that is convenient</td>
</tr>
<tr>
<td>Quota</td>
<td>Get a preset number of cases in each of several predetermined categories that will reflect the diversity of the population, using haphazard methods.</td>
</tr>
<tr>
<td>Purposive</td>
<td>Get all the cases that fit particular criteria, using various methods</td>
</tr>
<tr>
<td>Snowball</td>
<td>Get cases using referrals from one or a few cases and then referrals from those cases and so forth.</td>
</tr>
<tr>
<td>Deviant Case</td>
<td>Get cases that substantially differ from the dominant pattern (a special type of purposive sample).</td>
</tr>
<tr>
<td>Sequential</td>
<td>Get cases until there is no additional information or new characteristics (Often used with other sampling methods).</td>
</tr>
<tr>
<td>Theoretical</td>
<td>Get cases that will help reveal features that are theoretically important about a particular setting/topic.</td>
</tr>
</tbody>
</table>

3.5.2 Sample size

Remenyi et al (1998) refer to the determination of sample size as a complex problem. They argue that it is necessary to take into consideration factors such as type of sample, variability in the population, time, costs, accuracy of estimates required and the confidence with which generalisations about the population can be made. Neuman (2003) argues that determining sample size depends upon the type of data analysis to be conducted, the level of accuracy required and on the characteristic of the sample.

In considering sample size Neuman (2000) considers rule of thumb as a frequently used method of sample size estimation. Neuman refers to these as commonly or conventionally accepted amounts that are based on past experiences. But the general principal is that the smaller the population size the bigger the sampling ratio needs to be to create an accurate result. That is because it will have a higher probability of yielding the same results as the entire population. The size of the sample also depends upon the degree of accuracy required for a particular study the degree of variability or diversity within the population and the number of different variables to be simultaneously examined in the data analysis. Neuman (2003) argues that when a sample size is small relatively minor increases in sample size can produce significantly greater accuracy in results for instance he argues that increasing the sample size from 50 to 100 reduces errors from 7.1% to 2.1%.

Neuman states “Everything else being equal, larger samples are needed if one wants high accuracy, if the population has a great deal of variability or heterogeneity, or one wants to examine many variables in the data simultaneously. Smaller samples are sufficient when less accuracy is acceptable, when the population is homogeneous, or when only a few variables are examined at a time” (P233).

Roscoe (1975) cited in Sekaran, (2000, p296) proposes the following rules of thumb for determining sample size:

1. Sample sizes larger than 30 and less than 500 are appropriate for most research.
2. Where samples are to be broken into sub-samples (Males/Females, Juniors/Seniors etc.), a minimum sample size of thirty for each category is necessary.

3. In multivariate research (including multiple regression analyses), the sample size should be several times (preferably 10 times or more) as large as the number of variables in the study.

4. For simple experimental research with tight experimental controls (matched pairs etc.), successful research is possible with samples as small as 10 or 20 in size.

In this study a number of variable factors will influence sample size. As Neuman (2003) argues this research work does benefit from a relative homogeneity in the research sample which should assist accuracy and the number of different variables is low again this should seek to improve accuracy. The accuracy of the research conducted through this thesis also benefits from a good population frame. However it could be argued that the choice of a non-probability sampling technique could adversely affect accuracy. It has therefore been determined to gather as large a sample of data as reasonably possible.

### 3.6 Study response rate

Responses were received from established entrepreneurs through the distribution of the questionnaire to members of UK Business Incubation. A total of 695 questionnaires were distributed to UK Business Incubator member sites. Altogether 154 were returned of which 16 were incomplete or had not been completed in accordance with the wishes of the authors. These were rendered invalid for the purposes of this study. While 138 questionnaires were usable which represents a return of 19.86%.

Nascent entrepreneurs were questioned through a different contact strategy than the established entrepreneurs. Nascent entrepreneurs were targeted who were part of a formal business start-up programme. These respondents were either part of the New
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Entrepreneur Scholarship or on the government's New Deal programme. The questionnaires were distributed and administered as part of this formal process. Response rates are consequently much higher than the existing entrepreneur sample. Additionally, the quality of responses because of the supervision of the administration was also improved. A total of 240 questionnaires were distributed the NES and InBiz. While 122 questionnaires were returned to me by the research sites of which 119 questionnaires were usable representing a return of 49.58%.

In order to make a comparison between the scores of the target population and the general population a control group of undergraduate students enrolled on a part-time degree were also sent the research questionnaire. CSI, a version of the CEI for prospective businesses owners and the EPT. 51 replies were received, with 49 being usable.

Table 3.6 Study response rate

<table>
<thead>
<tr>
<th>Study Response Rate</th>
<th>Nascent Entrepreneurs</th>
<th>Established Entrepreneurs</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questionnaires Distributed</td>
<td>240</td>
<td>695</td>
<td>51</td>
</tr>
<tr>
<td>Questionnaires Returned</td>
<td>122</td>
<td>154</td>
<td>51</td>
</tr>
<tr>
<td>Usable Questionnaires</td>
<td>119</td>
<td>138</td>
<td>49</td>
</tr>
<tr>
<td>Response Rate</td>
<td>49.58%</td>
<td>19.86%</td>
<td>96.07%</td>
</tr>
</tbody>
</table>

3.7 Questionnaire design

This study consists of a number of individual questionnaires that have been through various stages and levels of analysis and scrutiny through the literature. The CSI, (appendix 1) Allinson & Hayes (1996), the KAI, (appendix 2) Kirton (1976), the 'Proactive Personality Scale', (appendix 3) Bateman and Crant (1993), and 'General Self-Efficacy Scale', (appendix 5) Markman et al (2002) are existing questionnaires that have gone through a number of testing stages to ensure their reliability and validity. Two other
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instruments the unpublished 'Global Regret Scale' (appendix 4) devised by Neal Roese at the University of Illinois in 2002 and the opportunity identification questionnaire (appendix 6), Westhead (2005) have received less rigorous testing in the literature. In addition to these questionnaires it was felt that further self-developed items needed to be developed for the purpose of this research. The self-developed filtering questions described in section 3.2.4 were developed in order to identify that respondents were nascent entrepreneurs. These self-developed items were developed from the literature to facilitate purposive, judgemental sampling techniques and to maximise the validity and rigour of the data collection.

According to Sekaran (2000) sound questionnaire design principles should focus on the wording of the questionnaire. Secondly the planning of the issues relating to the categorisation of the variables, how they will be scaled and coded after they have been returned, thirdly on the general appearance of the questionnaire. Taking this last point first it was decided to redesign the layout of the CSI questionnaire. The existing design included a small typeface and was difficult to follow. Changing the typeface to Ariel and increasing its size to 12 point improved the aesthetic appearance of the questionnaire and made it easier to complete.

There are a number of issues that make questionnaire design far from the simple process it may initially appear. Fortunately in all the instruments used in this thesis these issues have been addressed, although it is essential that the self-developed items do follow best practice. The self-developed items needed to be appropriately worded. Ensuring that respondents understand the questions makes the meaning and interpretation of the questions of paramount importance. The language needs to be simple but not patronising, without double meanings, no double barrelled questions and the use of jargon and
academic terms kept to a minimum. In an attempt to avoid the problems of lazy answering the CSI, KAI, Global Regret Scale, General Self-Efficacy scale and Self-developed items all contain positively and negatively worded questions.

3.8 Reliability and validity

3.8.1 Reliability

Neuman (2003) calls reliability dependability or consistency. He argues that reliability is an indicator that the results of a study do not vary because of the characteristics of the process or instrument. Therefore if a test is repeated under identical or similar conditions the same result will be observed again. Easterby-Smith et al (1991, P41) ask “will the measure yield the same results on different occasions?” Punch (1998) argues that there are two aspects to consistency. The first being that results are consistent over time “if the same instrument were administered to the same people in the same circumstances to what extent would they get the same results” (Punch, 1998, P99). Neuman (2003) calls this stability reliability and argues that the degree of stability that a measure indicates can be determined using a test-retest method of analysis. The second method of reliability investigates the internal reliability of the instrument. This is particularly important in studies such as this where instruments purport to measure a number of psychological factors within a single instrument. Neuman argues that a measure such as Cronbach’s alpha would be a suitable measure to assess the internal consistency of the measure. The third type of reliability looks at how representative an instrument is across subpopulations or groups. Nunnally (1978) argues that satisfactory reliability levels depend upon how a measure is to be used. Nunnally argues that for basic and initial research alpha coefficients of 0.7 are sufficient.

3.8.2 Validity

According to Nunnally (1978, P86) “a measuring instrument is valid if it does what it is intended to do”. Punch (1998, P100) argues that validity indicates the degree to which “we
know that this instrument measures what we think (or wish) it measures’. Validity in this context, Punch argues, is the extent to which an instrument measures what it claims to measure. Validity represents the extent to which an instrument represents empirically the concept that it purports to measure. Neuman (2003) contends that validity identifies how well conceptual definitions and operational definitions synergise together. The more they synergise the greater the measurement of validity. Neuman argues that validity is part of a dynamic process but that without validity all measurement becomes meaningless. Cresswell (2003) argues that threats to validity exist. Internal threats relate to the experimental process, treatments or experiences of participants that threaten the researchers ability to draw correct conclusions from the data. The external threats to validity occur when researchers draw incorrect conclusions from the data in terms of its applicability to other people or settings.

Neuman (2003) refers to four types of validity. The simplest is that of face validity which is a judgment of a professional community that the instrument appears to measure the construct. Punch (1998) argues that content validity measures the degree to which the full content of a construct is represented by the measure. Neuman argues that content validity can be assured through correct definition and sampling of the construct definition. Criterion validity is assured through the comparison of a construct with another measure which has been proven to possess validity and reliability (Punch, 1998). Criterion validity can be argued to be divided into two categories. Concurrent validity Punch argues occurs there the criterion variable exists in the present and is a comparison of two measures that purport to measure the same construct. Predictive validity occurs where a criterion variable will occur in the future (Punch, 1998). Neuman argues that predictive validity refers to the extent to which a measure predicts future events that are logically associated with the construct being measured. Cresswell (2003) argues that construct validity is threatened when researchers use
inadequate definitions and measures of variables. Punch (1998) argues that an instrument exists within a theoretical context and that the instrument should show relationships with other predictable and interpretable constructs within the context. Construct validity can be either convergent or divergent. Convergent reliability refers to the degree to which indicators converge or are associated with each other. Convergent validity can be identified where measures of similar constructs would be argued to be similar. Discriminant validity describes the opposite phenomenon it identifies the degree to which constructs that would be argued to be divergent actually display this phenomenon in the research testing.

Table 3.7 Reliability and validity

<table>
<thead>
<tr>
<th>Reliability (Dependable Measure)</th>
<th>Validity (True Measure)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability - over time</td>
<td>Face - in the judgment of others</td>
</tr>
<tr>
<td>Representative - across subgroups</td>
<td>Content - captures the entire meaning</td>
</tr>
<tr>
<td>Equivalence- across indicators</td>
<td>Criterion - agrees with an external source</td>
</tr>
<tr>
<td></td>
<td>Concurrent - agrees with existing measure</td>
</tr>
<tr>
<td></td>
<td>Predictive - agrees with future behaviour</td>
</tr>
<tr>
<td></td>
<td>Construct - multiple indicators are consistent.</td>
</tr>
<tr>
<td></td>
<td>Convergent - alike ones are similar</td>
</tr>
<tr>
<td></td>
<td>Discriminant - different ones differ</td>
</tr>
</tbody>
</table>

Source: Neuman (2003, P183)

3.8.3 Reliability and validity of instruments

3.8.3.1 Reliability and validity of the CSI

Allinson and Hayes (1996) reported that the internal consistency of the CSI using Cronbach’s alpha ranged between .84 and .92 across seven research samples. They also conducted a test-retest which indicated the index had temporal stability indicating no significant change over time. The test re-test coefficient was .90 \((p < .001)\) conducted among 30 management students at an interval of 4 weeks. Confirmatory factor analysis was achieved through the parcelling of the 38 items into six parcels. The single factor hypothesised by Allinson & Hayes was confirmed in five of the seven research samples.
conducted. They report that exploratory factor analysis produced a single factor solution for all seven samples.

Construct validity of the CSI has been determined through the use of five instruments which support the selected variables, Allinson and Hayes (1996). These were three personality inventories, the 16PF -Form A (Cattell et al, 1973), the MBTI-G (Myers, 1962) and the WEPS (Gordon, 1973). A measure of cognitive style the Honey & Mumford (1982) Learning Styles Questionnaire was administered, the Watson-Glaser Critical Thinking Analysis -Form C (Watson & Glaser, 1991) was administered to test reasoning ability. Concurrent validity was established through the ability of the instrument to discriminate between groups which were argued to differ in cognitive style. Concurrent validity was identified through the comparison of differences of gender and job levels and through correlational evidence. In a replication and extension of the validity and reliability of the CSI, Sadler-Smith et al (2000) concluded that the CSI revealed satisfactory inter-item correlations ($r>0.30$) and significant internal reliability with Cronbach alpha in the range 0.79 - 0.89. The unifactoral structure of the CSI was also replicated Sadler-Smith et al (2000, P180) who state “with respect to the CSI’s psychometric properties one may conclude therefore that the items are homogeneous and show good reliability across a diverse range of samples”. To test for criterion validity Sadler-Smith et al (2000) used the computer-based CSA (Riding, 1994) but found the correlations of the Wholist-Analyst dimension to be low. Concurrent validity was demonstrated through a comparison of job levels although relationships with gender and nationality were less strong.

3.8.3.2 Reliability and validity of the KAI

Kirton (1976) tested the internal reliability of the KAI using the Kuder-Richardson Formula 20 coefficient which produced a result of .88 accounting for 78° of internal variance. This test was repeated on a second independent sample and again the KR20 was
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reported at .88. The temporal stability of the KAI was determined using a test re-test method which produced a coefficient of .82 with an interval of 7 months between tests.

Kirton conducted a principle-factor analysis on the intercorrelations of the 32 KAI items. Using a varimax rotation technique the original 7 factors were divided to produce the three subscales that measure the components of the KAI. Validity of the KAI was determined using a range of parallel instruments which measure the same dimensions as the KAI subscales. In a fundamental reanalysis of the construct validity and generalisability of the KAI, Bagozzi & Foxall (1995) identify strong reliabilities on all the KAI components. They argue that their findings validate the original tripartite structure of the KAI. They also reported the convergent validity of results within each of the three factors was high, as was reliability and that discriminant validity was achieved within the factors.

3.8.3.3 Reliability and validity of the Proactive Personality Scale

The original proactive personality scale (Bateman & Crant, 1993) is a 17 item scale. Initial reliability tests were conducted across three independent samples. Reliability was determined by a Cronbach alpha coefficient which ranged between 0.87 and 0.89 across the three samples. The alpha coefficient of the final scale was 0.89 and the inter-item correlation was 0.32. Bateman & Crant argue that this is within the range of average inter-item correlations 0.20 to 0.40 suggested by Briggs and Clark (1986). Stability reliability was determined by the test re-test method reliability was 0.72 over a 3 month period. Factor analysis of the 17 item scale using principle-axis factoring identified a single factor with an eigenvalue of 5.63. Cattells (1966) scree plot criterion also indicated a single factor. Seibert, Crant & Kraimer (1999) created a shortened 10 item version of the Proactive Personality Scale. The correlation between the original scale and the shortened version was .96 and deleting 7 items had very little effect on the reliability of the reliability of the scale (17 item alpha = .88, 10 item version alpha=.86). The shortened 10 item version of the PPS was used in this study.
Validity was determined through the use of a battery of tests argued by Bateman & Crant to offer convergent and discriminant validity. The findings supported their predictions that proactive personality would correlate with four personality constructs, conscientiousness, extraversion, need for achievement and dominance. Discriminant validity was demonstrated between proactive personality and neuroticism, openness, agreeableness, intelligence, private self-consciousness, locus of control as well as age, gender and work experience. Bateman & Crant report criterion validity which related proactive personality to extra-curricular activities, personal achievement and transformational leadership.

3.8.3.4 Reliability and validity of the General Self-Efficacy Scale

A measure of general self-efficacy was developed by Markman et al (2002) based on the work of Maurer & Pierce (1998). This paper demonstrated the reliability of using Likert scale measures in the measurement of self-efficacy when compared to traditional often context specific measures. The general self-efficacy scale is an eight question, seven point Likert scale measure. Markman et al report a Cronbach alpha of .89. Validity for this approach is provided by Maurer & Pierce (1998) who demonstrated that Likert scale tests for general self-efficacy were reliable and valid. Predictive validity was demonstrated by comparing Likert scale measurements with other measures of self-efficacy. This led Maurer & Pierce to conclude that Likert scales were an acceptable method of measuring self-efficacy.

3.8.3.5 Reliability and validity of the Global Regret Scale – a measure of counterfactual and regretful thinking.

The Global Regret Scale is a six-item Likert scale unpublished measure that tests for the influence of counterfactual and regretful thinking on an individual. Both counterfactual thinking and regretful thinking is the automatically activated cognitive representation of
alternative scenarios produced as a result of misfortune or disappointment. The Global Regret Scale was developed by Professor Neal Roese of the University of Illinois and is a simultaneous test for both of the related constructs. Reliability of the scale in a single test was determined using a Cronbach alpha technique (Alpha = 0.75).

3.8.3.6 Reliability and validity of other instruments

The other instruments used in this study have principally been derived from the peer reviewed literature. These have been subjected to the scrutiny of the academic community. The measure of opportunity identification was derived from Hills et al (1997) and Chandler & Hanks (1998) and first used by Ucbasaran et al (2003). Measures of human capital were developed from Arenius & Minniti (2005) and Ucbasaran et al (2004). Business support and network support questions were derived from Birley & Westhead (1997), Hills et al (1997) and Bruderl & Preisendorfer (1998).

3.8.4 Summary of Instrument Reliabilities

Table 3.8 Reliability of the instruments used in this research

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Study</th>
<th>Reliability</th>
<th>Test-Retest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Style Index</td>
<td>Allinson &amp; Hayes (1996)</td>
<td>Range .84 - .92**</td>
<td>0.90</td>
</tr>
<tr>
<td></td>
<td>Sadler-Smith et al (2000)</td>
<td>Range .79 - .89**</td>
<td>n/a</td>
</tr>
<tr>
<td>KAI</td>
<td>Kirton (1976)</td>
<td>KR20=0.88*</td>
<td>0.82</td>
</tr>
<tr>
<td>Proactive Personality</td>
<td>Bateman &amp; Crant (1993)***</td>
<td>alpha=0.89**</td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td>Seibert et al (1999)***</td>
<td>alpha=0.86**</td>
<td>n/a</td>
</tr>
<tr>
<td>General Self-Efficacy</td>
<td>Markman et al (2002)</td>
<td>alpha =0.89**</td>
<td>n/a</td>
</tr>
<tr>
<td>Global Regret Scale</td>
<td>Roese</td>
<td>alpha=0.75**</td>
<td>n/a</td>
</tr>
</tbody>
</table>

* Kuder-Richardson Formula 20 coefficient
** Cronbach Alpha
*** Original 17 item scale
****10 item scale as used in this research
3.9 Reliability testing

3.9.1 Alpha coefficient and test re-test analysis

In order to determine the internal consistency reliability of the instruments administered in this study Cronbach alpha tests were conducted on the entrepreneur sample. Nunnally (1978) and Cronbach (1976) both consider coefficient alpha to be the most important index of test reliability. Table 3.9 illustrates the findings. The instruments tested were the Cognitive Style Index, KAI, Global Regret Scale, the General Self-Efficacy Scale, the Proactive Personality Scale and the measure of opportunity recognition. Kline (1993) argues that internal consistency reliability is seen as a prerequisite of high validity. Nunnally (1978) argues alpha coefficients should never fall below .7. However, Cattell and Kline (1977) argue that internal consistency should not be so high as to produce a very narrow test that would have high reliability but not be valid.

In order to determine temporal stability a test-retest was conducted on each measure administered. For each instrument a test-retest coefficient and a paired samples t-test was calculated in order to determine the correlation between the different samples and if a significant change had occurred over time. In total 30 nascent entrepreneur respondents completed the test-retest which mirrored the reliability analysis undertaken by Allinson & Hayes (1996). The test was conducted at an interval of 3 months as suggested by Kline (1993). The sample exactly mirrored the nascent entrepreneur sample analysed in this research. Kline (1993) argues that a test-retest correlation of .8 should be a minimum figure. However he acknowledges that this is likely to fall as the period of the study increases. Table 3.9 demonstrates that none of the test-retest coefficients in this study achieved this ‘minimum’. However it should be pointed out that all correlations were strong and statistically significant. One possible reason for the lower coefficient is cited by Kline himself. This is the nature of and possible changes in the sample over the testing period.
All of the nascent entrepreneurs sampled were engaged on a developmental process. They were founding and launching a new business; they were learning new skills and encountering new experiences. The first test was conducted at the start of the founding process while for many the retest was administered towards the end of the founding process. These changes may have impacted on how some of the respondents responded to the testing process contributing to measurement error.

Table 3.9 Research study reliability results - Summary table

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Alpha (n=257)</th>
<th>Test-Retest Coefficient (n=30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Style Index</td>
<td>.89</td>
<td>.82 (p&lt;.001)</td>
</tr>
<tr>
<td>KAI</td>
<td>.86</td>
<td>.79 (p&lt;.001)</td>
</tr>
<tr>
<td>Global Regret Scale</td>
<td>.73</td>
<td>.70 (p&lt;.001)</td>
</tr>
<tr>
<td>General Self-Efficacy</td>
<td>.81</td>
<td>.87 (p&lt;.001)</td>
</tr>
<tr>
<td>Proactive Personality</td>
<td>.91</td>
<td>.75 (p&lt;.001)</td>
</tr>
<tr>
<td>Opportunity Recogn</td>
<td>.84</td>
<td>.79 (p&lt;.001)</td>
</tr>
</tbody>
</table>

3.10 Operational definitions and measurement of variables

This section aims to provide operational definitions and specify rules of measurement and values in order that the correct statistical procedures are adopted in this research. These definitions and rules give meaning to the concepts and constructs under observation. Bryman & Cramer (2001) contend that the ability to recognise the forms that variables take is central to the understanding of statistical operations and administration of acceptable measures.
Stevens (1946) argues that four different levels of measurement are available and that these range from simple to sophisticated. The simplest level of measurement is obtained from a nominal variable. This allows the classification of objects into discrete categories that cannot be rank ordered to provide a quantitative distinction between the categories. At the next level of sophistication are ordinal variables. Ordinal variables can be rank ordered in terms of magnitude however the categories within the scale cannot be argued to be identical. At the highest level of sophistication are interval and ratio variables where the differences between the categories are identical. The distinction between interval and ratio variables being that the latter has an absolute zero. Bryman & Cramer (2001) argue that interval/ratio variables are the highest level of measurement and that a wider range of statistical techniques are available to interpret interval/ratio data. It is at this level where statistical techniques such as correlations can take place.

In applying the definitions above data derived from Likert scale measures is obtained at the ordinal level. This severely restricts the level of sophistication in the analysis of the data collected. However, Bryman and Cramer (2001) argue that it is current practice to treat ordinal data gathered from multiple-item measures as though they were interval. Bryman & Bell (2003) state that multiple-item measures of concepts such as Likert scales can be treated as if they produce interval/ratio variables because of the large number of categories they produce. Labovitz (1970, 1971) argues that ordinal data can and should be treated as interval. "Treating ordinal variables as if they are interval has these advantages: (1) the use of more powerful, sensitive and better developed and interpretable statistics with a known sampling error, (2) the retention of more knowledge about the characteristics of the data and (3) greater versatility in statistical manipulation" (P523). While this view is not without its critics (Mayer 1971; Grether 1976) Bryman and Cramer (2001) argue that "there seems to be a trend in the direction of this more liberal treatment of multiple-item scales having
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the qualities of an interval variable" (P59). In line with current trends this thesis will treat ordinal level data from multiple-item measures as if they were interval variables.

Operational definitions and scales of measurement for each of the variables in the study are now provided.

**Determination of entrepreneurial status**

Operational Definition: Determination of entrepreneurial status was achieved through analysis of respondent score on the self-developed test of entrepreneurial characteristics.

In order to be considered an entrepreneur respondent's had to answer YES to the following questions: 'Have you launched your own business that is currently trading?' Do you have a financial stake in the company where you work?'

Level of Measurement: Nominal

Four additional questions were posed measurement was based on a Likert scale ranging from 1 to 5. The verbal anchors were 1-Strongly Disagree, 2-Partly Disagree, 3-Neutral, 4-Partly Agree, 5-Strongly Agree.

Level of Measurement: Ordinal

**Business Launch**

Operational Definition: Nascent entrepreneurs were defined as having launched a business when business trading transactions had commenced. Information regarding launch status was provided by research sites following a monitoring interview.

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Level of Measurement: Nominal

**Continuation of Trading**

**Operational Definition:** Nascent entrepreneurs were defined as successfully trading if their business continued to engage in business trading transactions for the six months subsequent to the business launch.

Information regarding trading status was provided by research sites following a monitoring interview.

Level of Measurement: Nominal

**Cognitive Style - CSI**

**Operational Definition:** The cognitive style of an individual is defined as his or her score on the Allinson & Hayes (1996) Cognitive Style Index.

The CSI is a trichotomous scale in which respondents are asked to answer from a choice of True - Uncertain - False

Level of Measurement: Ordinal

**Cognitive Style - KAI**

**Operational Definition:** The cognitive style of an individual is defined as his or her score on the Kirton (1976) KAI.
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The KAI is a Likert scale measure with respondents being asked to choose from a scale of 4 possible answers. The verbal anchors provided are labelled; Very Hard, Hard, Easy and Very Easy.

Level of Measurement: Ordinal

**Proactive Personality**

**Operational Definition:** The proactive personality of an individual is defined as his or her score on the Bateman & Crant (1993) Proactive Personality Scale.

The PPS is a Likert scale measure respondents are asked to circle a number from 1 to 7 to indicate the extent to which they disagree or agree with a statement. Three verbal anchors are provided 1 - Strongly Disagree, 4 - Neither Agree Nor Disagree, 7 - Strongly Agree.

Level of Measurement: Ordinal

**Counterfactual and Regretful Thinking (The Global Regret Scale)**

**Operational Definition:** The extent to which respondents engage in counterfactual or regretful thoughts is defined by their score on the Global Regret Scale.

The Global Regret Scale is a Likert scale measure respondents are asked to circle a number from 1 to 7 indicating the extent to which they disagree or agree with a statement. The polar extremes are 1- Strongly Disagree, 7- Strongly Agree.

Level of Measurement: Ordinal
A Psychometric Analysis of Nascent Entrepreneurs: Understanding the impact of individual entrepreneurial cognition on the founding and survival of new small businesses.

**General Self-Efficacy**

*Operational Definition:* The general self-efficacy of an individual is defined by their scores on the General Self-Efficacy Scale (2002).

The General Self-Efficacy Scale is a Likert scale measure respondents are asked to circle a number from 1 to 7 indicating the extent to which they disagree or agree with a statement. The polar extremes are 1- Strongly Disagree, 7- Strongly Agree.

Level of Measurement: Ordinal

**Opportunity Identification**

*Operational Definition:* The extent to which respondents consider themselves to be able to identify opportunities is defined as his or her score on the measure of opportunity identification formulated by Ucbasaran (2003) from the work of Hills et al (1997) and Chandler & Hanks (1998).

Opportunity identification is measured on a five point Likert scale. The verbal anchors used were 1- Strongly Disagree, 2- Partly Disagree, 3- Neutral, 4- Partly Agree, 5- Strongly Agree.

Level of Measurement: Ordinal

**Human Capital**

*Operational Definition:* Human capital is defined as the unique capabilities and expertise of individuals and is demonstrated through a range of measures:
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Previous experience of founding a business: Nominal Level

Presence of a significant role model: Nominal Level

Level of work experience: Respondents were asked to rank the level of their work experience: Ordinal Level.

3.11 Conclusions

This chapter has discussed the research design of this thesis. The sampling technique of purposive judgement sampling to be employed has been fully explained and justified. This research design chapter has identified the philosophical orientation of the study through an analysis of the ontological and epistemological framework which forms the foundation of this work. This philosophical framework is located within the objective approach to social science research within ‘realist’ ontology and a positivist epistemology. This research stance fundamentally affects the subsequent chapters of this thesis.
4. RESULTS

4.1 Descriptive statistics

4.1.1 Descriptive statistics for nascent entrepreneurs

In total 125 completed questionnaires were received of which 119 were usable. The mean age of respondents was 35.45 years (range 18-59). Of the 119 total respondents 78 (65.5%) were male and 41 (34.5%) were female.

Although all respondents in this sample were nascent entrepreneurs some of the respondents had previous business start-up experience. Of these, 98 respondents (82.4%) had no previous start-up experience while 21 respondents (17.6%) did have previous start-up experience.

4.1.2 Descriptive statistics for existing entrepreneurs

Existing entrepreneurs completed 151 questionnaires of which 138 were usable. The arithmetic mean of respondents ages was 41.66 (range 22 years to 63 years). Of the 138 respondents, 101 (73.2%) were male and 37 (26.8%) were female.

4.1.3 Descriptive statistics for the control group

In total 51 completed questionnaires were received from the control group of non-entrepreneurs of which 49 were usable. The arithmetic mean age was 32.55 years (19 years to 55 years). Of the 51 respondents who completed the survey 22 (44.9%) were male and 27 (55.1%) were female. Refer to table 4.1.
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Table 4.1 Descriptive Statistics

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Nascent</th>
<th>Established</th>
<th>Control</th>
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</thead>
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<tr>
<td>Questionnaires Administered</td>
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<td>658</td>
<td>75</td>
</tr>
<tr>
<td>Questionnaire Returned</td>
<td>125</td>
<td>151</td>
<td>51</td>
</tr>
<tr>
<td>Usable Questionnaires for Analysis</td>
<td>119</td>
<td>138</td>
<td>49</td>
</tr>
<tr>
<td>Male Respondents</td>
<td>78</td>
<td>101</td>
<td>22</td>
</tr>
<tr>
<td>Female Respondents</td>
<td>41</td>
<td>37</td>
<td>27</td>
</tr>
<tr>
<td>Mean Age of Respondents</td>
<td>35.45</td>
<td>41.66</td>
<td>32.55</td>
</tr>
<tr>
<td>Age Range</td>
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<td>41</td>
<td>36</td>
</tr>
<tr>
<td>Age (Min - Max)</td>
<td>18 - 59</td>
<td>22 - 63</td>
<td>19 - 55</td>
</tr>
<tr>
<td>Respondents' Previous Start-up Exper</td>
<td>98</td>
<td>101</td>
<td>22</td>
</tr>
<tr>
<td>Have Experience</td>
<td>21</td>
<td>37</td>
<td>27</td>
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<tr>
<td>No Role Model</td>
<td>106</td>
<td>103</td>
<td>25</td>
</tr>
<tr>
<td>Have Role Model</td>
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<td>35</td>
<td>24</td>
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</tr>
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<td>33</td>
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<td>6 - 70</td>
<td>11 - 68</td>
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<td>5.45</td>
<td>4.95</td>
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<td>Median</td>
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<td>2.0 - 7.0</td>
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<tr>
<td>Global Regret Scale</td>
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<tr>
<td>Mean</td>
<td>3.11</td>
<td>2.70</td>
<td>3.31</td>
</tr>
<tr>
<td>Median</td>
<td>3.17</td>
<td>2.67</td>
<td>3.33</td>
</tr>
<tr>
<td>Std. Deviation</td>
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<td>1.07</td>
<td>1.03</td>
</tr>
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<td>Range</td>
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<td>4.67</td>
<td>5.00</td>
</tr>
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<td>1.0 - 5.67</td>
<td>1.0 - 6.0</td>
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<td>Opportunity Identification</td>
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<td>Mean</td>
<td>3.75</td>
<td>3.82</td>
<td>3.61</td>
</tr>
<tr>
<td>Median</td>
<td>3.75</td>
<td>3.83</td>
<td>3.58</td>
</tr>
<tr>
<td>Std. Deviation</td>
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<td>0.55</td>
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<td>Range</td>
<td>3.17</td>
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<td>3.92</td>
</tr>
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<td>Range (Min - Max)</td>
<td>1.83 - 5.00</td>
<td>2.42 - 5.00</td>
<td>1.00 - 4.92</td>
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<td>General Self-Efficacy</td>
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<td>Mean</td>
<td>5.74</td>
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<td>5.52</td>
</tr>
<tr>
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<td>5.88</td>
<td>6.12</td>
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</tr>
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<td>3.62</td>
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<td>2.5 - 7.0</td>
<td>1.25 - 7.00</td>
<td>3.38 - 7.00</td>
</tr>
<tr>
<td>KAI</td>
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<tr>
<td>Mean</td>
<td>101.85</td>
<td>109.37</td>
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<td>Median</td>
<td>101.00</td>
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<td>Std. Deviation</td>
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<td>Range</td>
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<tr>
<td>Range (Min - Max)</td>
<td>65 - 146</td>
<td>67 - 157</td>
<td>71 - 124</td>
</tr>
</tbody>
</table>
4.1.4 Descriptive statistics based on the gender of respondents

Descriptive statistics are presented below that provide a gender breakdown for the different instruments administered in this research (see table 4.2). An independent samples t-test was conducted to see if there was a statistical relationship between the male and female respondents. The results of this analysis identified that no significant relationship was identified with any of the instruments administered.

Table 4.2 Descriptive statistics based on gender

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Male</th>
<th>Female</th>
<th>t statistic</th>
<th>Significance p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Useable questionnaires returned</td>
<td>179</td>
<td>78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Age of Respondents</td>
<td>39.91</td>
<td>36.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Style Index</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Mean Score</td>
<td>38.83</td>
<td>37.79</td>
<td>.550</td>
<td>.583</td>
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<tr>
<td>Std. Deviation</td>
<td>13.97</td>
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</tr>
<tr>
<td>Proactive Personality Scale</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Mean</td>
<td>5.51</td>
<td>5.54</td>
<td>-.195</td>
<td>.846</td>
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<td>Std. Deviation</td>
<td>.96</td>
<td>1.11</td>
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<td>Global Regret Scale</td>
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<td></td>
</tr>
<tr>
<td>Mean</td>
<td>2.88</td>
<td>2.91</td>
<td>-.149</td>
<td>.882</td>
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<td>Std. Deviation</td>
<td>1.16</td>
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<td>Opportunity Identification</td>
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</tr>
<tr>
<td>Mean</td>
<td>3.82</td>
<td>3.73</td>
<td>1.194</td>
<td>.234</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>0.56</td>
<td>0.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Self-Efficacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>5.88</td>
<td>5.84</td>
<td>.351</td>
<td>.726</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>0.88</td>
<td>0.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KAI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>106.84</td>
<td>103.47</td>
<td>1.42</td>
<td>.157</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>15.79</td>
<td>18.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>t-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Significance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.2 Analysis of instruments

4.2.1 Analysis of results using the Cognitive Style Index

The Cognitive Style Index was administered to all respondents. Descriptive statistics for the CSI for each of the three samples is presented in table 4.1.

Respondents' scores were split at the median point in order to determine the proportion of respondents whose responses placed them towards the analytic and intuitive poles of the CSI continuum. The median score for the entire research sample was 40. These results are illustrated in table 4.1.

The frequency of responses was also analysed at the 33rd and 66th percentile of the theoretical mean to determine the proportion of respondents whose score was close to the mean and would represent an integrative group. The three groups represented scores from 0-25 (analytic), 26 - 51 (integrative) and 52 - 76 (intuitive). Details are illustrated in table 4.3.

### Table 4.3 CSI Descriptive statistics

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Nascent</th>
<th>Established</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median Split</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analytic</td>
<td>74 (65.2%)</td>
<td>48 (34.8%)</td>
<td>23 (46.9%)</td>
</tr>
<tr>
<td>Intuitive</td>
<td>45 (37.8%)</td>
<td>90 (65.2%)</td>
<td>26 (53.1%)</td>
</tr>
<tr>
<td>33rd &amp; 66th Percentile</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analytic</td>
<td>15 (12.6%)</td>
<td>38 (27.5%)</td>
<td>6 (12.2%)</td>
</tr>
<tr>
<td>Integrative</td>
<td>75 (63.0%)</td>
<td>78 (56.5%)</td>
<td>30 (61.2%)</td>
</tr>
<tr>
<td>Intuitive</td>
<td>29 (24.4%)</td>
<td>22 (15.9%)</td>
<td>13 (26.5%)</td>
</tr>
</tbody>
</table>

4.2.2 Descriptive statistics of respondent's human capital.

Analysis of nascent entrepreneurs was undertaken to determine whether these respondents had a significant entrepreneur role model within their close friends or family. The results indicated that 13 respondents (10.9%) had a significant entrepreneurial role model while 106 (89.1%) did not. The same analysis was conducted among established entrepreneurs.
The results indicated that 35 respondents (25.4%) had a significant entrepreneurial role model while 103 (74.6%) did not. Analysis of the control group revealed that 25 respondents (51.0%) had a significant entrepreneurial role model while 24 (49.0%) did not.

Educational attainment is considered to be a significant factor in an individual’s human capital. Analysis was therefore undertaken to ascertain the highest educational attainment of the respondents. The results are presented in table 4.4.

**Table 4.4 Descriptive statistics for human capital**

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Nascent</th>
<th>Established</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrepreneur Role Model</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has Role Model</td>
<td>13 (10.0%)</td>
<td>35 (25.4%)</td>
<td>25 (51%)</td>
</tr>
<tr>
<td>No Role Model</td>
<td>106 (89.1%)</td>
<td>103 (74.6%)</td>
<td>24 (49%)</td>
</tr>
<tr>
<td>Educational Attainment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary School</td>
<td>34 (28.6%)</td>
<td>11 (8.0%)</td>
<td>2 (4.1%)</td>
</tr>
<tr>
<td>Further Education</td>
<td>34 (28.6%)</td>
<td>14 (10.1%)</td>
<td>28 (57.1%)</td>
</tr>
<tr>
<td>Degree</td>
<td>21 (17.6%)</td>
<td>55 (39.9%)</td>
<td>14 (28.6%)</td>
</tr>
<tr>
<td>Postgraduate</td>
<td>7 (5.9%)</td>
<td>34 (24.6%)</td>
<td>1 (2.0%)</td>
</tr>
<tr>
<td>Technical Qualification</td>
<td>15 (12.6%)</td>
<td>17 (12.3%)</td>
<td>2 (4.1%)</td>
</tr>
<tr>
<td>Other</td>
<td>8 (6.7%)</td>
<td>7 (5.1%)</td>
<td>2 (4.1%)</td>
</tr>
<tr>
<td>Work Experience</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worker</td>
<td>63 (52.9%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supervisor</td>
<td>17 (14.3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manager</td>
<td>17 (14.3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Director</td>
<td>5 (4.2%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>15 (12.6%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Another significant factor in an individual’s human capital is their work experience. Within the nascent entrepreneur sample some respondents had no work experience while the maximum amount of work experience was 40 years. The frequency distribution of the number of years work experience reported by the respondents is illustrated in figure 4.1.
Among the established entrepreneur sample human capital centres around the length of time that individual has been in business. The minimum length of time in business was 1 year while the maximum was 40 years. The mean length of business trading among the respondents was 6.4 years.

Work experience is argued to be important not only in its totality or length but also according to the depth of work experience. Nascent entrepreneur respondents were also asked about their level of work experience. The results of this analysis are presented in table 4.4.

Although the majority of established entrepreneurs currently owned 1 business (71.7%) some entrepreneurs had established and currently owned more than one business. In total 29 respondents (21%) reported 2 businesses, 8 respondents (5.8%) owned 3 businesses while 1 respondent (0.7%) reported owning 4 businesses and 1 respondent (0.7%) reported owning 5 businesses.

4.2.3 Descriptive statistics for the entrepreneurial filter questions

As mentioned in chapter 3 all established entrepreneurs and the control group were asked four questions relating to key themes in entrepreneurship synthesised from the literature to
establish their predilection towards entrepreneurial activity. Answers were reported using a five point Likert scale ranging from 1 to 5. (1 representing strongly disagree, 2 representing partly disagree, 3 representing neutral, 4 representing partly agree and 5 representing strongly agree). The descriptive statistics for these questions are identified in table 4.5 below.

Table 4.5 Entrepreneurial filter questions

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Established</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Circumstances &amp; Fate</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valid</td>
<td>132</td>
<td>49</td>
</tr>
<tr>
<td>Missing</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Mean</td>
<td>3.14</td>
<td>3.39</td>
</tr>
<tr>
<td>Median</td>
<td>3.50</td>
<td>4.00</td>
</tr>
<tr>
<td>Mode</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>1.22</td>
<td>1.08</td>
</tr>
<tr>
<td><strong>Leadership &amp; Control</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valid</td>
<td>132</td>
<td>49</td>
</tr>
<tr>
<td>Missing</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Mean</td>
<td>4.02</td>
<td>3.35</td>
</tr>
<tr>
<td>Median</td>
<td>4.00</td>
<td>4.00</td>
</tr>
<tr>
<td>Mode</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>1.17</td>
<td>1.05</td>
</tr>
<tr>
<td><strong>Money &amp; Success</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valid</td>
<td>134</td>
<td>49</td>
</tr>
<tr>
<td>Missing</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Mean</td>
<td>2.62</td>
<td>2.73</td>
</tr>
<tr>
<td>Median</td>
<td>2.50</td>
<td>3.00</td>
</tr>
<tr>
<td>Mode</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>1.16</td>
<td>1.02</td>
</tr>
<tr>
<td><strong>Opportunities &amp; Solutions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valid</td>
<td>133</td>
<td>48</td>
</tr>
<tr>
<td>Missing</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Mean</td>
<td>4.38</td>
<td>4.15</td>
</tr>
<tr>
<td>Median</td>
<td>5.00</td>
<td>4.00</td>
</tr>
<tr>
<td>Mode</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>0.82</td>
<td>1.03</td>
</tr>
</tbody>
</table>

4.2.4 Descriptive statistics for entrepreneurial network and support

Nascent entrepreneurs were asked three questions to determine the importance of their network. The first question identified the extent to which they felt that external advice is crucial for the growth their business. In summary the responses were that 5 respondents (4.2%) strongly disagreed with this statement while 7 respondents (5.9%) partly disagreed and 18 respondents (15.1%) were neutral. However 30 respondents (25.2%) partly agreed
and 58 respondents (49.7%) strongly agreed with this point. A single respondent failed to answer this question.

In the second question respondents were asked if the idea for the business was theirs alone. Here 5 respondents (4.2%) reported that they strongly disagreed with this statement and 5 respondents (4.12%) partly disagreed while 15 respondents (12.6%) were neutral. Of the respondents that agreed with the statement 30 respondents (25.2%) partly agreed while 63 respondents (52.9%) strongly agreed. Again 1 respondent failed to complete this question.

The third question asked nascent entrepreneurs about the frequency at which they establish/develop new contacts. Here 7 respondents (5.9%) reported that they strongly disagreed with this statement, while 6 respondents (5.0%) reported that they partly disagreed and 20 respondents (16.8%) responded neutrally to this question. Additionally 29 respondents (24.4%) partly agreed and 56 (47.1%) respondents strongly agreed with the statement. While 1 respondent failed to answer this question.

**Table 4.6 Entrepreneurial network - summary**

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Disagree</th>
<th>Partly Disagree</th>
<th>Neutral</th>
<th>Partly Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 1</td>
<td>5 (4.2%)</td>
<td>7 (5.9%)</td>
<td>18 (15.1%)</td>
<td>30 (25.2%)</td>
<td>58 (49.7%)</td>
</tr>
<tr>
<td>Question 2</td>
<td>5 (4.2%)</td>
<td>5 (4.12%)</td>
<td>15 (12.6%)</td>
<td>30 (25.2%)</td>
<td>63 (52.9%)</td>
</tr>
<tr>
<td>Question 3</td>
<td>7 (5.9%)</td>
<td>6 (5.0%)</td>
<td>20 (16.8%)</td>
<td>29 (24.4%)</td>
<td>56 (47.1%)</td>
</tr>
</tbody>
</table>

Nascent entrepreneurs were asked who had provided them with the most support as they launched their business. Nascent entrepreneurs were asked to respond on a five point likert scale (where 1 indicated no support and 5 represented full support). The findings are located in table 4.7 below. Broadly these findings identify that the nascent entrepreneurs sampled in this study received the majority of their assistance from individuals to whom they were close, spouse, parents and friends. This sample displayed far lower levels of support from external acquaintances especially former employers, former co-workers and business partners.
Table 4.7 Start-Up assistance questions

<table>
<thead>
<tr>
<th>Network Type</th>
<th>Number</th>
<th>Mean</th>
<th>Mode</th>
<th>Median</th>
<th>St. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spouse/Life Partner</td>
<td>118</td>
<td>3.37</td>
<td>5</td>
<td>4.00</td>
<td>1.79</td>
</tr>
<tr>
<td>Parents</td>
<td>118</td>
<td>3.10</td>
<td>5</td>
<td>3.00</td>
<td>1.66</td>
</tr>
<tr>
<td>Friends</td>
<td>118</td>
<td>3.57</td>
<td>5</td>
<td>4.00</td>
<td>1.34</td>
</tr>
<tr>
<td>Relatives</td>
<td>118</td>
<td>3.36</td>
<td>1</td>
<td>3.00</td>
<td>1.43</td>
</tr>
<tr>
<td>Business Partners</td>
<td>118</td>
<td>2.06</td>
<td>1</td>
<td>1.00</td>
<td>1.66</td>
</tr>
<tr>
<td>Acquaintances</td>
<td>118</td>
<td>2.61</td>
<td>1</td>
<td>3.00</td>
<td>1.40</td>
</tr>
<tr>
<td>Former Employees</td>
<td>118</td>
<td>1.85</td>
<td>1</td>
<td>1.00</td>
<td>1.42</td>
</tr>
<tr>
<td>Former Workers</td>
<td>118</td>
<td>2.34</td>
<td>1</td>
<td>1.00</td>
<td>1.65</td>
</tr>
</tbody>
</table>

4.2.5 Descriptive Statistics for Proactive Personality

Respondent scores from the nascent entrepreneur sample were split at the theoretical mean point ($m=3.5$) to determine which respondents provided low/high proactive personality scores (see table 4.8). It was identified that 5 respondents (4.2%) provided scores that were below the theoretical mean indicating a lower proactive personality score. In total 113 respondents (95%) provided scores above the theoretical mean indicating a higher proactive personality.

Similarly all 138 established entrepreneur respondents completed the Proactive Personality Scale. Again scores were split at the theoretical mean point. In this analysis 7 respondents (5.1%) provided scores indicating a lower proactive personality score. Of the 131 respondents (94.9%) provided scores above the theoretical mean indicating a higher proactive personality.

In the control group responses 5 respondents (10.2%) provided scores indicating lower proactive personality score. While 44 respondents (89.8%) provided scores indicating a higher proactive personality.
Table 4.8 Descriptive Statistics for Proactive Personality

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Nascent</th>
<th>Established</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid Questionnaires</td>
<td>118</td>
<td>138</td>
<td>49</td>
</tr>
<tr>
<td>Missing</td>
<td>1 (0.8%)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>50th Percentile</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>5 (4.2%)</td>
<td>7 (5.1%)</td>
<td>5 (10.2%)</td>
</tr>
<tr>
<td>High</td>
<td>113 (95.0%)</td>
<td>131 (94.9%)</td>
<td>44 (89.8%)</td>
</tr>
<tr>
<td>33rd &amp; 66th Percentile</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>2 (1.7%)</td>
<td>4 (2.9%)</td>
<td>3 (6.1%)</td>
</tr>
<tr>
<td>Medium</td>
<td>12 (10.1%)</td>
<td>19 (13.8%)</td>
<td>14 (28.6%)</td>
</tr>
<tr>
<td>High</td>
<td>104 (87.4%)</td>
<td>115 (83.3%)</td>
<td>32 (65.3%)</td>
</tr>
</tbody>
</table>

As indicated in table 4.8. The frequency of responses for the nascent sample was also analysed at the 33rd and 66th percentile to establish the proportion of respondents whose score was close to the mean and would represent a group with a medium proactive personality score. The three groups ranged from 0-2.31 (low) 2.32 - 4.62 (medium) and 4.63 - 7.0 (high). Two respondents (1.7%) were in the low proactive personality group, while 12 respondents (10.1%) were in the medium group and 104 respondents (87.4%) provided high proactive personality scores.

Within the established entrepreneur sample 4 respondents (2.9%) were in the low proactive personality group, while 19 respondents (13.8%) were in the medium group and 115 respondents (83.3%) provided high proactive personality scores. For the control group 3 respondents (6.1%) were in the low proactive personality group, while 14 respondents (28.6%) were in the medium group and while 32 respondents (65.3%) provided high proactive personality scores.
4.2.6 Descriptive Statistics for Counterfactual and Regretful Thinking measured by the 'Global Regret Scale'

Respondents were asked to indicate on a seven point Likert scale the extent to which they believed they experienced counterfactual or regretful thoughts. In total six questions were asked. Questions 4, 5 and 6 are reverse scored. A copy of this instrument can be found within appendix 3. Descriptive statistics are illustrated in table 4.9.

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Nascent mean</th>
<th>Established mean</th>
<th>Control mean</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Global Regret Scale</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question 1</td>
<td>3.09 (sd1.900)</td>
<td>2.42 (sd1.479)</td>
<td>2.83 (sd1.277)</td>
</tr>
<tr>
<td>Question 2</td>
<td>3.55 (sd2.138)</td>
<td>3.15 (sd1.933)</td>
<td>3.98 (sd1.780)</td>
</tr>
<tr>
<td>Question 3</td>
<td>3.03 (sd1.926)</td>
<td>2.28 (sd1.498)</td>
<td>3.13 (sd1.468)</td>
</tr>
<tr>
<td>Question 4</td>
<td>2.13 (sd1.554)</td>
<td>2.10 (sd1.331)</td>
<td>2.75 (sd1.631)</td>
</tr>
<tr>
<td>Question 5</td>
<td>3.56 (sd1.812)</td>
<td>3.38 (sd1.837)</td>
<td>3.85 (sd1.429)</td>
</tr>
<tr>
<td>Question 6</td>
<td>3.10 (sd1.834)</td>
<td>2.80 (sd1.556)</td>
<td>3.30 (sd1.459)</td>
</tr>
<tr>
<td>Total</td>
<td>3.11 (sd1.242)</td>
<td>2.70 (sd1.068)</td>
<td>3.31 (sd1.029)</td>
</tr>
<tr>
<td><strong>General Self-Efficacy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question 1</td>
<td>5.95 (sd1.411)</td>
<td>6.22 (sd0.972)</td>
<td>5.78 (sd0.963)</td>
</tr>
<tr>
<td>Question 2</td>
<td>5.96 (sd1.411)</td>
<td>5.91 (sd1.477)</td>
<td>5.47 (sd1.276)</td>
</tr>
<tr>
<td>Question 3</td>
<td>5.76 (sd1.313)</td>
<td>5.96 (sd1.107)</td>
<td>5.45 (sd1.243)</td>
</tr>
<tr>
<td>Question 4</td>
<td>5.19 (sd1.796)</td>
<td>5.62 (sd1.577)</td>
<td>5.31 (sd1.342)</td>
</tr>
<tr>
<td>Question 5</td>
<td>5.70 (sd1.736)</td>
<td>5.88 (sd1.596)</td>
<td>5.51 (sd1.340)</td>
</tr>
<tr>
<td>Question 6</td>
<td>5.65 (sd1.430)</td>
<td>6.01 (sd1.104)</td>
<td>5.47 (sd1.209)</td>
</tr>
<tr>
<td>Question 7</td>
<td>5.77 (sd1.591)</td>
<td>6.06 (sd1.328)</td>
<td>5.80 (sd1.369)</td>
</tr>
<tr>
<td>Question 8</td>
<td>5.92 (sd1.236)</td>
<td>6.22 (sd0.959)</td>
<td>5.69 (sd1.140)</td>
</tr>
<tr>
<td>Total</td>
<td>5.74 (sd0.877)</td>
<td>5.98 (sd0.909)</td>
<td>5.52 (sd0.893)</td>
</tr>
<tr>
<td><strong>Opportunity Recognition</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question 1</td>
<td>4.03 (sd0.911)</td>
<td>4.02 (sd0.900)</td>
<td>3.86 (sd0.791)</td>
</tr>
<tr>
<td>Question 2</td>
<td>3.62 (sd0.873)</td>
<td>3.95 (sd0.874)</td>
<td>3.82 (sd0.882)</td>
</tr>
<tr>
<td>Question 3</td>
<td>3.83 (sd0.847)</td>
<td>3.97 (sd0.854)</td>
<td>3.57 (sd0.935)</td>
</tr>
<tr>
<td>Question 4</td>
<td>4.06 (sd0.886)</td>
<td>3.88 (sd0.967)</td>
<td>4.08 (sd0.862)</td>
</tr>
<tr>
<td>Question 5</td>
<td>3.90 (sd0.960)</td>
<td>4.07 (sd0.922)</td>
<td>3.90 (sd1.020)</td>
</tr>
<tr>
<td>Question 6</td>
<td>3.99 (sd0.934)</td>
<td>4.07 (sd0.856)</td>
<td>4.02 (sd0.946)</td>
</tr>
<tr>
<td>Question 7</td>
<td>3.79 (sd0.990)</td>
<td>3.67 (sd1.155)</td>
<td>3.57 (sd0.935)</td>
</tr>
<tr>
<td>Question 8</td>
<td>3.67 (sd1.001)</td>
<td>3.64 (sd1.009)</td>
<td>3.71 (sd0.957)</td>
</tr>
<tr>
<td>Question 9</td>
<td>3.60 (sd0.968)</td>
<td>3.65 (sd0.917)</td>
<td>3.14 (sd0.890)</td>
</tr>
<tr>
<td>Question 10</td>
<td>3.68 (sd0.956)</td>
<td>3.73 (sd0.956)</td>
<td>3.10 (sd0.918)</td>
</tr>
<tr>
<td>Question 11</td>
<td>3.17 (sd0.933)</td>
<td>3.78 (sd0.936)</td>
<td>3.53 (sd0.915)</td>
</tr>
<tr>
<td>Question 12</td>
<td>3.16 (sd1.008)</td>
<td>3.46 (sd1.047)</td>
<td>2.96 (sd1.060)</td>
</tr>
<tr>
<td>Total</td>
<td>3.75 (sd0.583)</td>
<td>3.82 (sd0.553)</td>
<td>3.61 (sd0.625)</td>
</tr>
</tbody>
</table>
4.2.7 Descriptive statistics for General Self-Efficacy

Respondents were asked to indicate on a seven point Likert scale the strength of their disagreement or agreement with eight statements. Each would indicate the extent to which the respondent demonstrated self-efficacy. Questions 2, 4, 5 and 7 are reverse scored. A copy of this instrument is located within appendix 4. Descriptive statistics are located within table 4.9.

4.2.8 Descriptive statistics for opportunity recognition

An analysis of an entrepreneurs’ self-assessed ability to recognise opportunity was conducted. Twelve statements were posed to respondents based on a five point Likert scale that ran from 1 (strongly disagree) to 5 (strongly agree). Analysis was conducted within the nascent entrepreneur, established entrepreneur and control group samples. The descriptive statistics are shown in table 4.9.

4.2.9 Descriptive statistics of the KAI

The KAI was administered to all nascent entrepreneur respondents. A small proportion of respondents failed to complete this part of the questionnaire. Completion statistics are given in table 4.9. Respondent scores from all three samples were split at the median point (Median = 105) to determine the proportion of respondents whose responses placed them towards the adaptive and innovative poles of the KAI continuum. Results of these analyses are illustrated in table 4.10.
A Psychometric Analysis of Nascent Entrepreneurs: Understanding the impact of individual entrepreneurial cognition on the founding and survival of new small businesses.

Table 4.10 Descriptive statistics for the KAI

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Nascent</th>
<th>Established</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid Questionnaires</td>
<td>110</td>
<td>121</td>
<td>47</td>
</tr>
<tr>
<td>Missing</td>
<td>9</td>
<td>17</td>
<td>2</td>
</tr>
<tr>
<td>Mean</td>
<td>101.85</td>
<td>109.37</td>
<td>99.83</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>15.56</td>
<td>17.01</td>
<td>14.67</td>
</tr>
<tr>
<td>Range (Min - Max)</td>
<td>81 (65 - 146)</td>
<td>90 (67 - 157)</td>
<td>53 (71 - 124)</td>
</tr>
<tr>
<td>Median Split</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adaptive Respondents</td>
<td>39 (35.5%)</td>
<td>41 (33.9%)</td>
<td>19 (40.4%)</td>
</tr>
<tr>
<td>Innovative Respondents</td>
<td>71 (64.5%)</td>
<td>80 (66.1%)</td>
<td>28 (59.6%)</td>
</tr>
</tbody>
</table>

**KAI SO**

| Mean                      | 45.56   | 47.55       | 43.83   |
| Std. Deviation            | 7.669   | 7.093       | 7.308   |
| Range (Min - Max)         | 33 (28 - 61) | 34 (29 - 63) | 28 (30 - 58) |

**KAI E**

| Mean                      | 19.04   | 20.88       | 19.30   |
| Std. Deviation            | 4.468   | 7.039       | 4.952   |
| Range (Min - Max)         | 22 (9 - 31) | 52 (9 - 61) | 23 (10 - 33) |

**KAI R**

| Mean                      | 37.35   | 40.94       | 36.70   |
| Std. Deviation            | 7.971   | 7.738       | 7.937   |
| Range (Min - Max)         | 33 (22 - 55) | 41 (19 - 60) | 30 (22 - 52) |

The KAI is broken down into three sub-scales. These subscale scores were calculated for the nascent entrepreneur sample. Sufficiency of originality (SO) relates to an individual's style of idea generation, efficiency (E) relates to an individual's method of problem-solving and role/group conformity (R) relates to an individual's style of relating to structure. The descriptive findings for these analyses can be found in table 4.10.

4.3 Correlation Analyses

4.3.1 Nascent Entrepreneurs

Based on the results from nascent entrepreneurs a correlation analysis was conducted. A correlation matrix is presented in Table 4.11 below which identifies the relationships that exist between the various instruments which comprised the research questionnaire. It
should be noted that a number of correlations appear negative. This is as a result of the scoring regime rather than the nature of the relationship.

Table 4.11 Correlation Table for Nascent Entrepreneurs

<table>
<thead>
<tr>
<th></th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>C5</th>
<th>C6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Regret Scale (C1)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Self-Efficacy (C2)</td>
<td>-.419**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>119</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Style Index (C3)</td>
<td>.196</td>
<td>.015</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>119</td>
<td>119</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proactive Personality (C4)</td>
<td>-.142</td>
<td>.145</td>
<td>-.039</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>118</td>
<td>118</td>
<td>118</td>
<td>118</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KAI (C5)</td>
<td>-.135</td>
<td>.185</td>
<td>-.661**</td>
<td>.193*</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>110</td>
<td>110</td>
<td>110</td>
<td>110</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opportunity Recognition (C6)</td>
<td>-.251**</td>
<td>.298**</td>
<td>.096</td>
<td>.480**</td>
<td>.091</td>
<td>1</td>
</tr>
<tr>
<td>N</td>
<td>119</td>
<td>119</td>
<td>119</td>
<td>118</td>
<td>110</td>
<td>119</td>
</tr>
</tbody>
</table>

** Correlation significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)

Table 4.11 reveals a number of significant findings. Self-efficacy correlated significantly with the Global Regret Scale which measures counterfactual and regretful thinking ($r = -.419$, $p \leq .01$) and opportunity recognition ($r = .298$, $p \leq .01$). Opportunity recognition also correlated with the Global Regret Scale ($r = -.251$, $p \leq .01$) and proactive personality ($r = .480$, $p \leq .01$). Proactive personality correlated with the KAI ($r = .193$, $p \leq .05$) although the correlation was weak. The strongest correlation identified by the matrix was between the CSI and the KAI ($r = -.661$, $p \leq .01$).

**4.3.2 Established entrepreneurs**

Table 4.12 below reveals a number of statistically significant results. The Global Regret Scale is significantly correlated with general self-efficacy ($r = -.476$, $p \leq .01$) it is also correlated with proactive personality ($r = -.225$, $p \leq .01$) and with the KAI ($r = -.220$, $p \leq .01$). General self-efficacy correlated with proactive personality ($r = .348$, $p \leq .01$) and with the KAI ($r = .195$, $p \leq .05$) and with opportunity recognition ($r = .276$, $p \leq .01$). Other significant results were identified between the CSI and proactive personality ($r = -.292$, $p \leq .01$) and a strong correlation between the CSI and the KAI ($r = -.618$, $p \leq .01$). Proactive personality...
correlated with the KAI ($r = .256, p \leq .01$) and opportunity recognition ($r = .488, p \leq .01$).

Additionally a weak correlation was identified between the KAI and opportunity recognition ($r = .190, p \leq .05$).

**Table 4.12 Correlation matrix for established entrepreneurs**

<table>
<thead>
<tr>
<th></th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>C5</th>
<th>C6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Regret Scale (C1)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>138</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Self-Efficacy  (C2)</td>
<td>-0.476**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>138</td>
<td>138</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Style Index (C3)</td>
<td>0.159</td>
<td>-0.067</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>138</td>
<td>138</td>
<td>138</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proactive Personality  (C4)</td>
<td>-0.220</td>
<td>0.388**</td>
<td>-0.292**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>138</td>
<td>138</td>
<td>138</td>
<td>138</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KAI (C5)</td>
<td>-0.220</td>
<td>0.195</td>
<td>-0.618**</td>
<td>0.256**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>121</td>
<td>121</td>
<td>121</td>
<td>121</td>
<td>121</td>
<td></td>
</tr>
<tr>
<td>Opportunity Recognition (C6)</td>
<td>-0.104</td>
<td>0.276**</td>
<td>0.000</td>
<td>0.488**</td>
<td>0.090*</td>
<td>1</td>
</tr>
<tr>
<td>N</td>
<td>138</td>
<td>138</td>
<td>138</td>
<td>138</td>
<td>121</td>
<td>138</td>
</tr>
</tbody>
</table>

**Correlation significant at the 0.01 level (2-tailed)**  
* Correlation is significant at the 0.05 level (2-tailed)

4.3.3 Control group

Table 4.13 below represents a correlation matrix based on the results from the control group. A strong correlation is observed between regretful thinking and general self-efficacy ($r = -0.415, p \leq .01$). A correlation is also observed between the CSI and proactive personality ($r = 0.308, p \leq .05$) and again a strong correlation is observed between the CSI and KAI ($r = -0.552, p \leq .01$).

**Table 4.13 Correlation Matrix for control group**

<table>
<thead>
<tr>
<th></th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>C5</th>
<th>C6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Regret Scale (C1)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>48</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Self-Efficacy  (C2)</td>
<td>-0.425**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>48</td>
<td>49</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Style Index (C3)</td>
<td>0.196</td>
<td>-0.131</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>48</td>
<td>48</td>
<td>49</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proactive Personality  (C4)</td>
<td>-0.173</td>
<td>0.197</td>
<td>0.308*</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>48</td>
<td>48</td>
<td>49</td>
<td>49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KAI (C5)</td>
<td>-0.051</td>
<td>0.105</td>
<td>-0.552**</td>
<td>0.015</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>46</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>Opportunity Recognition (C6)</td>
<td>-0.014</td>
<td>0.140</td>
<td>0.255</td>
<td>0.255</td>
<td>0.249</td>
<td>1</td>
</tr>
<tr>
<td>N</td>
<td>48</td>
<td>49</td>
<td>49</td>
<td>49</td>
<td>47</td>
<td>48</td>
</tr>
</tbody>
</table>

**Correlation significant at the 0.01 level (2-tailed)**
* Correlation is significant at the 0.05 level (2-tailed)
4.3.4 Correlation discussion

A few points from these correlation analyses are worthy of further explanation. The established entrepreneur sample reported a weak positive correlation between cognitive style as measured by the CSI and the KAI. However this correlation was not observed between the CSI and the nascent sample. The correlation between the KAI and proactive personality was very weak. Although the CSI/KAI correlation appears negative it is in fact a positive correlation resulting from differences in the scoring system. The established entrepreneur group was more intuitive than the nascent group and could account for the difference observed. Another observation relates to opportunity recognition. It is noted that both entrepreneur groups reported statistically significant results between opportunity recognition and general self-efficacy and between proactive personality. However this was not observed in the control group of non-entrepreneurs. It could be argued that this difference represents a potentially important distinction between entrepreneurs and non-entrepreneurs.

4.4 Other significant results

4.4.1 General Self-Efficacy and the Global Regret Scale

It was identified in the correlation descriptive statistics illustrated in tables 4.11 and 4.12 that there was a relationship between entrepreneurial General Self-Efficacy and the Global Regret Scale. This measures the extent to which entrepreneurs engage in counterfactual or regretful thinking. The correlation for the combined entrepreneur group (n=257) was a statistically significant and relatively strong correlation(r=-.459, p =.01).

4.4.2 The Global Regret Scale and Opportunity Recognition

The correlation matrix illustrated in tables 4.11 and 4.12 also identified a relationship between the Global Regret Scale and Opportunity Recognition. The correlation for the
A psychometric analysis of nascent entrepreneurs: Understanding the impact of individual entrepreneurial cognition on the founding and survival of new small businesses.

Combined entrepreneur group (n=257) was a statistically significant but weak correlation (r=-.187, p =.01).

2.4.3 General Self-Efficacy and Opportunity Recognition

The correlation analyses also identified a relationship between the Global Regret Scale and Opportunity Recognition. The correlation for the combined entrepreneur group (n=257) was a statistically significant but relatively weak correlation (r=-.291, p =.01).

2.4.4 The CSI and the KAI

The correlation matrices have indicated strong and positive relationships between the KAI and the CSI for both the nascent and the established entrepreneur sample (nascent sample r=-.661, p=.01, established sample, r=-.618, p=.01). The KAI total score is an aggregate score of three inter-related sub-scores. It was decided to identify if this correlation applied to the interrelated sub-scores across both entrepreneur samples as well as the totality of the scores.

A correlation was conducted between the CSI score and the Sufficiency of Originality (SO) sub-score of the KAI. The result indicates a strong positive correlation (n=257, r=-.451, p=.01). Secondly a correlation was conducted between the CSI score and the Efficiency (E) sub-score of the KAI. The result indicates a strong positive correlation (n=257, r=-.514, p=.01). Lastly a correlation was conducted between the CSI score and the Role/Group Conformity (R) sub-score of the KAI. The result indicates a strong positive correlation (n=257, r=-.561, p=.01). Hodgkinson & Sadler-Smith (2003) asserted that many existing measures of cognitive style that envision cognitive style from a unitary perspective fail to correlate. The results of this study demonstrate a strong correlation between these two measures of cognitive style.
4.4.5 Opportunity recognition and successful business launch and trading

An independent samples t-test was conducted which compared the means of the two samples. For the successful group the Opportunity Recognition mean was \((m=3.88, SE=0.071)\) while for the group that failed to launch a business the Opportunity Recognition mean was \((m=3.5745, SE=0.087)\). The results indicate that there is a statistically significant difference in the mean opportunity recognition scores for the successful and unsuccessful nascent entrepreneur groups in their self-assessed ability to recognise opportunities \((t(102)=2.792, p \leq 0.01)\).

This calculation was repeated for the sample of entrepreneurs who continued to trade successfully and those respondents who failed to trade for six months. The successful trading group reported an Opportunity Recognition mean of \((m=3.9344, SE=0.082)\) while for the group that failed to successfully trade the Opportunity Recognition mean was \((m=3.6510, SE=0.07580)\). The results indicate that there is a significant statistical difference between the opportunity recognition scores for the trading and non-trading nascent entrepreneur groups in their self-assessed ability to recognise opportunities \((t(104)=2.464, p \leq 0.05)\).
A Psychometric Analysis of Nascent Entrepreneurs: Understanding the impact of individual entrepreneurial cognition on the founding and survival of new small businesses.

4.5 Reliability testing

4.5.1 Alpha coefficient and test-retest analysis

Table 4.14 Reliability Table

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Alpha (n=257)</th>
<th>Test-Retest Coefficient (n=30)</th>
<th>Mean Scores</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Style Index</td>
<td>.89</td>
<td>.82 (p&lt;.001)</td>
<td>42.50 (sd =14.89)</td>
<td>.911, p&gt;.05</td>
</tr>
<tr>
<td>KAI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global Regret Scale</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Self-Efficacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proactive Personality</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opportunity Recognition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P-Hird Chapter 4
4.6 Results from hypothesis testing

In order to assist with testing of the research hypotheses developed in chapter 2 a database was created from the data collected. In total 306 usable responses were received from three distinct sample groups. Of these 119 responses were received from nascent entrepreneurs. Altogether 138 responses were received from established entrepreneurs and 49 responses from a control group of the general public. The database was formed of 163 variables. This facilitated comprehensive analysis of the data and comparison of individual responses. To facilitate more detailed analysis the nascent entrepreneur sample was also split between those nascent entrepreneurs that did succeed in founding a new business and those that did not.

4.6.1 Hypothesis 1

**Hypothesis 1a:** Nascent entrepreneurs on assisted entrepreneurial programmes will display a greater tendency towards an intuitive cognitive style (as measured by the CSI) than a control group of non-entrepreneurs.

An independent sample t-test was conducted in order to determine if nascent entrepreneurs displayed a greater tendency towards an intuitive cognitive style than the control group. The mean CSI score of the nascent entrepreneur group was ($m=42.08, SE=1.095$) and the mean of the control group was ($m=41.78, SE=1.926$). Both groups are above (analytic) the median point ($median=40$) of the CSI. The results show that the mean scores are very similar and that the nascent entrepreneur group is slightly more analytic than a sample of the control group. This difference was not significant ($t(166) = .417, >.05$). The null hypothesis is therefore supported. There is no significant difference in cognitive style between nascent entrepreneurs and the general population.

**Hypothesis 1b:** Nascent entrepreneurs on assisted entrepreneurial programmes will display a greater tendency towards an intuitive cognitive style (as measured by the CSI) than a sample of established entrepreneurs.
A further independent samples t-test was conducted between the nascent entrepreneur group and the established entrepreneurs to determine if nascent entrepreneurs have a greater tendency towards intuition than more established entrepreneurs. The mean of the nascent entrepreneur group was \( m = 42.08, SE = 1.095 \) and the mean of the established entrepreneur group was \( m = 35.43, sd = 1.244 \). The nascent entrepreneur group mean is above the median point (analytic) in the CSI while the mean of the established entrepreneur group is below (intuitive) the median point (median=40) on the CSI continuum. This difference was significant \( t(254) = 4.013, p < .01 \).

The alternate hypothesis has been supported as a significant difference in cognitive style was observed. However, the expectation from the literature was that the nascent group of entrepreneurs would be more intuitive than the established entrepreneurs but this was not found to be the case. An Analysis of Variance (ANOVA) was conducted to analyse the three groups together. The mean scores were nascent entrepreneurs \( m = 42.08, SE = 11.095 \), established entrepreneur \( m = 35.43, SE = 1.244 \) and control group \( m = 41.78, SE = 1.926 \). It was revealed that a significant difference exists between the cognitive style scores of the three groups \( f(2, 303) = 9.023, p < .01 \).

A Scheffe post hoc test indicated that a significant mean difference existed between the nascent entrepreneur group and the established entrepreneur group \( m = 6.65, p < .05 \). No difference was observed between the nascent entrepreneur group and the control group. The established entrepreneur group produced significant mean differences with both the nascent entrepreneur group \( m = -6.65, p < .05 \) and the control group \( m = -6.34, p < .05 \).
A Psychometric Analysis of Nascent Entrepreneurs: Understanding the impact of individual entrepreneurial cognition on the founding and survival of new small businesses.

**Hypothesis 1c:** Nascent entrepreneurs on assisted entrepreneurial programmes will display a greater tendency towards an innovative cognitive style (as measured by the KAI) than a control group of non entrepreneurs.

An independent samples t-test was conducted to determine if nascent entrepreneurs displayed a greater tendency towards an innovative cognitive style as measured by the KAI than the general population. The mean of the nascent entrepreneur group was \( m=101.85, SE=1.484 \) and the mean of the control group was \( m=99.83, SE=2.141 \).

The results of the analysis indicate that both groups are above (innovative) the median point \( (median=105) \) in the KAI. The results also indicate that the differences in mean scores was not significant \( (t (155) =.756, p =>.05) \). The t-test has failed to support the hypothesis that nascent entrepreneurs would have a more innovative cognitive style than a control group representing the general population. Hypothesis 1c is therefore refuted.

**Hypothesis 1d:** Nascent entrepreneurs on assisted entrepreneurial programmes will display a greater tendency towards an innovative cognitive style (as measured by the KAI) than a sample of established entrepreneurs.

A further independent samples t-test was conducted between the nascent entrepreneur group and the established entrepreneurs. The mean for the nascent entrepreneur group was \( m=101.85, SE=1.484 \) and the mean of the established entrepreneur group was \( m=109.37, SE=1.547 \).

Results indicate that the nascent entrepreneur group mean is above the median point (innovative) in the KAI while the mean of the established entrepreneur group is also above the median point (innovative) on the KAI \( (t (229) =-3.496, p \leq.01) \). Hypothesis 1d is therefore supported. A significant difference in adaptor - innovator cognitive style does exist between nascent and established entrepreneurs.
4.6.2 Hypothesis 2

**Hypothesis 2a:** The cognitive style of nascent entrepreneurs who successfully launch their own business will be more intuitive than those who fail to launch successfully.

In total 60 businesses were successfully launched by respondents. The mean CSI score for the successful nascent entrepreneur group was ($m=43.62, SE=1.518$). In total 46 respondents failed to launch a business. The mean CSI score of the unsuccessful nascent entrepreneur group was ($m=39.52, SE=1.799$). An independent samples t-test revealed that this difference was not significant ($t=(104) = 1.748, p>.05$). Hypothesis H2a is therefore refuted.

This was not the result anticipated by the hypothesis. It was decided to replicate this hypothesis using the KAI as a measure of cognitive style. The mean KAI score for the successful nascent entrepreneur group was ($m=99.71, SE=1.862$) and the mean KAI score of the unsuccessful nascent entrepreneur group was ($m=104.84, SE=2.543$). This difference was again not significant ($t=(96) = -1.665, p>.05$). This lends support to the previous finding where H2a was refuted.

**Hypothesis 2b:** Novice entrepreneurs who continue to trade successfully for the subsequent six months after launch will display a more analytic cognitive style than those who fail to sustain trading.

In total 42 respondents were still successfully trading after six months. An independent samples t-test revealed that the mean CSI score for the successful nascent entrepreneur group was ($n=42, m=43.14, SE=1.697$). In total 64 respondents had failed to launch a business and sustain the business for six months trading. The mean CSI score of the unsuccessful nascent entrepreneur group was ($n=64, m=40.98, SE=1.592$). This difference was not significant ($t=(104) = .900, p>.05$).
A Psychometric Analysis of Nascent Entrepreneurs: Understanding the impact of individual entrepreneurial cognition on the founding and survival of new small businesses.

Results are similar to those identified from the analysis of business launch. The mean CSI scores of those respondents who successfully launched and managed their business for six months was almost identical (launch \( m = 43.62 \), trading \( m = 43.14 \)). This indicates that although the number of businesses that continued to trade was reduced the CSI score of the successful entrepreneurs remained virtually unchanged.

The study was replicated using the KAI. The independent samples \( t \)-test revealed that the mean KAI score for the successful nascent entrepreneur group was \( (m=100.92, SE=2.137) \). The mean KAI score of the unsuccessful nascent entrepreneur group was \( (m=102.62, SE=2.134) \). This difference was not significant \( (t(96) = -0.534, p > 0.05) \). Again it is interesting to note that the KAI score for the successful group is almost identical in this analysis as it was at business launch. Hypothesis 2b is therefore refuted.

4.6.3 Hypothesis 3

**Hypothesis 3a** - Nascent entrepreneurs starting a new business will have higher self-efficacy scores than those that do not start their own business.

The statistical relationship between general self-efficacy and the successful transition of a nascent entrepreneur into business was investigated. The mean for the successful launch group was \( (m=5.8690, SE=0.10235) \) while for the unsuccessful group it was \( (m=5.4817, SE=0.14155) \). The difference was statistically significant \( (t(102) = 2.270, p < .05) \). The alternate hypothesis is therefore supported. There is a statistically significant relationship between an individual's self-efficacy and their successful launch of a new business.

**Hypothesis 3b** - There will be a positive correlation between the self-efficacy scores of an entrepreneur and their self-assessed capabilities towards opportunity identification.

This hypothesis determines if there is a relationship between an entrepreneur's general self-efficacy and their self-assessed capabilities towards opportunity identification. The results for the nascent group indicate that a correlation exists \( (r=.298, p < .01) \). Similarly the results
for the established group indicate a correlation \( r = .276, p \leq .01 \). However for the control group of non-entrepreneurs \( r = .140, p \geq .05 \) no correlation was observed. The alternate hypothesis (hypothesis 3b) is therefore supported in regard to the entrepreneur groups.

### 4.6.4 Hypothesis 4

**Hypothesis 4a - Nascent entrepreneurs will engage in counterfactual and regretful thinking less often than a control group of non-entrepreneurs.**

An independent samples \( t \)-test revealed that there was no significant difference \( (t(104) = -1.086, p > .05) \) in the engagement of counterfactual thinking (as measured by the Global Regret Scale) between nascent entrepreneurs \( (m = 3.1092, SE = .11388) \) and a sample of the general population \( (m = 3.3125, SE = .14864) \). Hypothesis 4a is therefore rejected.

**Hypothesis 4b - Nascent entrepreneurs will engage in counterfactual and regretful thinking less often than a control group of established entrepreneurs.**

An independent samples \( t \)-test revealed that there was a significant difference \( (t(255) = 2.811, p < .01) \) in the engagement of counterfactual and regretful thinking (as measured by the Global Regret Scale) between nascent entrepreneurs \( (m = 3.1092, SE = .11388) \) and established entrepreneurs \( (m = 3.3125, SE = .14864) \). Nascent entrepreneurs engaged in counterfactual thinking more often than established entrepreneurs. Hypothesis 4b is therefore refuted.

### 4.6.5 Hypothesis 5

**Hypothesis 5a - Nascent entrepreneurs on assisted entrepreneurial programmes will display a greater tendency towards a proactive personality as measured by the PPS than a control group of non-entrepreneurs.**

An independent samples \( t \)-test was conducted to test this hypothesis. It revealed a significant difference \( (t(165) = 3.517, p \leq .01) \) between the proactive personality scores of nascent entrepreneurs \( (m = 5.6025, SE = .09295) \) and the general population \( (m = 4.9571, SE = .17622) \). Proactive personality scores were significantly higher in nascent entrepreneurs and the hypothesis is therefore supported.
Hypothesis 5b: Nascent entrepreneurs on assisted entrepreneurial programmes will display a greater tendency towards proactive personality as measured by the PPS than a sample of established entrepreneurs.

This hypothesis was promulgated to investigate any differences in proactive personality that may be identified between the entrepreneurs at the nascent business start-up phase and more established entrepreneurs. An independent samples t-test was conducted and revealed no significant difference ($t(254) = 1.216, p > .05$) between the nascent entrepreneur group ($m=5.6025, SE=.09295$) and the established entrepreneur group ($m=5.4500, SE=.08453$). No significant difference exists between the proactive personality score of nascent and established entrepreneurs. Hypothesis 5b is therefore refuted.

4.6.6 Hypothesis 6

Hypothesis 6a: A positive relationship will be identified between entrepreneurs' self-assessed opportunity recognition capabilities and scores on the proactive personality scale.

In order to determine if a relationship exists between self-assessed ability to recognise opportunities and proactive personality a correlation analysis was conducted. The nascent group revealed a strong and statistically significant result ($r=.480, p \leq .01$).

The second analysis indicated a strong significant correlation ($r=.488, p \leq .01$) between proactive personality and opportunity recognition for the established entrepreneur group. A third correlation was conducted to analyse the combined entrepreneur group. This analysis established that a strong and statistically significant correlation exists between proactive personality and opportunity recognition for all categories of entrepreneurs ($r=.477, p \leq .01$). The final analysis of the control group revealed a weak but statistically significant correlation ($r=.255, p \leq .05$). This supports the alternate hypothesis that a statistical relationship exists between the ability of an entrepreneur to recognise opportunities and the proactive nature of their behaviours. Hypothesis 6a is therefore accepted.
Hypothesis 6b: Nascent entrepreneurs who successfully launch their own business will have a higher proactive personality score than those who fail to launch.

An independent samples t-test was conducted which compared the means of the two samples. The analysis revealed that there was no significant difference (t (101) =-.036, p>.05) between those nascent entrepreneurs who successfully launched a business ($m=5.5339, SE=.13222$) and the group that failed to launch a business ($m=5.5415, SE=.16301$). Hypothesis 6b is refuted.

Hypothesis 6c: Once a business is launched entrepreneurs with higher proactive personality scores will continue to trade for longer than those with less proactive personalities.

In total 42 businesses were still successfully trading after six months. The mean proactive personality score for the successful group was ($m=5.6286, SE=.17408$). While the mean proactive personality score for the unsuccessful group was ($m=5.50, SE=.12244$). However the difference was not significant ($t (103) =.622, p>.05$). Hypothesis 6c is therefore refuted.

Additional research for hypothesis 6

In attempting to clarify findings from the analysis of hypothesis 6 an independent samples t-test was used. This was to determine if there was a statistical relationship between the responses for proactive personality and opportunity recognition. Responses were split at the mean of the scores into groups representing high or low opportunity recognition scores. The mean for the high OR group was ($m=5.9061, sd=.92343$) while for the low OR group it was ($m=5.1160, sd=.92050$). As Levene’s test for equality of variances was not significant ($p=.215$) equal variances are assumed. The results of this analysis identified that the t value was ($t (254) =6.854, p<.01$). It can therefore be asserted that a significant difference exists between the proactive personality scores of respondents registering low OR scores and the proactive personality scores of those respondents registering high OR scores.
4.6.7 Hypothesis 7

_Hypothesis 7_: For nascent entrepreneurs; an intuitive cognitive style will be positively associated with a high self-assessment of their opportunity identification capacity.

In order to test this hypothesis the nascent entrepreneur group was sub-divided using the CSI into intuitive (n=59) and analytic (n=60) groups at the median point of the nascent scores (median= 45). The mean opportunity identification score for the intuitive group was (m=3.7133, SE=.08392) and for the analytic group (m= 3.7929, SE=.06681). The results of this analysis identified no significant difference was observed (t (117) =-.458, p>.05).

The nascent entrepreneur group was sub-divided using the KAI into adaptive (n=52) and innovative (n=58) groups at the median point of the nascent scores (median= 101). The results revealed no significant difference (t (108) =-.372, p>.05) between the mean score for the adaptive group (m= 3.7324, SE=.07385) and the innovative group (m=3.7714, SE=0.7406). Hypothesis 7 is therefore rejected.

4.6.8 Hypothesis 8

_Hypothesis 8a_: Nascent entrepreneurs displaying high levels of human capital will also demonstrate high self-assessed opportunity recognition capabilities.

In order to identify if there is a relationship between opportunity recognition and 'human capital' (see appendix 6) a number of independent samples t-tests were conducted. The first compared opportunity recognition with previous experience in starting up a business. For those respondents who had no previous business start-up experience (n=100) the mean was (m= 3.7758, SE=.05757) while for those who had previous start-up experience (n=19) the mean was (m=3.6360, SE=.14267). The results indicate that there is no statistical relationship between opportunity recognition and previous start-up experience (t (117) =.958, p >.05).
It is argued, Ucbasaran et al. (2004), that another component of human capital is the influence of role models on nascent entrepreneurs. The results reveal that there is no statistical relationship between opportunity recognition and having a significant role model ($t (117) = .483, p > .05$). For those respondents who had no role model ($n=106$) the mean score was ($m = 3.7625, SE = .05667$) while for those who did report having a role model ($n=13$) the mean was ($m = 3.6795, SE = .16528$).

A Pearson correlation of ($r = -.057, p > .05$) indicated that no correlation exists between self-assessed opportunity recognition and the length of a nascent entrepreneur’s education.

An independent samples t-test determined that no significant relationship exists between opportunity recognition and a nascent entrepreneur’s level of work experience ($t (115) = 1.650, p > .05$). Those individuals reporting themselves as workers, supervisors and others ($n=98$) were placed in the lower level category ($m = 3.7194, SE = .05939$). While those individuals reporting themselves as managers or directors ($n=19$) were placed in the higher level category ($m = 3.9602, SE = .12628$). Hypothesis 8 is therefore refuted.

<table>
<thead>
<tr>
<th>Table 4.15 Correlation matrix for human capital</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Start-up Experience (C1)</strong></td>
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<tr>
<td><strong>N</strong></td>
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| **Role Model (C2)**                           |
| **N**                                        |
| 119                                          |
| **Educational Attainment (C3)**               |
| **N**                                        |
| 119                                          |
| **Work Experience (Level) (C4)**             |
| **N**                                        |
| 119                                          |
| **Work Experience (Years) (C5)**             |
| **N**                                        |
| 117                                          |
| **Network Assistance (C6)**                  |
| **N**                                        |
| 119                                          |

**Correlation significant at the 0.01 level (2-tailed)**
*Correlation is significant at the 0.05 level (2-tailed)
**Table 4.16 Correlation matrix for this study**

| Item                  | Mean | 1    | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15
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<td>.060</td>
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<td>-.099</td>
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Notes: Significance (Two-tailed): **p<0.01, *p<0.05
Correlations based on entire entrepreneur sample (except items 3,7,8,9 - nascent entrepreneurs only)
A Psychometric Analysis of Nascent Entrepreneurs: Understanding the impact of individual entrepreneurial cognition on the founding and survival of new small businesses.

### Table 4.17 Summary of hypotheses findings

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Brief Description</th>
<th>Outcome</th>
</tr>
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<tbody>
<tr>
<td>1a</td>
<td>Nascent entrepreneurs more intuitive than non-entrepreneurs</td>
<td>Refuted</td>
</tr>
<tr>
<td>1b</td>
<td>Nascent entrepreneurs more intuitive than established entrepreneurs</td>
<td>Refuted</td>
</tr>
<tr>
<td>1c</td>
<td>Nascent entrepreneurs more innovative than non-entrepreneurs</td>
<td>Refuted</td>
</tr>
<tr>
<td>1d</td>
<td>Nascent entrepreneurs more innovative than established entrepreneurs</td>
<td>Refuted</td>
</tr>
<tr>
<td>2a</td>
<td>Intuitive cognitive style associated with successful business launch</td>
<td>Refuted</td>
</tr>
<tr>
<td>2b</td>
<td>Analytic cognitive style associated with sustained trading</td>
<td>Refuted</td>
</tr>
<tr>
<td>3a</td>
<td>High self-efficacy leads to successful launch</td>
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<tr>
<td>3b</td>
<td>Correlation between self-efficacy and opportunity identification</td>
<td>Supported</td>
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<tr>
<td>4a</td>
<td>Nascent entrepreneurs; less counterfactual thinking than non-entrepreneurs</td>
<td>Refuted</td>
</tr>
<tr>
<td>4b</td>
<td>Nascent entrepreneurs; less counterfactual thinking than established entrepreneurs</td>
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<tr>
<td>5a</td>
<td>Nascent entrepreneurs have more Proactive Personalities than non-entrepreneurs</td>
<td>Supported</td>
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<td>5b</td>
<td>Nascent entrepreneurs have more Proactive Personalities than established entrepreneurs</td>
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<td>6a</td>
<td>Relationship between opportunity recognition and proactive personality</td>
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<td>Successful launch associated with higher Proactive Personality Scores</td>
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<td>6c</td>
<td>Entrepreneurs with high PP will continue to trade longer than those with lower PP</td>
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<td>8a</td>
<td>High human capital associated with high opportunity identification</td>
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5. DISCUSSION OF RESULTS

5.1 Discussion of results relating to cognitive style

Hypothesis 1a which sought to identify the cognitive style of entrepreneurs was refuted which was contrary to the expected result suggested by the literature. The literature had suggested that the nascent group would be located towards the intuitive pole of the CSI scale. However this did not prove to be the case. The literature suggests that the control group of non-entrepreneurs would be more adaptive than the nascent entrepreneurs. This also did not prove to be the case. The unexpected findings indicated that the control group of non-entrepreneurs displayed a slightly more intuitive cognitive style than the nascent group, although the difference was not significant. Allinson et al (2000) argued that the cognitive style of entrepreneurs would be intuitive. However their research was conducted among existing entrepreneurs. This may be why the findings of this research do not support their assertion. Previous research had also supported the Allinson et al prediction. For example research by Buttner & Gryskiewicz (1993) who used the KAI instrument indicated that established entrepreneurs were more innovative than managers in large companies.

The results of this study indicate a mean CSI score of 42 for the nascent entrepreneur group. Allinson and Hayes (1996) identified a range of CSI scores from different occupations. The results from the nascent entrepreneur sample can be compared with results from these occupations. Surprisingly the nascent entrepreneur sample reports higher CSI scores than a number of different occupation groups while most manager groups identified in their research displayed more intuitive CSI scores. This contradicts the predictions of Allinson et al (2000) and Buttner & Gryskiewicz (1993). Allinson et al. (2001) reported a potential skew in the CSI towards the analytic. To correct for this they utilised the median figure obtained from results from a previous study which used a similar
sample for their analysis. This potential skew towards the analytic may be replicated in this study. In order to conduct the analysis for this study it was necessary to divide each of the three samples into intuitive and analytic groups. Like Allinson et al (2001) a justifiable means of obtaining a median score had to be devised. In the absence of an independent study which combined use of the CSI and nascent entrepreneurship a decision was taken to use the median figure of the entire sample (n=306) of this study for analysis rather than the mean. However this does not alter the general findings of this hypothesis, that nascent entrepreneurs were not more intuitive than non-entrepreneurs.

The KAI (Kirton, 1976) which measures adaptation-innovation was also administered as a second measure of cognitive style. A significant difference in cognitive style between the nascent entrepreneur group and non-entrepreneurs was expected. It was expected that the nascent entrepreneur group would be more innovative than the control group. Contrary to expectations this difference was not observed.

One of the justifications for conducting this study relates to the lack of literature pertaining to the characteristics of nascent entrepreneurs. By their very nature of being ‘nascent’ that is not having launched a business it is possible that this sample is no different from the general population. If this were the case then it is not at the nascent entrepreneur stage at which cognitive style becomes a relevant factor. Rather it becomes important at the launch stage. From this perspective cognitive style becomes a factor in the launch decision rather than the decision to embark on the preparatory (nascent) phases of entrepreneurship. Analysis revealed that there was no significant difference between the cognitive style of nascent entrepreneurs who successfully launched a business and those who failed to launch a business. Nor was this identified among successful entrepreneurs who had continued to trade for six months after launching.
The second implication is that the nature of the nascent entrepreneurs identified in this study is skewed towards the analytic ($m=42.08$, $sd=11.94$). The research sites identified for data collection were assisted programmes. These do have a tendency towards encouraging participation from groups experiencing some form of social exclusion. It could be argued that socially excluded people are more analytic than socially included people. Busentiz and Lau (1996) do argue that entrepreneurial cognition is affected by cultural values, social context and personal variables. However cognitive style theory does not fully support this idea. Hill et al, (2000) contend that cultural conditioning is argued to be internalised early in life through family and social influence. It could be argued that social capital may be affected by social inclusion/exclusion which may influence the business founding process.

Why have the hypotheses been refuted? The instruments used to measure cognitive style are appropriate for the study of nascent entrepreneurs. Greater validity is given to this study as the two measures used to determine cognitive style correlate very strongly. Testing of both measures has been rigorous within empirical research across a variety of subjects including entrepreneurs. In all these studies reliability has been good (see chapter 3 for details). It is unlikely that a problem exists with either measure. It would be incredulous to argue that nascent entrepreneurs are such a unique sample that representative reliability has not been achieved.

It was also hypothesised that nascent entrepreneurs would be more intuitive than established entrepreneurs. This outcome was suggested by the literature (Buttner & Gryskiewicz, 1993; Armstrong & Hird, 2003). However, this hypothesis was refuted. The established entrepreneurs were significantly more intuitive than the nascent entrepreneurs. The findings suggest that this result was influenced by the analytic nature of the nascent sample. It is unlikely that the established entrepreneur sample have become more intuitive
over time. In a previous study Hird (2003) identified that there was no significant difference in the cognitive style between entrepreneurs who had been established less than 5 years and those that had been established over 5 years. Messick (1976; 1984) and Harre & Lamb (1986) both talk of cognitive style being consistent over time. Curry (1993) and Janassen & Grabowski (1993) both describe the stable nature of cognitive style. This suggests that the cognitive styles for the established group have not altered over time. Instead this unexpected result was observed as a result of the analytic nature of the sample. The stable nature of cognitive style was also identified in those respondents who successfully launched their own business and maintained trading. The analysis reported that there was no significant difference between the cognitive style of those respondents who launched their business and those that launched and traded successfully.

The established entrepreneur group were more innovative than the nascent group. Significant differences were reported between the nascent entrepreneur group and the established group and between the control group and the established entrepreneur group. It had been hypothesised that a significant difference would exist between established entrepreneurs and nascent entrepreneurs. However it had been expected that the nascent entrepreneur group would be more innovative than the established group. These findings were influenced by the analytic cognitive style of the nascent entrepreneur group. This thesis hypothesises that the analytic/adaptive nature of the nascent group is impacting on findings of this and subsequent hypotheses.

Cognitive style theory argues that innovative individuals prefer to work outside the creatively constraining confines of a structured programme and bureaucracy (Kirton, 1976). Transposing this idea to nascent entrepreneurship it could be argued that highly intuitive/innovative entrepreneurs would find a formal assisted business start-up
programme too structured and bureaucratic. Lynch (1986) suggests that analytic people will prefer a structured approach to decision-making and apply a systematic, step-by-step method. Kirton (1999) argues that adaptive individuals will work within the scope of existing paradigms in seeking solutions to problems that reduce uncertainty, risk and the threat of conflict. It is possible therefore that adaptive entrepreneurs would engage in tasks for which they have previous experience. They will be more inclined to work in areas they understand than their intuitive/innovative counterparts.

From this perspective it could be reasoned that the highly structured nature of the New Entrepreneur Scholarship and New Deal programmes are likely to be more attractive to the adaptive entrepreneur. Adaptive individuals have a greater threshold of boredom and are argued to be more suited to accurate and detailed work which many intuitive entrepreneurs dislike. Both support programmes contain structured learning sessions. The nature of the public funding requires considerable bureaucracy. Participants need to complete a number of forms and agree to continual progress monitoring. The adaptive entrepreneur who generally seeks consensus and prefers to work within rules is compliant with these bureaucratic requirements. However the easily bored and relatively undisciplined intuitive/innovative is likely to challenge this bureaucracy and have little respect for custom and seeking consensus.

It could be argued that assisted programmes are attractive to analytic nascent entrepreneurs who would prefer the greater reassurance that a structured business start-up course would give. Equally this structured environment is likely to be less attractive to the intuitive individuals who prefer unstructured situations. Cognitive style theory would suggest that such individuals would find a structured start-up course boring and creatively restrictive. Furthermore residing within their preferred cognitive dimension, intuitive nascent
entrepreneurs would be more comfortable starting their own business without the
structured help offered by the New Entrepreneur Scholarship or New Deal. The findings
of this study suggest intuitive individuals are not seeking the assistance of these forms of
business advice. To what extent is this generalisable to the entire nascent entrepreneur
sample? It is clear from this research that this is generalisable to nascent entrepreneurs who
use assisted programmes. Further research would need to be conducted to determine the
generalisability across all nascent entrepreneurs. However, it is a prediction of this thesis
that this will be found to be true. This is an area for further research outside the current
remit of this thesis.

The author contends that intuitive/innovative nascent entrepreneurs are forming and
launching businesses without the assistance of agencies such as those identified as research
sites for this study. The results indicate that the cognitive style of nascent entrepreneurs at
successful launch and of those who continue to trade are dominantly analytic. Stability of
cognitive style was identified with little difference between nascent and established
entrepreneurs. Thus it could be claimed that cognitive style has played a lesser role in the
business launch decision. However cognitive style has significantly influenced the
approach taken by nascent entrepreneurs in their founding and subsequent management decisions.

The findings of this thesis suggest that there are two types of nascent entrepreneur;
intuitive and analytic. Intuitive nascent entrepreneurs mirror those facets of all individuals
with an intuitive cognitive style. They tend to avoid bureaucracy and structured situations.
They are social, possibly seeking the aid of friends and colleagues rather than formal
agencies. Analytic entrepreneurs prefer to start their own businesses with the greater
certainty of a structured solution where risk is minimised. Indeed it could be argued using
cognitive style theory that the nature of the intuitive individual is that they prefer to work
outside what they would consider to be the creatively constraining confines of a structured programme and bureaucracy.

It is a contention of this thesis based on the cognitive style literature that two types of entrepreneur exist; intuitive and analytic. This research was primarily conducted among the analytic nascent entrepreneurs. Research on established entrepreneurs was conducted within business centres where both intuitive and analytic entrepreneurs were sampled.

Previous research suggested that a distinction be made between small business owners and entrepreneurs based on their intentions for growth or strategic outlook (Carland et al 1984, Gartner, 1988). The findings of this research suggest that cognitive style could answer the question why these two groups appear to exist.

This study hypothesised that intuitive nascent entrepreneurs would start more businesses than analytic nascent entrepreneurs. However this hypothesis was refuted. The results of the statistical analysis actually identified that it was the analytic nascent entrepreneurs who were more successful in launching their business. Buttner & Gryskiewicz (1993) had identified using the KAI instrument that innovative entrepreneurs would start more businesses than their adaptive counterparts. However their research was conducted among existing entrepreneurs who were looking to launch subsequent businesses. As Delmar and Davidsson (2000) noted the term nascent does not imply the entrepreneur has no previous experience. Not all nascent entrepreneurs are novices. These entrepreneurs displayed a greater amount of experience than the first time entrepreneurs who largely characterised this study. The test was repeated using the KAI. Again no statistically significant result was identified. An innovative cognitive style was not associated with successful business launch.

It can be argued that an explanation for these findings comes from outside the cognitive domain. Røtefoss and Kolvereid (2005) argued that start-up businesses cannot be wholly
internally resourced and are therefore subject to the environment in which they are created. This is supported by Jack and Anderson (2002) who argue that firm creation is more than an economic process that is embedded in a specific environment. It could be claimed that the environment in which these nascent entrepreneurs launched their business has influenced the findings. This could result from the analytic nature of the sample or as a result of the level of social exclusion exhibited by the participants.

An alternative interpretation of these findings would suggest that Buttner & Gryskiewicz (1993) were correct in their assertions that a greater number of businesses are founded by intuitive entrepreneurs. However this includes businesses that are founded subsequently to the first business launch as serial or portfolio businesses. Further research needs to be conducted to identify any differences in cognitive style between first time entrepreneurs and those with the experience of multiple launches.

5.2 Discussion of results relating to self-efficacy

It was hypothesised that an individual who displays higher levels of self-efficacy will be more likely to launch a business successfully. The findings of this research support the hypothesis. A statistically significant relationship was identified between the general self-efficacy scores reported by the nascent entrepreneurs group and the likelihood that they would launch a business. According to Markham et al (2002) self-efficacy impacts on perceptions of control, stress, self-blame, the depression individuals experience and accomplishments that individuals experience in trying, taxing or uncertain situations. This research has demonstrated that nascent entrepreneurs who demonstrate high self-efficacy are able to utilise this ‘self-belief’ in their business launch decisions. Bandura (1986) argues that both self-efficacy and skills are needed for competent functioning suggesting that in ambiguous, unpredictable or stressful environments self-efficacy will determine an
individual's judgement of their capabilities rather than act as an assessment of their skills. Clearly therefore it can be argued that nascent entrepreneurs with high self-efficacy will be more likely to assess their capabilities as adequate for launch. This is supported by Boyd and Vozikis (1994) who argue that entrepreneurial self-efficacy impacts on the degree to which an individual believes they are capable of successfully performing the roles and tasks of an entrepreneur. Chen et al (1998) also argue that the entrepreneurial decision may be influenced by entrepreneurial self-efficacy (ESE). They argue that nascent entrepreneurs with high ESE would see opportunities in the same situation where an individual with low ESE will see costs and risks.

This research also demonstrated a relationship between opportunity recognition and general self-efficacy. The results indicated that there was a statistically significant relationship for both the nascent and established entrepreneur samples. However, the correlations were relatively weak. The findings also indicated that this was a phenomenon of the entrepreneur sample only. Within the control group of non-entrepreneurs general self-efficacy and opportunity recognition scores did not correlate. The relative weakness of the correlation was unexpected. The literature clearly suggests that recognising opportunities and self-efficacy would be strongly associated. Arenius and Minniti (2005) contend that self-efficacy or confidence in one's own skill is the single most important component in the decision to start a new business. This view is supported by Krueger and Brazeal (1994) who proposed that entrepreneurial self-efficacy was one of the key prerequisites of the potential entrepreneur. From a psychological perspective Wood and Bandura (1989) refer to self-efficacy as an individual's cognitive estimate of their capabilities to mobilise the motivation, cognitive resources and courses of action needed to exercise control over events in their lives. The relative weakness of the correlation casts some doubt as to the fundamental link between self-efficacy and opportunity recognition.
The significant impact self-efficacy has on the business launch decision of nascent entrepreneurs means it is a strong moderator on the business start-up process.

5.3 Discussion of results relating to counterfactual thinking

Baron (1998) argued that entrepreneurs were more susceptible to cognitive biases such as counterfactual thinking. However, counterfactual thinking is argued to have two distinct and opposite actions. There is negative counterfactual thinking in which the individual recognises the counterfactual thought as worse than reality which has the effect of making the individual more cautious. The second effect is that of upward counterfactual thinking in which evaluations of events are made that are better than the actual outcome. This may have a motivating effect on entrepreneurs, reduce perceived risk and persuade entrepreneurs to be less cautious. Therefore it could be argued that it is not the number of counterfactual thoughts that is important rather it is the direction of the counterfactual thought.

In this analysis the nascent entrepreneur group engaged more frequently in counterfactual thinking than the control group of non-entrepreneurs. This would seem to disagree with established literature (Baron, 1998). It was identified that the established entrepreneur group engaged in significantly less counterfactual than the nascent group. The reasons for this could be twofold. Firstly it could be that a reduction in such feelings is symptomatic of established entrepreneurs only, that it is a phenomenon acquired over time. Secondly it could be argued that the analytic/adaptive nature of the sample of nascent entrepreneurs which has already impacted on a number of hypotheses also impacts on counterfactual and regretful thinking. Certainly the strength of the influence of counterfactual thinking on nascent entrepreneurs and the business launch process appears less strong than some of the other measures of cognition explored in this study. This could mean that counterfactual
A Psychometric Analysis of Nascent Entrepreneurs: Understanding the impact of individual entrepreneurial cognition on the founding and survival of new small businesses.

thinking acts as a relatively weak moderator on the entrepreneurial process. Weak but statistically significant results were identified between cognitive style and the Global Regret Scale which is a measure of counterfactual thinking. Both the KAI and the CSI correlated significantly if weakly with the Global Regret Scale.

5.4 Discussion of results relating to proactive personality

The study identified that nascent entrepreneurs displayed greater proactive personality scores than a control group of non-entrepreneurs. The findings support the hypothesis that proactivity is a behavioural attribute that distinguishes the nascent entrepreneur from non-entrepreneurs. This finding had been suggested by research from Bateman & Crant (1993), Becherer & Maurer (1999) and suggested by the work of Parker (1998). It was also identified that established entrepreneurs were more proactive than non-entrepreneurs. The analysis also identified that no statistical difference was identified between the proactive personality scores of the nascent entrepreneur group and the established entrepreneur group. Both groups displayed higher proactive personality scores than non-entrepreneurs. This supports the notion that entrepreneurs have a behavioural disposition towards proactivity. It also identified that that while this proactivity continued within the established phase of entrepreneurship there was no significant differences between proactive personality scores between these two groups. No significant difference was identified between the proactivity scores of those respondents who failed to trade successfully and those who continued to trade after six months. Seibert et al (1999) had suggested that individuals who proactively exert control over their work structures are more likely to have a fuller understanding of the operations and environments in which they work using this to anticipate and react to changes.

It could be argued that the lack of significant difference between the nascent entrepreneur and established entrepreneur groups highlights the relative stability in proactive personality.
suggested by Bateman & Crant (1993). The findings suggest that proactive personality could be a factor in a nascent entrepreneur's decision to launch a new business. Proactive entrepreneurs continue to utilise this behaviour as established entrepreneurs, altering environments and reacting to change. Support for this suggestion comes from Becherer & Maurer (1999) they identified a difference between entrepreneurs who founded their own business and business owners who inherited or purchased their business. The latter group were less proactive than the entrepreneurial group. Indeed they identified a correlational link between the proactivity of an entrepreneur and the number of businesses founded.

The mean scores for proactive personality for both the nascent entrepreneur sample and established entrepreneur group are compared with results from other studies in table 5.1 below. This indicates that both groups display greater proactive personality scores than samples from other studies.

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seibert et al (2001)</td>
<td>University Alumni from Business &amp; Engineering</td>
<td>m=5.19</td>
</tr>
<tr>
<td>Harvey et al (2006)</td>
<td>Students (aged 17-24)</td>
<td>m=5.2</td>
</tr>
<tr>
<td>Pitt et al (2002)</td>
<td>Industrial Salespeople</td>
<td>m=2.19</td>
</tr>
<tr>
<td>Porath &amp; Bateman (2006)</td>
<td>Sales People</td>
<td>m=5.26</td>
</tr>
<tr>
<td>Chan (2006)</td>
<td>Rehabilitation Workers</td>
<td>m=5.09</td>
</tr>
<tr>
<td>This Study</td>
<td>Nascent entrepreneurs</td>
<td>m=5.60</td>
</tr>
<tr>
<td>This Study</td>
<td>Established Entrepreneurs</td>
<td>m=5.43</td>
</tr>
<tr>
<td>This Study</td>
<td>Control Group</td>
<td>m=4.95</td>
</tr>
</tbody>
</table>

One reason for the relative stability of the proactive personality score across the nascent and established entrepreneurs samples could be identified through its relationship with cognitive style. Bateman and Crant (1993) argue that proactive personality is fundamentally different from cognitive or affective traits such as empathy or well being. According to this assertion proactive personality would be unaffected by cognitive mechanisms such as...
learning. Proactive personality is neither a cognitive schema that can be utilised in new or novel situations nor is it a simplifying heuristic. Proactive personality is a behavioural action. Despite the assertions made by Bateman and Crant (1993) in this study a weak correlation was identified between cognitive style and the proactive personality scale. It is possible that some overlap does exist between the two scales at a definitional level there appears to be a relationship between the proactive individual and intuitive/innovative individual. Bateman and Crant (1993) describe the proactive individual as unconstrained by situational forces, opportunity seeking and pathfinders. Intuitive/innovative individuals are similarly described through none conforming to rules (Kirton, 1976), seeking opportunities (Allinson et al, 2000) and initiation and implementation (Sadler-Smith & Badger, 1998).

This is an interesting finding to juxtapose with those relating to cognitive style. Both constructs to some extent have an effect on the actions of entrepreneurs. The extant literature on cognitive style and entrepreneurship suggests that intuitive/innovative individuals will start more businesses whereas analytic/adaptive individuals will manage their businesses more successfully over time. The literature on Proactive Personality also suggests that business founders are more proactive than business owners who bought or inherited their business. Becherer and Maurer (1999) also contend that a link exists between the proactivity of an entrepreneur and the number of businesses founded. It could be argued that while they are different constructs cognitive style and proactive personality may be mutually compatible especially in regard to entrepreneurs. It could be suggested that a higher proactive personality score may assist the analytic entrepreneur to alter their environment through learned behaviours including opportunity recognition and external strategic orientation. Similarly a lower proactive personality score may afford the intuitive entrepreneur learned behaviours of a more cautious approach. Proactive personality therefore acts as a moderating factor for both intuitive and analytic entrepreneurs.
It was also hypothesised that there would be a significant link between proactive personality scores and an entrepreneur's self-assessed ability to recognise opportunities. Bateman and Crant (1993) suggest that proactive people scan for opportunities, show initiative, take action and persevere. This is supported by Crant (2000) who argued that proactive individuals take initiative and that they seek information and opportunities. It was identified that there was a strong and statistically significant correlation between these two characteristics for the nascent entrepreneur sample. This supports the work of Crant (1996) who argued that proactive personality was linked to start-up intentions. The proactivity of behaviour within the nascent entrepreneurs group was statistically correlated to their self-assessed ability to identify opportunities.

A second study identified that the established entrepreneur sample also revealed a strong correlation between their proactive personality and disposition towards opportunity identification. This result indicated that this link is maintained between the two entrepreneur groups and that the strength of this correlation is relatively consistent over time. The analysis of the control group of non-entrepreneurs revealed that a statistically significant correlation exists between PPS scores and their self-assessed opportunity recognition scores. However, this correlation was significantly weaker. This could indicate that a link between an individual's behavioural predisposition towards proactive personality and their ability to recognise opportunities is a universal concept across the entire population. However, it could be argued that this relationship is more acute within a highly proactive population such as the entrepreneur group. It could be argued therefore that the relationship between PPS and opportunity recognition is a phenomenon attributable to high scoring individuals only and not to the entire population. An additional analysis was conducted in order to investigate if the relationship between proactive personality and opportunity recognition occurs at the totality of the scores. The results suggest that
individuals who reported low opportunity recognition scores had lower PPS scores and those with higher opportunity recognition scores had higher PPS scores. This strengthens the findings of the original correlation analysis by indicating that this relationship occurs throughout the totality of the scores.

Hayek (1945) linked the discovery of opportunities with the distribution of information in society. It could be argued that an individual with a proactive personality seeks out information that others do not seek. The extent to which entrepreneurs actively search for opportunities is a moot point and potentially impacted upon by proactive personality. Although there is some contention in the literature about the degree to which the active search method is employed (Hills & Shrader, 1998) as a means of discovering opportunities. The fact that individuals and corporations do to some extent search for opportunities is not in dispute. Schneider (1983) argues that proactive individuals select situations in which to participate. Buss (1984) argued that proactive people intentionally evoke reactions from others through the manipulation of other people to alter their environment. Chandler et al (2003) are more cautious they argue that in defining opportunity recognition as an active search there is an assumption that those entrepreneurs with superior search skills will succeed in identifying opportunities. However, they contend that the success of active search is only minimally associated with either cognitive or behavioural differences.

Kirzner (1979) argued that opportunities are discovered not through active searching but through fortuitous discovery. He describes 'alert individuals' who are able to recognise changes in the business environment. Proactive individuals may feel they have the ability to alter their environment in such a way as to be able to recognise or act on these changes in order to create an opportunity. Seibert et al (1999) argued that proactive people alter work
environments to create opportunities for career success. They contend that proactive personality is linked to career success, salary and promotional history. It could be hypothesised that this would be translated in entrepreneurial businesses into income, number of ventures created and career satisfaction. It could be argued that individuals with a proactive personality could satisfy the criteria for the ‘alert individuals’ that Kirzner mentions.

Ucbasaran et al (2003) identified a difference between the opportunity identification attitudes of novice and habitual entrepreneurs. Ucbasaran et al suggested that opportunity identification may be an emergent developmental process. While both entrepreneur groups searched for opportunities in similar ways habitual entrepreneurs were more likely to identify opportunities. One of the explanations cited by Ucbasaran et al is experience and knowledge. Becherer & Maurer (1999) identified that entrepreneurs with greater proactive personality scores resulted in greater numbers of businesses founded. Kickual and Gundry (2002) argued that among small business owners proactive personality is linked to strategic posture of the firm permitting flexibility and change. They contend that proactive personality is important in entrepreneurial intentions and strategic orientation. It could be argued that a theoretical link exists between the attitudes of different types of entrepreneurs to opportunity identification and their proactive personality. The results suggest that while opportunity identification may be developmental and emergent as Ucbasaran et al (2003) suggest the underlying behavioural characteristics that form proactive personality are more stable.

Results revealed that there was no statistical difference in the PPS scores of those nascent entrepreneurs that successfully launched businesses than with those who did not launch a business. This is contrary to the expected result. Research previously reported clearly
demonstrates that PPS is strongly linked to opportunity identification. It was hypothesised that this proactive behaviour linked with a demonstrated ability to recognise opportunities would result in higher scoring individuals successfully launching more businesses. This is supported by the previously reported findings of Becherer & Maurer (1999). They identified that entrepreneurs with greater proactive personality scores resulted in greater numbers of businesses founded.

The research indicates some interesting findings. Results indicate both the successful and the unsuccessful group were almost exactly identical and these proactive personality scores were high compared to the control group. Those nascent entrepreneurs who successfully launched their business demonstrated higher opportunity recognition scores. The literature would suggest that such a strong set of inter-relationships would include proactive personality and opportunity recognition. The result of this hypothesis was not expected and requires further analysis of the relationships between business launch and nascent entrepreneurship which is outside the remit of this thesis.

5.5 Discussion of results relating to opportunity recognition

It was hypothesised that an intuitive cognitive style would be associated with a high self-assessed opportunity recognition score. However this hypothesis was largely refuted. This could be argued to support the views of Chandler et al (2003) who argues that cognition is only minimally associated with opportunity recognition. However a contrary perspective is offered by Corbett (2005) who argues that the cognition literature provides an explanation for how an individual’s mental make-up is related to their ability to recognise and exploit opportunities. Using the Cognitive Style Index it was identified that within the nascent entrepreneur sample no statistically significant difference between the opportunity recognition scores of intuitive and analytic group was identified. This analysis was repeated
using the KAI. Again it was found that no statistically significant difference was identified between the innovative and adaptive groups in terms of their self-assessed opportunity recognition score. Within the sample of established entrepreneurs no significant difference was identified between the intuitive and analytic groups using the CSI. However, a significant difference was reported using the KAI with those established entrepreneurs who were adaptive displaying lower mean opportunity recognition scores than innovative established entrepreneurs.

Baron (2004) argues that opportunities exist as complex patterns of stimuli and that the recognition of these diverse or unrelated patterns by the individual will determine the extent to which they recognise opportunities. Opportunity recognition has in the past been found to be associated with intuitive/innovative cognitive styles. Agor (1989) argues that intuitive decisions are more likely to induce the unconscious processes that create the unique combinations that are argued to be fundamental to opportunity recognition. The ambiguity and complexity that is associated with opportunity recognition is argued to favour the intuitive individual (Allinson et al, 2000). Although generally seen to be symptomatic of an intuitive cognitive style within the general population it could be argued that opportunity recognition in entrepreneurs is identified in both cognitive style groups. Indeed the findings of this research support this claim. It could be argued that analytic entrepreneurs have learned how to recognise opportunities. However, can opportunities be recognised without intuition? Sadler-Smith & Shefy (2004) contend that intuition combines with expertise to make sense of new or novel situations. While Scott & Bruce (1994) identified that individuals do not need to be intuitive problem-solvers in order to be innovative.
Cognitive style theory suggests that individuals can operate outside their preferred cognitive style in order to complete tasks. Riding (1989) argued that individuals could develop cognitive strategies which are learned and developed responses to meet the requirements of situations or tasks. Riding argues that cognitive strategies are employed where a cognitive style is not ideally suited to a particular task. Allinson & Hayes (1996) contend that individuals can employ temporary alternative strategies by combining styles and aspects of styles to meet new and unique situations. They argue that while cognitive styles remain relatively fixed, cognitive strategies possess a flexibility to deal with such situations. Kirton (1989) calls these coping behaviours and distinguished between these and style. Kirton argues they result in a repertoire of behaviours derived mainly from the preferred style and partly as a requirement of the situation. It could be argued that the results of this research are symptomatic of these cognitive strategies and the need of all entrepreneurs to identify opportunities. Sadler-Smith & Badger (1998) argues that adopting strategies other than those preferred or habitual is symptomatic of versatility.

Analytic entrepreneurs who report high self-assessed opportunity recognition skills could be argued to utilise an opportunity schema to help overcome their cognitive style deficiencies. Baron (2004) reported that opportunity recognition may improve over time and that serial and portfolio entrepreneurs may be able to recognise structural patterns more easily than others. However, this explanation can only be applied to established entrepreneurs; it cannot be applied to the nascent entrepreneur sample. Ucbasaran et al (2003) studied novice and habitual entrepreneurs they identified different attitudes to opportunity identification arguing that opportunity recognition was a developmental, emergent process. They argued that habitual entrepreneurs were more likely to identify opportunities than novice entrepreneurs and that cognitive mindset influenced by
experience and knowledge may be an important factor. The findings of this primary research cast some doubt on this claim.

Perhaps in the same way that highly intuitive entrepreneurs would dislike the structure and routine of paperwork and the bureaucratic aspects of business, analytic entrepreneurs act outside their preferred cognitive style in order to recognise opportunities. Opportunity recognition is argued to be a fundamental characteristic of entrepreneurship. It could be argued that the need to recognise opportunities is so fundamental to entrepreneurs it has become universal across the entire entrepreneurial population. This thesis measured self-assessed ability to recognise opportunities. The findings indicate that analytic entrepreneurs consider themselves to be as good at recognising opportunities as their intuitive counterparts in both nascent and established entrepreneur sample. This may be because they have developed the cognitive strategies in order to overcome the deficiencies of their preferred cognitive style.

It was hypothesised that different types and levels of human capital are associated with an entrepreneur's self-assessed recognition of opportunities. Davidsson & Honig (2003) argue that in terms of nascent entrepreneurship individuals with greater or a higher quality human capital will more readily recognise the economic opportunities that exist within the business environment. Similarly Shultz (1959) argued that the theory of human capital is based on the assumption that knowledge provides individuals with improvements or increases in their cognitive abilities that makes them more productive and efficient in conducting an activity. The human capital of entrepreneurs includes their cognitive characteristics; achieved attributes; and accumulated work and habits that may produce a positive or negative effect on productivity (Westhead, 2005). However, Davidsson and Honig (2003) caution researchers arguing against an automatic assumption that a greater
degree of human capital would encourage entrepreneurship. They argue that as human capital influences career choice a very high degree of human capital may discourage risk-taking and a lower degree may encourage it. This could have implications for the findings of this research. As previously stated this research was primarily conducted within research sites that implied a degree of social exclusion within the nascent entrepreneur cohort. This may have had the effect of both encouraging and discouraging entrepreneurship.

Wennekers (2002) argued that at the macro-level nascent entrepreneurship followed a U-shaped relationship. Higher levels of nascent entrepreneurship were identified in underdeveloped and highly developed economies. It could be argued that following this model at the micro level that nascent entrepreneurship will be identified in individuals at lower and upper levels of the economic scale Wennekers (2002) refers to as a ‘risk-reward’ profile.

No statistical link was identified between human capital and opportunity recognition in the nascent entrepreneur sample. Analysis identified that no relationship between previous start-up experience and opportunity recognition was identified. It might have been assumed that nascent entrepreneurs with previous start-up experience and embarking again on business launch preparations would have considered themselves to be more adept at opportunity recognition. Rotefoss and Kolvereid (2005) identified that current and previous entrepreneurial experiences were particularly associated with nascent entrepreneurship and business founding. Likewise it had been promulgated that individuals who had the benefit of a significant role model would also have had greater self-assessed opportunity recognition skills (Delmar and Davidsson, 2000). Minniti (2004) argues that the presence of role models increases an individual’s confidence through reduction in ambiguity. While Arenius and Minniti (2005) identified that a significant and positive relationship exists between an individual being a nascent entrepreneur and knowing another entrepreneur. However this has proven not to be the case in this research.
It is argued that an individual nascent entrepreneur who is highly educated will be able to cope more easily with problems and have the skills to search for resources. However, education on its own is unlikely to provide entrepreneurs with a competitive advantage on its own, as education is not unique and it is not inimitable (Ucbasaran et al, 2005). They argue that to be a source of competitive advantage education will need to be combined with other resources and capabilities. The findings of this thesis determined that in terms of work experience and education no significant results were identified. It could be argued that individuals who have work experience at 'higher' levels that involve the management and directing of businesses will have developed significant human capital that is useful in the founding and launching of a new enterprise. It could also be argued that this increased experience would again give the nascent entrepreneur greater confidence in their ability to recognise opportunities.

It was also hypothesised that there would be a relationship between human capital and the development of the nascent entrepreneur's network. The findings refuted the hypothesis and failed to substantiate the assertion that strong levels of network support would be associated with lower levels of human capital. Flora (1998) argued that networks facilitate co-ordination and co-operation for mutual benefit. Nahapiet & Ghoshal (1998) argue that networks of relationships are a valuable resource for conducting entrepreneurial activity.

This study sought to make a distinction between those aspects of support that could be argued to be definitive of strong network support and those of weak network support as suggested by Granovetter (1973). The findings identified that for the nascent entrepreneur sample they were most likely to have received support from groups which would represent strong ties rather than groups with which they would have weak ties. Strong ties will include family and close friends, they are people linked by strong trust. Weak ties are likely
to be of short duration and occur infrequently they will occur with other individuals or
organisations outside the immediate social circle. It is argued that weak ties can assist the
nascent entrepreneur by enabling them to draw upon information, advice and assistance
from a large and diverse pool. The weakness of strong ties is that the usefulness of these
contacts in an entrepreneurial setting is limited. They are likely to share the same contacts
and information as the entrepreneur. They are also unlikely to bring fresh perspectives to
exploit or create new business opportunities. However, Bruderl and Preisendorfer (1998)
argue that strong ties in the form of a family network can increase success. They suggest
that access to emotional support, especially during the start-up phase, is important to
maintain emotional stability during difficult times.

5.6 Additional findings

5.6.1 Correlation of the KAI and CSI

An important additional finding of this research has been the identification of a strong and
positive relationship between the KAI and the CSI and between the CSI and the KAI
subscales. This study represents the first large scale research project in which the two
measures of cognitive style have been simultaneously administered. One of the principle
criticisms made by Hodgkinson & Sadler-Smith (2003) in envisioning cognitive style as a
unitarily dimensional construct was the lack of evidence that different cognitive style
measures correlate. This study provides evidence of a strong positive correlation between
the KAI and the CSI challenging Hodgkinson & Sadler-Smith’s (2003) assertion.

The KAI instrument measures cognitive style on a bi-polar continuum measuring
adaptation and innovation. Whereas the CSI envisions cognitive style as a bi-polar unitary
construct measuring intuition and analysis. Other differences between the two measures
can also be identified. The scoring of the CSI is based on a true-uncertain-false trichotomy.
The KAI is based on a five point scoring system. The questions were written by different authors, tested on different samples of people and each instrument asks a different number of questions. The KAI is also an older scale than the CSI. The KAI was published in 1976 although subsequent amendments have been made while the CSI was published 20 years later in 1996. It can be observed therefore that a great many differences exist between the two instruments at the instrument design level.

At a conceptual level it can also be identified that differences exist between innovation and intuition. One of the principle differences between innovation and intuition is the nature of both processes. Scott & Bruce (1994) argue that innovation is a staged process, consisting of elements. Roberts & Fusfeld (1981) describe the progress of innovation through critical management functions. While Kirton (1998) also argues that innovation is a staged process and that innovative change is derived from memorable precipitating events. He argues that individuals will perform certain parts of the innovation process better than others. An idea supported by Chaharbaghi & Newman (1996) who describes three types of innovators 'innovating creators', 'innovating implementers' and 'innovating stabilizers'. The process of intuition is not described as a staged process. Authors frequently describe intuition in terms of its informality and unstructured nature (Kaheman & Tversky, 1982). Agor (1989) describes an unconscious process and Sadler-Smith & Shefy (2004) refer to a lack of logic and rational thought intruding into intuition. Intuition is also described in terms of its simplifying role in pulling together complex patterns and facilitating decision making in ambiguous and complex situations (Mintzberg, 1976; Parikhe et al, 1994; Showers & Chakrin, 1981).

There are also areas in which innovation and intuition are seen to be similar. Intuitive individuals are described as non-conforming random individuals (Allinson & Hayes, 1996).
while innovative individuals are similarly described by Kirton (1976) as less conforming.

Both constructs are similarly described as holistic (Allinson & Hayes, 1996; Sadler-Smith & Badger, 1998). Creativity is also argued to be a trait indicative of the innovative and intuitive individual. Claxton (2001) argues that intuition involves creativity with rumination, while Olsen (1985) considers creativity with innovation as indicative of intuitive individuals. Innovators are described in terms of the radical nature of their predisposition to act outside of the pre-existing boundaries (Kirton, 1976) a view supported by Foxall & Hackett (1994) and Buttner et al (1999). Prevedi & Carli (1987) argue that this predisposition directly affects the creativity of the ideas generated.

5.6.2 Cognitive style and gender

This research identified that no significant differences in cognitive style were obtained between male and female nascent entrepreneurs. The results of previous studies into cognitive style and gender have produced mixed results. Taggart et al (1997) identified no gender differences between male and female management trainees. Similarly Hayes et al (2004) identified no significant difference between male and female managers. This supported research by Allinson & Hayes (2000) who identified no significant gender difference in the cognitive style of managers across a number of countries. These findings among managers are interesting because they are not replicated in studies involving the general population. Kirton (1989) argues that gender differences in cognitive style are perceivable. Kirton (1976) identified that women tend to be more adaptive than men. This is supported by Allinson & Hayes (1996) who identified that women are more analytic than men and Allinson & Hayes (2000) who identified that British female management students were more adaptive than their male counterparts.
Results appear to suggest that there is a disparity between the findings of research involving managers and the general population which might account for the result observed in this research. The general female population demonstrates an orientation towards adaption/analysis while female managers display no significant difference from their male counterparts. Tullett (1995) suggests a possible reason. A study of the KAI results from male and female engineering managers identified that female engineering managers were more innovative than their male counterparts. Tullet suggests that this results from the need of female engineers to cross more ‘boundaries’ than their male colleagues. He argues that female engineers need to cross two ‘boundaries’. Firstly entering a largely male profession and secondly gaining managerial status. It could be argued that female entrepreneurs also have to cross more ‘boundaries’ than their male counterparts and this may have produced the result identified in this research.
6. CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH

6.1 Conclusions

6.1.1 Conclusions relating nascent entrepreneurship to cognition

This thesis has demonstrated that cognitive style has some bearing on nascent entrepreneurship. This research had argued that an intuitive cognitive style was associated with the necessary characteristics for launching an entrepreneurial venture. Research has indicated that cognitive style is a determinant of the business launch decision. The overwhelming conclusions of much of the entrepreneurship literature and research had suggested that the cognitive style of entrepreneurs would primarily be intuitive/innovative. It can be argued that this conclusion occurred because most studies are conducted among existing entrepreneurs. The findings of this research indicate that at the nascent stage of entrepreneurship particularly among inexperienced nascent entrepreneurs these assertions are open to challenge. Focusing on nascent entrepreneurship has highlighted the important role played by analytic/adaptive entrepreneurs. In reality, few of the cognitive style results identified in the research were located at the extremes of either the CSI or KAI continuum. As would be predicted by a normal distribution the majority of scores did not display extremes. Thus scores tended towards the compromise forms of cognitive style suggested by Allinson and Hayes (1996) with the nascent entrepreneurs benefiting from their ability to utilise aspects of both analytic and intuitive cognitive styles. This provides the nascent entrepreneur with a significant internal resource assisting in the founding and survival of their business.

Cognitive style plays a significant role in nascent entrepreneurship but it is not as a predictor of entrepreneurship where its significance lies. Rather cognitive style has determined the process that nascent entrepreneurs take in founding their business. The
decision to research this neglected field of nascent entrepreneurship and cognitive style means new insights have been made about the nature of the business launch decision. This thesis has demonstrated clearly that cognitive style affects an individual’s approach to business launch. This has significant implications for practice. A thorough awareness of these differences will assist business support agencies in developing programmes that provide assistance for the differing needs of analytic and intuitive entrepreneurs.

As suggested by Badger and Sadler-Smith (1998) highly analytic entrepreneurs may require assistance in the development of their business ideas. Although Kirton (1976) maintains that adaptive individuals are creative within their own contexts they lack the ability enjoyed by intuitive individuals to broaden the boundary of their creativity. This can lead to replication business and a lack of inimitability. This opens the business to external threats from similar competing organisations. These individuals need assistance to innovate to make their businesses unique and inimitable. Innovative individuals are more at ease with this extended creativity. Indeed, it is argued many require assistance to constrain their creativity in order to make it practical and relevant to market requirements. The innovators lack of structure can also make them vulnerable to boredom and lack attention to detail and clarity. This has the potential to lead to poor business structures and systems. Cognitive style theory suggests that highly innovative individuals dislike the bureaucratic and administrative elements of their business. The financial implications of poor costing and financial management can significantly harm small businesses. An awareness of an entrepreneur’s cognitive style may assist business support agencies identify programmes of support dependent upon the differing needs. An understanding of the role of cognitive style would also benefit the individual entrepreneur in recognising their strengths and weaknesses allowing the formation of strategies to facilitate the founding and survival of the business.
The research has indicated that other cognitive factors may influence the founding and survival of a new business. This research has demonstrated the importance of self-efficacy within nascent entrepreneurship. It can be argued that founding a new business is an uncertain process requiring both commitment and an element of risk. Risk extends past the obvious financial implications and includes risk to reputation and loss of self-esteem associated with failure. This thesis has reinforced the role played by self-efficacy in the founding decision. It has demonstrated that self-efficacy plays a significant role in nascent entrepreneurship. Successful nascent entrepreneurs had a high level of self-belief demonstrated through their self-efficacy scores. This has enabled them to utilise self-belief as a means to ensure competent functioning in complex and stressful situations. This facilitates the recognition of opportunities encouraging a more positive assessment of ambiguous situations. The implications for founding and survival are clear. Higher levels of self-efficacy are beneficial within the entrepreneurial business environment. Unlike cognitive style where limitations can be overcome through the adoption of cognitive strategies it is difficult to perceive how a deficiency of self-belief can be compensated. It is questionable whether such nascent entrepreneurs will continue to launch or succeed.

6.1.2 Conclusions relating to proactive personality

Proactive personality is a behavioural action that has been argued to be symptomatic of entrepreneurship. This research has strengthened this assertion by demonstrating that it is symptomatic of nascent and established entrepreneurs while it was not identified in a control group of non-entrepreneurs. The construct has demonstrated that it is stable overtime within the entrepreneurial sample. Proactive personality is a behavioural action. This distinguishes it from, and is independent of, cognitive style which is a psychological construct. Proactive personality therefore has the capacity to influence the behaviours of all
entrepreneurs. This may influence the actions of entrepreneurs causing them to act in a way that is contrary to their expected cognitive style. There is a definitional link between proactive personality and an innovative cognitive style in terms of the outcome of their actions. Analytic entrepreneurs can have proactive personalities. Analytic cognitive processes can function alongside proactive behaviours. In terms of business founding and survival, entrepreneurs who have proactive personalities can be argued to be at an advantage over those who do not. A link was also identified between opportunity recognition and proactive personality. Proactive individuals recognised more opportunities. This is a clear benefit for any nascent entrepreneur founding a new business.

6.1.3 Conclusions relating to opportunity recognition

This research has investigated the extent to which cognitive style influences opportunity recognition. It has revealed that among a sample of nascent entrepreneurs differences in cognitive style did not play a central role in influencing their self-assessed ability to recognise opportunities. This result was largely repeated among the established entrepreneur sample. These results were unexpected. However, the failure to identify a relationship between changes in cognitive style and differences in opportunity identification scores does not reduce the importance of opportunity identification as part of the entrepreneurial process. In actuality the scores for opportunity identification for both analytic/adaptive and intuitive/innovative entrepreneurs in both the nascent and established samples were high compared to the instrument midpoint. This research is predicated on an important distinction. It did not attempt to assess an entrepreneur’s ability to recognise opportunities by any quantifiable means. Instead, it attempted to discover an entrepreneur’s self-assessment of their ability to recognise opportunities.

This research has had the benefit of investigating the relationship between opportunity identification and a number of constructs all of which impact on nascent entrepreneurship.
A Psychometric Analysis of Nascent Entrepreneurs: Understanding the impact of individual entrepreneurial cognition on the founding and survival of new small businesses.

It has identified that an ability to recognise opportunities has influenced both business launch decisions and success in sustained trading. Furthermore, it has recognized that the self-assessed ability to recognise opportunities is associated with the decision to launch a business. Those individuals who successfully launched and successfully traded all indicated higher opportunity identification scores than those that either decided not to launch or who were ultimately unsuccessful in the trading environment.

No relationship was identified between opportunity identification and cognitive style. This research suggests that cognitive strategies are employed by nascent entrepreneurs to facilitate opportunity identification and that these cognitive strategies compensate for any deficiencies that cognitive style may present. It would also provide a justifiable answer to why differences in cognitive style failed to be related to differences in self-assessed opportunity identification. Through the implementation of cognitive strategies entrepreneurs are identifying opportunities and consequently making a positive assessment of their abilities in the light of these moderations. The construct of entrepreneurial self-efficacy has also produced a relatively weak relationship with opportunity identification compared to the strong relationship that had been suggested by the literature. Thus three instruments the KAI, CSI and General Self-Efficacy Scale measuring two different aspects of cognition, style and self-efficacy have failed to produce the strong association some authors had suggested. This supports the arguments of Chandler et al (2003) who suggest a low relationship between opportunity identification and cognition. Despite this, self-efficacy was a strong determinant of business launch. This thesis argues makes it an important moderator in the entrepreneurial process. However, it could be argued that the psychological domain has failed to demonstrate that it is the sole determining explanation of opportunity identification.
The behavioural domain demonstrated through proactive personality produced a strong and statistically significant relationship in both the nascent and established entrepreneur sample. It was identified that not only was a relationship identified but that this relationship existed across the range of scores. Low proactive personality was associated with low opportunity identification scores and high proactivity was associated with high opportunity identification. Thus it can be concluded that opportunity identification is strongly associated with behavioural dispositions such as proactive personality.

Another area in which this research has challenged the expectations of the literature is in the area of human capital. No relationship was identified between human capital and opportunity identification in the nascent entrepreneur sample. Rotefoss & Kolvereid (2005) had suggested that previous experience would be associated with business founding and Delmar & Davidsson (2000) suggested that role models would assist opportunity recognition skills. Other research including Ucbasaran (2003) had suggested that human capital would be a more significant moderator in the entrepreneurial process. It could be concluded that the relative simplicity of the entrepreneurial businesses launched by the nascent entrepreneurs in this study had an impact on the role played by human capital.

6.1.4 Conclusions on the contribution to knowledge of this thesis

Figure 6.1.4 below provides an illustrative representation of the impact of individual cognition on the founding and survival of small businesses. This model assumes a linear relationship from the founding stage to the survival stages of the business creation process.

The first contribution to knowledge that results from this thesis is the suggestion that greater emphasis should be placed on the conceptualisation of the nascent entrepreneur as defined by their cognitive style. This thesis identified that the role of individual cognition was strong in the founding process as it strongly influenced the approach that nascent entrepreneurs took during the founding process.
A significant contribution to knowledge has been made by identifying that nascent entrepreneurs engage in the founding process in different ways according to their cognitive style. These differences affect the way the nascent entrepreneur views and reacts to bureaucracy. It also significantly impacts on the way that nascent entrepreneurs seek assistance in the formation of their businesses. This has implications for practice and the business start-up agencies. It may be that different programmes of support need to be devised to meet the different needs of analytic and intuitive nascent entrepreneurs. This research suggests that intuitive nascent entrepreneurs require assistance in the management of their business. Alternatively analytic nascent entrepreneurs who find opportunity identification harder than their intuitive counterparts may need assistance in the generation of new business ideas. The nature of the business ideas may also depend upon the cognitive style of the nascent entrepreneur. The intuitive nascent entrepreneur may create a business that extends the boundaries of creativity through the generation or identification of new business ideas that are unique and inimitable.

A further contribution to knowledge identified in this thesis is the important role played by moderators on the nascent entrepreneur within the founding process. These moderators have been identified from both the behavioural and psychological domains. The findings of this research have also indicated that the influence of these moderators on the nascent entrepreneur is not equal. This research categorises these moderators in terms of the strength of their impact on the nascent entrepreneur. Irrespective of the strength of the moderator it is believed that this influence is pervasive across the founding and survival process. Counterfactual thinking and human and social capital were identified as weaker moderators. Self-efficacy and proactive personality were significant moderators on both the nascent entrepreneur and in turn the founding and survival process.
The main focus of this thesis was on the impact of cognitive style on the founding process of the business venture. Using the results from this thesis and applying existing cognitive style theory from the literature it is possible to extend this model to the launch and survival phases. Within the launch process stage of figure 6.1.4 cognitive style theory suggests that the creativity displayed by the intuitive nascent entrepreneur may also extend to the number of ideas generated. This proliferation may well result from the instinctive nature of the individual. This risks the possibility that ideas may lack commercial viability. The analytic nascent entrepreneur may find opportunity identification harder. They may prefer to stay within the boundary of their existing knowledge. They may identify fewer opportunities but with a greater consideration of the business idea resulting in greater commercial viability. In individual terms the intuitive nascent entrepreneur may appear abrasive or impatient, whereas the analytic nascent entrepreneur may appear more conforming, stable and patient (Kirton, 1976). These features are continued in the survival process. Although not the main objective of this thesis the impact of cognition on the survival process is no less interesting and important. It can be argued that it is at the survival stage that the true dynamism of the intuitive entrepreneur becomes apparent. It is at this point where most of the research on entrepreneurial cognition in the extant literature has been conducted. Although hampered by a lack of planning, but crucially with increased experience and knowledge, the intuitive entrepreneur continues to identify opportunities and think creatively. This results in the launch of subsequent business that were identified by Allinson & Hayes (2000) and Buttner & Gryskiewicz (1993). The analytic entrepreneur moves away for the identification of opportunities into an administrative role where the efficiency of existing opportunities rather than the identification of new ones take prime importance.
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Figure 6.1. A model of the impact of individual cognition on the founding and survival of small businesses.

Cognitive Style
- Intuitive/Innovative
- Analytic/Adaptive

Founding Process
- Intuitive
  - Dislikes structure and bureaucracy.
  - Eschewed NES & New deal formal start-up programmes.
  - Paradigm breaking creativity.
  - Acts on instinct
  - Find opportunity identification easy

- Analytic
  - Tolerant of bureaucracy.
  - Structured approach.
  - Participated in formal NES and New-deal start-up programmes.
  - Creative within existing contexts.
  - Acts after consideration
  - Opportunities harder to identify

Strong Moderators:
- Self-Efficacy
- Proactive Personality

Launch Process
- Intuitive
  - Multiple ideas generated
  - Innovative businesses
  - May lack commercial reality
  - Venture may be seen as more 'risky'
  - Can be abrasive and impatient

- Analytic
  - Fewer ideas generated
  - Replication businesses
  - Rooted in reality
  - Based on business principles, well planned
  - Seen as patient, stable and conforming

Survival Process
- Intuitive
  - Susceptible to boredom in admin tasks.
  - Can lack focus and planning
  - Continue to identify new opportunities
  - Flexibility of thinking

- Analytic
  - Comfortable with the routine of admin tasks.
  - Focused on the business plan.
  - Ensure efficiency of existing opportunities.
  - Thinking can become entrenched

Weak Moderators:
- Human/Social Capital
- Counterfactual Thinking
6.1.5 Conclusions on the contribution to practise of this thesis

This thesis represents a significant contribution to the theory of nascent entrepreneurship. However, the findings also have implications for practise. The findings suggest that cognitive style significantly impacts on the way in which nascent entrepreneurs seek assistance in the formation of their businesses. This has implications for policy-making and the business development and support agencies. A clear implication of this research suggests that the intuitive nascent entrepreneur is deterred from attending business start-up courses and activities as a result of the highly structured nature of these events. Cognitive style theory asserts such structured and bureaucratic events are boring and creatively constraining to the intuitive nascent entrepreneur. An example of this comes from the New Entrepreneur Scholarship (NES) which was one of the organisations that participated in this research. Participating in NES requires the nascent entrepreneur to attend an induction event that lasts one and a half days and this does not include any discussion of their business ideas. The start-up course involves ninety hours of structured training over six months including a number of 'guest lectures' and additional 'private study'. Funding for the start-up is also available but this is not in the form of an awarded grant but rather a credit which is held by the support agency. The nascent entrepreneur must then apply to access this credit with the administration being controlled by the support agency. Such structures, bureaucracy and control are an anathema to the intuitive nascent entrepreneur.

The findings suggest that enterprise agencies need to be aware that different programmes of support need to be devised to meet the differing needs of the analytic and intuitive nascent entrepreneur. This research shows that intuitive nascent entrepreneurs require assistance in the management of their business. However this support should have a contact strategy that meets the needs of intuitive nascent entrepreneurs. These could
involve shorter contact times with practical training focused on the needs of the entrepreneur and their business. The analytic nascent entrepreneur has different needs. Analytic nascent entrepreneurs find opportunity identification harder than their intuitive counterparts and may need assistance in the generation of new business ideas. This could be achieved through training in creative thinking techniques such as mind-mapping.

Riding and Sadler-Smith (1992) argue that cognitive style has important implications for the design of learning materials. They suggest that Wholists may have trouble disembedding information and may require instructional material to help them see the structure and sections of the learning material. Analysts who prefer to see situations as a series of parts will have problems integrating the whole and will require a unifying overview to help them integrate the sections as a whole. Teachers and trainers, they contend, should be aware of individual differences and aim to accommodate these in instructional programmes.

Fundamental changes at a policy-making level would need to be made in order to reduce the level of bureaucracy associated with enterprise support. Bureaucratic structures are put in place with the best of intentions to protect public funds from miss allocation and to ensure that targets are met. Policy makers need to be made aware that the justifiable desire to protect public funds may be alienating the very people these funds are created to support.

6.2 Limitations of this research

Nascent entrepreneurs are a difficult data set to identify. The transitory nature of nascent entrepreneurship means that in some instances entrepreneurs are nascent for a very short period of time. It was necessary therefore to identify research sites that would be associated with the nascent stage. Although it was not known at the time the decision to use assisted
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programmes as research sites has influenced this thesis. The assisted programme research sites have provided an unexpectedly analytic research data set. However, it can be argued that this has been useful as it has highlighted the differences between intuitive and analytic nascent entrepreneurs. To reduce such a limiting factor in the future some method of identifying intuitive nascent entrepreneurs needs to be identified without resorting to retrospective studies. Another difficulty associated with entrepreneurs is their reticence to engage in academic research. Of the 695 questionnaires distributed to established entrepreneurs only 138 questionnaires were returned a response rate of 19.86%. Therefore, 80.14% of those surveyed did not return the questionnaire. This could lead to concerns of non-response bias, which suggests that subjects who returned questionnaires may somehow different from those that did not. Hager et al (2003) argue that this can compromise the researchers ability to validate their claims about a particular population. Another consideration with a low response rate is its impact on the validity through the greater threat of bias. The literature is inconsistent in what constitutes an acceptable response rate Babbie (1990) suggest 50% is adequate, Bailey (1987) argues that for individual research a response rate of 75% is required. However for organisational research acceptable return rates are much lower. Baldauf et al (1999) argue that response rates of 15% are adequate. Dillman (2000) and Diamantopoulos and Schlegelmilch (1996) suggest ways in which response rates can be improved. Some of their suggestions were incorporated into the contact strategy which included a carefully composed covering letter and a reply paid envelope. The length of the study may also have impacted on response rates although research findings are inconsistent. Jobber (1989) reported that instrument length had no impact on response rates. However both Greer et al (2000) and Diamantopoulos and Schlegelmilch (1996) contend that content, and format and important considerations in improving response rates. It could be argued that greater consideration of
the format and layout of the questionnaires in the study and a more interactive contact strategy may have improved response rates from this data set.

This thesis has implied that all businesses founded, irrespective of the size or the complexity of their launch or market conditions should be treated equally. No distinction was made between simple and complex businesses. The entrepreneurship literature has argued (Shane and Venkataraman, 2000) that complex and simple businesses need to be distinguished as both require different levels of opportunity identification. Some businesses replicate those existing in the market and others are highly innovative. As this study is primarily concerned with the cognitive style of the individual entrepreneur, it was decided that all businesses launched would be treated equally. One problem in making this distinguishing judgement in nascent entrepreneurship is the transitory nature of the entrepreneurial decision-making in such a complex and dynamic environment. Often nascent entrepreneurs refine their business idea throughout the launch phase. Indeed, it could be argued that through experience and the rapid development of networks it is valuable that this should happen. Therefore, the initial business idea may change significantly through the nascent phase. This makes such judgements very difficult. However, it could be argued that some future research into the individual nature of the business should be investigated.

The data collected in this research was through a cross-sectional correlational survey. Responses were largely collected using self-report questionnaires. Although care was taken in the research design to ensure that the instruments used displayed adequate validity and reliability the use of self-report questionnaires is an area of some contention within the literature. Spector (1994) contends that concerns over method variance and mono-method bias have caused self-report questionnaires to fall into disrepute. He argues these objections
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are particularly strongly directed to cross-sectional research designs where all data is collected at a single point in time. Fortunately in studies such as this thesis which have a longitudinal element Spector argues that more confident conclusions can be made about causal relationships. Spector also argues that cross-sectional self-report questionnaires represent an acceptable way of initiating research into a phenomenon of interest. It can therefore be argued that in an under researched topic like nascent entrepreneurship such methodologies represent an important first step in the research process.

The measures of human capital used in this study were derived from an exhaustive review of the literature. All the measures used have been reproduced in published research. However, human capital is not assessed using a unified measure that has been tested. There is a potential weakness in choosing a series of aspects of human capital that inappropriate choices can be made and more seriously that influential aspects of human may be omitted.

Although this thesis contains an aspect of a longitudinal study it could be argued that greater attention needs to be paid to this aspect of the research and that six months constitutes only the very minimum time period. A time frame of up to three years although unachievable in this thesis would have been more desirable.

6.3 Recommendations for further research

6.3.1 Recommendations relating to cognitive style

Any replication study would need to determine if the skew towards the analytic observed in the sample of nascent entrepreneurs is a feature of this research alone or if it is generalisable to the wider nascent entrepreneur population. Future studies could attempt to compensate for any potential skew by administering a measure of cognitive style as a
method of screening respondents to ensure equal numbers of analytic and intuitive respondents are researched.

Any future analysis could usefully determine if the types of businesses launched vary depending upon the cognitive style of the entrepreneur. Do intuitive business entrepreneurs launch more creative businesses than analytic entrepreneurs? Are intuitive founded businesses more novel and paradigm breaking as could be hypothesised? Alternatively do analytic individuals launch replication businesses? How does this link to creativity? Kirton (1976) would argue that both cognitive types are capable of creativity but that it is the boundary's to creativity that may vary. An analysis of this boundary would represent an interesting and useful further study.

If intuitive/innovative entrepreneurs are launching businesses in a different manner to analytic entrepreneurs how does this differ? Do differences in cognitive style differentiate the characteristics of the launch process, if so how? Future studies could look at the implications for practice and business support? This study demonstrated that the business support offered to nascent entrepreneurs in this research were attractive to analytic entrepreneurs but not intuitive entrepreneurs. Do intuitive entrepreneurs seek assistance in different ways to their analytic counterparts?

This research indicated that there was no significant difference in cognitive style between those individuals who successfully launched their own business and those that did not. It would be useful if replication studies paid greater attention to this aspect of research. Additionally it would be beneficial if greater analysis of the analytic and intuitive businesses was conducted. This research could to determine if cognition impacts on success over an extended period of time.
Research sites encouraged the participation of individuals with some type of social exclusion. Although theory had identified that there is no link between cognitive style and intelligence very little research has been conducted relating to cognitive style and social exclusion. This would be a fruitful investigation and would have implications across the cognitive style research agenda.

This research questions whether intuitive nascent entrepreneurs really do start more businesses than adaptive nascent entrepreneurs. It is important to note that in this study particular reference is being made to first time nascent entrepreneurs. Previous research was largely conducted in studies where intuitive entrepreneurs were launching further businesses. The extent to which this is generalisable to first time entrepreneurs is questioned. The difference between first time entrepreneurs and established entrepreneurs needs to be investigated. It can also be argued that there is a definitional issue. The term nascent entrepreneur does not distinguish between an individual launching their first business and any subsequent businesses. It could be argued that experienced entrepreneurs utilise cognitive schema, experience and greater levels of human capital and network support which can be employed to assist in the business launch. It could be argued that this has led to confusion in the literature. Attention should be paid to either the creation of distinct terms for inexperienced and experienced nascent entrepreneurs. It can also be argued that researchers need to indicate a clear differentiation between the two terms.

A working hypothesis suggests that two types of nascent entrepreneur exist and that these types can be differentiated by their cognitive style. Greater research needs to be conducted to determine if these entrepreneurial types accurately match these cognitive style characteristics.
Although it was argued that there was no theoretical link between an individual's cognitive style and their proactive personality this thesis has identified at a definitional level that similarities do exist. It is also suggested that the two constructs may be mutually compatible and may indeed work together to support the entrepreneur. The learned behaviours of proactive personality may work with the more instinctive cognitive style to moderate behaviours. The cognitive style literature clearly suggests that cognitive strategies can be used to assist the individual to work outside their preferred cognitive style. Further research needs to be conducted to determine if proactive personality can also act as a mechanism for moderating behaviour to assist the entrepreneur in new or uncertain situations.

6.3.2 Recommendations relating to opportunity identification

It has been hypothesised that there would be a significant link between an individual's self-efficacy and their ability to recognise opportunities. A number of authors had suggested such a relationship. Although this was identified the strength of the correlation was surprisingly low. It is argued therefore that while supporting the assertions of other authors that a relationship exists between ESE and opportunity recognition future research should identify the nature and importance of this link.

The literature had indicated that there would be a significant link between an individual's cognitive style and their ability to recognise opportunities. This research indicated that this was only partially true. Both the analytic and intuitive subjects reported higher self-assessed opportunity recognition skills than a control group of non-entrepreneurs. Further research needs to be conducted to establish if high self-assessed opportunity recognition is a feature of entrepreneurs only or if this is also demonstrated among other managers or more widely replicated among the general population. Furthermore, research needs to be conducted
identifying the differences in the nature of the opportunities identified by analytic or intuitive entrepreneurs. It could be hypothesised that both types of nascent entrepreneur recognise opportunities but that those of the intuitive entrepreneur will be formed through the adoption of a more extensive creative boundary. Further research needs to be conducted on the contention that opportunity recognition skills are symptomatic of all entrepreneurs and that cognitive strategies are employed by the analytic sample to overcome their opportunity recognition deficiencies. The impact of cognitive strategies on opportunity recognition would be a fruitful investigation. It would also be helpful for researchers who are investigating the importance of cognitive schema on opportunity recognition among established entrepreneurs to widen their research to include nascent entrepreneurs.

6.3.3 Other recommendations

This research is one of very few projects investigating nascent entrepreneurship. The results indicate that the novice nascent entrepreneur is different from the experienced nascent entrepreneur and their established entrepreneur counterparts. Although in many ways similar there are distinct differences at this early stage. There needs to be far greater research into nascent entrepreneurship to identify and more clearly explain these differences.
Appendix 1 The Cognitive Style Index

COGNITIVE STYLE INDEX

<table>
<thead>
<tr>
<th>NAME</th>
<th>AGE</th>
<th>OCCUPATION</th>
<th>SEX</th>
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People differ in the way they think about problems. Overleaf are 38 statements designed to identify your own approach. If you believe that a statement is true about you, answer T. If you believe that it is false about you, answer F. If you are uncertain whether it is true or false, answer ?. This is not a test of your ability, and there are no right or wrong answers. Simply choose the one response which comes closest to your own opinion. Work quickly, giving your first reaction in each case, and make sure that you respond to every statement. Indicate your answer by completely filling in the appropriate Box opposite the statement:

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<th>T</th>
<th>?</th>
<th>F</th>
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<tbody>
<tr>
<td>1. In my experience, rational thought is the only realistic basis for making decisions.</td>
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<tr>
<td>2. To solve a problem, I have to study each part of it in detail.</td>
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<tr>
<td>3. I am most effective when my work involves a clear sequence of tasks to be performed.</td>
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<tr>
<td>4. I have difficulty working with people who 'dive in at the deep end' without considering the finer aspects of the problem.</td>
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<tr>
<td>5. I am careful to follow rules and regulations at work.</td>
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<tr>
<td>6. I avoid taking a course of action if the odds are against its success.</td>
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<tr>
<td>7. I am inclined to scan through reports rather than read them in detail.</td>
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</tr>
<tr>
<td>8. My understanding of a problem tends to come more from thorough analysis than flashes of insight.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I try to keep to a regular routine in my work.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. The kind of work I like best is that which requires a logical, step-by-step approach.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. I rarely make 'off the top of the head' decisions.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. I prefer chaotic action to orderly inaction.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Given enough time, I would consider every situation from all angles.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. To be successful in my work, I find that it is important to avoid hurting other people's feelings.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. The best way for me to understand a problem is to break it down into its constituent parts.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A Psychometric Analysis of Nascent Entrepreneurs: Understanding the impact of individual entrepreneurial cognition on the founding and survival of new small businesses.

<table>
<thead>
<tr>
<th></th>
<th>T</th>
<th>?</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.</td>
<td>I find that to adopt a careful, analytical approach to making decisions takes too long.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>I make most progress when I take calculated risks.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>I find that it is possible to be too organised when performing certain kinds of task.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>I always pay attention to detail before I reach a conclusion.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>I make many of my decisions on the basis of intuition.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>My philosophy is that it is better to be safe than risk being sorry.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>When making a decision, I take my time and thoroughly consider all relevant factors.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>I get on best with quiet, thoughtful people.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>I would rather that my life was unpredictable than that it followed a regular pattern.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>Most people regard me as a logical thinker.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>To fully understand the facts I need a good theory.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td>I work best with people who are spontaneous.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td>I find detailed, methodical work satisfying.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td>My approach to solving a problem is to focus on one part at a time.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td>I am constantly on the lookout for new experiences.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31.</td>
<td>In meetings, I have more to say than most.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32.</td>
<td>My 'gut feeling' is just as good a basis for decision making as careful analysis.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33.</td>
<td>I am the kind of person who casts caution to the wind.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34.</td>
<td>I make decisions and get on with things rather than analyse every last detail.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35.</td>
<td>I am always prepared to take a gamble.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36.</td>
<td>Formal plans are more of a hindrance than a help in my work.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37.</td>
<td>I am more at home with ideas rather than facts and figures.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38.</td>
<td>I find that 'too much analysis results in paralysis'.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Appendix 2 The Kirton Adaptation-Innovation Index

How easy or difficult do you find it to present yourself consistently over a long period as:

1. A person who is patient
2. A person who conforms
3. A person who when stuck will always think of something
4. A person who enjoys the detailed work
5. A person who would sooner create something than improve it
6. A person who is prudent when dealing with authority or general opinion
7. A person who never acts without proper authority
8. A person who never seeks to bend (much less break) the rules
9. A person who likes bosses and work patterns which are consistent
10. A person who holds back ideas until they are obviously needed
11. A person who has a fresh perspectives on old problems
12. A person who likes to vary set routines at a moment's notice
13. A person who prefers changes to occur gradually
14. A person who is thorough
15. A person who is a steady plodder
16. A person who copes with several new ideas and problems at the same time
17. A person who is consistent
18. A person who is able to stand out in disagreement alone against a group of equals and seniors.
19. A person who is stimulating
20. A person who readily agrees with the team at work
21. A person who has original ideas
22. A person who masters all details painstakingly
23. A person who proliferates ideas
24. A person who prefers to work at one problem at a time
25. A person who is methodical and systematic
26. A person who often risks doing things differently
27. A person who works without deviation in a prescribed way
28. A person who likes to impose strict order on matters within their own control
29. A person who likes the protection of precise instructions
30. A person who fits readily into 'The System'.
31. A person who needs the stimulation of frequent change
32. A person who prefers colleagues who never 'rock the boat'.
33. A person who is predictable
Appendix 3 Proactive Personality Scale

Proactive Personality Scale

Please answer these items carefully but do not spend too much time on any one item. Be sure to answer every item. Also try to respond to each item independently when making your choice; do not be influenced by your previous choices. There are no right or wrong answers; we really just want to know what people think about a number of issues. Please indicate your agreement or disagreement with each of the following statements. Circle a number from 1 to 7 to indicate the extent to which you disagree or agree with the statement.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Neither Agree Nor Disagree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) I am constantly on the lookout for new ways to improve my life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2) Wherever I have been, I have been a powerful force for constructive change.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3) Nothing is more exciting than seeing my ideas turn into reality.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4) If I see something I don’t like, I fix it.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5) No matter what the odds, if I believe in something I will make it happen.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6) I love being a champion for my ideas, even against others’ opposition.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7) I excel at identifying opportunities.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8) I am always looking for better ways to do things.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9) If I believe in an idea, no obstacle will prevent me from making it happen.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10) I can spot a good opportunity long before others can.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Please ensure you have answered all the questions.
Appendix 4 The Global Regret Scale

Please indicate the extent to which you agree with each of the following statements (circle one number for each item).

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7 = Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I regret a lot of my actions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>2. I wish I could live parts of my life over again.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>3. I think &quot;if only&quot; a lot.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>4. I prefer to focus on the future rather than the past.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>5. I rarely think about what might have been.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>6. &quot;With no regrets&quot; is how I like to approach life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

Appendix 5 General Self-efficacy

Please indicate the extent to which you agree with each of the following statements (circle one number for each item).

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7 = Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am strong enough to overcome life's struggles</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>2. At root, I am a weak person</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>3. I can handle the situations that life brings</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>4. I usually feel that I am an unsuccessful person</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>5. I often feel that there is nothing I can do well</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>6. I feel competent to deal effectively with the real world</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>7. I often feel like a failure</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>8. I usually feel I can handle the typical problems that come up in life</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>
Appendix 6 Opportunity Identification

Opportunity Identification

Please answer these items carefully but do not spend too much time on any one item. Be sure to answer every item. Also try to respond to each item independently when making your choice; do not be influenced by your previous choices. There are no right or wrong answers; we really just want to know what people think about a number of issues. Please indicate your agreement or disagreement with each of the following statements. Circle a number from 1 to 5 to indicate the extent to which you disagree or agree with the statement.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Partly Disagree</th>
<th>Neutral</th>
<th>Partly Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>One of my greatest strengths is identifying goods and services people want.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>I make resource allocation decisions that achieve maximum resources with minimum resources.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>I accurately perceive unmet customer needs.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td>One of my greatest strengths is organising resources and co-ordinating tasks.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5.</td>
<td>One of my greatest strengths is my ability to supervise, influence and lead people.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6.</td>
<td>One of my greatest strengths is achieving results by organising and motivating people.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7.</td>
<td>One of my greatest strengths is my expertise in a technical or functional area.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8.</td>
<td>One of my greatest strengths is my ability to delegate effectively.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9.</td>
<td>One of my greatest strengths is my ability to seize high quality business opportunities.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10.</td>
<td>One of my greatest strengths is my ability to develop goods or services that are technically superior.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11.</td>
<td>I have a special alertness or sensitivity towards spotting opportunities.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12.</td>
<td>I can usually spot a real opportunity better than professional researchers/analysts.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
Appendix 7 Measures of Human Capital

The measure of human capital was disseminated from the entrepreneurship literature.

1. Have you ever started your own business before? Yes No

2. If Yes, What was the nature of the business(es)?
   1. ....................................
   2. ....................................
   3. ....................................

   Please list all your previous businesses

3. When you launched your business did you have a significant role model such as a parent or close relative who owned their own business? Yes No

4. a) What is your highest educational attainment?

   Secondary School □  Further Education □  Degree □  Postgraduate □
   Technical Qualification □  Other □

   (b) How many years of education have you had?

5. (a) What was your previous occupation? .........................................................

5. (b) What is your current occupation? ............................................................

5. (c) At what level?

   Worker □  Supervisor □  Manager □  Director □  Other □

6. How many years work experience do you have?

References:
Questions 1 & 2 suggested by Arenius & Minniti (2005)
Questions 3 to 6 developed by Ucbasaran et al (2004)
A Psychometric Analysis of Nascent Entrepreneurs: Understanding the impact of individual entrepreneurial cognition on the founding and survival of new small businesses.

Assistance received in starting the business

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Partly Disagree</th>
<th>Neutral</th>
<th>Partly Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Advice is crucial for the growth of the business (i)</td>
<td>1  2  3  4  5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I frequently try to establish/develop new contacts (i)</td>
<td>1  2  3  4  5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The idea for my business was mine alone (ii)</td>
<td>1  2  3  4  5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

References

(i) Birley & Westhead (1994)

Network Support

Please indicate the level of support you have received from the following people?

<table>
<thead>
<tr>
<th>People</th>
<th>No Support</th>
<th>Moderate</th>
<th>Full Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your spouse/life partner</td>
<td>1  2  3  4  5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents</td>
<td>1  2  3  4  5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friends</td>
<td>1  2  3  4  5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relatives</td>
<td>1  2  3  4  5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business Partners</td>
<td>1  2  3  4  5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acquaintances</td>
<td>1  2  3  4  5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Former Employers</td>
<td>1  2  3  4  5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Former Co-Workers</td>
<td>1  2  3  4  5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reference:
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A Psychometric Analysis of Nascent Entrepreneurs: Understanding the impact of individual entrepreneurial cognition on the founding and survival of new small businesses.

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