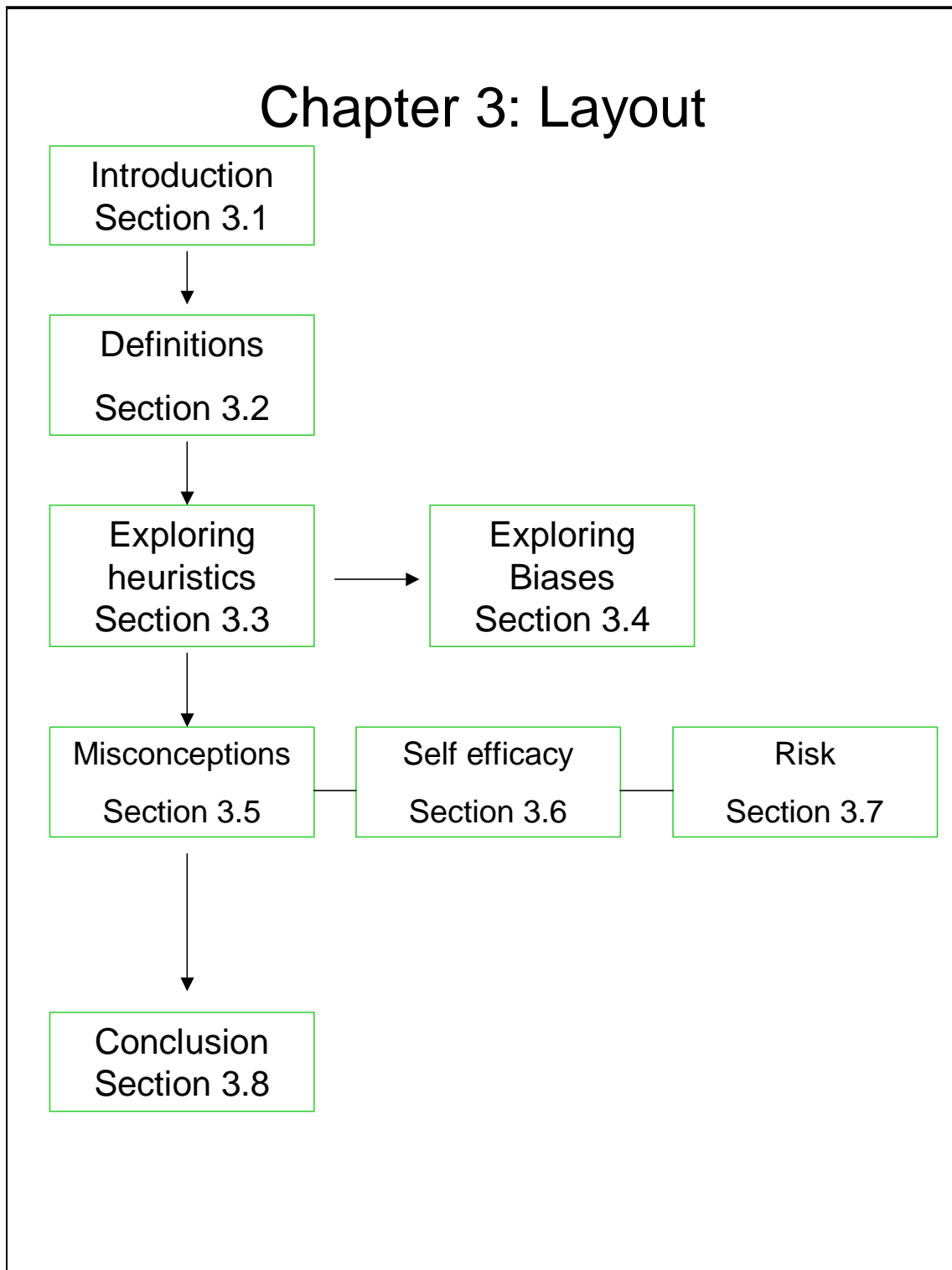


Chapter 3: Cognition, heuristics and biases



3.1 Introduction

The field of entrepreneurship seeks to understand how opportunities are discovered, created and exploited (Markman, Balkin & Baron, 2002: 149). The cognitive perspective, on the other hand, emphasises the fact that mental processes include everything we think, say or do during the start-up process. These mental processes also include the cognitive mechanisms (styles) through which we acquire, store, transform and use information (Baron, 2004: 221).

The cognitive perspective provides us with useful lenses (patterns) with which to explore entrepreneur-related phenomena and to address some meaningful issues that we have not been able to probe effectively up to now (Mitchell et al 2002: 93). Shepherd & Krueger (2002: 177) agree that social cognition research helps to give direction to the study of entrepreneurial thinking. Pretorius, Le Roux & Millard (2004: 3) also quote the remark of Gatewood, Shaver, Powers & Gartner (2002: 187) that recent research has demonstrated the impact that cognitive and social processes have on entrepreneurial behaviour.

Although cognitive research has been going on for over a century, research in the entrepreneurial domain has prospered over the last two decades (Baron, 1998: 278). Pretorius et al (2004: 3) quote several authors who have identified different areas specifically relevant to entrepreneurship:

- Our capacity to process new information about the world around us is severely limited and can be readily exceeded (Baron, 1998: 278)
- As human beings we seek to minimise cognitive effort in coping with the information overload. As a result, we often use various heuristics (shortcuts) in our thinking techniques that reduce mental effort (Baron, 1998: 278)
- Because of our limited information-processing capacity and our tendency to minimise mental effort and several other factors (e.g. the powerful

impact of emotions on thought), we are often less than totally rational in our thinking (Baron, 1998: 278)

- Various aspects of human cognition are subject to a wide range of biases and errors (Baron, 1998: 278)
- The environment in which entrepreneurs operate is complex and demands quick decisions; the concepts of cognitive psychology are increasingly being found to be useful tools for probing entrepreneurial related phenomena
- The role of intuitive (sensing) rather than rational (thinking) on decision-making is underestimated (Hayes & Allison 1994: 59)
- The rich, broad field of social cognition literature gives us several new insights into how to develop an entrepreneurial-friendly “cognitive infrastructure” at both self and collective efficacy level (Shepherd & Krueger, 2002: 177).
- When receiving equivocal information, individuals are likely to perceive that which they are predisposed to see (Palich & Bagby, 1995: 59). Such predispositions and preferences for information have been categorised by Herrmann (1996) into four categories: factual, procedural, affective and imaginative information (see Chapter 2).

According to Baron (2004: 237), the cognitive perspective should be viewed as complementary to, rather than incompatible with, other points of view in entrepreneurship such as personality and characteristic traits. The cognitive perspective may provide additional insight into the complex process of entrepreneurship.

The failure of past research into the “entrepreneurial personality” to clearly distinguish the unique contribution of the entrepreneur as a person to the entrepreneurial process has created a vacuum within the entrepreneurship literature that is waiting to be filled. Research in entrepreneurial cognition aims to understand how entrepreneurs use simplifying models to piece together previously unconnected information that helps them to identify and invent new

products or services and to assemble the necessary resources to start and grow businesses (Mitchell et al, 2002: 97).

According to Mitchell (2002: 97), research in entrepreneurial cognition emerged in the mid-1990s, when some of the first work was done on cognitive biases and heuristics in strategic decision-making. In the context of past entrepreneurial cognition research, some of the problematic aspects of entrepreneurial cognitions have been argued to occur in entrepreneurial environments characterised by information overload, high uncertainty, strong emotions, time pressure and fatigue. These include counterfactual thinking, affect infusion, self-serving bias, planning fallacy and self-justification (Baron, 1998: 278); overconfidence or representative errors (Busenitz & Barney, 1997); and overconfidence, illusion of control and misguided belief in the law of small numbers (Simon, et al, 2000). The work of Tversky & Kahneman over the past several decades helped to uncover systematic biases in human decision-making processes. Many of these biases, such as framing, representativeness and availability, have become well known in the literature (George, Duffy & Ahuja, 2000: 195). Markman, Baron & Balkin (2004: 2) also identified cognitive mechanisms such as alertness, overconfidence, counterfactual thinking and self-efficacy associated with one's pursuit of a new business.

The assertion of the cognitive view of entrepreneurship represents a refreshing change: the articulation of a theoretically rigorous and empirically testable approach that does systematically explain the role of the individual in the entrepreneurial process. Mitchell et al (2002: 95) reported that, based on the research they have reviewed, the cognitive viewpoint may be seen as an effective tool in probing and explaining the previously unexplained phenomena within the entrepreneurship domain.

Simon & Houghton (2002: 106), as well as Zacharakis & Shepherd (2001), assert that perceptions and biases vary according to the nature of the venture. They conclude that biases are unlikely to be universally evident. Their presence,

magnitude and consequences depend upon the decision task. They also postulate that future researchers should distinguish between different types of entrepreneurial decisions, because entrepreneurial risk-taking is situation specific.

Before the different types of heuristics and biases are reported, it is important to define some of the concepts the chapter is dealing with in order to ensure clarity.

3.2 Definitions of heuristics and bias, cognition and entrepreneurship

Heuristics, or short cuts or rules of thumb, are perceived to lead to cognitive biases or simplifying strategies. Entrepreneurs appear to make greater use of heuristics and biases, which allow for quicker information processing. Before the influence of heuristics and biases are investigated, one needs to define the concepts the study is dealing with.

The key definitions for this chapter are:

3.2.1 Heuristics and Biases

According to Gowda (1999: 59), heuristics and biases can be seen as systematic deviations from rationality in people's judgement and decision-making; they form the core of behavioural decision theory, a descriptively accurate model of human judgement and choice. For the purposes of this study, heuristics and biases are separated and dealt with individually.

3.2.1.1 Heuristics

For this study heuristics are defined as non-rational decision rules or cognitive mechanisms that simplify an entrepreneur's decision-making process. These simplifying approaches enable entrepreneurs to seize opportunities by providing

decision-making short cuts in complex decision settings (Lichtenstein, Lumpkin & Shrader (2003: 23).

The use of short cuts or heuristics is, according to Gowda (1999: 60), sometimes efficient in that they facilitate judgements without tremendous information-processing cost. They may, however, lead to inefficient or suboptimal outcomes. Thus a venture might not be started if more rational decision-making rules were used (Lichtenstein et al 2003: 23), but it might be started when heuristics were applied.

Sub-section 3.3 refers to other heuristic definitions found in the literature, by authors such as Farrel & Howorth (2002: 1), Hisrich & Peters (2002: 175), Alvarez & Busenitz (2001: 58) and Busenitz & Barney (1997: 12).

3.2.1.2 Biases

For this study biases are defined as decision-making errors. Gowda (1999: 60) quotes Camerer (1995), who postulates that when judgemental heuristics lead to suboptimal outcomes, they are termed biases.

3.2.2 Cognition and cognition psychology

Cognition and cognition psychology, on the other hand, concern themselves with the study of individual perceptions, memory and thinking. Cognition can be defined as all processes by which sensory inputs are transformed, reduced, elaborated, stored, recovered and used. Cognition psychology emerged to help explain the mental processes that occur within individuals as they interact with other people and the environment around them. The development of social psychology theory considers that individuals exist within a total situation configuration of forces described by two pairs of factors:

- Cognition and motivation

- The person in the situation

Social cognition theory, for example, introduces the idea of knowledge structures; that is, mental models / patterns (cognitions) that are ordered in such a way as to optimise personal effectiveness within a given situation. Thus, where entrepreneurship consists of individuals and teams creating work for other persons within a market environment, the concepts developed in cognitive psychology are increasingly being found to be useful tools for understanding entrepreneurial-related phenomena (Mitchell et al, 2002: 97).

3.2.3 Entrepreneurship

Entrepreneurship is a quality possessed by individuals who create opportunities where others do not, and who attempt to exploit those opportunities through various modes of organising, without regard to resources currently controlled (Mitchell et al, 2002: 96). The entrepreneurial process is explored in more detail in Chapter 4.

3.2.4 Entrepreneurial cognition

Entrepreneurial cognition can therefore be defined as the knowledge structures that entrepreneurs use to make assessments, judgements or decisions involving opportunity evaluation, venture creation and growth. In other words, research in entrepreneurial cognition is about understanding how entrepreneurs use simplifying mental models to piece together previously unconnected information that helps to identify and invent new products or services, and assemble the necessary resources to start and grow a *business*. This definition could be a useful platform for further work in this field because it incorporates thinking and perception issues developed by cognitive psychologists, while comprehending the domain of entrepreneurship research (Mitchell et al, 2002: 97).

Wright, Hoskisson, Busenitz & Dial (2000) define entrepreneurial cognition as the extensive use of individual heuristics and beliefs that impact on the decision-making process.

Baron (1998: 290) argues that the role of studying cognitive mechanisms in entrepreneurship is primarily that of formulating means for holding in check errors stemming from these cognitive mechanisms. The decisions reached by the entrepreneurs and the strategies they adopt then have an increased chance of success. Baron (1998: 289) reports an overview of cognitive mechanisms potentially relevant to entrepreneurship (see Table 3.1).

Table 3.1 Overview of cognitive mechanisms potentially relevant to entrepreneurship.

Source: Baron (1998: 289).

Mechanisms / Process	Description	Relevance to Entrepreneurship	Predictions
Counterfactual thinking	The tendency to imagine what might have been the case in a given situation.	“If only thoughts” cause individuals to feel dissatisfaction with outcomes; missed opportunities may lead to intense regrets because of lost potential benefits.	Entrepreneurs are more likely to have “if only thoughts” or regrets over missed opportunities than other people.
Affect infusion	Affective states produced by one source influence judgements and	Can lead to serious errors in judgement and decisions	Entrepreneurs engage more often in careful, effortful thought

	decisions about other, unrelated sources.	including business situations.	than other people; Entrepreneurs experience stronger emotions at work than other people; together these tendencies make them more susceptible to affect infusion.
Attributional styles	Attribution of positive outcomes to internal causes (own talent or effort) but negative outcomes to external causes (the self-serving bias).	Attributing positive outcomes to internal causes can lead to overconfidence in one's abilities; blaming others for negative outcomes.	Entrepreneurs are more prone to self-serving bias than other people. Successful entrepreneurs are less susceptible to self-serving bias than unsuccessful entrepreneurs.
Planning Fallacy	Tendency to underestimate the time it will take to complete a project or to overestimate how much can be	Unrealistic timetables for the completion of various tasks.	Entrepreneurs are more prone to the planning fallacy than other people, leading to the tendency to make overly

	accomplished in a given time.		optimistic predictions about future outcomes.
Escalation of commitment: self-justification	Tendency to keep on investing time, effort & money in losing courses of action because of the initial commitment.	Escalation of commitment can lead to a waste of resources (young companies cannot afford it); self-justification is an important factor in the above scenario.	Entrepreneurs are more susceptible to escalation of commitment effect and self-justification than other people.

Sub-sections 3.3 and 3.4 specifically deal with heuristics and biases relevant to the decision-making necessary to start a venture.

3.3 Exploring Heuristics as a construct

According to Manimala (1992: 477) the focus of entrepreneurship studies has turned to a new variable, namely entrepreneurial heuristics. The research stream is now starting to identify the fact that entrepreneurs' more prevalent use of heuristics in their decision-making process is at least a partial extension of who they are as individuals (Wright et al, 2000).

Manimala did groundbreaking work in this area in 1992. The following recent definitions by Manimala and other authors were found in the literature.

Manimala (1992: 480) defines entrepreneurial heuristics as 'thumb-rules' or decision-rules underlying entrepreneurial decision-making actions.

Busenitz & Barney (1997: 12) describe heuristics as a term used to refer to simplifying strategies individuals use to make decisions, especially in uncertain and complex conditions. In their research Busenitz & Barney (1997: 14) found that entrepreneurs use heuristics more extensively in their decision-making process than managers in larger organisations. They also assert that entrepreneurs are more prone to the use of decision-making biases and heuristics than managers in larger organisations.

According to Alvarez & Busenitz (2001: 758), the term heuristics refers to simplifying strategies which entrepreneurs utilise to make strategic decisions, especially in more complex situations when only incomplete and / or uncertain information is available.

Hisrich & Peters (2002: 175) define heuristics as: “Developing a new idea through a thought process progression”. According to these authors, heuristics relies on the entrepreneur’s ability to discover, through a series of thoughts, insight and learning. They further state that heuristics are probably used more often than we think, due to the fact that entrepreneurs often have to settle for an estimated outcome of a decision, instead of a certainty.

Farrel & Howorth (2002: 1) define heuristics as the cognitive short cuts decision-makers utilise in order to simplify information processing.

Scholars in Political Economy have long recognised that people utilise short cuts when faced with decision-making tasks that require significant processing of information. Goglia (2004: 560) also argues that heuristic processing is generally faster, so one would predict shorter reaction times to various stimuli from entrepreneurs than from others. This reaction-time measure could be used to determine whether entrepreneurs do prefer using heuristics rather than systematic processing. Utilising such short cuts is not advisable if it leads to suboptimal results and lowers a decision-maker’s efficiency (Gowda, 1999: 61).

It is clear that people rely on several important and systematic short cuts when making judgements about the probabilities of events. While such possible errors in judgement could theoretically be ameliorated through education, deviations from rationality in the realm of choices are caused by factors other than “rational laziness”. Interestingly people tend to stand by ‘inferior’ or ‘irrational’ choices even after they are made aware of their mistakes. This is because when individuals make choices, their heuristics are driven more by intuition than by cognition, that is they represent true preferences (Godwa, 1999: 63).

Baron (1998) and Busenitz & Barney (1997) state that in most research done on cognition it was assumed that all individuals tend to make heuristic decisions in a similar manner and are vulnerable to common errors. Recent research, however, indicates that entrepreneurs use heuristics more in their decision-making than do managers in established organisations. Alvarez & Busenitz (2001: 758) state that managerial cognition is based more on facts, whereas entrepreneurial cognition builds from limited or key experience and beliefs.

Katz & Shepherd (2003: 23) quote Alvarez & Busenitz, (2001) as saying that the ability to make these types of start-up decisions may actually confer advantages on entrepreneurs by making them able to undertake ventures in ways that other potential founders would be unwilling to attempt.

Entrepreneurial cognition is used here to refer to the wide-ranging use of individual heuristics and beliefs that impact on the decision-making process (Busenitz & Lau, 1996; Wright et al, 2000). Managerial cognition, on the other hand, refers to a more systematic decision-making process in which managers use accountability and compensation schemes, structural coordination of business actions across various business units, and justification of future developments using quantifiable budgets (Alvarez & Busenitz, 2001: 758)

Heuristic-based reasoning can have a huge impact on the actions of entrepreneurs, enabling them to make decisions more quickly in an effort to make

the most out of a brief window of opportunity (Tversky & Kahneman, 1974), as opposed to the cognition of managers, who use elaborate policies, procedural routines and structural mechanics that ultimately lead to the erecting of barriers to seizing innovative opportunities (Alvarez & Busenitz, 2001: 758).

According to Alvarez & Busenitz (2001: 759), the more frequent occurrence of heuristic-based reasoning in decision-making by entrepreneurs suggests that they think in a different way, guiding them to make decisions in fundamentally different ways from those who approach situations in a more factual way, for instance managers in established organisations.

This heuristic-based reasoning enables entrepreneurs to make more rapid sense out of uncertain and intricate scenarios. Such decisional approaches can guide the entrepreneur to more opportunities, faster learning and unconventional innovations.

In an empirical study, Busenitz & Barney (1997) examined the difference between entrepreneurs and managers in large organisations with respect to two biases and heuristics:

- Overconfidence (overestimating the likelihood of being right)
- Representativeness (the propensity to over-generalise from limited characteristics or observations).

They found that in these aspects entrepreneurs behave in a substantially different way from managers in large organisations.

Busenitz & Barney (1997: 758) further point out that, “With entrepreneurs in particular, the window of opportunity (see Chapter 4) would often be gone by the time all the necessary information became available for more rational decision-making. Additionally, successfully starting a new business usually involves

overcoming multiple hurdles. Using biases and heuristics as simplifying mechanisms for dealing with these multiple problems may be crucial.”

Although many types of heuristics are prevalent in the literature, this study concentrates on heuristics used in the decision-making process.

3.3.1 Major types of heuristics

Manimalas (1992) made an exceptional contribution to entrepreneurial cognition research by focusing on the correlation between individual entrepreneurial heuristics and the mainstream of information processing's focus on generalised (cognitive style) heuristics, as well as on the differences between entrepreneurial and managerial decision-making (Baron, 1998). This enabled him to make an important contribution to the growth of entrepreneurship theory, by introducing the idea that degrees of entrepreneurial innovativeness are associated with grouping of individual heuristics (Manimala, 1992: 480).

Manimala also progressed some way towards his objective by correlating specific heuristics and heuristic orientations with categories of innovativeness. His pilot study identified a list of more than 600 heuristics. Through a process of combinations and eliminations this was reduced to 186 heuristics that he subdivided into 57 categories, or as he called them, 'major heuristics'.

Vallaster (2000) summarised the categories of the major types of heuristics, per originator (author), with the effects on the strategic decision-making process (see Table 3.2). She stated that although the notion of heuristics has been accepted as a major component of the strategic decision-making process, their characteristics, evidence for their use, and directions in the use of heuristics in decision-making are generally uncertain. Table 3.2 lists key heuristics as defined by different authors. This is followed by a discussion of some of the most prominent heuristics at work in an entrepreneurial environment.

Table 3.2: Main reported generic types of cognitive heuristics

<u>AUTHOR: TVERSKY AND KAHNEMAN (1974)</u>	
<u>TYPE OF HEURISTIC</u>	<u>EFFECTS ON STRATEGIC DECISION-MAKING PROCESS</u>
Refer to past cases (hindsight heuristic)	Similar past cases are identified, using their decision outcomes as guides
Simplification	Aspects of the decision problem are intentionally ignored in order to reduce the complexity of a strategic problem
Imitation	Similar decisions taken previously are identified and adopted
Risk aversion	Small-scale experiments which relate to recent or high-profile failure cases are carried out and specified types of risk are searched
Satisfying representativeness	Decision-makers are engaged in a search for an acceptable solution rather than the optimal one; alternatives are only generated if the first possibility is rejected.
Availability heuristic	Tendency of decision-makers to recall or imagine frequently occurring events and critical incidents more easily than rare ones.
<u>AUTHOR: BARNES (1984)</u>	

<u>TYPE OF HEURISTIC</u>	<u>EFFECTS ON STRATEGIC DECISION-MAKING PROCESS</u>
Inability to understand the fundamental principle of sampling	Limited linkages between two variables might lead to actually non-existent causalities
Cooperation	Knowledge is pooled; risk is shared with competitors, customers and suppliers
<u>AUTHOR: HALEY AND STUMPF (1989)</u>	
<u>TYPE OF HEURISTIC</u>	<u>EFFECTS ON STRATEGIC DECISION-MAKING PROCESS</u>
Input biases	Decision-makers selectively rely on data due to availability, accessibility or salience of some information leading to false estimations of situations.
Operational biases	Limited samples of past data form the basis of future decisions, with errors likely to occur
Output biases	Decision-makers (un)-consciously influence the result as desired
<u>AUTHOR: SCHWENK (1984, 1986, 1988; 1996)</u>	
<u>TYPE OF HEURISTIC</u>	<u>EFFECTS ON STRATEGIC DECISION-</u>

	<u>MAKING PROCESS</u>
Escalating commitment	Overconfidence and a “loss of touch towards reality” may lead to resistance to change in the strategic decision-making approach
“Self-serving attribution patterns”	Decision-makers attribute success to own actions and qualities, whereas poor performance is generally ascribed to external factors
Biases in recollection	Decision-makers tend to recall past strategic decisions as being more rational and consistent with current strategies than they actually were

Source: Adapted from Vallaster (2000)

Many heuristics and biases are mentioned in Table 3.2, and the literature includes many more, such as reference point effect; risk seeking in the domain of losses; loss aversion, the status quo bias and the endowment effect; as well as certainty effect and zero risk bias (as described by Gowda 1999: 65). For the purposes of this study, however, only the following heuristics, namely the availability heuristic, representative heuristic and framing heuristic, will be explored further.

3.3.1.1 Availability heuristic

Definition

Tversky & Kahneman (1972) define representativeness as the tendency to assess the probability of an event’s occurrence more on the basis of its similarity to a population and the process by which it is generated than to the base rate of

its occurrence in the population (Farrel & Howorth 2002: 2). People assess the frequency of a class or the probability of an event by the ease with which instances or occurrences can be brought to mind; in other words, if people can readily think of an example of events, they will inflate their probability estimates of the likelihood of its occurrence (Gowda, 1999: 62).

The availability heuristic, according to Barnes (1984: 130), has special relevance for risk perception. The biasing effects of memorability and imaginability may pose a barrier to open and objective discussion of risk (Barnes, 1984: 130). Gowda (1999: 62) argues that the availability heuristic affects how people assess the risks associated with different causes of, for example, death. People typically rate accidents as causing as many deaths as diseases, even though diseases kill more than ten times as many people. People appear to base their judgement on media coverage, which typically devotes substantially more coverage to accidents than to disease.

Entrepreneurial Application

Events happening frequently are easier to recall and imagine than rare events. Entrepreneurs may rely more on recent knowledge or events and give them more weight than is really warranted.

On the other hand, factors such as a sharp drop in earnings also cause entrepreneurs to overreact, thus causing them to diverge from their business plan or current action plan.

3.3.1.2 Representativeness heuristic

Definition

According to Busenitz & Barney (1997: 16), decision-makers manifest this heuristic when they are willing to generalise about a person or a phenomenon on the basis of only a few attributes of the person or a few observations of the phenomenon. In short, representative heuristics can be described as the willingness of decision-makers to generalise from small, non-random samples.

For example, people ascribe characteristics to groups and subgroups based on their experiences with or perceptions of members of a group. Individuals' experiences with certain members of a group may lead to their incorrectly ascribing the characteristic to the entire population (Gowda, 1999: 62).

Entrepreneurial application

According to Katz (1992), representativeness and especially the willingness to generalise from small, non-random samples is a decision-making short cut made by entrepreneurs. In such a setting, large random samples which could reliably estimate customer demand, production costs and other key pieces of information are rarely available (Busenitz & Barney 1997: 16).

Such data collection could prematurely reveal an entrepreneur's products / technologies to competitors. This scenario may force entrepreneurs to prefer to act on small non-random samples when making a decision to start a venture or go ahead with production (Busenitz & Barney 1997: 16).

3.3.1.3 Framing heuristic

Definition

People's response to information is influenced by how that information is presented to them. An appropriate framing of information can reverse people's preferences. Pretorius et al (2004: 6) argue on the basis of the tenets of cognitive theory that entrepreneurs may simply categorise and subsequently frame the same stimuli differently from non-entrepreneurs. That is, what has been widely recognised as a propensity for risk on the part of the entrepreneur may instead be an artefact of this alternate framing.

Entrepreneurs may not necessarily prefer to engage in more risky behaviour; instead their behaviour may be the result of their framing a given situation more positively than negatively, thus focusing on the high probability of favourable outcomes and responding according to these perceptions. In contrast, non-entrepreneurs may not share this "rosy" view, leading to their reacting more cautiously (Palich & Bagby, 1995: 427).

Thinking preferences as based on the Herrmann Brain Dominance Instrument (HBDI), discussed in Chapter 2, also influence all cognitive activities, including conceptualisation in equivocal and complex situation (Maree & De Boer, 2003: 453; Alvarez & Busenitz, 2001). The tendency to be led by one's preference for certain types of information and avoidance of others when perceiving the world around us supports the argument that different individuals frame the same situation differently (Pretorius et al, 2004: 6).

Entrepreneurial Application

The question arises of whether people could learn to change the way they frame the environmental conditions to benefit the start-up decision (Pretorius et al, 2004: 6).

In conclusion, heuristics can be regarded as the cognitive short cuts decision-makers utilise in order to simplify information processing. Heuristics are employed, mainly unconsciously, to simplify the decision-making process. This strain-reducing measure may lead to suboptimal decisions. Tversky & Kahneman (1974) argue that people are more inclined to make decisions using non-statistical, inferential heuristics, “rules of thumb”, than statistical principles. A heuristic is thus a cognitive method of circumventing informational limitations. Entrepreneurs need to rely on heuristics, given the high ambiguity and uncertainty that they typically face in their quest for starting and growing a new venture, even with limited information for making convincing decisions.

3.4 Exploring biases as a construct

The following two descriptions of entrepreneurs suggest that entrepreneurs, more than other people, are exposed regularly to situations that test the limits of their cognitive capabilities and therefore increase their susceptibility to various forms of bias or errors (see Table 3.1) Baron (1998: 279).

- Schumpeter (1934: 7): “The entrepreneur seeks to reform or revolutionise the pattern of production by exploiting an invention or, more generally, an untried technological possibility.... Entrepreneurship essentially consists in doing things that are not generally done in the ordinary course of business routine.”
- Holt (1992: 11): “ Entrepreneurs are those who incubate new ideas, start enterprises based on those ideas ... have vision for growth, commitment to constructive change, persistence to gather resources and the energy to achieve unusual results.”

According to Simon & Houghton (2002: 105), entrepreneurship researchers have made great strides towards explaining why some individuals proceed with entrepreneurial action when others do not. Much of this research has concluded

that differences in individuals' perception of a potential entrepreneurial action play a major role in the decision to proceed. It was found that individuals who perceive lower risk associated with a venture are more likely to decide to start the venture. Simon & Houghton (2002: 112) also mention that numerous scholars have suggested that perceptions of feasibility and desirability lead to venture formation and other entrepreneurial activities.

Simon et al (1999: 112) state that some individuals neither comprehensively search for, nor accurately interpret, information because their cognitive capacity is limited. To cope with these limitations, they employ cognitive heuristics and simplifying strategies, which may lead to a number of cognitive biases. These cognitive biases may affect the entrepreneur's risk perception, because they might discount the negative outcomes and the uncertainty associated with their decisions, thereby underestimating the risk (Simon et al, 1999: 114). Entrepreneurs' perception may be distorted by cognitive biases such as overconfidence, a belief in small numbers, illusion of control, counterfactual reasoning, affect infusion, the planning fallacy and self-justification (Simon & Houghton, 2002: 107).

The above aspects that Baron (1998: 4) points out have specific reference to entrepreneurs, because entrepreneurs tend to maximise the impact of their biases; this is because it is not possible for entrepreneurs to make comprehensive decisions when they need to act quickly to exploit brief windows of opportunity (Busenitz & Lau, 1996).

Simon et al (1999: 113) explored in a study what influence the three biases of overconfidence, belief in the law of small numbers and illusion of control have on an entrepreneurs' risk perception and decision to start a business venture. Keh, Foo & Lim (2002) tried to replicate the research of Simon et al (1999), but also added the cognitive bias "planning fallacy" to their research.

Though biases help individuals cope with their cognitive limitations in uncertain circumstances, they may result in less rational, less comprehensive decision-making because cognitive biases systematically violate the laws of probability. Researchers who have studied cognitive biases postulate that the individual who originally founded the venture may display greater bias, because the entrepreneur's decision-making environment can be especially uncertain and complex. In these situations, cognitive biases contribute to the entrepreneurs' tendency to hold positive perceptions regarding a potential action (Simon & Houghton, 2002: 106).

Although many biases exist, this study will explore the following specific biases: the overconfidence bias; belief in small numbers bias; the illusion of control bias; and the planning fallacy bias. All four of these biases have an impact on the entrepreneur's decision to start or not to start a potential venture.

3.4.1 Specific biases

3.4.1.1 Overconfidence bias

Definition

Overconfidence, according to Zacharakis & Shepherd, (2001), refers to the failure to know the limits of one's knowledge which could lead to overestimation of one's certainty regarding facts (Simon et al, 2000; Keh et al, 2002: 128). Overconfidence was first described by Oskamp (1995), and has been shown to exist in a wide variety of settings (Lichtenstein & Fischhoff, 1977; Bazerman, 1990).

According to Busenitz & Barney (1997: 15), overconfidence exists when decision-makers are overly optimistic in their initial assessment of a situation, and are then slow to incorporate additional information about a situation into their assessment due to their overconfidence. Overconfidence seems likely to manifest itself in decisions made by entrepreneurs to a greater extent than in decisions made by managers (Busenitz & Barney, 1997: 15).

Overconfidence may occur because individuals do not sufficiently revise their initial estimates after receiving new data, therefore they do not realise to what extent their estimation may be incorrect. They tend to base their certainty on the ease with which they can recall reasons for confidence (Simon et al, 1999: 117).

The question is often asked what effect cognitive biases have on an entrepreneur's risk perception. In order to explore this phenomenon we need to take a closer look at the effect cognitive biases have on the decision to start a new venture.

Entrepreneurs exhibiting overconfidence treat their assumptions as facts, and they may not see the uncertainty associated with conclusions stemming from those assumptions (Simon et al, 2000: 5). It can be deduced that due to the entrepreneurs being overconfident about their assumptions of fact, they may perceive less risk and this in turn will increase their probability of viewing a risky business opportunity favourably, leading to the decision to start the venture.

However, to look at the other side of the coin or to view it differently, if entrepreneurs wait until all the "facts" are in before starting to convince others that the venture is indeed legitimate, the opportunity they seek to exploit (see "window of opportunity" in Chapter 4) will very likely be gone by the time the complete data set has become available (Busenitz & Barney, 1997: 15).

Entrepreneurial Application

This bias is especially common in ill-structured decision situations, such as whether to introduce a new product. Overconfidence may occur because of the certainty with which the entrepreneurs can recall reasons for their confidence (i.e. availability heuristic).

They tend not to revise their initial estimates after receiving new data, due to

their initial overconfidence, and have a tendency to seek supporting evidence instead of disconfirming evidence (Russo & Schoemaker, 1992, as quoted by Keh et al 2002: 128).

Entrepreneurs exhibiting the overconfidence bias will seek confirmation support for their decision to start or introduce a product from positive sources, rather than gathering evidence from a negative source.

3.4.1.2 The belief in the law of small numbers bias

Definition:

Belief in the law of small numbers is evident when an individual uses a limited number of information inputs (a small sample of information) to draw definitive conclusions about the much larger population (Tversky & Kahneman, 1971; Simon & Houghton, 2002: 113; Keh et al, 2002: 130). People ignore sample size in situations where it should play a role because of the representative heuristic which leads people to believe that small samples are highly representative of the population from which they were drawn. A sample may not represent the population, because small samples are variables and lack predictive validity.

Entrepreneurs who display the belief in the law of small numbers may be overly certain of their conclusions. In turn, they may not relate their conclusions about their endeavour to the base rates associated with similar endeavours about which quite a lot may be known (Simon & Houghton, 2002: 113). A statement by two people (a small sample) that a new venture will succeed may lead the entrepreneur to believe that he or she will succeed. The entrepreneur ignores the fact that over 50% of all new ventures fail (the base rate associated with similar endeavours). Using personal sources of information may lead to the belief in the law of small numbers and that they can generate rich and detailed information about a given subject.

Such individuals give more weight to information received from personal sources and they remember it more easily. According to Simon & Houghton (2002: 113), this bias is evident when an individual uses a limited number of information inputs (a small sample of information) to draw definitive conclusions about the much larger population.

A stronger belief in the law of small numbers coupled with mainly positive information is likely to induce an overly optimistic view of the venture and thus a lower perceived risk (Kahneman & Lovallo, 1993; Simon et al, 2000; Keh et al, 2002). Of course, as Busenitz & Barney (1997) point out, entrepreneurs do not have the resources to engage in systematic data collection (Keh et al, 2002: 130).

Simon et al (2000) postulate that it is more likely for entrepreneurs to receive disproportionately more positive information because failures are less likely to be well publicised. A stronger belief in the law of small numbers linked to disproportionately more positive information is likely to induce an overly optimistic view of the venture and thus lower perception of risk, making the decision to start more likely (Keh et al, 2002: 130).

Entrepreneurial Application

An example of this bias is where an entrepreneur decides to start a new business venture based on the fact that two or three individuals have said that they would be willing to buy the product from the new company.

These three people's responses do not represent the overall view of the whole population (Simon & Houghton, 2002: 115). This may cause entrepreneurs to discount more relevant statistical data about similar ventures. Market research in order to determine the real need in the market may also be ignored (Simon & Houghton, 2002: 115).

An entrepreneur who makes the decision to start a venture based on a few people's response therefore makes use of the belief in the law of small numbers bias.

3.4.1.3 Illusion of control bias

Definition

An illusion of control bias occurs when an individual overemphasises the extent to which his or her skill can increase performance in situations where chance plays a large part and skill is not necessarily the deciding factor (Langer 1975; Houghton & Aquino, 2000; Keh et al, 2002: 131; Simon & Houghton, 2002: 112; Pretorius et al, 2004: 8).

Individuals exhibiting this bias have a higher expectancy of personal success than objective probability would warrant because they believe their skills are greater than those of others. An illusion of control may play a part in a variety of strategies, ranging from making acquisitions to production innovations (Simon & Houghton, 2002: 112). In order to alleviate their own uncertainty, individuals convince themselves that they can control and accurately predict the outcomes of uncertain future events (Simon et al, 2000: 6).

Keh et al (2002: 131) postulate that individuals exhibiting an illusion of control bias will underestimate risk because they believe their skills can prevent negative occurrences.

Entrepreneurial Application

An entrepreneur will view a possible opportunity more favourably than any

other person. His belief in his personal ability and skill may lead to the assumption that he personally can see the venture through. It has been suggested (Shaver & Scott, 1991; Keh et al, 2002) that entrepreneurs show a strong preference for exerting control over their outcomes because they believe they can exert control over people and events.

According to Simon & Houghton (2002: 112), an illusion of control bias may play a part in a variety of strategies, ranging from making acquisitions to production innovation.

The illusion of control bias will enhance the entrepreneur's decision to start the venture because of his belief in his own ability, which may lead to a lower risk perception. Because of his belief in his ability to make the venture work, irrespective of other external difficulties, he will make the decision to start based on the belief that he himself is the reason for success.

3.4.1.4 Planning fallacy bias

Definition

Planning fallacy relates to the tendency of entrepreneurs to underestimate risks and overestimate the likelihood of success. The planning fallacy is described as occurring when the individual treats the current situation or decision as unique, thus isolating it from past experience, and not recognising the high levels of risk. Such individuals often forecast the future results not based on the lessons from the past, but on plans and glowing images of the future. These forecasts may be more optimistic than they should be (Baron, 1998: 285).

This indicates that entrepreneurs will perceive less risk when the planning fallacy influences them to a greater extent. According to Kahneman & Lovallo (1994), the planning fallacy can be referred to as a "cognitive blind spot". These tendencies may lead to unrealistic timetables for the completion of different tasks (Baron, 1998: 289).

Entrepreneurial Application

An entrepreneur may ignore his past failures. Instead of analysing his previous projects to gain insight into what went wrong, he may embark on a new project without even considering how he could avoid making the same mistakes again.

According to Baron (1998: 285), entrepreneurs tend to treat the current situation or decision as unique and not anchored on the lessons of the past, thus providing themselves with an optimistic image of the future outcomes.

To conclude the section on biases, we need take a closer look at findings from the previous studies on cognitive biases. Authors such as Simon et al (2000) and Keh et al (2002) came to the following conclusions:

Simon, Houghton & Aquino (2000) stated that:

- The tolerance for risk does not affect one's decision to start a venture.
- Collectively, the cognitive biases explained a significant proportion of the variance in risk perception.
- Both the illusion of control and belief in the law of small numbers lowered risk perception.
- There was no significant relationship between overconfidence and risk perception; therefore overconfidence cannot affect the decision to start a venture indirectly through risk perception.
- There was a significant relationship between risk perception and cognitive biases.
- Overconfidence was not found to be significantly related to the decision to start a venture.

The findings made by Simon, Houghton & Aquino (2000) are graphically represented in Figure 3.1

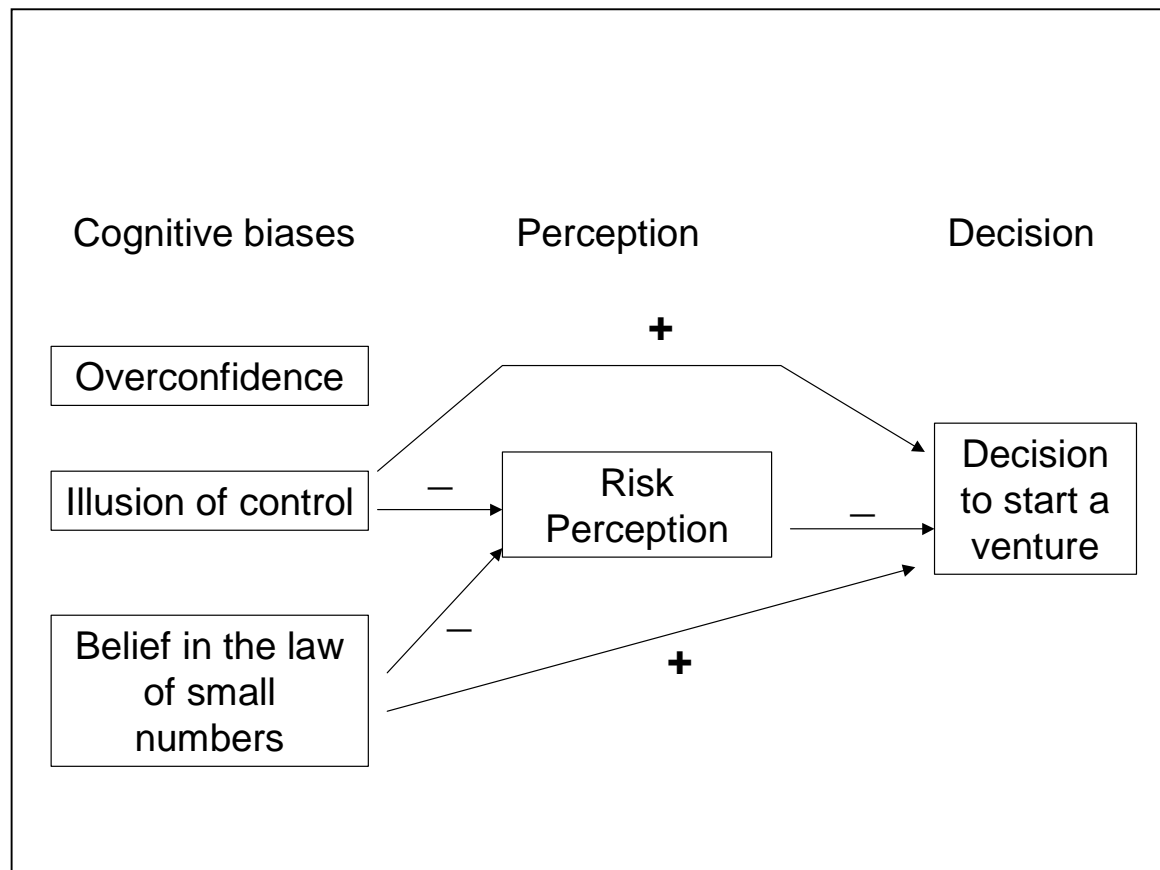


Figure 3.1 Model for the decision to start a new venture

Source: Simon et al (1999: 125)

Keh, Foo, Lim (2002: 4) stated that:

- Illusion of control and the belief in the law of small numbers have a significant relationship with opportunity evaluation.
- The effect of illusion of control on opportunity evaluation is fully mediated by risk perception.

- Belief in the law of small numbers has a direct affect on opportunity evaluation.
- The planning fallacy did not affect opportunity.

In conclusion, Lichtenstein et al (2003: 23) postulate that many benefits may accrue to entrepreneurs who rely on biases and heuristics to make decisions about launching a start-up venture. However, venture perceptions that are based on faulty assumptions must eventually be adjusted to fit environmental and market realities. According to these authors, the insights and information required to make such adjustments can be learned.

Cognitive learning is the type of learning that is most likely to be involved in reassessing biases and heuristics. Lichtenstein et al (2003: 23) quote Kim (1993) as arguing that cognitive learning occurs when there is a shift in the mental map that changes the way a problem or opportunity is perceived; no longer can the situation be viewed in the “biased” way it was seen before.

According to Drucker (1994), this approach whereby an entrepreneur’s “vision or theory” of the business must be altered in order to survive, in other words where old assumptions must be replaced by new knowledge, may seem chaotic and uncertain. For this to happen entrepreneurs must foster collaboration and creativity as well as flexibility and willingness to change (Lichtenstein, 2003: 23).

Entrepreneurial cognition plays an important role in identifying the role of the individual in the entrepreneurial process. It aids us in explaining why entrepreneurs do the things that they do. Cognitive biases help entrepreneurs to perceive less risk, causing them to be more willing to start a new venture.

It has, however, become evident that the differences between heuristics and biases as found in the literature are somewhat blurred. Some authors describe heuristics as short cuts, while others, like George et al (2000: 195) refer to

framing, representativeness and availability as biases, and yet others refer to them as heuristics (Tversky & Kahneman, 1972; Barnes, 1984; Godwin, 1999).

Gaglio (2004: 556) also argues that although the distinction between heuristic and biases is sometimes vague and somewhat blurred, it has become clear that our thinking is often strongly affected by a wide array of errors and biases – “cognitive tilts” that can lead one to faulty decisions, erroneous inferences and unrealistic expectations. It is, however, important to remember that all people make use of such thinking and that the entrepreneur is also not immune to such errors.

3.5 Misconceptions

The biases discussed above may help entrepreneurs come to conclusions more rapidly in environments that have high uncertainty. Simon & Houghton (2002: 114) postulate, however, that even though cognitive biases reduce uncertainty and improve decision-making speed they may create specific misconceptions that could lead to incorrect action.

In the whole problem of a misfit between the entrepreneurs' cognitive make-up and the varying demands of the new venture over time, the central element is the individual entrepreneur. Both Busenitz & Barney (1997) and Baron (1998) found that entrepreneurs and managers use different biases and heuristics when faced with complex situations. These findings may be explained by the fact that entrepreneurs tend to operate in more uncertain and complex environments than do other individuals (Brigham & De Castro, 2003: 42).

The interaction between the individual's dominant decision-making style, pattern or preference and the particular demands of a given situation may lead to varying degrees of fit and ultimately to either positive or negative outcomes.

3.5.1 Specific misconceptions

There are typical “errors” that people make when evaluating an opportunity. The following context-specific misperceptions under investigation are:

- Underestimating competitive response
- Overestimating demand
- Misjudging the need for complementary assets
- The concept of fit.

3.5.1.1 Underestimating competitive response

Very often entrepreneurs ignore the likelihood that the new venture will encounter substantial competition. According to Lieberman & Montgomery (1985: 5) and Simon & Houghton (2002: 114), underestimating competitive response affects the extent to which a company will gain an advantage by pioneering its product, contingent upon the actions of its competitors. In order to be successful, an entrepreneur who is a pioneer needs to do the following:

- Block the attempts of followers to imitate the offering;
- Pre-empt followers’ entry into a profitable market segment by generating loyal customers;
- Make sure that their product, not the product of late entrants, becomes the technological standard.

Entrepreneurs who pioneer face a lot of uncontrollable forces and need to partly rely on luck in order to be able to complete the above-mentioned tasks. Despite all these uncontrollable forces, pioneers still frequently fail to recognise that the actions of competitors are often beyond the firm’s / entrepreneur’s control. The underestimation of competitive response may increase the likelihood of introducing a pioneering product to the market. Biases cause individuals to

believe that competitive retaliation will not hinder their success, making them more likely to proceed with the product (Simon & Houghton, 2002: 115)

It can be suggested that entrepreneurs entering new markets neglect the probable reaction of existing firms because they believe that they have the ability to pre-empt competitors. This then may be associated with the illusion of control bias and believing that they are able to control their competitors' response (Simon & Houghton 2002: 115). Relying on the belief that the competitors' response will not affect the success of the enterprise, the entrepreneur may be more willing to proceed with the introduction of a pioneering product on the market.

Entrepreneurial Application

Pioneer entrepreneurs frequently fail to recognise that the actions of competitors are often beyond the entrepreneur's control. Entrepreneurs entering new markets may neglect the probable reaction of existing firms, believing that they have the ability to pre-empt competitors.

Biases may cause individuals to believe that competitive retaliation will not hinder their success, making them more likely to proceed with the product (Simon & Houghton, 2002: 115). This may lead to a lower risk perception when evaluating the opportunity, so that the decision to pursue is taken.

3.5.1.2 Overestimating Demand

Entrepreneurs are often overly optimistic in their perception of market acceptability. They believe that the output from this new venture will achieve its planned acceptance in the marketplace. Entrepreneurs who pioneer, do not have a pre-existing customer base for their product that they are about to release to the

market, but in order to reap the benefits of pioneering there must be a substantial demand for the product. Pioneer entrepreneurs face substantial demand uncertainty, which could lead to failure.

In order to offset the large initial capital outlay associated with pioneering, the entrepreneur counts on large sales volumes in order to recoup his expenses. Many firms fail to generate the substantial sales they anticipated because they overestimated the demand (Simon & Houghton, 2002: 115). This kind of entrepreneur is idea driven rather than demand driven.

According to Simon & Houghton (2002: 115), the belief in small numbers bias may explain why entrepreneurs overestimate demand, because individuals who utilise limited amounts of information may unintentionally select positive and not negative information, which could lead to overly optimistic forecasts of what the demand for their product and in turn their sales could be.

The overestimation of demand misconception may lead the entrepreneur who is thinking of introducing a new product on the market to proceed with the pioneering action. The belief in small numbers is less likely to occur in established firms who are introducing non-pioneering products to the market. The assumed reason for this is the fact that established firms are more likely to be guided by established demand patterns, which will guide them to estimate the probable demand for the new product introduction more accurately.

Entrepreneurial Application

Entrepreneurs often base their assumptions on the belief in small numbers or their intuitive feel about the possibility of success. Hearing positive remarks from family and friends may be enough to lead them to conclude that the whole population will feel the same way.

Simon & Houghton (2002: 115) confirm this, arguing that entrepreneurs utilise biased samples such as a few potential customers or a couple of friends. Their input may generate positive conclusions and belief that they have an adequate feel for the market.

An overestimation of demand makes entrepreneurs more likely to proceed with the venture or product because they have a lower risk perception based on hearsay and not real market research.

3.5.1.3 Misjudging the need for complementary assets

Complementary assets can include the following: sales and distribution costs, storage and stock holding and finance for slow payment. They also include financial considerations such as the necessity to adopt both a cash-flow orientation and a profit and loss orientation when judging potential new business opportunities. Projected long-term profitability (3–5 years) should also be taken into account, as well as projected short-term cash flow (start-up to 3 years).

Simon & Houghton (2002) argue that many pioneer entrepreneurs' fail because they lack complementary assets. They also postulate that in order to achieve economic success, the know-how used to develop a pioneering product must be utilised in conjunction with other complementary assets. Most scholars argue that pioneers need extensive distribution systems in order to achieve rapid market recognition and large-scale manufacturing to gain the experience curve effects. Yet many entrepreneurs still misjudge the need for complementary assets (Simon & Houghton, 2002: 116).

Misjudging the need for complementary assets can contribute to misperception by creating an overly simplistic view of a very complex situation (Simon, 2002: 116).

These miscalculations may be more likely to occur in pioneering decisions, because the entrepreneurs in pioneering decision contexts do not have other industry models to compare their product with and therefore have fewer cues regarding the potential problems of lacking complementary assets (Simon & Houghton, 2002: 116).

Entrepreneurial Application

Entrepreneurs who misjudge the need for complementary assets such as sales and distribution costs tend to direct their attention to a limited set of variables and exclude other important variables. This helps to explain why entrepreneurs fail to consider the need for adequate distribution and production facilities when deciding to proceed with actions.

Entrepreneurs also need to prepare a proper financial plan based on the anticipated complementary assets needed to determine both short- and long-term profitability. A cash-flow analysis is therefore of crucial importance.

3.5.1.4 Concept of fit

For this study the concept of fit looks at the misfit between the venture and the entrepreneurs that need to manage the new venture. The following are of importance when dealing with the concept of fit.

According to Katz & Shepherd (2003: 38), the concept of fit varies in the different fields. In strategic management, variables such as fit between the firm and its environment, strategy, structure, processes, resources and capabilities are of relevance. In the field of organisational behaviour most fit research incorporates

individual (person) variables, which are then matched with elements of the individual's work environment.

Katz & Shepherd (2003: 37) postulate that many key questions in entrepreneurship might also be successfully addressed through a fit approach. For instance questions such as the following may be asked:

- Why do entrepreneurs often make poor managers?
- Why must founders often be replaced by professional managers?

Misfit is implicit in both these questions. An assumption can be made that a greater degree of fit between the different variables involved will lead to greater venture performance.

Entrepreneurial Application

Many entrepreneurs are good at seeing the opportunity and performing activities needed to start the venture but not at managing the venture once it is up and running.

Misfit can also apply to the entrepreneur and the team and the venture team's overall managerial skills as well as those demanded by the new venture.

In conclusion we can postulate that there appears to be a relationship between cognitive biases and misconception which may lead entrepreneurs to misperceive certain factors in the business environment. Confirmation of this relation is part of this study. The small amount of research done on misconceptions led to the inconclusiveness of this construct in the empirical part of this study.

3.6 Self-efficacy

Markman et al (2003: 74) define self-efficacy as the belief in one's ability to perform certain tasks successfully. According to Urban (2004: 25), self-efficacy is an important motivational construct that influences the individual's choices, goals, emotional reactions, effort, coping and persistence. He also refers to Bandura (1986, 1997, 2001), who defines self-efficacy as individuals' conviction about their abilities.

Efficacious people are quick to take advantage of opportunity structures and figure out ways to circumvent institutional constraints or change them by collective action. Conversely, inefficacious people are less apt to exploit the enabling opportunities provided by the social system and are easily discouraged by institutional impediments (Bandura 1997: 6).

According to Urban (2004: 26), self-efficacy has become an important construct in behavioural management. Bandura (1986: 391) has defined perceived self-efficacy as "people's judgements of their capabilities to organize and execute courses of action required to attain designated types of performance". Shepherd & Kreuger (2002: 171) also quote Bandura (1991) and Wang (1995) as suggesting that people with high self-efficacy are those who have a high belief in their capacity to perform.

Self-efficacy refers to the conviction that one can successfully execute the behaviour required, or the amount of faith entrepreneurs have in their own ability to succeed (Pretorius et al, 2004: 7). Self-efficacy reflects on the perception of a person's capability to do a particular job or set of tasks. According to Markman et al (2002: 152) and Markman et al (2003: 85), self-efficacy impacts on our perceived control, how much stress, self blame and depression we experience while we cope with taxing circumstances and the level of accomplishments we realise.

Self-efficacy involves a generative capability in which cognitive, social and behavioural subskills are organised into integrated courses of action requiring perseverant effort. Self-efficacy is central to most human functioning, and since action is based more on what people believe than what is objectively true, thoughts are a potent precursor to one's level of motivation, affective states, and actions (Markman et al, 2003: 85). According to Urban (2004: 28), entrepreneurship literature has found that persons who believe that their skill and ability set is adequate for achieving success with new ventures are motivated to exert the necessary effort.

If self-efficacy impacts on career undertakings, performance and success, the question may be asked whether it also predicts or at least is related to entrepreneurial pursuits. Markman et al (2003: 85) suggest that this is the case because of the following three reasons:

- People avoid careers and environments they believe exceed their capabilities (regardless of the benefits these may hold). The higher their self-efficacy, the more challenging the activities they pursue.
- Entrepreneurs operate at the crux of change, innovation and market perturbation.
- Individuals with higher self-efficacy perform more adeptly than those with a lower self-efficacy.

Some research (Chen, Greene & Crick, 1998), as well as the pilot study of Markman et al (2004) engaging in exploitation activities, suggests that self-efficacy differentiates entrepreneurs from non-entrepreneurs. In the research done by Markman et al (2003: 92), a higher self-efficacy was reported amongst entrepreneurs than amongst other people.

3.7 Risk

Cassons (1990: 11) describes entrepreneurial risk as the insecurity that exists due to the fact that the success of market penetration can never really be determined beforehand. The correct prediction of the question by the entrepreneur would therefore be an indication of success through a decrease in risk. Hence, risk can be described as the possibility of innovation having an unwanted result (Antonites, 2004: 58). Heuristics and biases may influence the perception of the risk and its probability.

Zimmerer & Scarborough (1996: 48) regard risk as the cause of the conflict situation wherein the entrepreneur will find him/herself. Therefore all risk variables must be studied in depth with regard to the potential reward that could be a result of the venture. The authors refer to the successful entrepreneur as one who capitalises on the constructive effect of the conflict situation that originates when a certain risk is taken. This includes the decrease of the negative reaction that can develop from the accompanying exhaustion and frustration which result from continuous failure. Antonites (2004: 58) also refers to the evaluation model of Zimmerer & Scarborough (1996: 51), who argue that the following risks could occur:

3.7.1 Time risk

Time risk refers to the time implication of taking a new idea right through the product development phase until it could be considered right for the market.

3.7.2 Investment risk

Investment risk refers to the cost of establishing a new venture and whether the entrepreneur has access to enough capital to enable the venture to survive to the point of being an entrepreneurial venture.

3.7.3 Technical risk

Technical risk deals with all the technical aspects associated with the product development process in order to deliver a product that adheres to all technical quality standards.

3.7.4 Competitive risk

The possibility always exists that competitors may come up with the same or comparable products in the market, while the success rate of competitors in comparable markets is also an indication of risk. The financial depth and strength of the competitors should not be omitted, as a “follower” strategy by the competitors could pose a risk. A timely closing of the window, as mentioned in “the window of opportunity” in Chapter 4, is needed to minimise such a risk.

To decide whether an idea is an opportunity involves judgement or decisions made under conditions of uncertainty and complexity. Risk is also closely associated with uncertainty, which is whether the entrepreneur is able to successfully turn an idea into an opportunity. Because failure could lead to financial losses, perceived risk is a significant aspect of how entrepreneurs evaluate available ideas. Thus, entrepreneurs are more likely to evaluate an idea more favourably when they perceive less risk in that idea (Keh et al, 2002: 126).

An entrepreneur’s readiness to take risks also involves a preparedness to capitalise on the opportunities identified in the market. Risk taking can be referred to as calculated, thought-through and not impulsive decision-making. According to Crous, Nortje & Van der Merwe (1995: 55), entrepreneurs evaluate themselves positively regarding their ability to solve problems, their tolerance for conflict and stress, the fact that they take calculated risks and the fact that they can function despite insecurity. According to Osborne (1995: 5), successful entrepreneurs

avoid opportunities where there is a high probability that they will be unsuccessful, regardless of the reward involved.

Although risk-taking seems to be the common denominator to most definitions of entrepreneurship, Palich & Bagby (1995: 427) postulate that entrepreneurs have no greater propensity to bear risk than non-entrepreneurs. They argue that entrepreneurs may simply categorise and frame the same stimuli differently from non-entrepreneurs. They also postulate that what has been widely recognised as a propensity for risk on the part of the entrepreneur may instead be an artefact of this alternate framing. It seems that entrepreneurs may not necessarily prefer to engage in more risky behaviour, but instead their behaviour may be the result of framing a given situation more positively than negatively, focusing on the probability of favourable outcomes and responding according to these perceptions. They also argue that non-entrepreneurs may not share this “rose-tinted” view, resulting in their being more cautious.

According to Palich & Bagby (1995: 428), the characteristics reported as risk-taking are the result of systematic differences in cognitive processes. Research has shown that entrepreneurs are notably more optimistic in their assessment of business opportunities.

If we summarise Palich & Bagby’s viewpoint, it seems that they argue that although entrepreneurs are widely considered to be risk-takers, their business-related behaviours may be the result of their unique perception from systematic differences in cognitive processes, not a desire to pursue ventures because they are risky per se. In their discussions they concluded that in accordance with cognitive theory, entrepreneurs may not actually prefer to take risks but rather, due to schema accessibility, they simply tend to associate business situations with cognitive categories that suggest more favourable attributes.

Keh et al (2000: 126) also argue that less known are the antecedents of the risk perception of entrepreneurs. They quote Simon et al (2000), who have shown

that people's cognitive biases affect their decision to start a business venture and postulate that it is not certain whether entrepreneurs exhibit the same cognitive biases. Kirzner (1973) argues that entrepreneurs are entrepreneurially alert and able to discern opportunities when others do not, although this assertion has been challenged by authors such as Gaglio (1997). Researchers have found that the cognitive processes of entrepreneurs and non-entrepreneurs are different. Keh et al (2002: 126) quote Baron (1999), who postulates that entrepreneurs focus on the future and engage in less counterfactual thinking than non-entrepreneurs.

Keh et al (2002: 126) argue that various cognitive processes affect opportunity evaluation, which is mediated by the entrepreneur's risk perception. According to Das & Teng (1997), traits and cognition are two major approaches which help us to distinguish entrepreneurs from non-entrepreneurs and to understand how people make decisions (Lim et al, 2002: 126). They also quote Palich & Bagby (1995) who argue that the trait approach asserts that entrepreneurs can be recognised by traits such as risk propensity, need for achievement and locus of control. Keh et al (2002: 126) also quote Allison, Chell & Hayes (2000), who argue that the cognitive approach is concerned with the entrepreneur's preferred way of gathering, processing and evaluating information, while according to Palich & Bagby (1995), the individual constructs opportunity and risk is on his / her mind. Therefore, as Krueger (2002) points out, perception and other cognitive phenomena are critical to opportunity evaluation and risk perception (Keh et al, 2002: 126).

As previously mentioned, the research done using the trait approach has had limited success in explaining entrepreneurial behaviours and perceptions. According to Keh et al (2002: 127), the quality of decision-making can be improved with a better understanding of risk and its role in opportunity evaluation. It is obvious that entrepreneurs who perceive less risk are more likely to make risky decisions. Although there are many cognitive factors involved, Simon et al (2000) argue that the biases of overconfidence, illusion of control and belief in

small numbers directly influence risk perception and the decision to start a business (Keh, 2000: 127).

3.8 Conclusion

In conclusion, the above sections should not be interpreted to mean that we view cognitive biases in a negative light. Although they can lead to important misperceptions (Baron, 1998; Simon & Houghton, 2002), they also facilitate the entrepreneur's willingness to take risky actions that can benefit society and the firm (Busenitz & Barney, 1997; Simon & Houghton, 2002).

Gaglio (2004: 534) also argues that much of the work regarding cognitive heuristics to date has tended to focus on ways in which cognitive processes introduce bias and error into entrepreneurial reasoning. The unstated implication is that flawed reasoning may be associated with venture failure. However, the judgement and decision-making literature also notes that cognitive heuristics can have positive effects (Kahneman & Tversky, 1982) and can facilitate successful entrepreneurial activity (Gaglio, 2004: 534).

Regardless of whether the net effects of biases are positive or negative, an increased understanding of how particular biases arise and their consequences is beneficial (Simon & Houghton, 2002: 118). It is extremely difficult to minimise cognitive biases. Psychologists and others have been interested in determining how to mitigate or eliminate the effects of decision-making biases and heuristics for almost as long as such biases have been reported (George et al 2000: 195). They also quote Fischhoff, who calls the efforts to diminish the effects of biases "debiasing" and mention that "debiasing" efforts can include warnings, feedback and training.

The framework provided in this chapter might lead to more insight into possible actions that entrepreneurs may take to minimise the detrimental effects of cognitive biases, either by decreasing the chances that biases will occur or by correcting their consequences after it happens (Simon & Houghton, 2002: 118).

However, decreasing and minimising the chance that biases may occur might be detrimental because it could inhibit the actions of the entrepreneur. If insight could be gained into which misconceptions are most likely to occur, it might help entrepreneurs to cope more effectively with the subsequent problems (Simon & Houghton, 2002: 118).

Entrepreneurs may, however, have a degree of success in this regard by paying more careful attention to their search processes. For example, entrepreneurs may need to invest more time in reading statistical information, rather than talking to a few individuals, to minimise their belief in small numbers. Similarly they may want to minimise their active involvement in the search process through delegation in order to lessen their illusion of control. Identifying specific information search processes and their associated biases might prove an important first step to minimise biases, if desired (Simon & Houghton, 2002: 118).

Even though many benefits may accrue to entrepreneurs who rely on biases and heuristics to make decisions about launching a start-up, venture perceptions that are based on faulty assumptions must eventually be adjusted to fit environmental and market realities. Katz & Shepherd (2003: 23) postulate that the insights and information required to make such adjustments can be learned through cognitive learning. Cognitive learning is the type of learning most likely to be involved in reassessing heuristics and biases. Katz & Shepherd (2003: 23) quote Kim (1993) as arguing that cognitive learning occurs when there is a shift in the mental map that changes the way a problem or opportunity is perceived. The result is that the problem is no longer viewed in the biased way.