

**OPPORTUNITY IDENTIFICATION AND EXPLOITATION:
PSYCHOLOGICAL FACTORS FOR START-UP AND
SUCCESS IN ENTREPRENEURSHIP**

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CHAPTER 1

General Introduction to the Role of Psychological Factors in Entrepreneurship

1.1 Psychological Factors in Entrepreneurship

The goal of this dissertation is to investigate the phenomenon of entrepreneurship from a psychological perspective. I argue that psychological factors contribute to a better theoretical understanding of the mechanisms underlying successful entrepreneurship. Entrepreneurship can be defined as “the process of discovery, evaluation, and exploitation of opportunities” and it includes the investigation of “the set of individuals who discover, evaluate, and exploit them“ (Shane & Venkataraman, 2000, p. 218). This definition implies that entrepreneurship involves a set of behaviors that individuals have to perform. It is the individual who recognizes a situation which promises a profit and who takes the necessary actions to pursue this opportunity. Additionally, entrepreneurship research showed that under similar contextual conditions, individuals differ in their propensity to identify opportunities and different individuals identify different opportunities given the same environmental stimuli (Davidsson & Honig, 2003; Shane, 2000). Thus, it is difficult to understand entrepreneurship detached from the individual characteristics of the people who initiate and proceed through the entrepreneurial process.

Acknowledging the importance of the individual in the entrepreneurial process, researchers have focused on personality traits to distinguish between entrepreneurs and non-entrepreneurs and between successful and unsuccessful entrepreneurs (D. C. McClelland, 1967; Sexton & Bowman, 1985). Although meta-analyses showed that personality characteristics are related to entrepreneurial behavior and success (C. J. Collins, Hanges, & Locke, 2004; Rauch & Frese, 2007; Stewart & Roth, 2001; Zhao & Seibert, 2006), entrepreneurship scholars argued recently that personality characteristics

have only little theoretical and practical value because of their limited potential to predict entrepreneurship outcomes (Baum, Frese, Baron, & Katz, 2007; R. K. Mitchell et al., 2002). They further argued that to gain a thorough understanding of the mechanisms underlying entrepreneurship, it is important to identify factors that are more proximal to entrepreneurship outcomes. Given that entrepreneurship is the process of identifying, evaluating, and exploiting opportunities, two factors should be of particular relevance: cognitions and actions (Frese, 2009; McMullen & Shepherd, 2006; R. K. Mitchell et al., 2002). Entrepreneurs identify opportunities through combining and reorganizing information, for example about technological, political, societal, or demographic changes (Shane & Venkataraman, 2000). Connecting previously unconnected information to identify an opportunity is a fundamentally cognitive process (R. K. Mitchell et al., 2007). Subsequently, entrepreneurs have to act to exploit the identified opportunity. Exploiting an opportunity is a process of organizing and creating new structures which requires continuous actions to assemble the necessary resources and to prepare the implementation of the opportunity (Gartner, 1985). This is the case irrespective of whether the entrepreneur wants to start a new organization, introduce a new product, or change the method of production in an existing organization. Thus, individuals successfully accomplish the entrepreneurial tasks of identifying and exploiting opportunities through their thinking and their actions (Baum, Frese, Baron et al., 2007).

Focusing on the psychological factors of cognition and action, I draw on theories of entrepreneurial alertness (Kirzner, 1997; Shane, 2003; Shane & Venkataraman, 2000), of creative capacities (Amabile, 1983; Mumford, Mobley, Uhlman, Reiter-Palmon, & Doares, 1991), and of action regulation (Frese, 2009; Frese & Zapf, 1994; Karoly, 1993) to argue for the importance of a psychological perspective on entrepreneurship. Specifically, I want to show that the cognitive factors of creativity and goal-referent thinking as well as the behavioral factors of action planning and active information search help answering the question of why some people are more successful in identifying and exploiting opportunities than other people – a question that has been considered central in recent years by entrepreneurship scholars (Shane & Venkataraman, 2000). In addition to the question of why some people are better able to

identify and exploit opportunities, this dissertation also seeks to contribute to the stream of research investigating the mechanisms of how individual characteristics influence firm-level outcomes. Entrepreneurship may have many outcomes, such as the emergence of a new organization, product/service innovations, or venture growth in terms of sales, profits, and number of employees (R. A. Baron, 2007b; Gartner, 1985). Establishing a conceptual link between individual characteristics and entrepreneurial outcomes on the firm-level is another key area for entrepreneurship researchers to advance scientific knowledge of successful conception, launch, and operation of new organizations (R. A. Baron, 2007a).

1.2 The Importance of Entrepreneurship

This dissertation deals with the general topic of entrepreneurship because entrepreneurship has three important functions. First, entrepreneurship has an economic function. Reviews of research on the impact of entrepreneurship on economic development concluded that entrepreneurial firms highly contribute to the creation of new jobs and growth in value added (Carree & Thurik, 2003; van Praag & Versloot, 2007). Entrepreneurship exerts these positive effects on micro- and macro-levels of the economy. Entrepreneurial firms have the highest percentage growth in employment compared to other business units (van Praag & Versloot, 2007). Additionally, entrepreneurship has a positive effect on regional employment in the short- and long-term (Fritsch, 2008) and it contributes to national GDP growth (e.g., Carree & Thurik, 2008). These findings suggest that entrepreneurship is an important driving force for economic growth and wealth creation.

Second, entrepreneurship has a societal functional. Many technological inventions are converted into innovative products or services by entrepreneurs for the benefit of the wider society. In a qualitative study, Shane (2000) illustrated how different entrepreneurs market different novel products and services on the basis of a single technological invention. Similarly, Acs and Varga (2005) provided evidence that entrepreneurial activity contributes to knowledge spillover and technological change. They argue that most research and development is carried out in large firms and universities, but subsequent implementation of the research outcomes depends on

entrepreneurial individuals who decide to economically exploit these opportunities. Additionally, research showed that entrepreneurial firms introduce innovations more efficiently than established firms and entrepreneurial firms are more innovation intensive in terms of innovations per employee (van Praag & Versloot, 2007). This underlines the importance of entrepreneurship for technological transfer from research institutions to the general society.

Third, entrepreneurship has a theoretical function for understanding economic development. In traditional models, economic growth is achieved by capital accumulation and labor expansion; but these factors do not completely explain the total variance in nations' output (Baumol, 1968). Furthermore, traditional models focus on issues of optimizing a given set of values to maximize or minimize standard economic indices. Mathematical calculations yield the parameters for optimal decisions, for example to maximize revenues and minimize costs. Such models are of great value for solving well-defined problems, which frequently occur in the daily business, but they are not able to explain economic change and industry evolution (Baumol, 1968). To fully understand economic development, it is important to explicitly account for factors that cause changes in the environment and introduce technological progress. According to Schumpeter (1934), the main cause of economic development is the entrepreneur. The entrepreneur challenges incumbent organizations by introducing innovations which replace existing technologies or products. This process of creative destruction leads to a dynamic process of businesses rising and falling as entrepreneurs keep on introducing innovations and constantly disturbing the status quo. Thus, understanding entrepreneurship is critical to understand economic development.

1.3 The Conception of the Dissertation

The conception of this dissertation is based on a process perspective on entrepreneurship (see Figure 1.1). The entrepreneurial process has three major phases: the pre-launch phase, the launch phase, and the post-launch phase (R. A. Baron, 2007b). In each phase, the entrepreneur has to achieve different entrepreneurial outcomes to successfully proceed to the next phase. For example, an entrepreneurial outcome of the pre-launch phase is the identification of numerous and original business opportunities,

an entrepreneurial outcome of the launch phase is the successful start-up of a new venture, and finally, achieving high rates of venture growth is an important entrepreneurial outcome of the post-launch phase (R. A. Baron, 2007b). Thus, entrepreneurship includes a broad range of outcomes that are all central to the domain. On the one hand, this variety of entrepreneurial outcomes poses a challenge to the entrepreneurs because the entrepreneur needs different qualities to achieve all necessary outcomes. For example, cognitive capacities might be particularly important in the process leading to opportunity identification and action regulation capacities might be particularly important in the process leading the successful start-up of a new venture. On the other hand, the variety of entrepreneurial outcomes also poses a challenge to the scholars studying entrepreneurship. Studying entrepreneurship needs a comprehensive approach taking into account the diversity of entrepreneurial outcomes and accordingly, the diversity of entrepreneurial qualities necessary for achieving the different outcomes.

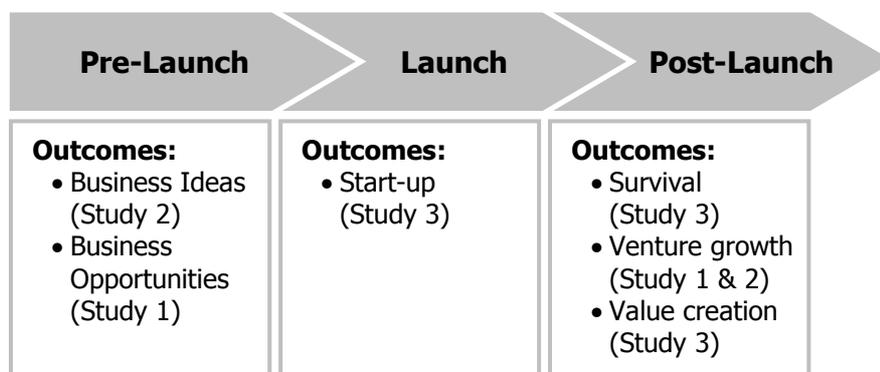


Figure 1.1. The three phases and respective entrepreneurial outcomes of the entrepreneurial process (adapted from R. A. Baron, 2007b).

This dissertation seeks to give due consideration to the multifaceted field of entrepreneurship by examining different entrepreneurial outcomes as well as different sets of predictors to explain the outcomes. Specifically, the dissertation develops and tests different theoretical models that aim to explain differences in individuals' entrepreneurial performance in terms of opportunity identification, start-up, and venture growth. In chapter 2, the theoretical model describes the whole entrepreneurial process

from opportunity identification through implementation of product/service innovations to venture growth. In this study, we¹ argue that the psychological factors of creativity, general mental ability (GMA), and active information search are important individual-level antecedents of opportunity identification. Creativity and GMA are cognitive capacities that facilitate combining and reorganizing information to identify business opportunities. In addition, we hypothesize that active information search also contributes directly to opportunity identification and that it moderates the positive effects of creativity and GMA on opportunity identification. Entrepreneurs should leverage the full potential of their cognitive capacities if they acquire a broad base of information. The aim of this study is to investigate the interplay of cognitive factors (in terms of creativity and GMA) and behavioral factors (in terms of active information search) for the entrepreneurial outcomes of opportunity identification, product/service innovations, and venture growth. Furthermore, we want to show that entrepreneurial outcomes derived from different phases of the entrepreneurial process are related to each other. Providing empirical evidence for this link helps understanding how individual-level factors are related to entrepreneurial outcomes on the firm-level. The findings of this study suggest that creativity and active information search both contribute directly to opportunity identification and they interact in such a manner that active information search enhances the positive effect of creativity on opportunity identification. In addition to the relationship between the individual characteristics and opportunity identification, we also find support for our general model that opportunity identification is related to venture growth through the introduction of innovative products or services.

In chapter 3, we further examine the interplay of creativity and information. In chapter 2, we found that entrepreneurs, who show higher levels of active information search, identify more opportunities which also results in higher levels of product/service innovations and venture growth. Consequently, a recommendation is to search more actively for information. In chapter 3, we seek to specify our recommendation. We conduct an experimental study to investigate the question of what type of information entrepreneurs should look for in order to increase their likelihood of successfully

¹ I use the term “we” throughout the three empirical chapters (Chapter 2, 3, and 4) because several colleagues and students contributed to each study.

identifying opportunities. We distinguish between diverse information, that is information from several diverse domains, and constrained information, that is information from one single domain. In the entrepreneurship literature, both approaches – searching for diverse information vs. searching for constrained information – find advocates (Fiet, 2002; Ward, 2004). We argue that an investigation of the type of information has to take into consideration the entrepreneur's level of creativity. Highly creative entrepreneurs benefit from diverse information because they are able to process this type of information and they are stifled by constrained information because this type of information limits their associational processes to this domain. The type of information should have a smaller effect on entrepreneurs low in creativity because their creative potential is generally lower. Our study provides support for the hypothesized interaction effect of creativity and type of information on the generation of business ideas. We further find a positive relationship between originality of business ideas and venture growth indicating that an entrepreneur's ability to generate original business ideas is conducive to business success. Our study thus provides further evidence that cognitive factors contribute to understand the opportunity identification process and that the generation of original business ideas is a mechanism that links individual characteristics with firm-level outcomes.

In chapter 4, we develop and test a theoretical model to investigate psychological factors important for the successful exploitation of an opportunity. Based on theories of action regulation (Frese, 2009; Frese & Zapf, 1994; Karoly, 1993), we argue that entrepreneur's actions are central to opportunity exploitation and that self-regulatory mechanisms facilitate the successful implementation of actions. In this study, we focus on the self-regulatory mechanisms of action planning and goal-referent thinking. We apply a longitudinal design and trace 139 entrepreneurs over a period of 30 months. This design allows us to investigate the entrepreneurial outcomes of start-up, survival, and value creation within one study. Our findings suggest that the self-regulatory mechanism of action planning in the pre-launch phase has a positive effect on the probability of successful start-up. Additionally, action planning has positive, long-term effects on survival and value creation. We also find that goal-referent thinking in terms of fantasizing positively about the future has a negative impact on the probability of

survival. Thus, this study provides evidence for the important role of self-regulatory mechanisms in the launch and post-launch phases of the entrepreneurial process.

Chapter 5 concludes this dissertation with a general discussion of the three empirical studies. In summary, this dissertation shows that behavioral and cognitive factors exert influences on different short- and long-term entrepreneurial outcomes. The general finding that psychological factors have a significant impact holds true across different contexts and across the whole entrepreneurial process. The significant effects of the cognitive factors of creativity and goal-referent thinking as well as of the behavioral factors of action planning and active information provide a fruitful basis for deriving practical implications for trainers, consultants, and entrepreneurs themselves.

CHAPTER 2

Cognitive Capacities and Their Interplay with Active Information Search in the Opportunity Identification Process

2.1 Abstract

Building on the concept of entrepreneurial alertness, we test the effects of creativity, general mental ability (GMA), and active information search on opportunity identification, and of opportunity identification on venture growth through innovativeness of product/service innovations. We further hypothesize that active information search moderates the effects of creativity and GMA. We sampled 100 business owners. Path analyses showed that creativity, active information search, and the interaction between the two affect opportunity identification. Furthermore, opportunity identification influenced venture growth via innovativeness of product/service innovations. Results suggest that creativity and active information search jointly contribute to success in the entrepreneurial process.

2.2 Introduction

To explain why some people discover business opportunities while others do not is of central importance to the field of entrepreneurship (R. A. Baron, 2004; Shane & Venkataraman, 2000). A possible explanation that received wide attention is the construct of entrepreneurial alertness which Kirzner (1979) defined as the ability to notice business opportunities without search. So far, the entrepreneurship literature adopted various approaches to investigate entrepreneurial alertness and consequently, a clear and consistent conceptualization of entrepreneurial alertness has not yet been developed (cf., Busenitz, 1996; Gaglio, 2004; Gaglio & Katz, 2001; Kaish & Gilad, 1991; Kirzner, 2009). Recently, Shane (2003) and Baron (2006) re-emphasized the ability aspect of entrepreneurial alertness and proposed that entrepreneurial alertness rests, at least partly, on the cognitive capacities of creativity and general mental ability (GMA). According to their proposition, people with high levels of creativity and GMA should have the capacities to imagine new products or services and to develop solutions to satisfy customer needs – even when they are not actively searching for business opportunities. Consequently, Baron (2006) noted that “when alertness is very high, active searches for opportunities may not be necessary; entrepreneurs are so sensitive to them that they do not have to engage in formal, systematic search processes” (pp. 112). Shane (2000) provided evidence for this notion by showing that people discover business opportunities without actively searching for them.

In line with Shane (2003) and Baron (2006), we argue that creativity and GMA are important for identifying business opportunities. However, we also argue that these cognitive capacities are not independent of an active search. In fact, a number of previous studies showed that seeking information is related to entrepreneurship and opportunity identification (Busenitz, 1996; Cooper, Folta, & Woo, 1995; Fiet, 2002; Kaish & Gilad, 1991; Ucbasaran, Westhead, & Wright, 2008). Yet, while these studies argued for a main effect of information search, we would like to build on this research and propose that, in addition to the main effect, active information search enhances the effects of creativity and GMA on opportunity identification. In case of a very active approach towards information search, entrepreneurs high in creativity and GMA can

leverage the full potential of their cognitive capacities and discover more opportunities. In case of a less active information search, the advantage of entrepreneurs high in creativity and/or GMA should be less pronounced because the necessary informational input for opportunity identification is lacking.

We base our study on Kirzner's (1997) theoretical framework of the entrepreneurial discovery. Although Kirzner (1997) notes that an active search for opportunities might be difficult or even impossible because one cannot look for something that is utterly unknown, we suggest that his theory of the entrepreneurial discovery provides a framework to integrate cognitive capacities that are related to entrepreneurial alertness and an active search – not for opportunities but for information – into one model. According to Kirzner's (1997) theoretical conception, entrepreneurial discovery depends on two factors. The first factor is people's alertness to business opportunities. People must be imaginative and able to perceive opportunities for making profit. The second factor is information that imply the opportunity for entrepreneurial profit and that are available to alert people. Kirzner (1997) notes that information is not perfectly distributed among people. This means that some people do not have sufficient information to identify an opportunity. By seeking more information, they should increase their chances of obtaining the necessary information.

Shane and Venkataraman (2000) elaborated upon Kirzner's (1997) theoretical conception and note that cognitive capacities and information are two central categories that influence the discovery of business opportunities. Neither cognitive capacities nor information alone lead to opportunity identification but people must possess sufficient information and they must be able to cognitively process and combine the information to come up with business opportunities. The conclusion is that if one of the two factors is absent, entrepreneurial discovery is unlikely take place.

From these theoretical conceptions follows that an examination of the joint effects of cognitive capacities and active information search in addition to the main effects should contribute to a better understanding of the mechanisms underlying the opportunity identification process. In summary, we propose main effects of creativity, GMA, and active information search on opportunity identification. We also hypothesize that active information search moderates the main effects of creativity and GMA. In

addition to the central focus of our study – the interplay of creativity, GMA, and active information search on business opportunity identification – we also investigate the relationship between opportunity identification, product/service innovation (in terms of innovativeness), and venture growth. Business opportunities are chances to introduce new products or services and such innovations should provide a competitive advantage that leads to venture growth (Porter, 1980; Shane & Venkataraman, 2000). The model guiding our study is depicted in Figure 2.1.

Our study seeks to contribute to the current entrepreneurship literature in two ways: First, we want to investigate the combined role of cognitive capacities and active information search for opportunity identification. There are theoretical reasons to predict that the effects of cognitive capacities on opportunity identification will vary with the level of active information search. However, to our knowledge, there are no studies that investigate the joint effect. We thus provide empirical evidence that cognitive capacities and active information search are related to opportunity identification and we extend current perspectives that focus on main effects only. Second, empirical research linking business opportunity identification and value creation is scarce so far (Ucbasaran et al., 2008). We want to show that opportunity identification is beneficial for small business owners as it contributes to their venture growth through product/service innovation. Providing evidence for this relationship is important to unravel the different steps in the entrepreneurial process that influence venture performance. Furthermore, investigating the mediating processes that link creativity, GMA, and active information search with venture performance is also important to develop a better understanding of the mechanisms that explain how individual level characteristics influence firm level performance (R. A. Baron, 2007a; Hambrick & Mason, 1984).

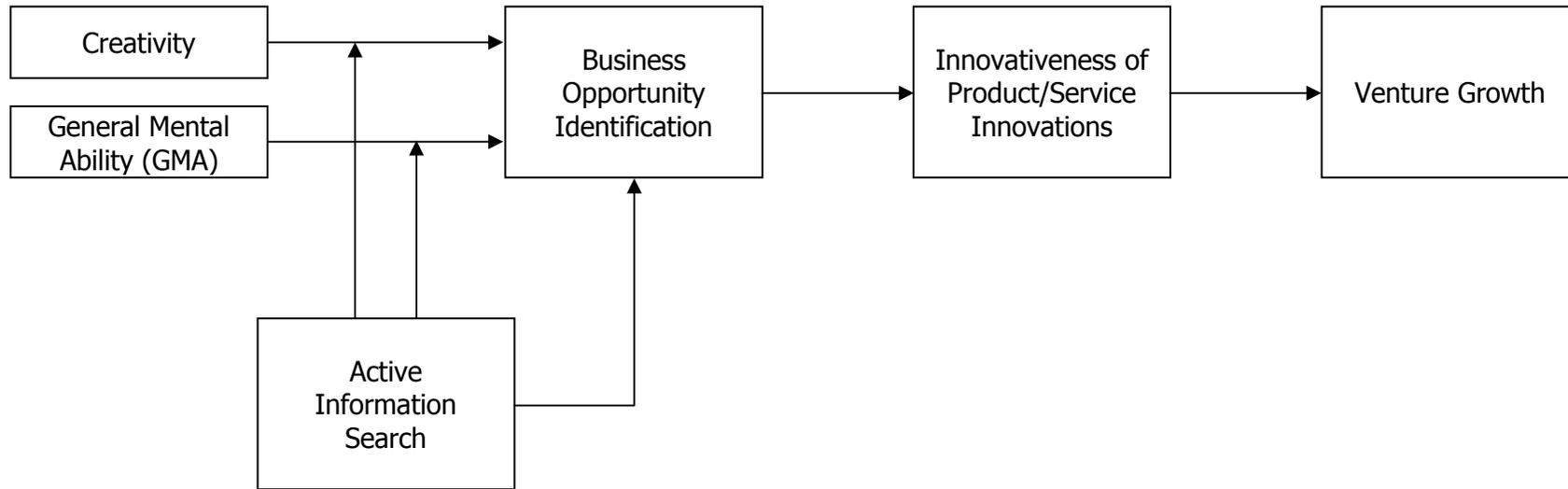


Figure 2.1. The model guiding our study: the interplay of creativity, intelligence, active information search on business opportunity identification and the process from business opportunity identification to venture growth.

2.2.1 Creativity, GMA, and Business Opportunity Identification

Business opportunities are situations in which the entrepreneur believes that he or she can earn a profit by introducing new products or services to the market (Shane, 2003; Shane & Venkataraman, 2000). Entrepreneurship scholars proposed that superior abilities to combine information contribute to entrepreneurial alertness and account for differences in individuals to identify business opportunities (R. A. Baron, 2006; Shane, 2003; Shane & Venkataraman, 2000; Ward, 2004). Entrepreneurs identify business opportunities by connecting previously unconnected information to come up with an innovative idea for recombining resources in such a way that it will yield a profit. The importance of combining information for business opportunity identification is underlined by Mitchell et al. who argue that piecing together information to identify new products or services is a central element of entrepreneurial cognitions (R. K. Mitchell et al., 2002).

However, people vary widely in their ability to link information and to come up with ideas for a business opportunity (Dimov, 2007a; Gaglio & Katz, 2001). We argue that an individual's creativity accounts in part for these inter-individual differences. Creativity reflects the cognitive capacity to generate multiple and original ideas (Runco, 2004). According to Mumford's process model of creative thought, the core operation that underlies creativity is the combination and reorganization of activated pieces of information (Mumford et al., 1991). Research supported this model by showing that performance in generating multiple and original ideas increased with higher skills in combining and reorganizing information (Mumford, Baughman, Maher, Costanza, & Supinski, 1997). As the identification of business opportunities rests in part on combining information to come up with new ideas, creativity should contribute to people's ability to identify business opportunities. We therefore hypothesize:

Hypothesis 1a: Creativity is positively related to business opportunity identification.

Apart from differences in combining information, the entrepreneurship literature suggests that a better comprehension of the market, its customers, and their problems also contributes to entrepreneurial alertness and explains why some people but not others discover business opportunities (R. A. Baron, 2006; Shane, 2000, 2003). To develop a better comprehension of the market, its customers, and their problems, people have to process information. That is, they have to pay attention to and store important information while ignoring irrelevant information. They have to interpret and understand how the information relates to the status quo. They have to infer implications from their interpretations and formulate conjectures about how changes in the environment might influence markets and future customer demands (R. A. Baron & Ward, 2004; Eckhardt & Shane, 2003; Shane, 2000; Shane & Venkataraman, 2000). Moreover, entrepreneurs have to perform these tasks fast because the time window to exploit an opportunity might close as conditions in the environment are shifting or a competing entrepreneur becomes the first mover (McGrath, 1996; J. R. Mitchell & Shepherd, 2010).

People's capability to process information increases with their level of GMA and therefore GMA should facilitate the opportunity identification process. GMA is the cognitive ability to decompose and understand complex information, to derive conclusions, and to solve problems by reflecting and reasoning (Neisser et al., 1996). Moreover, GMA is strongly related to speed of information processing, to the ability to focus attention and to store information (Colom, Rebollo, Palacios, Juan-Espinosa, & Kyllonen, 2004; Engle, Tuholski, Laughlin, & Conway, 1999). Research showed that in numerous areas of everyday life people with higher levels of GMA are more likely to master complexity and select relevant information, to derive appropriate conclusions, and to formulate faster and more correct forecasts about future developments (Gottfredson, 1997; Sternberg & Kalmar, 1997). We therefore hypothesize:

Hypothesis 1b: GMA is positively related to business opportunity identification.

2.2.2 Active Information Search and Business Opportunity Identification

Kirzner (1997) notes that imperfectly distributed information are the basis for opportunity identification. In other words, some people identify business opportunities

because they have information that others lack (Shane, 2003). Having information, for example about technological, political/regulatory, or demographic changes, should increase the likelihood of identifying an opportunity that emerges from these changes (R. A. Baron, 2006). Shane (2000) showed that people who had information about the technological invention of a three-dimensional printing process (i.e., technological change) identified various opportunities for offering new products or services. Having more information about other changes in the environment should provide people with more opportunities for identifying additional ways of earning a profit (cf., Shane, 2003). Moreover, it is important to note that often, it is not only one piece of information that triggers the identification of an opportunity, but people have to connect several pieces of information (R. A. Baron, 2006). In conclusion, the more information a person receives the more likely it is that he or she will discover a business opportunity.

We argue that people can gather more information and thus enhance the chances of identifying opportunities by actively seeking information. In line with an action theory approach towards entrepreneurship (Frese, 2009), we propose that entrepreneurs who take a more active approach towards searching information are more successful in terms of business opportunity identification. People, who show high levels of active information search, execute more information seeking behavior, they put more time, effort and other resources into information search, and they explore different sources to acquire new information (Frese, 2009). Accordingly, they have frequent interactions with others (e.g., fellow business people), they access different sources of information (e.g., newspapers, magazines, knowledgeable people), and they also put extra effort into accessing more uncommon sources of information. This approach towards information search should provide people with a broader information basis that they can use to make the necessary connections between different pieces of information to identify business opportunities. Research supports this line of reasoning by showing that information search intensity is related to entrepreneurship and opportunity identification (Busenitz, 1996; Kaish & Gilad, 1991; Ucbasaran et al., 2008). We therefore hypothesize:

Hypothesis 2: Active information search is positively related to business opportunity identification.

2.2.3 The Interplay of Cognitive Capacities and Active Information Search

We hypothesize a stronger relationship of creativity and GMA with business opportunity identification in case of a high level of active information search than when there is a low level of active information search. In the latter case, entrepreneurs cannot use their creativity and GMA as fruitfully as in the case of high active information search. We expect a moderating effect of active information search on the relationship of creativity with opportunity identification because models of creativity emphasize the importance of creative abilities (e.g., combination and reorganization abilities) in combination with informational input as necessary factors for creative performance (Mumford et al., 1991; Ward, Smith, & Finke, 1999). For example, in their interactionist model of creativity, Woodman and Schoenfeldt (1990) argued that individuals must have the necessary abilities to achieve creative outcomes but depending on contextual factors, such as the availability of information, their creative achievements might be enhanced or reduced. Research supported this line of reasoning by showing that even highly creative individuals are inhibited and create only ordinary ideas when their access to information is confined (Perttula & Sipila, 2007). Similarly, high levels of GMA might not result in the identification of a business opportunity if the necessary informational input is lacking. High levels of GMA help people to comprehend markets and customers and to make true conjectures about how new information (e.g., about changes in the environment) might affect markets and customer needs (Shane, 2003). Comprehending and formulating conjectures depends on selecting, encoding, and interpreting information that one has previously acquired. People who seek less information should have less information available in the process of selecting, encoding, and interpreting. Consequently, only the combination of a sufficient base of information with GMA leads to a comprehensive understanding of the market and valid conjectures about future developments.

The opportunity identification process also implies that people have to modify and shape their initial ideas into a viable and feasible business opportunity which involves a learning process (Dimov, 2007a). Learning is important to familiarize oneself with specific needs of the customers and particular conditions of the target market (Schwens & Kabst, 2009, in press). People start out with a first idea for a new product, service, or

other way to earn a profit. Then, by gathering information through various media or discussions with friends, professionals, and other stakeholders, they begin evaluating the initial idea and learn about the idea's potential strengths and weaknesses (Davidsson & Honig, 2003; Greve & Salaff, 2003; Singh, Hills, & Lumpkin, 1999). By interpreting and integrating the feedback, entrepreneurs refine and shape their initial idea into a clearer business concept (Dimov, 2007a; Singh et al., 1999). GMA is important for interpreting and integrating information (Neisser et al., 1996). These notions show that both GMA and information are necessary in the development process that turns a business idea into a business opportunity. Through social communication and accessing different sources of information the entrepreneur gets the necessary input in terms of suggestions and advice from different perspectives which he or she can use to make interpretations and judgments to come up with the final business opportunity. Furthermore, in addition to receiving and integrating new information, entrepreneurs have to come up with new creative ideas for further progressing with their idea (Dimov, 2007a). Getting different opinions and suggestions should stimulate the entrepreneur to combine and reorganize different pieces of information to come up with new ideas on how to proceed.

In conclusion, we propose that business owners high in creativity and GMA leverage the full potential of their cognitive capacities by showing high levels of active information search. In contrast, low levels of active information search should reduce the positive effect of creativity and GMA on opportunity identification because necessary information is lacking.

Hypothesis 3a: Active information search moderates the relationship between creativity and business opportunity identification. In case of high active information search, creativity has a strong effect on business opportunity identification. In case of low active information search, creativity has a reduced effect on business opportunity identification.

Hypothesis 3b: Active information search moderates the relationship between GMA and business opportunity identification. In case of high active information search, GMA has a strong effect on business opportunity identification. In case of

low active information search, GMA has a reduced effect on business opportunity identification.

2.2.4 Business Opportunity Identification, Product/Service Innovations, and Venture Growth

We argue that business opportunity identification is related to venture growth through the innovativeness of product/service innovations. We focus on venture growth because scholars consider venture growth to be the ultimate outcome of entrepreneurship (R. A. Baron, 2007b; Carland, Hoy, Boulton, & Carland, 1984; Stevenson & Jarillo, 1990), because venture growth is important for firm survival (Aldrich & Auster, 1986; Davidsson, 1991), and because venture growth contributes to nations' development of gross national product (Wong, Ho, & Autio, 2005). According to the strategic management literature, venture growth results from a competitive advantage (Porter, 1980). Firms can achieve a competitive advantage by differentiating the own firm from competitors through innovations, that is the introduction of products or services that offer unique features or that satisfy previously unaddressed demands. Research supports this line of reasoning by providing evidence that a firm's tendency to introduce new products or service is related to its growth rates (Roper, 1997; Rosenbusch, Brinckmann, & Bausch, in press; Thornhill, 2006).

Products or services that are more innovative are more likely to offer unique benefits to customers or to occupy a niche and be unrivalled in the market (Fiet, 2002; Gaglio & Katz, 2001; Shepherd & DeTienne, 2005). Thus, highly innovative products or services should provide a stronger competitive advantage which translates into higher growth rates whereas the introduction of non-innovative copies of existing products or services should contribute less to a firm's growth rate. This reasoning is supported by research showing that the degree of innovativeness of new products and services is the driving factor for growth and wealth creation (Kirchhoff, 1991; Mueller, 2007).

We propose that business opportunity identification is related to the innovativeness of product/service innovations and that the innovativeness of product/service innovations mediates the relationship between business opportunity identification and venture growth. A business opportunity is the situation in which a

new product or service can be introduced (Shane, 2003; Shane & Venkataraman, 2000). An innovation is the actual introduction of a new product or service (West & Farr, 1990). Consequently, the identification of a business opportunity is a necessary prerequisite for the introduction of a new product or service and it initiates the entrepreneurial process that eventually leads to venture growth (R. A. Baron, 2007b). Further, Simonton (1989) showed that the generation of innovative outcomes can be understood in stochastic terms. The chance that among a pool of identified opportunities is an exceptionally innovative opportunity that leads to a highly innovative product or service increases by the number of identified opportunities. Shepherd and DeTienne (2005) support this reasoning by providing evidence for a strong relationship between number and innovativeness of identified opportunities. In conclusion, we hypothesize:

Hypothesis 4a: Business opportunity identification is positively related to the innovativeness of product/service innovations.

Hypothesis 4b: The innovativeness of product/service innovations is positively related to venture growth.

Hypothesis 4c: The innovativeness of product/service innovations mediates the relationship between business opportunity identification and venture growth.

2.2.5 Creativity, GMA, Active Information Search, and Venture Growth

Several entrepreneurship scholars stress the importance of business owners' / CEOs' characteristics for venture performance (Baum & Locke, 2004; Baum, Locke, & Smith, 2001; Frese et al., 2007; Rauch & Frese, 2007). In a meta-analytic review, Unger and colleagues (Unger, Rauch, Frese, & Rosenbusch, 2006) found a positive relationship between GMA and business success. Similarly, researchers argued for positive effects of creativity (Heunks, 1998; Morris & Fargher, 1974) and of owners' approach towards information search (Daft, Sormunen, & Parks, 1988; Keh, Nguyen, & Ng, 2007) on business success. It is important to note that business owners' / CEOs' characteristics should exert an influence on their ventures' success only through their actions or strategic choices that are closely related to the development and operation of their ventures (R. A. Baron, 2007a; Frese, 2009; Hambrick & Mason, 1984). An action that might transmit the effect of business owners' characteristics to venture growth is

the identification and exploitation of business opportunities (Shane, 2003; Shane & Venkataraman, 2000). Creativity, GMA, and active information search are hypothesized to facilitate opportunity identification and opportunity identification may lead to venture growth through the introduction of innovative product/services. We therefore hypothesize:

Hypothesis 5a: Business opportunity identification and the innovativeness of product/service innovations mediate the relationship between creativity and venture growth.

Hypothesis 5b: Business opportunity identification and the innovativeness of product/service innovations mediate the relationship between GMA and venture growth.

Hypothesis 5c: Business opportunity identification and the innovativeness of product/service innovations mediate the relationship between active information search and venture growth.

2.2.6 The Context of South Africa: Poverty Alleviation through Entrepreneurship

At the time of the study, South Africa was still suffering from a high unemployment rate (23.5% in the first quarter of 2009; Statistics South Africa, 2009) and resulting poverty, particularly among the formerly disadvantaged population (Statistics South Africa, 2000). To improve the employment situation and per capita income, the government of South Africa adopted a policy with a strong focus on the promotion of small enterprises (Department of Trade and Industry, 1995). Part of the new strategy is the redressing of discrimination against black people who were actively discouraged to run enterprises by the apartheid regime's repressive measures (Rogerson, 2000). The objective is to create a supportive environment that allows private enterprises to thrive and that is equally conducive towards all enterprises. However, the government's initiative can only create favorable conditions. Opportunities which emerge from the initiative must be identified and exploited by the people. Therefore, it is important to identify factors on an individual level that facilitate the identification of opportunities and that lead to entrepreneurial behavior. Research showed that innovative ideas and the implementation of new technologies contribute particularly to economic

development (Mueller, 2007). Unfortunately, entrepreneurship in South Africa is characterized by a high rate of copying existing products or services and by a low propensity towards innovation and implementing new technologies (Maas & Herrington, 2008). This is detrimental for wealth creation. Therefore, identifying factors that enhance opportunity identification and the degree of innovativeness may offer additional approaches for taking action to alleviate unemployment and poverty in South Africa.

2.3 Method

2.3.1 Sample

We interviewed 100 business owners in Cape Town, South Africa, and surrounding suburbs. All participants had founded their business and were running the business as general manager or chief executive officer. Because of our practical focus on poverty alleviation among the formerly disadvantaged people, we included only business owners from this population in our sample. To meet the definition of small businesses, we interviewed only business owners who had between one and 50 employees. Furthermore, the businesses had to operate for at least one year. As many small businesses are not registered or listed in directories, we used several approaches to acquire our sample. First, we used a random walk procedure in different industrial areas. In the industrial areas the interviewers selected randomly a route or a specific part and asked every business owners to participate in our study if they met our criteria. Second, we used the data base of the Western Cape Business Opportunities Forum (WECBOF) to contact further business owners. The interviewers contacted randomly business owners from the data base. Third, we used a snowball system and asked business owners who had participated in our study to introduce us to further business owners who might be interested in taking part in the study. Across all three approaches the refusal rate was 27.5%. In our sample, 78% of the business owners were male. On average, the business owners were 43 years old, they employed nine employees, and their businesses were operating for eight years. Of the total sample, 73% were in the service sector and the remaining 27% were engaged in manufacturing.

2.3.2 Procedure

We collected all data on the basis of face-to-face interviews and a questionnaire that participants filled-in after the interview. The interviews were conducted by two German Master students of psychology who had received a thorough interviewer training. The training included sessions on interview techniques to probe participants' answers, the appropriate use of prompts to clarify vague statements, on note taking, and on typical interviewer errors, such as non-verbal agreement. The interview approach and the interviewer training have been successfully applied in previous studies in similar settings (Frese et al., 2007; Unger, Keith, Hilling, Gielnik, & Frese, 2009). The interviews took place in the offices or workshops of the business owners. The interviewers were told to take verbatim notes during the interviews and to produce a protocol of each interview. Subsequently, two independent raters used the typed protocols to rate participants' answers. We calculated intra-class coefficients (ICC; Shrout & Fleiss, 1979) to determine inter-rater reliabilities. All ICCs ranged between .96 and .99 indicating good inter-rater reliabilities for our interview measures.

2.3.3 Study Measures

Creativity. During the interview, we applied the consequences test by Christensen, Merrifield, and Guilford (1953) to assess participants' creativity. The consequences test measures an individual's divergent thinking ability which creativity scholars consider to reflect an individual's creative potential (Runco & Chand, 1995). We selected the consequences test because it captures aspects of creativity that are relevant to occupational settings (Mumford, Marks, Connelly, Zaccaro, & Johnson, 1998). The consequences test asks participants to list as many consequences as they can to fictional incidents. An example for a fictional incident is "*What would be the result if human life continued on earth without death?*". For each fictional incident, participants got four sample responses (for the example above: *overpopulation, more old people, housing shortage, and no more funerals*). We set a time limit of two minutes for each fictional incident. When the participants stopped generating consequences or when the two minutes were over, we presented the next fictional statement and asked again to list as many consequences as possible. In total, they received four fictional incidents. We rated

the participants' answers using the scoring guide developed by Mumford et al. (1998). We rated participants' answers for fluency and flexibility. Fluency is the number of responses that are not identical to other responses or to the four sample responses. ICCs for the four fluency ratings ranged between .99 and 1.00 indicating good inter-rater reliability. We aggregated the four fluency score to one overall fluency score (Cronbach's Alpha = .88). Flexibility is the number of different core themes underlying the participants' responses. Again, inter-rater reliabilities between the two raters were good (ICCs for the four fictional incidents ranged between .98 and .99). We aggregated the four flexibility scores to one overall flexibility score (Cronbach's Alpha = .84). The final score for creativity was calculated by summing the z-standardized overall scores for fluency and flexibility (Cronbach's Alpha = .95).

GMA. At the end of the interview, we administered the short version of the Raven Advanced Progressive Matrices Test (Arthur & Day, 1994). The Raven Advanced Progressive Matrices Test proved to be a valid instrument in general as well as in an African setting (Rushton, Skuy, & Ann Bons, 2004). The short version includes four example matrices to get accustomed to the task. The interviewers explained the principles of the task and demonstrated how to solve the example matrices. Then, the participants were asked to solve 12 test matrices. The score for intelligence was derived from the number of correct solutions to the 12 test matrices (Cronbach's Alpha = .69).

Active information search. For our measure of active information search, we used six questionnaire items developed by Tang and colleagues (Tang, Murphy, Chadha, & Zhu, 2007) on the basis of previous works by Kaish and Gilad (1991) and Busenitz (1996). Example items are "*I am always actively looking for new information.*" and "*I have frequent interactions with others to acquire new information.*". Participants answered the items on a 5-point Likert scale ranging from "*strongly disagree*" to "*strongly agree*". We computed the mean of the six items to attain the participants' score for active information search (Cronbach's Alpha = .85).

Business opportunity identification. We followed the approach applied by Hills, Lumpkin, and Singh (1997) and Ucbasaran, Westhead, and Wright (2008) to operationalize business opportunity identification. During the interview, we asked the open questions "*How many business opportunities for creating a business have you*

identified within the last five years?” and “How many business opportunities for creating a business have you pursued (that is committed time and resources to) within the last five years?”. According to Ucbasaran et al. (2008), the second question refers to activities to evaluate the costs and benefits of an identified opportunity. Scholars argued that such activities are part of opportunity identification (Dimov, 2007a). We therefore combined the two questions to our measure of business opportunity identification (Cronbach’s Alpha= .69). We selected a time period of five years because it can take several years to implement a business opportunity (Carter, Gartner, & Reynolds, 1996; Singh et al., 1999). In line with Ucbasaran et al. (2008), we collapsed participants’ answers into broader categories to eliminate extreme responses and to approximate a normal distribution. We recoded participants’ responses into five categories: participants with no opportunities received the value of “0”, one opportunity was recoded into “1”, two to four opportunities was recoded into “2”, between four and eight opportunities into “3”, and eight or more opportunities was recoded into “4”.

Innovativeness of product/service innovations. To assess the innovativeness of new products or services the business owners had introduced, we asked during the interview: *“In the last year have you introduced any new, innovative products or services?”*. If they had introduced a new product or service we further asked them to give a detailed description of the new product or service. The business owners’ description was subsequently rated for innovativeness. To rate the degree of innovativeness we used a 6-point scale based on Fiet (2002) and Romijn and Albaladejo (2002). The scale ranged from a value of zero for *“no innovation introduced”* to a value of five for *“first mover, a new-to-South-Africa product/service”*. The inter-rater reliability for the rating was good (ICC = .98). We concentrated on product/service innovations because these are the most common forms of innovations among small scale businesses (Hoffman, Parejo, Bessant, & Perren, 1998).

Venture growth. We based our measure for venture growth on the revenues and profits generated by the business. We asked for the revenues and profits from the two previous years. Based on the business owners’ statements on the absolute figures, we computed the percentage change in their revenues and profits. To get a single value for venture growth we calculated the mean between the percentage change in revenues and

the percentage change in profits (Cronbach's Alpha = .75). Our scale of venture growth relies on the business owners' subjective statements of their revenues and profits. We chose to rely on the business owners' estimates rather than objective accountancy-based measures because many small businesses in South Africa do not keep financial records (Bradford, 2007) and if they do the figures might be manipulated by including personal expenses to reduce business income tax (Bradford, 2007; Sapienza, Smith, & Gannon, 1988). Subjective measures of company performance proved to be a valid reflection of actual performance (Wall et al., 2004). Our approach is also in line with other research conducted in similar contexts that showed that business owners' estimates about their financial performance are significantly related to independent ratings of the businesses' performance (Baum et al., 2001; Frese et al., 2007).

Controls. We ascertained the following variables as control variables: age of the business owner, age of the business, line of business (service vs. manufacturing), and business size. We used four indicators for business size. We combined last month's revenues, the current overall value of the business, the value of the assets, and the number of employees to form one scale of business size (Cronbach's Alpha = .80).

2.3.4 Method of Analysis

We had to exclude data from two business owners whose venture growth rates were more than three standard deviations below the mean, from five business owners who refused to report any data on their revenues or profits and from eight business owners who were only able to report data for one year. We used PRELIS 2.70 (Jöreskog & Sörbom, 2002) to impute the missing data in our data set. We then calculated a path model using LISREL 8.70 (Jöreskog & Sörbom, 2001) to test our hypotheses. The path model allowed us to simultaneously test direct and indirect effects (Bollen, 1989).

To test the hypothesized moderations we followed the recommendations by Cortina, Chen, and Dunlap (2001) and by Williams, Edwards, and Vandenberg (2003). First, we computed aggregate measures of our variables as described in the section on the study measures. Second, we computed the interaction term for creativity and active information search and for GMA and active information search by multiplying the respective centered aggregate measures. Third, we determined the factor loadings and

measurement errors for our aggregate measures and for our interaction terms to fix the respective values in our path model. The factor loadings are set equal to the square roots of the measures' reliabilities and the measurement errors are set equal to the measures' variance multiplied by one minus their reliabilities. We calculated the reliability of the interaction terms according to the approach developed by Bohrnstedt and Marwell (1978) and used the reliabilities to determine the factor loadings and measurement errors for the interaction terms. Fourth, we used PRELIS 2.70 (Jöreskog & Sörbom, 2002) to compute an asymptotic covariance matrix as input for LISREL. An asymptotic covariance matrix was required because product terms (in our case the interaction terms) are not normally distributed and therefore they violate the assumption of normality necessary for maximum likelihood estimations (Bollen, 1989). This violation results in inflated standard errors and χ^2 -statistics. Using the asymptotic covariance matrix prompts LISREL to compute the Satorra-Bentler (Satorra & Bentler, 1994) correction which adjusts standard errors and χ^2 -statistics according to the degree of non-normality. Finally, to test for the hypothesized moderation, we compared a nested baseline model without the path from the interaction term to our dependent variable of business opportunity identification with a model that included the path. The null hypothesis that there is no moderation is rejected when the second model shows a significant better model fit (Cortina et al., 2001; Williams et al., 2003). We used the corrected χ^2 -statistic (Satorra & Bentler, 1994) to determine whether the difference in the fit between the two models was significant.

We evaluated the fit of our overall model with the corrected χ^2 -statistic (Satorra & Bentler, 1994), the root mean square error of approximation (RMSEA), the squared root mean residual (SRMR), and the comparative fit index (CFI). According to recommendations by Hu and Bentler (1999) a RMSEA smaller than .06, a SRMR smaller than .08, and CFI larger than .95 indicate good model fit.

2.4 Results

Table 2.1 presents the descriptive statistics and zero-order correlations for the study variables. Creativity ($r = .33$; $p < .01$) and active information search ($r = .20$; $p < .05$) were positively and significantly related to business opportunity identification.

Table 2.1

Descriptive statistics and zero-order correlations.

Variables and Scales	Mean	s.d.	1	2	3	4	5	6	7	8	9
1. Creativity ^a	0.00	0.97	(.95)								
2. General Mental Ability (GMA)	0.27	0.20	.38**	(.69)							
3. Active Information Search	3.94	0.75	.14	-.04	(.85)						
4. Business opportunity identification	2.04	1.04	.33**	.05	.20*	(.69)					
5. Innovativeness of p/s innovations	1.82	2.05	.01	.06	.16	.22*	(.98)				
6. Venture growth	0.38	0.58	.02	.10	-.15	.11	.19*	(.75)			
7. Age of business owner	42.83	9.75	-.02	-.18	.19*	-.02	.10	-.15	---		
8. Age of business	7.73	5.84	-.10	-.07	-.04	.02	.04	-.30**	.36**	---	
9. Business size ^a	0.00	0.79	.19*	.08	.07	.19*	.22*	-.07	.15	.24**	(.80)
10. Line of business ^b	0.27	0.45	.02	.01	-.11	.04	.07	.05	.01	-.03	.03

Note: In parentheses: reliability of the variable (ICC or Cronbach's alpha). ^a Scale is based on z-standardized variables. ^b 0 = service; 1 = manufacturing. * $p < .05$; ** $p < .01$ (two-tailed).

GMA did not show a significant relationship with business opportunity identification ($r = .05$; n.s.). Between the three variables of creativity, GMA, and active information search only the inter-correlation of creativity and GMA was significant ($r = .38$; $p < .01$). Furthermore, the correlations between business opportunity identification and innovativeness of product/service innovations ($r = .22$; $p < .05$) and between innovativeness of product/service innovations and venture growth were both positive and significant ($r = .19$; $p < .05$). From the set of control variables, age of the business owner was significantly related to active information search ($r = .19$; $p < .05$) and marginally to GMA ($r = -.18$; $p < .10$). Age of the business was negatively related to venture growth ($r = -.30$; $p < .01$). Business size showed significant relationships with creativity ($r = .19$; $p < .05$), business opportunity identification ($r = .19$; $p < .05$), and innovativeness of new products/services ($r = .22$; $p < .05$). Line of business was not substantially related to any variable and we therefore excluded line of business from our path analytic calculations.

2.4.1 Test of Hypotheses

We computed four path models with our main variables and the control variables to test our hypotheses. First, we computed a nested base line model without paths from the interaction terms to business opportunity identification. The model showed an unsatisfactory model fit (Satorra-Bentler corrected χ^2 (15) = 23.48; RMSEA = .08; SRMR = .05; CFI = 0.92) which also disallows to interpret the path coefficients. To test hypothesis 3a which states that active information search moderates the relationships between creativity and business opportunity identification, we computed a second model where we included the path from the interaction term to business opportunity identification. The second model yielded a Sattora-Bentler corrected Chi²-value of 19.30. The test against the nested baseline model showed that the second model had a significantly better model fit (Satorra-Bentler corrected χ^2 difference (1) = 4.18; $p < .05$). Thus, hypothesis 3a found support in the data. To interpret the moderation we created a plot (see Figure 2.2) by adapting the procedure described by Aiken and West (1991). Figure 2.2 shows that there was a strong relationship between creativity and business opportunity identification when active information search was high. The

relationship was weaker when active information search was low. We conducted simple slope analyses (Jaccard, Wan, & Turrisi, 1990) to further investigate the moderation. The analyses showed that the slopes for high active information search ($t = 3.39$; $p < .01$) and for medium active information search ($t = 2.80$; $p < .01$) were significant. The slope for low active information search was not significant ($t = 0.54$; n.s.). These results indicate that creativity was not related to business opportunity identification when business owners showed low levels of active information search.

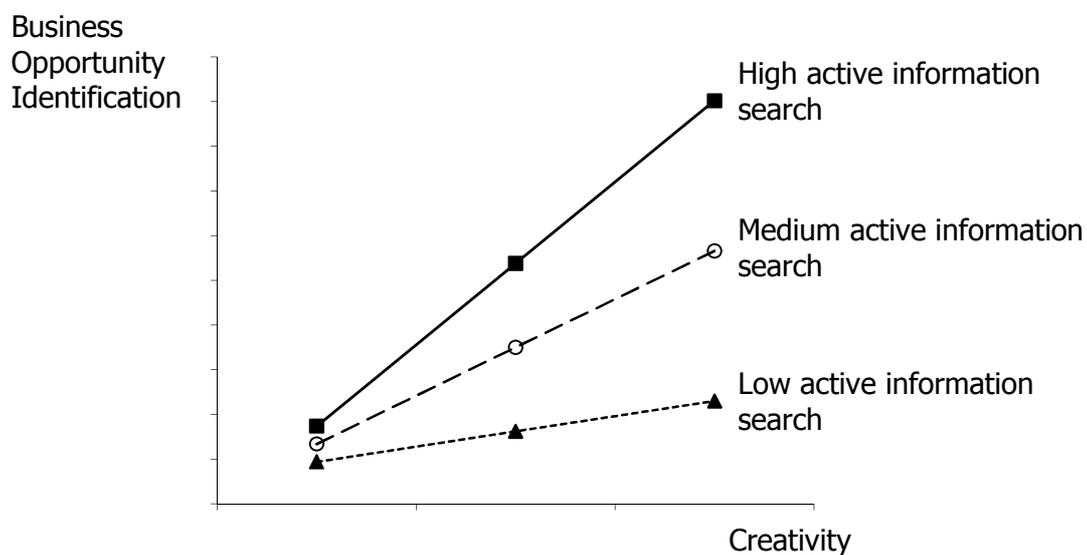


Figure 2.2. The moderating effect of active information search on the relationship between creativity and business opportunity identification.

To test hypothesis 3b which posits that active information search moderates the relationship between GMA and business opportunity identification, we computed a third model based on the baseline model. This time we included the path from the interaction term of GMA and active information search to business opportunity identification. The third model yielded a Sattora-Bentler corrected χ^2 -value of 23.10. The test against the nested baseline model showed that the third model did not have a significantly better model fit (Sattora-Bentler corrected χ^2 difference (1) = 0.38; n.s.). Thus, hypothesis 3b was not supported.

We tested the remaining hypotheses on the basis of the full model depicted in Figure 2.3. The model had a good fit (Satorra-Bentler corrected $\chi^2(13) = 16.88$; RMSEA = .05; SRMR = .05; CFI = 0.96). The path coefficients from creativity ($\beta = .40$; $p < .01$) and active information search ($\beta = .41$; $p < .05$) on business opportunity identification were positive and significant. These results support hypothesis 1a and hypothesis 2 that creativity and active information search are positively related to business opportunity identification. Hypothesis 1b which posited a positive relationship between GMA and business opportunity identification was not supported ($\beta = -.12$; n.s.). In accordance with the results from the difference tests of the models, the path coefficient from the interaction term of creativity and active information search on business opportunity identification was significant ($\beta = .54$; $p < .05$) while the path coefficient from the interaction term of GMA and active information search on business opportunity identification was not ($\beta = -.38$; n.s.). Furthermore, the path coefficients from business opportunity identification to innovativeness of product/service innovations ($\beta = .25$; $p < .05$) and from innovativeness of product/service innovations to venture growth ($\beta = .26$; $p < .05$) were both positive and significant. These findings support hypothesis 4a and 4b that business opportunity identification is positively related to innovativeness of product/service innovations and that innovativeness of product/service innovations is positively related to venture growth.

To test our hypotheses regarding the mediating effects of business opportunity identification and innovativeness of product/service innovations we used the approach developed by Sobel (1982) which tests whether indirect effects are significant and which is incorporated in the LISREL software. We found a marginal significant indirect effect of creativity on innovativeness of product/service innovations ($p < .10$). The remaining indirect effects were not significant. We thus conclude that hypothesis 4c (innovativeness of product/service innovations mediates the relationship between opportunity identification and venture growth) and hypotheses 5a-c (business opportunity identification and innovativeness of product/service innovations mediate the relationships between creativity, GMA, active information search and venture growth) were not supported.

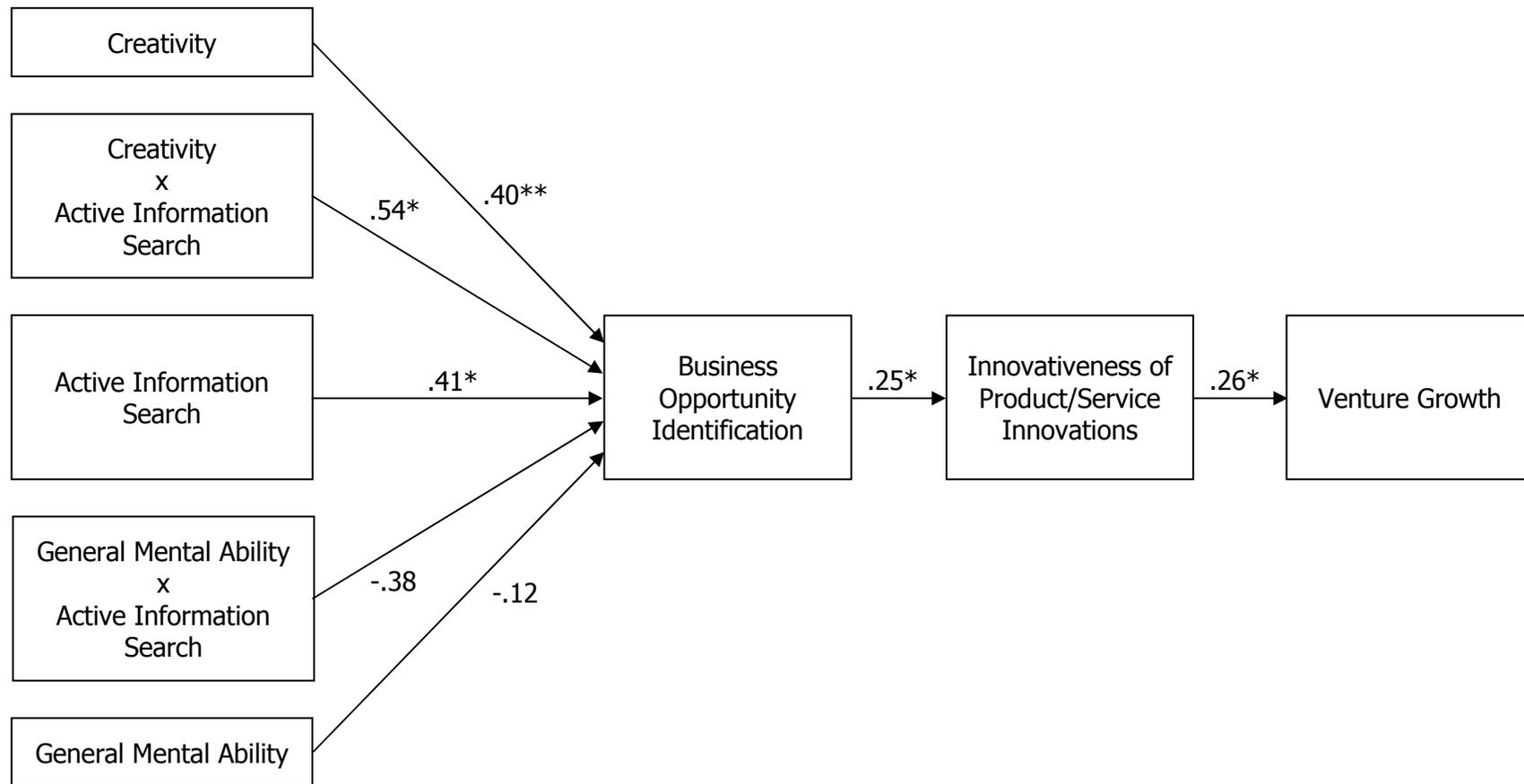


Figure 2.3. Hypothesized model and standardized parameter estimates from path analytic calculations (control variables of age of business owners, age of business, and business size are not depicted for reasons of clarity). Fit statistics: Satorra-Bentler corrected $\chi^2(13) = 16.88$; RMSEA = .05; SRMR = .05; CFI = 0.96. * $p < .05$; ** $p < .01$.

To rule out the alternative explanation that the independent variables had direct effects on the dependent variables, we computed an additional model in which we included paths from creativity, GMA, and active information search to innovativeness of product/service innovations, and from business opportunity identification to venture growth. The alternative model yielded a Satorra-Bentler corrected χ^2 -value of 13.59 indicating that this model did not fit the data significantly better than our hypothesized model (Satorra-Bentler corrected χ^2 difference (4) = 5.48; n.s.). Moreover, none of the additional path coefficient was significant. Thus, we failed to find support for the mediation hypotheses not because of direct effects that remained significant in the presence of hypothesized mediators but because of non-substantial relationships of the predictor variables on more distal endogenous variables (see also Table 2.1). We note that the hypothesized relationships in the sequence of our model were significant. This points to a multiple-part causal linkage from creativity and active information search over business opportunity identification and innovativeness of product/service innovations to venture growth (cf., Kirkpatrick & Locke, 1996).

2.5 Discussion

Our first goal in this study was to build on Kirzner's (1997) theory of entrepreneurial discovery and to investigate the interplay of creativity, GMA, and active information search in the entrepreneurial process. Creativity and GMA are considered to partly form entrepreneurial alertness (R. A. Baron, 2006; Shane, 2003). Although Kirzner (1997) proposes that both alertness and information are necessary to understand entrepreneurial discovery, most studies in the entrepreneurship literature focused only on one of the two elements. Combining aspects of both elements in our study, we found that creativity was significantly related to business opportunity identification while GMA was not. Additionally, the positive effect of creativity on business opportunity identification was dependent on business owners' approach towards information search. In case of low levels of active information search, the business owners' creativity was unrelated to business opportunity identification. The higher the level of active information search was, the stronger the relationship between creativity and business opportunity identification was.

We think that our findings contribute to the entrepreneurship in several ways. We sought to add to the discussion on the concept of entrepreneurial alertness. Kirzner (1979) introduced entrepreneurial alertness as one of two important prerequisites for entrepreneurial discovery. However, Kirzner (2009) does not concretely specify how to be alert and the entrepreneurship literature offers different conceptualizations of the construct (cf., Busenitz, 1996; Gaglio, 2004; Gaglio & Katz, 2001; Kaish & Gilad, 1991). Our study investigates recent theoretical considerations that entrepreneurial alertness rests in part on the cognitive capacities of creativity and GMA (R. A. Baron, 2006; Shane, 2003).

Creativity has been traditionally linked to entrepreneurship but a direct examination of creativity in the entrepreneurial process is still missing (Zhou, 2008). Schumpeter (1934) argued that entrepreneurs recombine resources into more valuable forms and create opportunities for profit through a process of creative destruction. In more recent papers, entrepreneurship scholars proposed that abilities to combine information are crucial for identifying business opportunities (R. A. Baron, 2006; R. K. Mitchell et al., 2002; Shane & Venkataraman, 2000). Our findings support the notions by providing evidence that creativity, which builds on the ability to combine information, contributes to opportunity identification and we thus consider creativity to be an important part of entrepreneurial alertness.

We did not find support for our hypothesis that GMA has a positive effect on business opportunity identification. This is in contrast to theoretical considerations in the entrepreneurship literature (cf., R. A. Baron, 2006; Shane, 2003). GMA might have a smaller impact on opportunity identification than expected. People with high levels of GMA should be better able to understand markets and to solve customer problems which might help them to come up with new ideas for products or services. However, high levels of GMA are also related to high levels of deductive reasoning and convergent thinking (Runco, Dow, & Smith, 2006). Deductive reasoning and convergent thinking may lead to conventional answers. They may also be related to providing a one best strategy. Yet, identifying business opportunities is a process that is less characterized by finding one best way than by making creative decisions and creating non-conventional means-ends frameworks (Eckhardt & Shane, 2003). Thus, the

process of identifying business opportunities might correspond to a larger extent to divergent thinking which is captured by the construct of creativity. In fact, studies investigating the relationship between GMA and business opportunity identification are rare in the entrepreneurship literature. Although de Wit and van Winden (1989) found an effect of GMA on the status of self-employment (see also van Praag & Cramer, 2001), a more direct examination is lacking. Thus, GMA might be important for some steps in the entrepreneurship process (Unger et al., 2006) but our results question theoretical considerations that GMA is related to entrepreneurial alertness and opportunity identification. We note, however, that it is problematic to interpret non-significant findings. Non-significant findings do not provide statistical support that there is no relationship between two constructs. Low statistical power might be an alternative explanation for our results.

We also provide evidence for the important role of active information search on business opportunity identification. Business owners with high levels of active information search were more likely to identify more business opportunities and they also leveraged their full creative potential. The finding of the direct effect supports theoretical notions that seeking more information increases the chances of identifying business opportunities (Kirzner, 1997; Shane & Venkataraman, 2000). Our finding of the direct effect may also add to the debate whether people can search systematically for entrepreneurial discoveries (Fiet & Patel, 2008) or whether one cannot search for something that one does not yet know that it exists as opportunities are unknown until discovered (Kaish & Gilad, 1991; Kirzner, 1997). Shane (2000) argued that people do not discover entrepreneurial opportunities through search but through recognizing the value of new information that “they happen to receive through other means” (p. 451). A deliberate search *for opportunities* might be difficult; however, our findings indicate that a deliberate search *for information* facilitates opportunity identification. An active approach towards information search should increase the chance that people happen to receive the information they need for opportunity identification.

The significant interaction between creativity and active information search supports theoretical notions that people identify business opportunities through an interplay of creativity and information (Kirzner, 1997; Shane & Venkataraman, 2000).

This finding also contributes to our understanding of factors that enhance or inhibit creativity. Zhou (2008) noted that an interactional approach investigating context factors that facilitate or restrict creativity would provide useful insights for obtaining a comprehensive understanding of the influence of creativity in the entrepreneurial process.

Our second goal was to examine the different steps in the entrepreneurial process and to investigate the mechanisms that link the individual characteristics of creativity, GMA, and active information search with entrepreneurial success. Empirical evidence on this link is rare although scholars emphasized the importance of this topic for developing a better understanding of the entire entrepreneurial process (R. A. Baron, 2007a; Ucbasaran et al., 2008). We found that business owners, who identified more business opportunities, were more likely to introduce products or services with higher degree of innovativeness which was positively related to their venture growth.

Our results provide evidence that the individual level characteristics of creativity, GMA, and active information search are related to venture growth through the identification of business opportunities and the introduction of innovative products or services. Our results also highlight the importance of innovativeness for achieving higher venture growth rates in the context of a developing country such as South Africa. Several scholars pointed to a weak propensity among African entrepreneurs to develop and introduce truly innovative products or services (Adeboye, 1997; Oyelaran-Oyeyinka, Laditan, & Esubiyi, 1996; Robson, Haugh, & Obeng, 2009). Rather, the majority of entrepreneurial activity is based on copying and imitating existing products or services (Maas & Herrington, 2008; Walter et al., 2005). In line with research in similar contexts (Chudnovsky, Lopez, & Pupato, 2006; Mahemba & De Bruijn, 2003), our finding suggest that the degree of innovativeness is a crucial factor for wealth creation. Particularly innovative products or services provide a strong competitive advantage that translates into higher venture growth rates.

Although the direct relationships in the sequence of our proposed model were significant, we did not find support for our mediation hypotheses. We only found a marginally significant indirect effect of creativity on innovativeness of product/service innovations. This result supports theoretical notions that creativity is often the starting

point for innovation processes (West & Farr, 1990). The non-significant findings regarding the remaining mediation hypotheses were mainly due to weak relationships between independent and more distal dependent variables. For example, creativity, GMA, and active information search were not significantly related to venture growth. The findings support notions that business owners' characteristics do not exert a direct influence on business performance but only through manifest entrepreneurial behavior, such as opportunity identification and exploitation (R. A. Baron, 2007a; Rauch & Frese, 2007). Similarly, opportunity identification was also not significantly related to venture growth. The finding indicates that opportunity identification might be necessary for introducing new products and services, but not sufficient for wealth creation. Thus, an identified opportunity will unfold its wealth creating potential, only if it leads to an innovation that is introduced.

2.5.1 Strengths and Limitations

Some potential limitations prevent an unambiguous interpretation of the study findings. We have to note that our sample of business owners from the population of formerly disadvantaged people in South Africa restricts the generalizability of our findings. This group, however, is of particular importance to alleviate poverty and unemployment in South Africa. Regarding our sample, we also have to note that the non-significant findings of GMA might be due to a selection effect: people who are low on GMA are less likely to become business owners and fail more quickly (Frese, 2007). Such a selection effect might reduce the variance in our sample and result in low correlations. Hence, it is possible that a positive effect of GMA on opportunity identification exists in the general population despite our non-significant findings. Similarly, the relationship between GMA and business performance was also not significant in our sample which is in contrast to meta-analytic findings (Unger et al., 2006). However, our non-significant relationship between GMA and venture growth is consistent with other research in similar settings (Frese et al., 2007; Unger et al., 2009). An explanation for this finding might be that the conditions for doing business are less complex in developing countries (Bond et al., 2004). The impact of GMA on

performance decreases in general with diminishing levels of complexity (Schmidt & Hunter, 2004).

Another shortcoming concerns the cross-sectional design of our study. We argued that creativity, GMA, and active information search lead to business opportunity identification and that business opportunity identification results in venture growth through the innovativeness of product/service innovations. We cannot rule out a reverse causal direction of the proposed relationships. However, our hypothesized model is in line with models of the entrepreneurial process that assume that individual characteristics contribute to opportunity identification and that opportunity identification is an antecedent of product/service innovations and venture growth (R. A. Baron, 2007b; Rauch & Frese, 2007). Furthermore, research showed that individual levels of creativity and GMA remain stable over a period of several years (Deary, Whalley, Lemmon, Crawford, & Starr, 2000; McCrae, Arenberg, & Costa, 1987). These findings validate the proposed directions of our hypotheses

We also remark that the operationalization of our measure for venture growth might be a weakness. We relied on estimates by the business owners about their revenues and profits of the previous years. Alternatively, we could have used more objective data such as accountancy-based measures. Yet, such measures might be deliberately manipulated to reduce business income tax (Sapienza et al., 1988). This is particularly true in the African context where business owners include personal expenses in their records to avoid high taxation (Bradford, 2007). Moreover, many small businesses in Africa and in other regions do not record their financial transactions and have no accounting system in place (Shinder, 1997; Wall et al., 2004). However, business owners have typically a clear conception of the performance of their business. Research provided evidence that performance estimates by managers and chief executives show convergent and construct validity and the use of subjective measures of performance leads to valid conclusions (Wall et al., 2004).

A strength of the operationalization of our measures is the diversity of measurement methods. We used objective scoring procedures for creativity and GMA. We assessed active information search by a questionnaire measure. Innovativeness of product/service innovations was rated on the basis of business owners' qualitative

descriptions by using an established scoring guide that provided a set of fixed anchors for the raters. Finally, we derived our measures for business opportunity identification and venture growth from business owners' estimates. We used different approaches to minimize the percept-percept bias and to reduce common method variance.

2.5.2 Future Research

We think that our study offers some interesting starting points for future research. We provided evidence that active information search has a double positive impact on business opportunity identification. The question that remains concerns the type of information current and future business owners should look for. Fiet (2007) suggested that people should look for information only in specific channels that fit their prior knowledge to increase the likelihood of identifying a business opportunity. Yet, such an approach is in contrast to scholars advocating a search in various sources to acquire diverse information because this should promote the generation of original and innovative business ideas (Ward, 2004). Another approach might be to look for information from either public or more exclusive sources – independent of the fact whether or not they are related to one's prior knowledge. Hills and Shrader (1998) found that entrepreneurs belonging to the Chicago Area Entrepreneurship Hall of Fame differed from a random sample of entrepreneurs in the importance they ascribed to various sources of information for identifying business opportunities. Identifying what type of information is beneficial for opportunity identification and why certain sources of information might be more valuable than other sources would enhance our understanding of the opportunity identification process and enable us to provide entrepreneurs with further recommendations for guiding their active search for information. Additionally, apart from investigating the information that business owners should seek to identify opportunities, it might be important to investigate the information that business owners have to provide during subsequent steps of the entrepreneurial process to successfully implement and market the new opportunity. For example, providing information to potential customers and other stakeholders might be important to change perceptions and gain acceptance for the new product or service (Weisenfeld, 2003; Weisenfeld, Nissen, & Gassert, 2003).

Furthermore, the role of cognitive capacities in the opportunity identification process needs further clarification. We found a positive relationship between creativity and business opportunity identification but not between GMA and business opportunity identification. Entrepreneurship researchers proposed that GMA facilitates opportunity identification (R. A. Baron, 2006; Shane, 2003) but evidence supporting this proposition was rather indirect so far (e.g., de Wit & van Winden, 1989; van Praag & Cramer, 2001). A closer examination of the influence of cognitive capacities might reveal different processes that lead to the identification of business opportunities (see also Dimov, 2007b). Business opportunity identification might result from a process of divergent thinking. Some people might generate numerous business ideas on a constant basis and once they hit upon an idea they consider worthwhile to exploit they proceed in the entrepreneurial endeavor. In this case, the starting point is an abstract situation without a clear goal or solution and the entrepreneur comes up constantly with various business ideas by combining and connecting the information he or she receives. This process of naturally combining and connecting information to generate ideas would be facilitated by high levels of creativity.

Alternatively or in a mixed process, business opportunity identification might involve processes of convergent thinking where specific customer problems are solved. In this case, the starting point would be a well-known customer demand and the entrepreneur engages in a deliberate process of problem solving to find the one solution that fulfills the demand. Such a process might rely more on comprehending the situation at hand and bringing together given facts. This process should rely on deductive and convergent thinking and it should be facilitated by high levels of GMA. Thus, future research could adopt a more differentiated perspective on the influence of different cognitive capacities on different types of opportunity identification processes.

2.5.3 Practical Implications and Conclusions

Our findings indicate that two factors are important to identify business opportunities: creativity and active information search. Creativity can be enhanced by training interventions. Research showed that creativity trainings have a strong effect (Ma, 2006; Scott, Leritz, & Mumford, 2004). The literature offers several established

training manuals (Isaksen, Dorval, & Treffinger, 2000; Parnes, Noller, & Biondi, 1977) which can be used by institutions to offer training courses or by current and future business owners for self-study purposes. Also, the training program developed by DeTienne and Chandler (2004) with a particular focus on creativity proved to be effective in enhancing trainees' performance in identifying business opportunities.

Current and future business owners should also increase their active information search. Action theory and related concepts offer several avenues to increase one's level of activity (Frese, 2009). For example, formulating implementation intentions (i.e., if/then-plans) should help current and future business owners become more active in their search behavior (Gollwitzer, 1999). Similarly, applying self-regulation mechanisms, including goal-setting, planning, and self-monitoring, facilitates getting started and showing more persistence in one's actions (Karoly, 1993). Teaching general principles of becoming more active might be a fruitful approach to increase the level of active information search.

Our findings regarding the interaction between creativity and active information search also emphasize that people who possess high levels of creativity, and who should thus have higher levels of entrepreneurial alertness (cf., R. A. Baron, 2006; Shane, 2003), should nevertheless engage in active information search. That is, instead of relying on one's high levels of entrepreneurial alertness, highly creative people should actively seek information.

Finally, business owners should be made aware that the degree of innovativeness of their new products or services is a driving force for their venture growth. It is less beneficial to introduce products or services with no innovative value, for example by just coping or imitating competitors' offerings. Current and future business owners should strive for novel and original business opportunities that add value for the customers and that provide a strong competitive advantage. Implementing highly innovative products or services contributes to wealth creation. Our model shows that an individual level approach that focuses on the business owner might offer several starting points for facilitating the innovation process and achieving higher venture growth.

CHAPTER 3

Interplay of Creative Ability and Diverse Information in the Opportunity Identification Process: An Experimental Study

3.1 Abstract

We take an interactionist view and investigate (1) how the interplay of creative ability and diverse information affects generating business ideas and (2) how the ability to generate business ideas is related to venture growth. We apply an experimental design to examine the first question and a field study design to examine the second question. We sampled 98 Ugandan business owners. Results showed that constrained information weakened the relationship between creative ability and generating business ideas. Ability to generate original business ideas was related to venture growth. Our findings suggest that entrepreneurs high in creative ability benefit from diverse information.

3.2 Introduction

An integral part of entrepreneurship is the process of identifying business opportunities and understanding this process is a core task of the scholarly domain of entrepreneurship (Gaglio & Katz, 2001; Shane & Venkataraman, 2000). The entrepreneurship literature suggested that the identification of opportunities depends on individual factors, particularly cognitive capacities, as well as on contextual factors, such as changes in the environment (Shane, 2003; Shane & Venkataraman, 2000). An overarching theory that integrates these factors, however, is still lacking. Recently, scholars proposed that splitting the opportunity identification process into several parts and examining each part separately might be helpful to develop a better theoretical understanding of the process (R. A. Baron, 2007b; Dimov, 2007a). In the present study we focus on the beginning of the opportunity identification process. The process of opportunity identification starts with generating business ideas (Dimov, 2007a; Locke & Baum, 2007) or to put it more figuratively: “novel and useful ideas are the lifeblood of entrepreneurship” (Ward, 2004, p. 174). According to Dimov (2007a), business ideas are precursors of business opportunities and as such, they are ideas for introducing innovative products or services to the market (Shane & Venkataraman, 2000).

A cognitive capacity that should have a positive influence in the beginning of the opportunity identification process is creative ability, which can be defined as the ability to generate multiple and original ideas by cognitively combining concepts or information (Guilford, 1950; Mumford et al., 1991). Empirical research examining the influence of creative ability on opportunity identification is rather sparse but existing studies point to a beneficial effect of creative ability (Zhou, 2008). For example, DeTienne and Chandler (2004) provide evidence that enhancing individuals’ creative ability has a positive impact on their capability to identify business opportunities. Acknowledging the importance of creative ability for opportunity identification, entrepreneurship scholars have recently emphasized the need to extend research on creative ability from investigating main effects only to adopting an interactional perspective that takes both individual and contextual factors into consideration (Zhou,

2008). The focus should be on the question what contextual factors enhance or restrict creativity and thus facilitate or inhibit opportunity identification.

We follow this call and focus on the idea generation part of the opportunity identification process which allows us building on existing theoretical frameworks from the creativity literature that integrate individual and contextual factors. We base our study on Amabile's (1983) theoretical framework of the social psychology of creativity because it considers the interplay of individual and environmental factors for creative achievements. Specifically, Amabile's (1983) theory suggests that creative ideas are not the outcome of a unitary psychological capacity but result from a particular constellation of creative abilities and environmental circumstances conducive to creativity. An important contextual factor that contributes to the final level of creativity is information that people assemble and use for generating ideas. Information that people receive is an important factor because bits of information trigger and direct a train of thought that leads to the accumulation of new and original ideas (Nijstad, Stroebe, & Lodewijkx, 2003).

The assumption made by Amabile's (1983) theoretical framework that individual and contextual factors interact with each other is based in the broader framework of person-environment fit theory (Kristof, 1996) and states that certain contextual factors match individual characteristics and this match leads to the generation of creative ideas. In contrast, a mismatch would constrain people and lead to less creative outcomes. Applying this assumption to the present study leads to the first of our two main research questions: What type of information matches business owners' creative ability and enhances the generation of multiple and original business ideas? This question is important because it has practical and theoretical implications for the entrepreneurship domain. It has practical implications because our findings might help entrepreneurs identify the type of information that matches their creative abilities and optimizes their chances of identifying business opportunities. It has also theoretical implications because our study extends current theoretical perspectives in the entrepreneurship literature on the question what type of information entrepreneurs should look for. There are two contradictory theoretical frameworks. Fiet's (2002) theoretical framework of a systematic search argues that individuals should search in a constrained, systematic way

to receive only information from a limited number of domains they know well. In contrast to Fiet's (2002) suggestion, the creativity literature proposes that focusing too much on one's domain can become a barrier reducing people's performance in generating new and original ideas (Simonton, 2003; Ward, 2004; Wiley, 1998). Consequently, a high degree of diversity of information should be related to creative outcomes even if this information goes beyond one's domain of expertise (Mumford, Baughman, Supinski, & Maher, 1996).

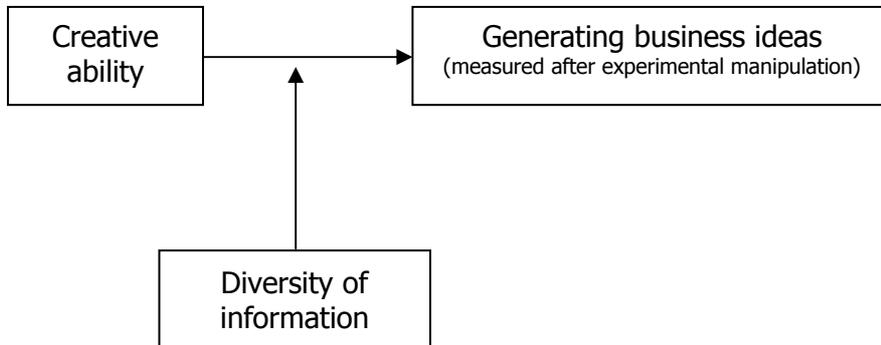
We propose that both frameworks may be right depending upon the interaction of person's creative ability and diversity of information. Based on Amabile's (1983) theoretical framework, we suggest that there is a match between creative ability and diverse information. People who are able to link apparently diverse bits of information are more likely to produce multiple and original ideas (Amabile, 1983). Individuals who have high creative abilities benefit from diverse information because they are able to process the diverse information. In contrast, constrained (non-diverse) information should stifle high levels of creativity and lead to lower levels of generating business ideas. By taking individual as well as contextual factors into account, we attempt to offer a more comprehensive perspective on the combined role of creative ability and information in the first step of the opportunity identification process than has been taken by the entrepreneurship literature so far. Furthermore, we test boundary conditions of theoretical frameworks that favor a systematic search. We do this in an experiment with business owners and thus follow calls by several scholars to combine individual and contextual characteristics in an experimental design to contribute to the understanding of the opportunity identification process (Dimov, 2007a; Eckhardt & Shane, 2003; Fiet & Patel, 2008; Zhou, 2008).

The second research question is to examine how business owners' creative abilities are related to measures of entrepreneurial success. More specifically, we want to show that business owners' creative ability is related to the generation of business ideas, and the generation of multiple and original business ideas is related to the venture growth the business owners experience. Generating multiple and original business ideas should lead to higher innovation approaches. Innovative approaches to products, services, and processes by the owner should be related to higher success of the business

(Porter, 1980; Stevenson & Jarillo, 1990). We use business owners' ability to generate business ideas as an instantiation of their general potential to come up with multiple and original business ideas. We investigate the second question for three reasons: First, establishing this link is important because it supports assumptions on the functional value of creative ability and ability to generate business ideas for entrepreneurial success and venture growth (Dimov, 2007a; Ucbasaran et al., 2008). Second, providing evidence for a positive relationship between creative ability, being able to generate business ideas, and venture growth would support our assumption that diverse or constrained information have important implications for venture outcomes. In case that diverse or constrained information interact with creative ability and thus enhance or inhibit the potential to generate business ideas, business owners might influence their venture performance by seeking information that are conducive to their creative abilities. Third, creative ability has been suggested to influence entrepreneurial success but it is a general characteristic that is equally or even more important for success in other domains. We would gain a better understanding of the entrepreneurial process by examining how cognitive processes that are specific to entrepreneurship mediate the relationship between general cognitive characteristics and venture performance (R. A. Baron, 2007a). The ability to generate business ideas should be such a specific characteristic that is more closely related to the conception and development of a venture.

The two different models guiding our study are depicted in Figure 3.1. Panel A of Figure 3.1 pertains to the first research question of our study which aims at examining how the interplay of creative ability and diverse information influences business owners' generation of business ideas. We use an experimental design manipulating diversity of information to investigate this question. Panel B of Figure 3.1 pertains to the second question regarding the functional value of business owners' creative ability and their ability to generate business ideas for venture growth. We use a field study design to investigate this question. We note that we designed our study in such a way that we are able to investigate the second question with the same sample but independently of the experimental manipulation.

Panel A (Experimental design)



Panel B (Field study design)



Figure 3.1. The hypothesized interaction effect of creative ability and diversity of information on generating business ideas (Panel A) as well as the indirect effect of creative ability on venture growth through ability to generate business ideas (Panel B).

3.3 Theory

3.3.1 Creative Ability, Diversity of Information, and Generating Business Ideas

The focus of our first research question is on how the interplay of creative ability and diversity of information affects generating business ideas (see Figure 3.1, Panel A). Information is needed to understand the business opportunity identification process – “some people are more likely than other people to discover opportunities because they have information that the other people lack” (Shane, 2003, p. 45). However, assuming a simple main effect and providing more information to everyone might be counterproductive because people often receive too much information from the most

diverse fields in our interconnected world. This mass of information might result in information overload and overstrain people's cognitive capacities (R. A. Baron, 1998; Zacharakis & Meyer, 1998). As a consequence, Fiet (2002; 2007) argued for a constrained, systematic search for information. Searching systematically implies that the search for information is restricted to those domains that people know something about. Fiet (2002) calls the group of information channels that fit the prior knowledge "consideration sets". He argues that consideration sets offer the most promising information for identifying a business opportunity because people can link all incoming information to their existing knowledge. Existing knowledge helps to comprehend and to interpret the incoming information meaningfully (Shane, 2000). Thus, this theory argues for restricting the search to one set which should boost the chances of identifying business opportunities. Fiet provides evidence for the effectiveness of a systematic search for the identification of business opportunities (Fiet, 2002; Fiet, Clouse, & Norton, 2004; Fiet, Nixon, Gupta, & Patel, 2006; Fiet, Norton, & Clouse, 2007; Fiet & Patel, 2008).

In contrast to Fiet and co-workers, findings from basic research on creativity suggest that diverse information from many different domains facilitate the generation of ideas. According to Mumford's process model of creative capacities (Mumford et al., 1991), original outcomes originate from the combination of ideas and concepts that stem from various, unrelated domains. Diverse pieces of information direct associational processes into various directions resulting in the generation of more original ideas (Mumford & Gustafson, 1988; Santanen, Briggs, & De Vreede, 2004; Ward et al., 1999). Empirical research supports these theoretical notions. For example, attending to a broad and diverse range of information leads to more and original insights (Seifert, Meyer, Davidson, Patalano, & Yaniv, 1995; Yaniv, Meyer, & Davidson, 1995). Alissa (1972) found that over-inclusion – the tendency to attend to and use a wide range of information, which may be irrelevant at first sight – is associated with creative achievements. Similarly, Mumford showed in a series of studies (Baughman & Mumford, 1995; Mobley, Doares, & Mumford, 1992; Mumford et al., 1996) that a wide and unconstrained search for facts and for a diverse set of information from multiple domains has a positive impact on the generation of original ideas. Accordingly,

Mumford and colleagues (Mumford et al., 1991) recommend to extend one's search and to encourage over-conclusion to foster creative achievements.

Based on Amabile's (1983) theoretical framework, we argue that it is important to adopt an interactionist perspective (see Figure 3.1, Panel A). Neither constrained nor diverse information per se lead to creative outcomes but people must combine the information in creative ways to generate multiple and original ideas. People's creative abilities interact with information to determine the depth and breadth of associational processes that lead to new and original ideas. This is also in line with Shane and Venkataraman's (2000) propositions that both cognitive capacities and information from the environment are necessary for opportunity identification. Diverse information should match highly creative individuals because they have the ability to combine diverse information. People with high creative abilities are able to make use of diverse information and to generate multiple and highly original ideas when they receive diverse information. On the other hand, diverse information is not useful for people with low levels of creative ability because they are less able to combine or recombine diverse information. Due to their limited ability to combine different concepts or domains, the creative outcome in terms of number and originality of ideas should be limited (A. M. Collins & Loftus, 1975). Therefore, there will be a clear relationship between creative ability and generating business ideas when diverse information is available. In contrast, there should be a low or zero correlation between creative ability and generating business ideas when individuals receive constrained information. Given constrained information, creative ability does not help people to produce multiple and original ideas. Individuals with low creative ability may not be overwhelmed by the overload of diverse pieces of information and can, therefore, concentrate on the task to generate business ideas. Individuals with high creative ability will not be stimulated to use their full creative potential. An incoming flow of information from only one domain should fix their creative thinking to this domain and thus reduce the number of linkages they would be usually able to make between various domains (Runco & Chand, 1995). Research demonstrates that even very creative people can be constrained in their creativity and produce only standard solutions when they are confronted with

homogeneous information from one specific domain (Perttula & Sipila, 2007). In conclusion, we hypothesize:

Hypothesis 1: Diversity of information moderates the relationship between creative ability and generating business ideas. In case of diverse information, creative ability has a positive effect on generating business ideas. In case of constrained information, the impact of creative ability on generating business ideas is weak.

3.3.2 Creative Ability, Ability to Generate Business Ideas, and Venture Growth

Our second research question aims at investigating the mediating effect of ability to generate business ideas in the relationship between creative ability and venture growth (see Figure 3.1, Panel B). While creative ability is a general characteristic, the ability to generate business ideas is a specific characteristic. The ability to generate business ideas indicates the potential to come up with business ideas and it is therefore more closely related to the successful development and operation of a venture (cf., R. A. Baron, 2007a). We argue that the general characteristic of creative ability should have a positive effect on the more specific ability to generate business ideas. The social psychology theory of creativity (Amabile, 1983) as well as other contemporary creativity theories assert that creative ability is central to generating ideas and the underlying mechanism is a process of linking and combining information (Mednick, 1962; Mumford et al., 1991; Ward et al., 1999; Welling, 2007). Individuals with superior creative abilities combine information more easily and form more and broader cognitive associations which results in being able to produce a higher number and more original ideas (Mumford et al., 1997). Further evidence from the creativity literature suggests that creative ability is generalizable: people's general creative abilities transfer to various specific domains (C. S. Chen, Himsel, Kasof, Greenberger, & Dmitrieva, 2006; Clapham, Cowdery, King, & Montang, 2005).

In the specific domain of entrepreneurship, scholars also stress the importance of combining different pieces of information for the discovery or recognition of business opportunities (R. A. Baron, 2006; Dimov, 2007a; Shane & Venkataraman, 2000). Shane and Venkataraman (2000) emphasized that people must have specific abilities to

combine various pieces of information to discover meaningful relationships between them. Similarly, Baron (2006) argues that people have to combine information about changes in technology, economics, politics, society, or demographics to recognize a business opportunity. Certain combinations of these changes constitute business opportunities. Creative ability should contribute to the processes described by Baron (2006) and Shane and Venkataraman (2000) that lead to the identification of business opportunities. Opportunity identification is a multi-step process starting with the generation of business ideas (Dimov, 2007). Therefore, in the first step of the process, business owners with higher levels of creative ability should be better able to generate multiple and original business ideas. In conclusion, we hypothesize:

Hypothesis 2: Creative ability is positively related to (a) the ability to generate a high number of business ideas and to (b) the ability to generate original business ideas.

We argue that ability to generate business ideas is related to venture growth. We focus on venture growth as success measure for three reasons: First, for small firms growth is particular important for survival (Aldrich & Auster, 1986; Davidsson, 1991); second, growth is considered as the ultimate outcome of entrepreneurship (R. A. Baron, 2007b; Carland et al., 1984; Stevenson & Jarillo, 1990); and third, small firms with high growth are most important for the development of the gross national product of nations (Wong et al., 2005). An important source of venture growth is the continuous introduction of innovations. Empirical research shows that a firm's innovativeness (i.e., the tendency to introduce new products, services, or processes (Lumpkin & Dess, 1996)) is related to its growth rates (Roper, 1997; Rosenbusch et al., in press; Thornhill, 2006). This finding is usually explained by the competitive advantage provided by innovations. Introducing new products or services that no one else introduced yet differentiates one's own firm from competitors and provides a superior position in the market. Similarly, introducing new processes might lead to increased quality or reduced costs which can also be used strategically to differentiate the own firm from competitors (Porter, 1980).

Introducing new products, services, or processes starts with a business idea (Dimov, 2007a). Business owners' cognitive abilities should have a major influence in the processes that lead to venture growth (Hambrick & Mason, 1984). Research both in the small and micro business domain as well as in larger firms provides support for the important influence of business owners' and CEOs' characteristics on business performance in terms of venture growth (Hambrick, 2007; MacKey, 2008); in small and medium sized organizations the business owner is probably even more important than in large organizations (Baum & Locke, 2004; Baum et al., 2001; Frese et al., 2007; Rauch & Frese, 2007). Business owners with higher abilities to generate multiple and original business ideas should have an advantage over their competitors. Their higher abilities to generate multiple and original business ideas should give business owners a better grasp of opportunities resulting in a higher degree of venture growth. More specifically, business owners' abilities to generate original business ideas should be related to venture growth because more original business ideas have the potential to lead to products, services, or processes with unique properties. Innovations with unique properties should provide a stronger competitive advantage and contribute more to business growth (Ahuja & Lampert, 2001; Kirchoff, 1991). Furthermore, business owners' abilities to generate a high number of business ideas should be related to venture growth because generating a high number of ideas itself increases the probability that there is an exceptionally good idea among the pool of generated ideas (Simonton, 1989). The generation of exceptionally creative ideas can be illustrated in stochastic terms. Simonton (1989) showed that outstanding creative achievements can be explained by the general amount of ideas and achievements produced at that time. Accordingly, the generation of a large amount of business ideas should increase the likelihood of generating original business ideas and thus also contribute to venture growth. In conclusion, we hypothesize:

Hypothesis 3a: The ability to generate a high number of business ideas is positively related to venture growth.

Hypothesis 3b: The ability to generate original business ideas is positively related to venture growth.

We argue that ability to generate business ideas functions as a mediator of the relationship between creative ability and venture growth. We have discussed the function of creative ability for the ability to generate a higher number and originality of business ideas. We, further, argued for the relationship between ability to generate a higher number and originality of business ideas and venture growth. Creative ability should be related to venture growth, similar to many other traits that have an important function for the development of businesses (Rauch & Frese, 2007; Zhao & Seibert, 2006). Creative ability, however, is a general ability and should be indirectly related to venture growth through having a good grasp of opportunities. A grasp of opportunities depends upon the specific ability to generate a high number and originality of business ideas. Thus, the argument is that creative ability leads in general to a higher degree of business ideas and a higher originality of these ideas which then leads to a higher degree of venture growth. It follows:

Hypothesis 4: The ability to generate business ideas mediates the relationship between creative ability and venture growth.

3.3.3 The Context of Uganda: Highly Entrepreneurial but Less Creative?

We chose the context of Uganda to conduct the study for several reasons. Uganda is among the countries with the highest entrepreneurial activity. In 2004, about one third of the Ugandan adult population was trying to start a business or had started a business within the last 3.5 years (Walter et al., 2004; Walter et al., 2005). However, Uganda does not just have a very high rate of start-ups but also a high rate of business closures. In 2004, 30% of Ugandan adults reported that they had shut down a business in the previous 12 months (Walter et al., 2005). This implies that Uganda is more extreme than other countries in producing new business units but also in closing them down. Therefore, it is of particular importance to ask the question of potential antecedents of sustainable growth in a country like Uganda.

It has also been suggested that many firms in Uganda and in Africa in general are not as high in their innovative potential than they ought to be (Buame, 1996; Kiggundu, 2002). This leads us to the second reason for Uganda as the setting for our study: The role of creativity in Africa and in African entrepreneurship. There is a striking

difference between creativity in culture and creativity in entrepreneurship. African culture and tradition is characterized by high artistic and creative expression. However, it seems that creative culture is less pronounced when entrepreneurship is involved. When asked for their business ideas two thirds of Ugandan entrepreneurs indicated that they just copied or intended to copy an existing business concept (Walter et al., 2005). Just copying a business concept does not produce any competitive advantage and does not lead to sustained growth and wealth creation. Therefore, empirical evidence on the functioning of original business ideas is particularly important in this context (see also Ngowi, Iwisi, & Mushi, 2002).

3.4 Method

3.4.1 Sample

The sample consists of 98 small business owners from Kampala and surrounding suburbs (Nakawa, Kololo, Nateete, Wandegaya, and Lugogo). To meet the definition of a small business owner, the participants had to fulfill the following criteria to be included in the sample: The participants had to run the business for at least one year, they must have started their business themselves and they had to have between one and 50 employees. To recruit business owners for our study we contacted the three main organizations for the development of small business in Kampala (the Uganda National Chamber of Commerce, the Uganda Small Scale Industries Association, and the Private Sector Foundation) and were provided with listings of their members. Further contacts were taken from public business directories. From the listings participants were randomly called to fix an appointment for conducting an interview. The refusal rate was 34%. Of the total sample, 68% were male. The average age of the business owners was 42 years, their average starting capital was 323,000 Uganda Shilling (approximately 180 USD), and they employed on average 13 people. Of our sample, 58% were in the manufacturing sector and the remaining 42% in the service sector.

3.4.2 Procedure

All data were collected on the basis of face-to-face interviews. The interviews were conducted by two German Master students in their final year who had received a thorough interviewer training on interview techniques, note taking and about typical interviewer errors (e.g., non-verbal communication). During the interview the participants received a task to generate business ideas. The task is based on a hypothetical scenario stating that the trend of lifelong learning is emerging in Uganda (see Appendix A). According to the scenario, people are more and more willing to pay privately for their own and their children's continuous education which implies an opportunity for making profit. We administered the scenario using the following two-step approach: First, we asked all participants to generate as many business ideas as possible to profit from the new trend. That is, all participants received the same basic scenario without any further artificial stimuli. Thus, this measure was not affected by any experimental manipulation. We combined business owners' business ideas to a set of business ideas generated before the experimental manipulation. We used this set of business ideas for our measure of business owners' ability to generate business ideas. Our approach to measure ability to generate business ideas is line with common approaches in psychology to assess individual abilities (cf., Sternberg & Kaufman, 1998). Second, when participants stopped generating ideas for new products or services, they received additional pieces of information (see Appendix B). The additional pieces of information constituted the experimental manipulation. Before each interview, participants were randomly assigned to one of two groups. One group received diverse information, the second group constrained information. In sum, all participants received four additional pieces of information. After each piece of information they were again asked whether any idea for a new product or service came to the mind. We combined participants' answers in response to the additional pieces of information to a set of business ideas generated after the experimental manipulation. We used this set of business ideas to investigate our question on how diversity of information affects the relationship between creative ability and generating business ideas.

To generate the two different sets of diverse and constrained information we followed the approach by Nijstad and Stroebe (2006) to classify ideas or information as

conceptually similar or distinct. We developed a category system for our task by testing the same scenario stated above in a pilot study with 18 business owners and four MBA students. Based on their ideas how they would try to profit from the emerging trend we constructed a two-dimensional category system. The first dimension covers different goals. The second dimension covers different means to achieve the goals. An example for a goal is “educate older people” and an example for a mean is “learning networks”. In the pilot study we identified six different goals and 11 different means. We crossed the goals and means resulting in goal-by-means matrix with 66 different categories. Each idea from the pilot study was assigned to one category. From these ideas we constructed our sets of diverse and constrained information (see Appendix B). An example is “Starting a training centre which provides specialized courses for senior citizens”. Diversity is represented by the number of different categories used across different means and goals (Nijstad & Stroebe, 2006). Therefore, for our set of constrained information we used ideas from categories covering the same goal whereas our set of diverse information contained ideas from four different categories covering different goals and means. Following Nijstad and Stroebe (2006), we presented the additional pieces of information in the form of ideas of other people.

On average the interview lasted 109 minutes. Open questions were tape-recorded and subsequently transcribed. The transcripts were then used for the ratings of the participants’ answers. The answers were rated by two independent raters. We computed intraclass coefficients (ICCs; Shrout & Fleiss, 1979) to assess interrater reliabilities. All coefficients ranged between .78 and .99 indicating good interrater reliabilities.

3.4.3 Measures

Creative ability. To measure creative ability, we used the consequences test developed by Christensen, Merrifield, and Guilford (1953). The consequences test measures divergent thinking ability which is considered to assess the potential of creative ability (Runco & Chand, 1995). We chose the consequences test because it proved to be valid in an occupational setting (Mumford et al., 1998). Participants were asked to list consequences of four different statements. An example for a statement is “*What would be the results if suddenly no one could use their arms or hands?*”.

Together with each statement, four standard answers were also given as examples for the participants. If the participants stopped generating consequences, they received the next statement. According to the scoring procedure developed by Mumford and colleagues (1998), the answers were rated for fluency (number of ideas) and flexibility (different topics covered by the participant). Fluency is operationalized as the number of responses that are not identical to other responses or to the four standard answers. Interrater reliabilities (ICCs) for the fluency ratings for the four statements ranged between .98 and .99. The four ratings were aggregated to one fluency score (Cronbach's Alpha = .86). Flexibility is operationalized as the number of different topics. Responses that have an underlying core theme belong to one topic. Interrater reliabilities (ICCs) for the flexibility ratings were good ranging between .84 and .93. The four ratings were aggregated to one flexibility score (Cronbach's Alpha = .81). We computed a score for creative ability by summing the fluency and flexibility scales, which was justified by an internal consistency of .91 for the two variables.

Ability to generate business ideas (generating business ideas before the manipulation). During the interview we presented a hypothetical scenario which stated that lifelong learning is a new trend in Uganda and people are more and more willing to pay privately for their own and their children's education (Appendix A shows the scenario). After presenting the scenario, we asked the participants to come up with ideas for new products or services to start a new business or to extend their existing one. We explicitly told the business owners that their ideas may or may not be related to their current businesses. To make sure that the participants generated business ideas, we asked them to list ideas for new products or services they could introduce. Whenever an idea was not clearly referring to a new product or service, the interviewers used prompts or probed the answer to find out whether the participant had a product or service in mind. Ideas that were too general and not making any statement about a new product or service were not counted. Note that we used for this measure only the set of business ideas that the business owners generated in response to the basic scenario without any experimental manipulation. This measure is thus an indicator of business owners' general potential to come up with business ideas (cf., Sternberg & Kaufman, 1998). As

this measure is independent of the experimental manipulation, it is also a baseline measure of generating business ideas in response to the basic scenario.

For our measure of ability to generate a high number of business ideas we counted the number of non-redundant business ideas. Interrater reliability between the raters was good (ICC = .89). For our measure of ability to generate original business ideas we used a four-point scale with anchors for each point developed by Dean and colleagues (2006). The anchors are (1) common, mundane, or boring business ideas, (2) somewhat interesting business ideas and not obvious on first sight, (3) unusual business ideas that show some imagination, and (4) rare, unusual, ingenious, imaginative, or surprising business ideas. The interrater reliability for the originality rating was good (ICC = .85).

In addition to the number and originality ratings, we rated the diversity of generated business ideas to be able to conduct a manipulation check for our experiment. To rate the diversity of business ideas we used the goals-by-means matrix developed during our pilot study (see description of procedure). The matrix allowed us to rate each business idea into a specific category of the matrix. The number of different categories covered by a participant represents the measure of diversity. This standardized procedure resulted in a good interrater reliability for this measure (ICC = .84).

Generating business ideas after the manipulation. When participants stopped generating business ideas in response to the basic scenario, they received additional pieces of information (see Appendix B). After each piece of information they were again asked whether they could come up with business ideas for new products or services. In total, they received four additional pieces of information (see also description of procedure). Again, only business ideas that referred to a new product or service were used in our further analyses. We note that this measure does not reflect business owners' ability to generate business ideas because they received different pieces of information depending on the experimental group they were randomly assigned to. This measure reflects business owners' potential to generate business ideas in the specific case of receiving diverse or constrained information. We rated the total set of business ideas generated after the manipulation for number, originality, and diversity. We used the same rating procedures as for generating business ideas before

the manipulation. The interrater reliabilities for the three measures were good (number: ICC = .83; originality: ICC = .82; diversity: ICC = .78).

Diversity of information. As described in our procedure, when participants stopped generating ideas for the first time, they received additional pieces of information. They either received four pieces of information that were constrained (i.e., only from categories that have the same goal regarding our goals-by-means matrix developed in the pilot study) or diverse (i.e., from four different categories covering different goals and means of our goals-by-means matrix). Thus, we created two experimental groups by manipulating the set of information participants received in each group (constrained vs. diverse).

Venture growth. In the interview, we asked participants for the percentage increase or decrease of profits, sales, and customers of the last three years (2004-2007) (Krauss, Frese, Friedrich, & Unger, 2005). We computed the yearly average of increase or decrease for each indicator to consider differences in the age of the businesses. Subsequently, we summed up the three indicators to one scale of venture growth (Cronbach's alpha = .87). We had to rely on subjective estimates made by the business owners because in small businesses it is generally difficult to ascertain exact objective performance data (Daniels, 1999; Sapienza et al., 1988). This is particularly true in the African context where standard procedures of book-keeping are not commonly used or do not reflect a valid indicator of the actual performance (McPherson, 1998; Shinder, 1997). Our approach to measure venture growth is in line with other research in similar contexts (Frese et al., 2007; Krauss et al., 2005; Unger et al., 2009).

Controls. The following controls were ascertained to rule out third variable effects. First, we controlled for cognitive ability because there is a debate that creative ability is only a facet of general cognitive ability (cf., Runco, 2004). We measured cognitive ability using the short version of the Raven Advanced Progressive Matrices Test (Arthur & Day, 1994). This test proved to be valid in general and also for the African setting (Rushton et al., 2004). Second, we controlled for business size because size and growth might be negatively related due to decreased growth rates of larger companies (Hart & Oulton, 1996). We measured business size by the number of

employees. Finally, we controlled for business owners' gender and line of business (manufacturing vs. service).

3.5 Results

3.5.1 Manipulation Check

To test whether our manipulation worked we conducted a t-test between the two experimental groups for the diversity of generated business ideas before and after the participants received the additional information. Before the participants received the additional information there should be no statistical difference in diversity of generated ideas because the stimulus material was identical in both groups. There should be, however, a statistical difference in the diversity of generated ideas after the participants received the additional information (constrained vs. diverse) if our manipulation worked. The statistical analyses revealed this pattern of results. Whereas the diversity of generated ideas showed no statistical difference between the two groups before the manipulation ($t = -1.24$; $p = .22$), we found a statistically significant difference between the diversity of generated ideas for both groups after the participants received the different information sets ($t = 2.00$; $p < .05$).

3.5.2 Descriptive Statistics and Intercorrelations of Study Variables

Table 3.1 shows the descriptive statistics and zero-order correlations for the variables used in the present study. The descriptive statistics for ability to generate business ideas reveal that on average the business owners produced only 1.66 ideas and the originality ratings indicated that on average most ideas were common, mundane, or only somewhat interesting ($M = 1.63$). The zero-order correlations between creative ability and the two measures for ability to generate business ideas (number and originality) were both positive and significant indicating a beneficial effect of creative ability for the ability to generate multiple and original business ideas (number: $r = .28$; $p < .01$; originality: $r = .48$; $p < .01$). Of the two measures for ability to generate business ideas (number and originality), number was not significantly correlated with venture growth ($r = .04$; ns.). In contrast, originality was positively and significantly correlated

Table 3.1

Descriptive statistics and zero-order correlations

Variables and Scales	Mean	s.d.	1	2	3	4	5	6	7	8	9	10
1. Creative ability	3.56	1.63	(.91)									
2. Diversity of information ^a	0.47	0.50	-.06	-								
3. Ability to generate business ideas (number)	1.66	1.94	.28**	.21*	(.89)							
4. Ability to generate business ideas (originality)	1.63	0.78	.48**	.02	.37**	(.85)						
5. Generating business ideas after manipulation (number)	2.78	1.87	.40**	-.10	.54**	.28**	(.83)					
6. Generating business ideas after manipulation (originality)	1.83	0.60	.23*	-.09	.26**	.44**	.52**	(.82)				
7. Venture growth	23.29	27.61	.00	-.17	.04	.30**	.06	.27*	(.87)			
8. Cognitive ability	0.36	0.22	.21*	-.15	-.10	.21*	.07	.27*	.17	(.69)		
9. Gender ^b	0.32	0.47	.05	.02	.02	-.02	.08	.01	-.05	-.12	-	
10. Business size	10.58	11.76	-.09	.11	.01	.03	-.04	.06	.15	.07	-.23*	-
11. Line of business ^c	0.58	0.50	-.19	-.07	-.03	-.19*	-.15	-.21*	-.04	-.30**	.04	.04

Note: In parentheses: reliability of the measure (ICC or Cronbach's alpha). ^a 0 = diverse; 1 = constrained. ^b 0 = male; 1 = female. ^c 0 = service; 1 = manufacturing. * $p < .05$; ** $p < .01$.

with venture growth ($r = .30$; $p < .01$). Of the control variables, only cognitive ability showed consistently significant relationships. Cognitive ability was significantly related to creative ability ($r = .21$; $p < .05$), to ability to generate original business ideas ($r = .21$; $p < .05$), and marginally to venture growth ($r = .17$; $p < .10$).

3.5.3 Test of Hypotheses

Hypothesis 1 states that diversity of information (constrained vs. diverse) moderates the relationship between creative ability and generating business ideas. The hypothesis was supported by the data. We calculated two hierarchical regression analyses using generating a high number and generating original business ideas after the manipulation as dependent variables. To have a baseline for generating business ideas before the manipulation we included the respective measures in the model². Table 3.2 shows that generating business ideas before the manipulation predicted significantly generating business ideas after the manipulation (number: $\beta = .58$, $p < .01$; originality: $\beta = .39$, $p < .01$). No other control variable explained additional variance. Entering creative ability, diversity of information and the interaction term into the model explained additional 10% of variance in number and additional 8% of variance in originality of generating business ideas after the manipulation.

Regarding the dependent variable of generating a high number of business ideas, the beta for creative ability was positive and significant ($\beta = .24$, $p < .01$). The beta for diversity of information was negative and significant ($\beta = -.18$, $p < .05$) indicating that diverse information led to a higher number of generated business ideas. Relevant for hypothesis 1 is the beta of the interaction term which was negative and significant ($\beta = -.18$, $p < .05$). We followed Aiken and West (1991) to display the nature of the interaction (see Figure 3.2). There was a strong relationship between creative ability and generating a high number of business ideas for diverse information. For constrained information the relationship between the two variables was weaker. Simple slope analyses (Jaccard et al., 1990) revealed that the slope for diverse information was

² The measures for generating business ideas before the manipulation are identical to the measures for ability to generate business ideas (see description of measures).

Table 3.2

Generating business ideas after the manipulation regressed on creative ability, diversity of information, and the interaction term.

	Generating business ideas after manipulation					
	Number			Originality		
Base model	B	SE	β	B	SE	β
Cognitive ability	1.00	0.81	.11	0.42	0.29	.15
Gender ^a	0.36	0.36	.09	0.02	0.13	.01
Line of business ^b	-0.38	0.35	-.10	-0.14	0.12	-.11
Generating business ideas before manipulation (number) ^c	0.59**	0.09	.58**			
Generating business ideas before manipulation (originality) ^c				0.31**	0.08	.39**
Change in R ²			.37**			.24**
Full model						
Creative ability	0.28**	0.11	.24**	.03	0.04	.08
Diversity of information ^d	-0.70*	0.32	-.18*	-0.09	0.11	-.07
Creative ability x diversity of information	-0.34*	0.16	-.18*	-0.17**	0.06	-.27**
Change in R ²			.10**			.08*

Note: ^a 0 = male; 1 = female. ^b 0 = manufacturing; 1 = service. ^c measure is identical to ability to generate business ideas (see description of measures. ^d 0 = diverse; 1 = constrained. * p < .05; ** p < .01.

significant ($t = 2.82, p < .01$) whereas the slope for constrained information was not ($t = 0.55, ns.$).

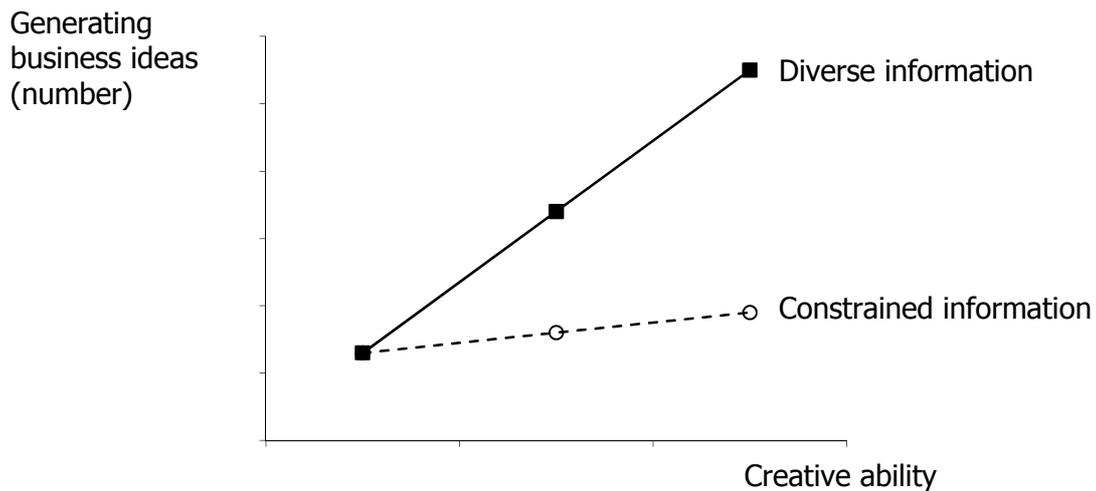


Figure 3.2. Relationship between creative ability and number of generated business ideas moderated by diversity of information.

Regarding the dependent variable of generating original business ideas we found that the beta for diversity of information was not significant ($\beta = -.07, ns$) suggesting that diverse versus constrained information alone does not influence the originality of business ideas. Similarly, the beta for creative ability was not significant ($\beta = .08, ns$). However, the beta of the interaction term was significant ($\beta = -.27, p < .01$). To illustrate the nature of the interaction we followed the same procedure as for generating a high number of business ideas. Figure 3.3 displays that there is a strong positive relationship between creative ability and generating original business ideas for diverse information whereas the relationship is weaker (and slightly negative) for the constrained information condition. Simple slope analyses revealed that the slope for diverse information was significant ($t = 2.53, p < .01$) whereas the slope for constrained information was not ($t = -1.41, ns.$).

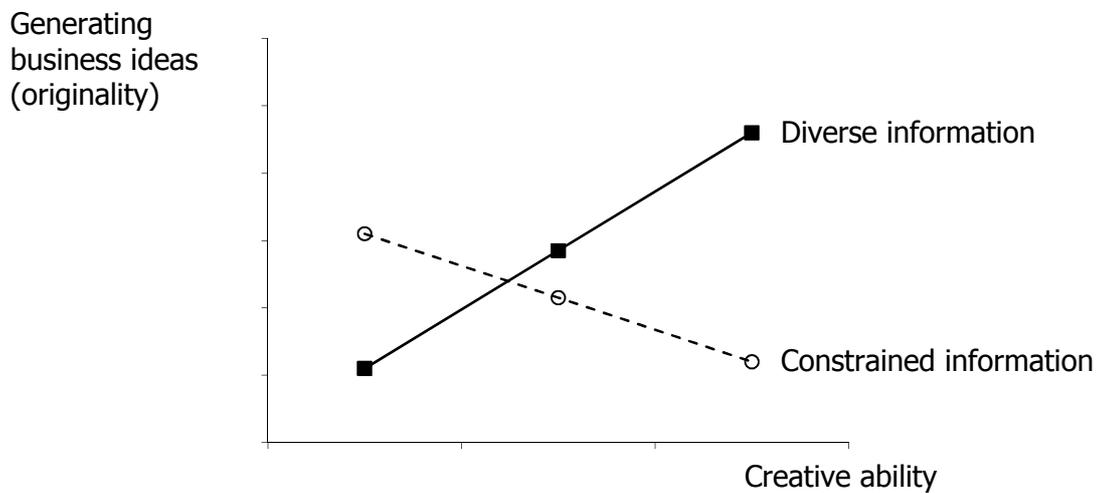


Figure 3.3. Relationship between creative ability and originality of generated business ideas moderated by diversity of information.

Hypotheses 2a and 2b state that creative ability is related to the ability to generate a high number and originality of business ideas and they were fully supported. Table 3.3 reports the results of the hierarchical regression analyses. Note that our measures for ability to generate business ideas were not affected by the experimental manipulation. In the first step, we included the controls which did not explain a significant amount of variance in ability to generate business ideas (number: $R^2 = .02, p = .71$; originality: $R^2 = .06, p = .16$). In the second step we entered creative ability which explained additional 8% of variance in number and 17% in originality. In both cases the betas were positive and significant (number: $\beta = .30, p < .01$; originality: $\beta = .42, p < .01$).

Hypothesis 3a and 3b state that ability to generate a high number and ability to generate original business ideas are positively related to venture growth. Results are presented in Table 3.4. Ability to generate a high number of business ideas did not explain additional variance over and above the control variables ($\beta = .04, ns$). Thus, hypothesis 3a was not supported by our study. However, ability to generate original business ideas explained additional variance in venture growth when added to the equation and the beta was positive (7%, $\beta = .28, p < .01$). The finding supports

hypothesis 3b. Our findings suggest that being only able to generate a high amount of business ideas is not related to venture growth but it is important to be able to generate original business ideas to experience higher growth rates.

Table 3.3

Ability to generate business ideas regressed on creative ability.

Ability to generate business ideas						
Base model	Number			Originality		
	B	SE	β	B	SE	β
Cognitive ability	-0.91	0.99	-.10	0.69	0.39	.20
Gender ^a	0.26	0.44	.06	0.08	0.17	.05
Line of business ^b	-0.16	0.43	-.04	-0.14	0.17	-.09
Change in R ²	.02			.06		
Full model						
Creative ability	0.35**	0.12	.30**	0.20**	0.05	.42**
Change in R ²	.08**			.17**		

Note: ^a 0 = male; 1 = female. ^b 0 = manufacturing; 1 = service. * p < .05; ** p < .01.

To test whether ability to generate business ideas is a mediator in the relationship between creative ability and venture growth (hypothesis 4), we used the bootstrapping method suggested by Preacher and Hayes (2004). This method has several advantages over the causal step approach specified by Baron and Kenny (1986) or Sobel's (1982) test of indirect effects. The bootstrapping approach can be used even when the sample size is small, it is independent of a non-normal distribution of the indirect effect, and it has a better power to detect real effects (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; Shrout & Bolger, 2002).

Table 3.4

Venture growth regressed on ability to generate business ideas.

	Venture Growth		
Base model	B	SE	β
Cognitive ability	20.31	14.70	.16
Gender ^a	-0.39	6.63	-.01
Line of business ^b	-0.26	6.31	-.01
Business size	0.33	0.29	.13
Change in R ²			.04
Full model (separate analyses)			
Ability to generate business ideas (number)	0.92	2.70	.04
Change in R ²			.00
Ability to generate business ideas (originality)	10.18**	3.91	.28**
Change in R ²			.07**

Note: ^a 0 = male; 1 = female. ^b 0 = manufacturing; 1 = service. * $p < .05$;

** $p < .01$.

We calculated two different analyses using ability to generate a high number and ability to generate original business ideas as mediators. Regarding ability to generate a high number of business ideas the bootstrapping result showed that the 95% confidence interval around the indirect effect contained zero (indirect effect: .01; lower level: -.05; upper level: .03). Thus, there was no indirect effect of creative ability on venture growth through ability to generate a high number of business ideas. Regarding ability to generate original business ideas the 99% confidence interval around the indirect effect did not contain zero (indirect effect: .18; lower level: .01; upper level: .47). The finding shows that creative ability had an indirect effect on venture growth through ability to generate original business ideas ($p < .01$). We note that there is no significant

relationship between creative ability and venture growth (see Table 3.1). Scholars argued recently that a significant relationship between the independent and dependent variable is not a necessary requirement for a mediation effect (MacKinnon et al., 2002; Shrout & Bolger, 2002). Our analyses of the direct effects revealed that creative ability is related to ability to generate business ideas and ability to generate original business ideas is related to venture growth (see Table 3.3 and Table 3.4). Kirkpatrick and Locke call this type of relationships between an independent, mediating, and dependent variable a “two-part causal linkage” (1996, p. 44). We therefore conclude that ability to generate original business ideas mediates the relationship between creative ability and venture growth and that hypothesis 4 finds support regarding ability to generate original business ideas.

3.6 Discussion

3.6.1 Interpretation of the Interplay between Creative Ability and Diversity of Information

Our first research question aimed at extending current perspectives on individual and contextual factors in the opportunity identification process by taking an interactionist view. We examined the combined effect of the individual factor of creative ability and the contextual factor of diversity of information on generating business ideas. We attempted thus to follow calls in the literature to take a more comprehensive look on factors that enhance or restrict creative ability and eventually opportunity identification (Zhou, 2008). Our interactionist perspective with the focus on diversity of information also aimed at examining boundary conditions of existing theoretical frameworks that recommend a constrained, systematic search for information to come up with business ideas (Fiet, 2002, 2007). We found that the positive impact of creative ability on the generation of business ideas was dependant on the diversity of information the business owners received. When provided with diverse information, we found a strong relationship between creative ability and generating business ideas. Providing business owners with constrained information led to a weaker relationship between creative ability and generating business ideas. The results show that owners

with high creative abilities benefit from diverse information and generate a higher number and more original business ideas. They generate fewer and less original business ideas when provided with constrained information. We think that our finding adds to the entrepreneurship literature in several ways. Our finding regarding the interaction between creative ability and diversity of information offers an approach to integrate two opposing theoretical frameworks on the type of information entrepreneurs should look for to increase their chances of identifying a high number and more original business opportunities. While Fiet (2002; 2007) proposes to look for constrained information, the creativity literature recommends to seek diverse information (e.g., Ward, 2004). We suggest that it is important to take into consideration the combined effects of creative ability and diversity of information. Amabile's (1983) model provides theoretical grounds that creative achievements result from a combination of cognitive abilities and the absence of constraining environmental factors. Diverse information match high levels of creative ability and result in the generation of a higher number and more original business ideas. However, people with low creative ability perform equally well as owners with high creative ability when they were provided with constrained information. The low creative individuals might benefit from the advantages of a constrained search without experiencing the disadvantages regarding number and originality of business ideas.

The significant interaction between creative ability and diversity of information also provides evidence for Shane and Venkataraman's (2000) reasoning that cognitive capacities and information are two broad categories of factors that have an impact on opportunity identification. So far, research dealing with the factor information mostly concentrated on a main effect of amount of information or information search intensity on opportunity identification (Busenitz, 1996; Kaish & Gilad, 1991; Ucbasaran et al., 2008). We add to this approach by investigating diversity of information and providing evidence that the diversity of information influences to what extent business owners can make use of their creative abilities in order to generate business ideas.

In line with Dimov (2007a) and several other scholars in the entrepreneurship domain (e.g., R. A. Baron, 2007b; Singh et al., 1999), we think that entrepreneurship literature would benefit from regarding opportunity identification as a process that starts

with the generation of business ideas and continues with the development of these ideas into business opportunities. By splitting the opportunity identification process into several parts and focusing on the idea generation part, we could build on existing theories from the creativity literature. We were thus able to get a better understanding of the effect that creative ability exerts in the first part of the opportunity identification process and why diverse or constrained information might enhance or inhibit this effect.

3.6.2 Interpretation of the Link between Creative Ability, Ability to Generate Business Ideas, and Venture Growth

Our second research question aimed at investigating the functional value of creative ability and ability to generate business ideas for venture growth. We found that creative ability has a positive effect on the ability to generate multiple and original business ideas. Moreover, creative ability was indirectly and ability to generate original business ideas directly related to venture growth. The notion that creative ability plays an important role in entrepreneurship dates back to the seminal works by Schumpeter (1934) on entrepreneurship and his concept of “creative destruction”. Our result on the main effect of creative ability on ability to generate business ideas supports theoretical arguments that business opportunity identification involves processes of combining information to create new means-ends-frameworks or to identify meaningful patterns (cf., R. A. Baron, 2006; Shane & Venkataraman, 2000).

Our results also show that creative ability and the ability to generate original business ideas are related to venture growth. This finding supports approaches that stress the importance of the psychology of business owners and CEOs for venture success (e.g., R. A. Baron, 2007a; Baum, Frese, & Baron, 2007; Frese et al., 2007). Our findings also support the notions that the originality of business ideas is an important indicator for the wealth creating potential of business ideas (Fiet, 2002; Shepherd & DeTienne, 2005; Ucbasaran et al., 2008). Business owners who were better able to generate original business ideas were more successful in terms of venture growth. We did not find support for the hypothesis stating that the ability to generate a high number of business ideas is related to venture growth. This finding suggests that just generating a lot of business ideas is not beneficial for venture growth. The quality dimension of

originality needs to be considered as well. Non-original ideas may not be useful because they do not provide a competitive advantage.

Although creative ability was not directly related to venture growth, we found an indirect relationship of creative ability to venture growth mediated by ability to generate original business ideas. Interestingly, the relationship between creativity and venture growth was also not significant in the study by Heunks (1998), which is the only other study that we are aware of that also investigated the relationship between the two constructs. The findings suggest that whereas creative ability per se is not strongly related to venture growth, it exerts an indirect effect on venture growth through the ability to generate original business ideas. Our study supports theoretical arguments that general cognitive characteristics, such as creative ability, may only have limited predictive value and it is necessary to investigate cognitive constructs that are more closely related to opportunity identification and exploitation (R. A. Baron, 2007a). Our findings show that the ability to generate original business ideas is a specific cognitive construct that links creative ability and venture growth.

3.6.3 Strengths and Limitations

As in any study, there are some limitations in this research as well. We have to note that the design of our study might be a potential limitation. We investigated the first research question on how the interplay of creative ability and diversity of information influences generating business ideas using an experimental design. Due to our experimental design the external validity of this finding might be limited. We used an experimental design to manipulate the diversity of information the business owners received. This artificial situation heightens the internal validity of the study. Although research showed that people's performance in generating ideas in an artificial setting is related to their creative performance in their work setting (Clapham et al., 2005), we acknowledge that the gain in internal validity was at the expense of external validity. Future studies have to replicate our findings in a more natural setting to provide evidence for the external validity and generalizability of our findings. Yet, despite the potential disadvantages of experiments regarding the external validity, we consider the experimental design as a clear strength of our study. Experiments allow drawing causal

conclusions. Thus, we are able to conclude that certain pieces of information constrain the positive effect of creative ability on generating business ideas.

The design of our second research questions on the relationship between creative ability, ability to generate business ideas, and venture growth might also have some limitations. We used a cross-sectional design to study the relationship between ability to generate business ideas and venture growth. We argued that ability to generate business ideas leads to higher venture growth. A reverse causal direction of the relationship might also be possible. We cannot rule out this interpretation of our results. However, our interpretation of an effect of ability to generate business ideas on venture growth is in accordance with the entrepreneurship literature (R. A. Baron, 2007b; Ward, 2004). Additionally, individual differences in the ability to generate original ideas are stable over time (McCrae et al., 1987). Therefore, business owners' ability to generate business ideas should have predictive value for their venture growth.

Furthermore, our measure of venture growth was based on business owners' subjective estimates about their growth rates. The alternative would be to obtain more objective data, for example accountancy-based measures. Yet, it is important to note that accountancy-based measures also include subjective assumptions, for example about cost of stock (Smith, 1996). Similarly, performance measures (e.g., profit) might be deliberately manipulated for tax reasons (Sapienza et al., 1988). Particularly in the African context, business owners include personal expenses in their financial records to reduce business income tax (Bradford, 2007). Additionally, many smaller enterprises, in Africa but also elsewhere, do not keep appropriate and continuous financial records (Shinder, 1997; Wall et al., 2004). We therefore relied on estimates by the business owners who have, in general, a comprehensive overview of the performance of their business. Our approach is justified by research that showed that managers' and chief executives' estimates about the performance of their companies have convergent and construct validity and that the use of subjective measures of performance does not lead to erroneous conclusions (Wall et al., 2004).

Finally, we want to discuss some strengths and limitations regarding the overall design. We consider the operationalization of the constructs as a strength of our study. We used an objective scoring procedure to measure creative ability. Diversity of

information was experimentally manipulated. The originality of business ideas was rated by two independent raters using a scoring guide with fixed anchors. The measure for venture growth was based on the business owners' statements. Our approach included multiple measurement methods and multiple sources which should reduce the percept-percept bias and common method variance.

A limitation might be the sample of our study. We acknowledge that our results can strictly be generalized only to the population of Ugandan business owners located in the wider area of Kampala. However, we think that our somewhat uncommon sample might also have a number of strengths. The sample allows us to address several questions that are still unanswered in entrepreneurship research and that are of high practical importance. The sample enabled us to relate the owners' ability to generate business ideas to venture growth. Investigating such relationships contributes to our understanding of the underlying mechanisms of venture growth and how capabilities on the individual level translate to firm-level performance. Additionally, entrepreneurship is an important factor for economic growth and poverty reduction in developing countries (Mead & Liedholm, 1998). Acknowledging the importance of entrepreneurship for economic development, the Ugandan government revised its development strategy. The main goal is now to promote the private sector and to establish economic policies that allow private enterprises to thrive. To support such governmental programs and to enhance wealth creation it is important to identify factors that facilitate the identification of opportunities. Our study is a step in this direction by demonstrating how creative ability and information interact in the opportunity identification process.

3.6.4 Future Research

In line with several scholars (Dimov, 2007a; Eckhardt & Shane, 2003; Fiet & Patel, 2008), we consider experiments to be a promising research design to test entrepreneurship theories. The entrepreneurial process consists of several steps and each step has its unique characteristics to take into account (R. A. Baron, 2007b). For example, future research could use an experimental design to investigate how current and future business owners develop business ideas into business opportunities. Scholars

suggest that the successful development of a business idea into a business opportunity depends on learning processes (Dimov, 2007a). Learning is influenced by cognitive abilities, approaches to learning (e.g., self-regulated learning), and informational input (Unger et al., 2009). Studies could manipulate the informational input or induce people to use certain learning approaches to investigate factors that influence the development of a business idea into a business opportunity.

Similarly, the role of creative ability in the business opportunity identification process needs further clarification. Creative ability might not only facilitate the generation of new business ideas, but also the process that leads to the development of the idea into a business opportunity. In this process, it is likely that people will face several setbacks, problems, and barriers. Creative ability could help generate multiple and original solutions to overcome these problems (Bledow, Frese, Anderson, Erez, & Farr, 2009). Investigating the role of creative ability along the entrepreneurial process seems promising as it would shed light on the different underlying mechanisms that lead to the identification of business opportunities.

3.6.5 Practical Implications and Conclusions

Combining our two research questions, we think that our findings have a number of practical implications. First, it is important to consider interindividual differences among current and future business owners when giving recommendations regarding the type of information that optimizes the chances of identifying business opportunities. A constrained search might have some advantages (cf., Fiet, 2002) but it may also inhibit the positive effects of creative ability. Therefore, current and future business owners should look for information that match their creative abilities. They could expand their considerations sets depending on their individual levels of creative ability. This would combine the beneficial aspects of a constrained search and a search that enhances the positive effects of creative ability.

Second, business owners have to come up with original business ideas to stimulate venture growth. Our results suggest that ordinary ideas, for example by copying or imitating ideas from competitors, are not sustainable sources for venture growth. Particularly in Uganda, where most of the entrepreneurs indicate that their

business ideas are based on existing products or services (Walter et al., 2005), current and future business owners should be educated to strive for non-standard, novel, and extraordinary business ideas. Furthermore, contextual factors that enhance the effect of creative ability on the potential to generate original business ideas should thus be relevant for venture performance. Business owners should seek diverse information, particularly when they possess high levels of creative ability, to come up with original business ideas in order to achieve higher venture growth.

Finally, current and future business owners should be made aware that there is a difference between being highly creative and using the creative ability for the business. Our results show that creative ability is only indirectly related to venture growth through the ability to generate original business ideas. Business owners' general creative ability has to translate into the specific ability to generate multiple and original business ideas. It is important to use the available creative ability in order to generate ideas for innovative products or services that might lead to the creation of a new venture or the significant improvement of an existing one.

3.7 Appendix A

Hypothetical scenario on new lifelong learning trend in Uganda.

Lifelong learning in Uganda

You are watching the news on TV and you hear that nowadays skills and competencies become more important. There is still room for improvement in the education system in Uganda. Although it rather seems to be a governmental or political issue, the news say that this is a huge new market with a big profit potential because people are more and more willing to pay privately for their own and their children's education. Lifelong learning is the new trend.

What business ideas come to your mind? Please list as many business ideas for new products or services as possible. The ideas may or may not be related to your current business.

3.8 Appendix B

Constrained and diverse information used in the study.

Constrained information	Diverse information
Founding mechanical schools.	Offering after work refresher courses.
Developing a program that combines university with the job.	Developing learning board games for kids.
Starting a training centre which provides on the job training.	Starting a training centre which provides specialized courses for senior citizens.
Founding an internship agency to foster job skills.	An internet platform where people can exchange knowledge.

CHAPTER 4

Intentions, Plans, and Fantasies: A Longitudinal Study of the Entrepreneurial Process

4.1 Abstract

Building on theories of action regulation and notions that entrepreneurial success requires action, we argue for the importance of self-regulatory mechanisms for entrepreneurial success. In a longitudinal study over a 30-month period, we traced 139 nascent entrepreneurs. We ascertained entrepreneurial success in terms of start-up, survival, and value creation. Our findings show that action planning moderated the effect of entrepreneurial intention on entrepreneurial success. We also found main effects of entrepreneurial self-efficacy and positive fantasies on entrepreneurial success. Our results suggest that nascent entrepreneurs can effectively influence the success of their entrepreneurial endeavor by using means of self-regulation.

4.2 Introduction

A key outcome of entrepreneurship is the emergence of new organizations (R. A. Baron, 2007b; Gartner, 1985). The process of forming new organizations begins with the intention to start a new venture and it should lead to a business that makes its first sale (R. A. Baron, 2007b). People who are involved in this process are referred to as nascent entrepreneurs (Reynolds et al., 2005). However, not all people who intend to start a business accomplish the necessary tasks and achieve their goal of creating a new organization. In fact, Reynolds and Curtin (2008) report a rate of only 12% to 23% of nascent entrepreneurs who succeed in creating a new business. Therefore, an important question is why some people are more successful in the process of exploiting a business opportunity and why they achieve the full transition from nascent to mature entrepreneurship that results in the emergence of a new organization (Parker & Belghitar, 2006; Shane & Venkataraman, 2000). Although the terms process and emergence imply a temporal perspective, relatively few studies investigated the phenomena of entrepreneurship and venture creation across a longer period of time (Reynolds, 2007). Those studies that adopted a longitudinal design consistently showed that successful entrepreneurs have a more active approach towards creating a new organization. Successful entrepreneurs engage in more start-up (gestation) activities to develop a business structure and establish operational procedures (Carter et al., 1996; Gatewood, Shaver, & Gartner, 1995; Kessler & Frank, 2009; Lichtenstein, Dooley, & Lumpkin, 2006; Newbert, 2005). Accordingly, Lichtenstein et al. (2007) recommended to “go fast” and “steady” (p. 253) and to initiate a high-rate of start-up activities in order to successfully proceed through the process from the initial intention to the actual launch of a new venture.

It is important to note, however, that having the intention to start a business is not sufficient to initiate the necessary actions. Although some scholars argued that entrepreneurial intentions are the best predictors for entrepreneurial behavior (Bird, 1988; Krueger, Reilly, & Carsrud, 2000; Zhao, Seibert, & Lumpkin, 2010), other scholars emphasized that the strength of the relationship varies strongly and in many cases people fail to act on their intentions (Brandstätter, Heimbeck, Malzacher, & Frese,

2003; Davidsson & Honig, 2003; Gollwitzer, 1999). We concur with the latter view and suggest that intending to achieve the goal of starting-up a business is not sufficient for actually succeeding in this endeavor. Based on theoretical frameworks of action regulation (Frese & Zapf, 1994; Karoly, 1993), we argue that two cognitively based, self-regulatory mechanisms play a major role in the process that leads to the successful implementation of entrepreneurs' intentions. First, intentions of starting-up a business must be combined with action plans that specify when, where, and how to engage in the necessary activities for a successful start-up (Frese, 2009; Gollwitzer, 1999). By specifying how to proceed to achieve a goal, action plans bridge the gap between intentions and actions (Frese, 2009; Frese & Zapf, 1994; Heckhausen & Gollwitzer, 1987). Action plans are thus a self-motivating force that enhance the effect of intentions by facilitating the initiation of actions. In the absence of action plans, entrepreneurs should not achieve their goals even if they have strong intentions because their goals are not translated into actions. Thus, we expect that action plans moderate the effect of intentions on entrepreneurial success.

A second important self-regulatory mechanism is goal-referent thinking (Karoly, 1993). We argue that how an entrepreneur thinks about his or her goal affects the initiation of start-up activities and thus important entrepreneurial outcomes. We focus on two different types of goal-referent thinking: expectations and fantasies. Expectations are informed by past experiences and they thus reflect an individual's performance history. In contrast, fantasies are images of future events that emerge independent of past experiences (Oettingen & Mayer, 2002). These two forms should have different effects on performance. On the one hand, positive expectations should have positive effects on intentions, effort, and persistence which should translate into higher performance (Ajzen, 1991; Bandura, 1989). On the other hand, positive fantasies should seduce people to indulge in the imagined positive future and prevent them from initiating action (Oettingen & Mayer, 2002). Thus, we expect a negative effect of positive fantasies on entrepreneurial success.

With our study, we aim to contribute to the entrepreneurship literature in three ways. First, we apply a theoretical framework of action regulation (Frese & Zapf, 1994; Karoly, 1993) to the field of nascent entrepreneurship in order to explain why some

people are more successful than others in implementing their intentions of starting a business. Previous research showed that certain factors and activities have an effect in this process but offered little theoretical explanations for their findings (e.g., Kessler & Frank, 2009). We seek to fill this gap by drawing on action regulation theories to explain how initial intentions are successfully implemented and what factors enhance or hinder this process. Second, we answer calls in the entrepreneurship literature to investigate in more detail how nascent entrepreneurs' expectations and perceptions regarding the future affect their performance (Carter et al., 1996). While previous research stated that thinking positively about the future should be beneficial, a more differentiated perspective might be necessary. For example, Hmieleski and Baron (2009) showed that being overly optimistic (i.e., expecting positive outcomes in the future) has negative effects for subsequent venture growth. Similarly, we argue that positive thoughts about the future in terms of fantasies are detrimental for entrepreneurial success. By differentiating between different forms of thinking about the future, we seek to add to the entrepreneurship literature that emphasizes the importance of entrepreneurs' thoughts and cognitions in the entrepreneurial process (R. K. Mitchell et al., 2007). Third, we conducted a longitudinal study with three measurement waves to be able to report data on nascent entrepreneurs over a period of 30 months. Scholars stated that it is important to conduct follow-up studies on nascent entrepreneurs beyond the time of the first sale to get more insights about their success in the long run (Carter et al., 1996; Delmar & Shane, 2003). Our study design allows us to make predictions regarding several entrepreneurial success measures (cf., R. A. Baron, 2007b). Specifically, we investigate the entrepreneurial success measures of start-up, survival, and value creation in terms of generated revenue and number of employees. We are thus able to derive causal conclusions regarding the hypothesized effects of intentions, plans, and fantasies on different entrepreneurial success measures. Our hypothesized effects are depicted in Figure 4.1.

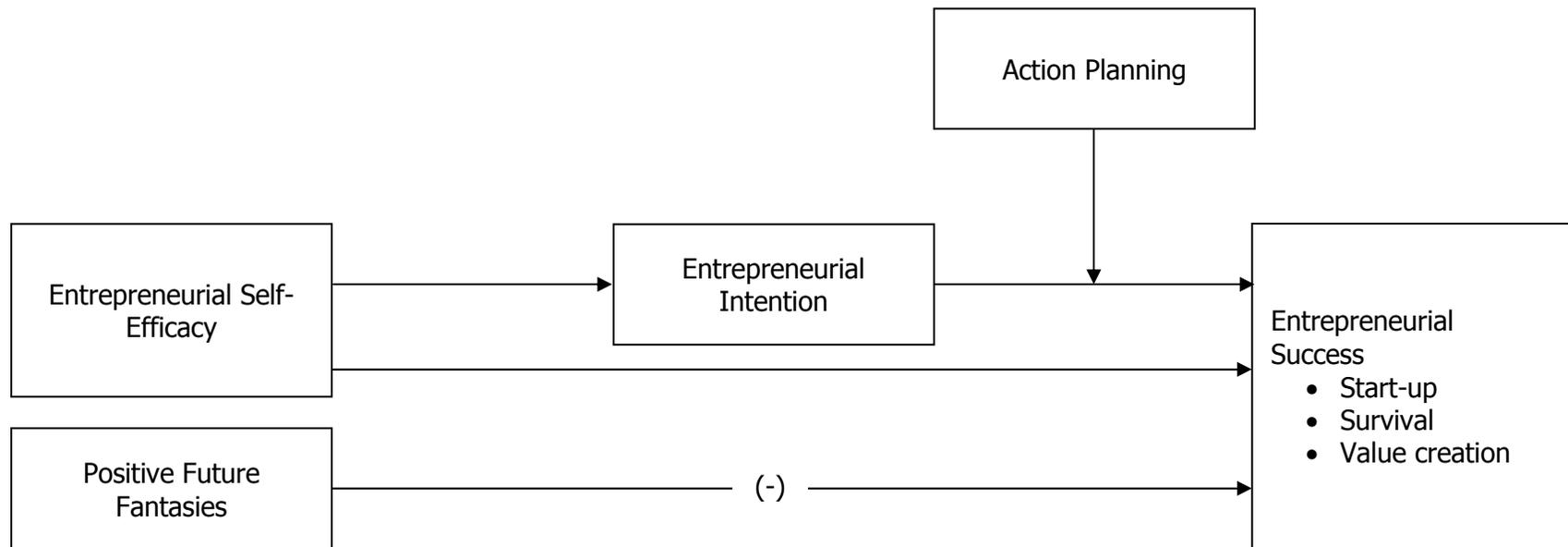


Figure 4.1. Hypothesized effects of intentions, plans, and fantasies on entrepreneurial success.

4.2.1 Entrepreneurial Intentions, Action Planning, and Entrepreneurial Success

The importance of action for entrepreneurship is theoretically acknowledged (Frese, 2009; Gartner, 1985; McMullen & Shepherd, 2006) and empirically supported (e.g., Carter et al., 1996; Gatewood et al., 1995; Kessler & Frank, 2009; Lichtenstein et al., 2007; Lichtenstein et al., 2006; Newbert, 2005). Creating new ventures is a process of organizing and it requires ongoing interdependent actions by the entrepreneur to assemble the necessary resources and to develop viable structures (Gartner, 1985). In fact, Carter et al. (1996) found that nascent entrepreneurs who did not successfully start-up a business but remained in the status of a nascent entrepreneur were more passive, performed less start-up activities, and showed less effort in the preparatory phase before launching the business. Given that entrepreneurship depends on actions and that these actions must be directed towards the goal of starting-up a business, several scholars argued that entrepreneurial action can be considered as intentionally planned behavior (e.g., Bird, 1988; Krueger et al., 2000). Based on the theory of planned behavior (Ajzen, 1991), they suggested that entrepreneurial intentions, which are the expressed intentions to start a business (Zhao et al., 2010), should be the best predictor for entrepreneurial actions and success. The assumption is that people with stronger entrepreneurial intentions are more likely to engage in entrepreneurial activities and to achieve the goal of starting-up a business. Indeed, research supported this line of reasoning by providing evidence for a positive relationship between entrepreneurial intentions and entrepreneurial outcomes (Kolvereid & Isaksen, 2006). However, other research did not find entrepreneurial intentions to be a predictor of becoming self-employed questioning the assumed importance of entrepreneurial intentions (Henley, 2007).

Within an action-theoretical framework (Frese & Zapf, 1994; Heckhausen & Gollwitzer, 1987), several scholars argue that intentions are necessary but not sufficient for initiating action. Additionally to forming the intention, it is important to formulate plans how to effectively implement the intention. For example, Gollwitzer (1999) notes that goal realization requires the formulation of if-then plans specifying the course of action to successfully implement the intention. Gollwitzer (1999) distinguishes between goal intentions and implementation intentions. Goal intentions specify the end point an

individual wants to achieve which may be either a desired outcome or performing a desired behavior. Implementation intentions are plans that specify when, where, and how the individual will instigate the necessary action leading to goal achievement. By specifying the when, where, and how of actions, implementation intentions increase the accessibility of the situation that requires action and they trigger the execution of the predetermined behavior that one will perform to achieve the goal (Gollwitzer, 2006; Gollwitzer, Fujita, & Oettingen, 2004; Gollwitzer & Sheeran, 2006). Implementation intentions (if-then plans or the specification of when, where, and how someone intends to perform a behavior) thus facilitate getting started with a specified action and increase persistence in one's goal pursuit.

Similarly, Frese (2009; Frese & Zapf, 1994) argues that successful goal pursuit requires the development of action plans that turn intentions into action. Action plans are mental simulations of actions (*Probehandlung*) that determine the sequence of operational steps to achieve a goal (Frese, 2009). Action plans are distinct from business plans. While business plans can be considered written documents that illustrate the current state and the envisioned future of an organization (Honig & Karlsson, 2004), action plans refer to lists of activities that are necessary for successful goal pursuit and that are often not formally recorded (Frese et al., 2007). Action plans specify the necessary steps for goal attainment and elaborate the details of how to perform the steps to achieve the goal. The detailedness of action plans may range from very elaborate and specific to very general without specifying concrete steps. By specifying the single steps (what to do) and the operational details (how to do it), action plans mobilize and control the effort necessary for initiating action. Action plans thus increase the likelihood of overcoming procrastination and getting started with goal-oriented behavior. Furthermore, once goal-oriented actions are initiated, action plans direct effort and increase persistence for successfully performing those actions (Frese, 2009; Frese & Zapf, 1994). Planning structures the pursuit of goals; it facilitates prioritizing the necessary activities and performing them in a systematic way (Locke & Latham, 2002; Tripoli, 1998). People who plan are thus better able to focus their attention and efforts towards activities that help achieving the goal. Furthermore, planning helps people stay on track in the face of distractions and difficulties. Plans provide marks people can

return to in case they have been distracted. Plans are also the basis for anticipating problems and preparing alternative options to overcome the problems (Locke & Latham, 2002). Plans thus contribute to persistence in goal pursuit. In conclusion, action planning is an important self-regulatory mechanism that supports the implementation of intentions. Several studies provide support for the enhancing effect of plans on the relationship between intentions and performance (e.g., Brandstätter, Lengfelder, & Gollwitzer, 2001; Gollwitzer & Brandstätter, 1997; Sheeran, Webb, & Gollwitzer, 2005)

Following this line of reasoning, we suggest that nascent entrepreneurs who furnish their entrepreneurial intentions with action plans achieve higher levels of entrepreneurial success. We thus assume that action planning moderates the relationship between entrepreneurial intention and entrepreneurial success (see Figure 4.1). Nascent entrepreneurs who intend to start-up a business should be more successful in actually starting a business if they form action plans how to achieve this goal. Action plans should help nascent entrepreneurs to initiate the start-up activities necessary for implementing their intentions. Additionally, once nascent entrepreneurs have initiated the start-up activities, actions plans should control their efforts and increase their persistence to successfully accomplish the start-up of the business (Frese, 2009). Planning helps nascent entrepreneurs to focus their efforts on key start-up activities and reduce the likelihood that entrepreneurs waste effort by executing unnecessary activities or activities in an ineffective sequence (Delmar & Shane, 2003). Furthermore, nascent entrepreneurs who form action plans should be better able to monitor the progress of the start-up process and make the necessary corrections if deviations occur. As a consequence, the start-up process should run more efficiently and be completed in a timely manner. We therefore hypothesize that action plans enhance the effect of entrepreneurial intentions on being successful in starting-up a businesses. In case of high levels of action planning, entrepreneurial intentions should have a strong effect. In case of low levels of action planning, nascent entrepreneurs should be less likely to successfully implement their entrepreneurial intentions resulting in a lower probability of successfully starting-up a new business.

Hypothesis 1: Action planning moderates the effect of entrepreneurial intentions on entrepreneurial success in terms of start-up. In case of high levels of action planning, there is a strong effect of entrepreneurial intentions on start-up. In case of low levels of action planning, the effect is weaker.

We further argue that entrepreneurial intentions and action planning in the pre-launch phase also influence entrepreneurial success in the post-launch phase. Activities performed in the pre-launch phase can spill over into subsequent phases which means that nascent entrepreneurs can already lay the basis for later success in the pre-launch phase (R. A. Baron, 2007b). For example, securing orders with potential customers in the pre-launch phase should be beneficial for survival and value creation in the post-launch phase. In accordance with our line of reasoning that leads to Hypothesis 1, we argue that entrepreneurial intentions should be a prerequisite for engaging in start-up activities. However, forming plans should help nascent entrepreneurs to gear start-up activities towards the future and to prepare for future aspects that become relevant after the start-up has been successfully accomplished. We therefore assume that action planning moderates the relationship between entrepreneurial intentions and entrepreneurial success in later stages of the entrepreneurial process (see Figure 4.1).

Planning implies forethought and thinking about the future at present (Frese et al., 2007; Frese & Zapf, 1994). Nascent entrepreneurs who thoroughly plan the start-up of their businesses should be more likely to survive and create value because thinking about the future facilitates considering preparatory as well as preventive activities conducive to later success (Castrogiovanni, 1996; Frese, 2009). For example, by developing and executing a plan to test an initial product or service on customers, nascent entrepreneurs could identify a new market niche and thus obtain a better competitive advantage. Similarly, plans that reach into the future should help anticipating future demands and opportunities. Nascent entrepreneurs can prepare for such anticipated demands and opportunities at present (e.g., by assembling resources) and then exploit them more quickly than their competitors. Having actions plans ready for potential opportunities facilitates initiation of action to exploit opportunities when they appear (Gollwitzer, 1999). The increased scope of anticipation can also include

considering potential threats and problems that might occur in future. For example, retaliation by incumbents as a reaction to the entry of a new business might impair the performance of the new venture (Robinson & McDougall, 2001). Planning makes it possible to anticipate such threats and develop back-up or contingency plans to effectively deal with them.

In conclusion, we hypothesize that entrepreneurial intentions which are furnished with action plans are strongly related to entrepreneurial success in terms of survival and value creation while entrepreneurial goal intentions that are not furnished with action plans are only weakly related to these entrepreneurial success measures. The rationale for this hypothesis is that action planning implies a focus towards the future thereby facilitating the achievement of future goals.

Hypothesis 2: Action planning moderates the effect of entrepreneurial intentions on entrepreneurial success in terms of (a) survival and (b) value creation. In case of high levels of action planning, there is a strong effect of entrepreneurial intentions on survival and value creation. In case of low levels of action planning, the effect is weaker.

4.2.2 Goal-Referent Thinking and Entrepreneurial Success

Besides forming intentions and action plans, goal-referent thinking is an important self-regulatory mechanism underlying cognitively based motivation and performance (Karoly, 1993). Goal-referent thinking is a volitional regulator that refers to an individual's thoughts and beliefs regarding his or her goals (Karoly, 1993). In general, scholars argue that thinking positively about the future and one's goals is beneficial for motivation and performance while negative thoughts and beliefs impair motivation and performance (Bandura, 1989; Scheier & Carver, 1992; Seligman & Csikszentmihalyi, 2000). However, recent approaches in the entrepreneurship literature question the universally beneficial effect of positive thoughts and beliefs. For example, Hmieleski and Baron (2009) and Koellinger et al. (2007) showed that being overly optimistic or confident is negatively related to performance and survival. Accordingly, we argue that it is important to adopt a more differentiating perspective and to distinguish between different types of goal-referent thinking. Following fantasy realization theory (Oettingen

& Mayer, 2002), we distinguish between expectations and fantasies. Expectations are based on past experiences and consequently, positive expectations should be a valid predictor for future performance. Although the beneficial effect of positive expectations is well demonstrated in the literature (e.g., Rauch & Frese, 2007; Stajkovic & Luthans, 1998), we include expectations in our theoretical model to show that fantasies have additional exploratory value.

In the present study, we focus on expectations in terms of ability expectations (i.e. self-efficacy) regarding one's entrepreneurial capabilities (Bandura, 1989; Oettingen & Mayer, 2002). Entrepreneurial self-efficacy is defined as an individual's belief about his or her capabilities to successfully perform the roles and tasks of an entrepreneur (C. C. Chen, Greene, & Crick, 1998). We focus on ability expectations and not on outcome expectations because ability expectations are a robust predictor of firm start-up while outcome expectations play only a marginal role (Townsend, Busenitz, & Arthurs, 2010). Self-efficacy arises from prior performance accomplishments and provides information about what an individual is able to achieve (Gist & Mitchell, 1992). Entrepreneurial self-efficacy has been theoretically (Boyd & Vozikis, 1994; Krueger et al., 2000) and empirically (Zhao, Seibert, & Hills, 2005) linked to entrepreneurial intentions. Thus, we assume that there is a positive relationship between entrepreneurial self-efficacy and entrepreneurial intention (see Figure 4.1). The rationale is that individuals who feel more competent to set-up a business should form stronger intentions to do so (Krueger et al., 2000). Additionally, entrepreneurial self-efficacy should have positive effects on goal pursuit and thus on entrepreneurial success (see Figure 4.1). Self-efficacy has a guiding function; individuals with stronger beliefs in their capabilities to control their own level of functioning should exert more effort and persistence in the start-up process (Boyd & Vozikis, 1994). This line of reasoning is supported by previous research that provided evidence for a positive effect of people's self-efficacy on their success in starting-up and running a business (e.g., Baum et al., 2001; De Clercq & Arenius, 2006; Markman, Balkin, & Baron, 2002; Townsend et al., 2010). We therefore hypothesize:

Hypothesis 3: Entrepreneurial self-efficacy is positively related to entrepreneurial intentions.

Hypothesis 4: Entrepreneurial self-efficacy predicts entrepreneurial success in terms of (a) start-up, (b) survival, and (c) value creation.

While entrepreneurial self-efficacy is hypothesized to be positively related to entrepreneurial success, other forms of thinking positively about one's future or goals should be less beneficial. So far, several studies in the entrepreneurship literature investigated the negative effects of entrepreneurs' optimism and over-optimism (e.g., Hmieleski & Baron, 2009; Koellinger et al., 2007; Lowe & Ziedonis, 2006). Optimism is the generalized believe that the future in general will be positive (Scheier & Carver, 1992). These studies found that being overly optimistic may lead to flawed strategic decisions and judgments with negative effects on entrepreneurial success. Thus, optimism might exert a negative effect through the entrepreneur's decision making behavior. We want to extend this line of research by showing that positive thoughts might not only have negative effects on entrepreneurs' decision making but also on entrepreneurs' initiation of action. We therefore investigate the concept of positive fantasies because fantasies have a direct relevance for instigating action. Fantasies are imagined future events and they appear in the stream of thought independent of past experiences (Oettingen & Mayer, 2002). As fantasies are not informed by an individual's performance history, they exert no positive effect on effort or persistence. Instead, positive fantasies embellish desired future events and lead to a positive state based on imagination but removed from reality. Positive fantasies seduce people to mentally enjoy the imagined future and obscure the necessity to act. Indulging in positive fantasies should be a motivational burden that hampers the initiation of action (Oettingen & Mayer, 2002). Setting-up a business, however, requires high levels of self-regulated and self-initiated actions; entrepreneurs must show more self-initiated actions than other people because there are no external instructions or role requirements that push an entrepreneur towards action. As positive fantasies are detrimental for initiating action, we expect a negative effect of positive fantasies on start-up (see Figure 4.1). Furthermore, we expect a negative effect of positive fantasies on entrepreneurial success in later stages of the entrepreneurial process. Positive fantasies prevent people from thinking about possible upcoming threats and problems which leads to less preparatory

action to overcome them (Oettingen, 2000; Oettingen, Pak, & Schnetter, 2001). Particularly in the beginning of a new business, entrepreneurs have to deal with many problems and responsibilities (Locke & Baum, 2007). Because of the high workload and the fact that most tasks are non-routine and require the entrepreneur's full attention, entrepreneurs are at risk of being cognitively and motivationally overextended. Preparatory actions, for example in form of ready-made solutions, reduce the load and free resources that can be used to develop the new business and increase the likelihood of survival and business success (Frese, 2009). As positive fantasies should lead to less preparatory actions, we expect that positive fantasies have a negative effect on survival and value creation. In summary:

Hypothesis 5: Positive fantasies have a negative effect on entrepreneurial success in terms of (a) start-up, (b) survival, and (c) value creation.

4.2.3 Entrepreneurship in Uganda

Investigating entrepreneurship in developing countries such as Uganda is useful for several reasons. In general, entrepreneurship is seen as an important means to reduce poverty and promote economic growth (Acs & Varga, 2005; van Praag & Versloot, 2007). Several developing countries acknowledged the importance of entrepreneurship for economic development and revised their development plans. A common objective of these development plans is to establish policies that promote the private sector and allow private enterprises to flourish. Given the common objective of the development plans, it seems to fit that developing countries and changing economies have in general higher rates of entrepreneurial activity because in such environments opportunities emerge more likely and people have a higher necessity to become self-employed (Acs, Desai, & Hessels, 2008). In Uganda, for example, the entrepreneurial activity is among the highest in the world. About 30% of the Ugandan adult population is involved in the start-up of a new business (Walter et al., 2005). However, only a small part of nascent entrepreneurs is successful in actually starting a new firm (Reynolds & Curtin, 2008). Identifying mechanisms that facilitate the process of establishing a new business would have practical implications to support the governmental programs.

Furthermore, the governmental development plans aim at promoting sustainable and wealth creating businesses. However, Uganda suffers from a very high rate of business closures. A similar rate as the rate of people who report to be involved in a new start-up state that they have closed down a business in the past 12 months (Walter et al., 2005). This means that business churning in Uganda is very high with a net change that is near zero and that the businesses in Uganda are not sustainable. Additionally, there is a negative relationship between entrepreneurial activity and growth in gross domestic product in developing countries (van Stel, Carree, & Thurik, 2005). These results suggest that much of the entrepreneurial activity is invested in marginal businesses (e.g., shopkeepers or small crafts) with only little potential for wealth creation. We seek to identify factors that contribute to the creation of more promising ventures. Identifying factors that predict sustainable success in entrepreneurship should therefore be of practical relevance for the micro- and macro-economic development.

4.3 Method

4.3.1 Sample and Procedure

The longitudinal study was carried out in 40 different parishes in the wider area of Kampala. In each parish, we selected a random street and asked an adult (between 18 and 64 years) from a random household to participate in our study. Our study focuses on nascent entrepreneurs' action planning and goal referent thinking. We therefore asked the selected adult whether he or she intended to start a new business within the next six months. In case the selected adult affirmed the question, he or she was included in our sample. We then asked the person to introduce us to another adult in the parish who might be willing to participate in our study. The interviewers were told to repeat this procedure until the designated number of participants per parish was reached. The designated number of participants per parish was proportional to the size of the parish. In our sample, the number of participants from one parish ranged between $n = 1$ and $n = 19$. We chose this approach to acquire our sample because the total population of adults in Kampala is not reliably listed in an official registration or telephone directory. We

therefore applied an approach similar to the GEM data collection method in Uganda (cf., Walter et al., 2005).

We applied face-to-face interviews and administered a questionnaire at the end of the interview to collect our data at the first measurement wave (T1). The standardized interviews were conducted by local interviewers. The majority of interviews were conducted in English (87%). The remaining interviews were conducted in Luganda (12%) or Runyankole (1%). Whenever a second language was used, it was the mother language of the interviewer. The standardized interviews included questions on the nascent entrepreneurs' entrepreneurial intentions, action planning, positive fantasies, and on background information such as the nascent entrepreneurs' age, gender, entrepreneurial experience, and level of education. All interviewers received a thorough interviewer training which included sessions on interview techniques to probe participants' answers, the proper use of prompts to clarify abstract statements, on note taking, and on typical interviewer errors, such as non-verbal agreement. The interviewers were told to take verbatim notes of open questions.

The sample at the first measurement wave (T1) included 139 people who intended to start a business. Of the 139 participants, 67% were male. The average age was 30 years. The majority of participants held a college / university degree (48%) or completed at least the A-Level (17%). On average the participants earned between 118 and 294 USD per month. 55% of the participants had started a business before.

Six months after T1 we traced the participants of our initial sample and collected data for our second measurement wave (T2). We were able to collect data from 71 participants (51%). We conducted a series of t-tests to examine whether the 71 participants interviewed at T2 differed from the 68 participants who were not interviewed at T2. We did not find any significant differences except for gender. There were significantly more male participants in the subsample we interviewed at T2 (75%) than in the subsample we did not interview at T2 (59%). At the second measurement wave, we conducted a standardized interview to ask the participants whether or not they had started-up their intended business. The interviewers were the same persons as at T1.

We carried out the third measurement wave (T3) 24 months after T2 (i.e. 30 months after T1). At T3 we were able to trace 100 participants of our initial sample (72%). We calculated t-tests to examine whether the 100 participants interviewed at T3 differed from the 39 participants who were not interviewed at T3. There were no significant differences between the two subsamples except for gender. The subsample interviewed at T3 included significantly more male participants (74%) than the subsample not interviewed at T3 (51%). We gathered all data at T3 on the basis of a standardized interview. Interviewers were two German master students who received an interviewer training on the basis of the training we conducted with the interviewers at T1. The majority of interviews were done in English (90%). The remaining interviews were done in Luganda or Runyankole with the help of an interpreter. To increase the accuracy of the data of the last two years, we employed the method of a life history calendar (Freedman, Thornton, Camburn, Alvin, & Young-DeMarco, 1988). Life history calendars increases the quality of retrospectively gathered information by relating the timing of critical life events with events relevant for the research question. Critical life events, such as marriages or births, serve as reference points for recalling less salient events. The life history calendar improves respondents' recall accuracy even over lengthy periods of time because the respondents can place different events within the same time frame (Freedman et al., 1988). We recorded monthly sequences over the whole research period of the 30 months. We used the life history calendar to collect data on business start-up, business closure, generated revenue, and number of employees. We were able to interview more participants at T3 than at T2. 29 participants who were interviewed at T3 had not been interviewed at T2. We used the information collected on the basis of the life history calendar at T3 to complete the information regarding start-up of the intended business for the 29 missing participants at T2. To justify this approach, we cross tabulated the variable for start-up measured at T2 with the variable for start-up retrospectively measured at T3 on the basis of the life history calendar. The cross tabulation revealed that 67% of the participants correctly indicated at T3 whether they had started-up their intended business at T2 or not. This rate is similar to the rate for correctly remembered employment status found by Freedman et al. (1988) in their validation study of the life history calendar.

4.3.2 Measures

Entrepreneurial intention. Based on Ajzen (1991) and Carter et al. (1996), we developed seven items asking the participants for their intentions to start a business and to perform several start-up activities within the next six months. We asked the seven questions during the interview at T1. Two questions asked for the participants' intention and determination to start a business within the next six months. The items regarding the start-up activities covered the areas of looking for facilities, looking for employees, preparing a business plan, registering the business, and making the first sale. We asked "Within the next six months, do you intend to" followed by the specific activities. Participants answered all items on a 5-point Likert scale ranging from "not at all" to "absolutely". If a participant indicated that a start-up activity was already accomplished, the item was not included for this participant. We calculated the mean of the seven items to form our scale of entrepreneurial goal intention (Cronbach's Alpha = .67).

Action planning. Our measure of action planning was based on approaches developed by Frese et al. (2007) and Brandstätter et al. (2003). To ascertain the participants' level of action planning, we asked three questions during our interview at T1. We first requested the participants to tell us more about their intentions to start a business and to describe how they wanted to start their business. Subsequently, we referred to two specific start-up activities they intended to perform within the next six months. For each start-up activity, we requested the participants to tell us more about their intention and to describe how they wanted to go about to accomplish the specific activity. Whenever statements by the participants were unclear or too abstract, the interviewers used standardized prompts to probe and clarify the statements. The participants' responses were rated by two independent raters. The detailedness of the description indicates the elaborateness of an action plan. Important details of an action plan are the specification of sub-steps (i.e., several sub-steps how to achieve the goal) and time aspect (e.g., exact date when a sub-step has to be accomplished) (Frese et al., 2007). We therefore rated the participants' responses on the two dimensions "specification of sub-steps" and "specification of time aspects". We used 5-point Likert scales ranging from "not at all detailed" to "very detailed". We adapted guidelines and anchors developed by Frese et al. (2007) to standardize our rating procedure. We

determined inter-rater reliabilities by calculating intra-class coefficients (Shrout & Fleiss, 1979). The intra-class coefficients for the six different ratings ranged between .82 and .95 indicating good inter-rater reliabilities. The mean score of the six ratings formed our measure for action planning (Cronbach's Alpha = .62)³.

Entrepreneurial self-efficacy. We measured entrepreneurial self-efficacy at T1 with five questionnaire items. The items were developed by Frese et al. (2007) following theoretical conceptions by Bandura (1989). An example item is “*How confident are you that you can identify new business opportunities well?*”. Participants answered the items on a 5-point Likert scale. The Likert scale ranged from “not at all confident” to “very confident”. We computed the mean of the five items for our scale of entrepreneurial self-efficacy (Cronbach's Alpha = .82).

Positive fantasies. Our measure for positive fantasies followed the procedure developed by Oettingen and Mayer (2002). During the interview at T1, we first asked the participants whether they had any positive fantasies or imaginations with regard to their intentions to start a business and with regard to the time when they are running the business. Answers were recorded as either “yes” (1) or “no” (0). If they affirmed the question we asked them to describe their positive fantasies and imaginations. We asked these questions to activate the positive fantasies the participants had in the past. After the participants had finished the description of their positive fantasies, we requested them to indicate on a 5-point Likert scale how positive these fantasies or imaginations were for them. The answers ranged from “a little bit” to “extremely”. We repeated this procedure asking for the negative fantasies and imaginations the participants had with regard to starting-up and running a business. Subsequently, the participants indicated on a 5-point Likert scale how negative these fantasies or imaginations were for them. To arrive at our measure for positive fantasies, we computed two difference values: we subtracted the factual information whether they had negative fantasies from the factual information whether they positive fantasies and we subtracted the reported negativity from the reported positivity of fantasies. We then standardized and combined the two

³ It is objectively not necessary to plan out all important parameters in detail for each intended start-up activity. Rather, the most important parameters should be considered (Frese et al., 2007). The importance of different parameters may vary across different start-up activities which may results in lower internal consistency. Furthermore, the different aspects covered by planning need not necessarily coincide which also leads to lower values for the measure's Cronbach's Alpha (Brandstätter et al., 2003).

difference values to form our measure of positive fantasies (Cronbach's Alpha = .77). This measure represents the experienced tone of fantasies regarding the intention to start-up a business (Oettingen & Mayer, 2002). Computing difference values from participants' reported positive and negative fantasies has been shown to be reliable and valid for assessing individuals' tone of experienced fantasies (Oettingen & Mayer, 2002).

Start-up. Successful start-up was measured at T2 six months after our first measurement wave. We asked the participants during our interview whether they had started-up their business within the previous six months. Answers were coded as “yes” (1) or “no” (0). For participants who were interviewed at T3 but not at T2 (29 participants), we used the retrospective reports collected at T3 to ascertain whether or not they had started-up their intended business in the six-month period between T1 and T2. These information were derived using the method of the life history calendar. This method improves participants' recall accuracy (Freedman et al., 1988). In our study, the recall accuracy of the participants interviewed at T2 and T3 was 67% which is in line with accuracies reported by Freedman et al. (1988).

Survival. We measured survival at T3 (i.e., 24 months after T2). We asked the participants during the interview whether they had started-up their intended business. This could have been in the first six months of the study (the period between T1 and T2) or later. 55% of the participants (55 participants) indicated that they had started-up their intended business. Out of the 55%, 72% had started-up their business within six months after T1 and 87% had started-up their business within 12 months after T1. All new businesses were started-up within a period of 23 months after T1. We then asked them whether their business was still running or whether they had closed it down. Answers were coded as “survival” (1) or “failure” (0). As expected, there was a positive correlation between the time the business was started (months after T1) and survival ($r = .37, p < .01$) indicating that the later the business was started the more likely it was to be categorized as survival. We therefore controlled for time lag of start-up (measured in months after T1) when we conducted our analyses regarding survival.

Value creation. At T3, we ascertained the value the participants had created with their businesses in the previous 24 months. We computed a scale based on two

measures that are considered to important indicators for entrepreneurial success and value creation: generated revenue and number of employees (R. A. Baron, 2007b). During the interview, we asked the participants how much revenue they had generated in the current year and how much revenue they had generated in the previous year. Because standard accountancy procedures and book-keeping are not prevalent among small businesses in Uganda, we asked for the number of good, bad, and fair months in the respective years and how much revenue the participants had generated in a good, bad, and fair month. Based on the participants' answers, we computed the total amount for the respective years. We relied on subjective estimates of generated revenue because many small businesses in Africa do not keep financial records or records might be altered to reduce business income tax (Bradford, 2007; Sapienza et al., 1988). Additionally, subjective estimates were shown to be a valid reflection of objective performance measures (Wall et al., 2004). Our approach is line with other research conducted in similar settings (e.g., Delmar & Wiklund, 2008; Frese et al., 2007; Unger et al., 2009). During the interview, we also asked the participants how many employees they had in the current year and how many employees they had had in the previous year. We then standardized the amount of revenue and the number of employees to combine them to one scale of value creation (Cronbach's Alpha = .89).

Control variables. At T1, we asked the participants whether they had ever started a business before. We used participants' answers ("yes" = 1, "no" = 0) for our measure of *entrepreneurial experience*. At T1, we also asked the participants for their highest degree of formal education. Answers ranged from primary school to post graduation education. We used the participants' answers for a 6-point measure of *education*. Finally, we controlled for *gender* ("female" = 1, "male" = 0) in all our analyses.

4.3.3 Method of Analysis

To test our hypotheses, we used linear regression models in case of continuous dependant variables (entrepreneurial intention and value creation) and logistic regression analyses in case of dichotomous dependant variables (start-up and survival). To compute the interaction term for the regression analyses, we centered and then multiplied the independent and moderator variable (Aiken & West, 1991). As the

detection of interaction effects is difficult in field studies, we consider an interaction effect as significant if its p-value is below the threshold of .10 (G. H. McClelland & Judd, 1993).

4.4 Results

Table 4.1 shows the descriptive statistics and zero-order correlation of our variables. The descriptive statistics show that 37% of the participants had started-up their business between T1 and T2 (mean value of start-up at T2 = 0.37). The zero-order correlations among the measures collected at T1 reveal that entrepreneurial self-efficacy is positively related to entrepreneurial intention ($r = .20, p < .05$). This finding indicates that higher levels of entrepreneurial self-efficacy are associated with higher levels of entrepreneurial intention. Entrepreneurial intention is also positively related to action planning ($r = .28, p < .01$). Stronger entrepreneurial intentions are thus associated with developing action plans. We also found a positive relationship between entrepreneurial intention and positive fantasies ($r = .25, p < .01$). With regard to our dependent variables measured six and 30 months later, we found marginally significant relationships between action planning and value creation ($r = .17, p < .10$) and action planning and survival ($r = .25, p < .10$). Positive fantasies had a negative effect on survival ($r = -.32, p < .05$). This finding indicates that positive fantasies are detrimental for survival and lead to failure.

4.4.1 Test of Hypotheses

We test our hypotheses in chronological order of the measurement waves. We hypothesized that entrepreneurial self-efficacy at T1 is related to entrepreneurial intention at T1 (Hypothesis 3). To test this hypothesis we regressed entrepreneurial intention on our control variables and entrepreneurial self-efficacy. The results are shown in Table 4.2. In the first step, we entered the control variables. Gender was marginally related to entrepreneurial intention ($\beta = -0.17; p < .10$) indicating that male participants were marginally more likely to have stronger entrepreneurial intentions. Neither entrepreneurial experience nor education were significant predictors of entrepreneurial intention. In the second step, we entered entrepreneurial self-efficacy.

Table 4.1

Descriptive statistics and inter-correlations of study variables.

Variable	Wave	Mean	SD	1	2	3	4	5	6	7	8	9
1. Entrepreneurial intention	T1	4.09	0.41	(.67)								
2. Action planning	T1	2.65	0.55	.28**	(.62)							
3. Entrepreneurial self-efficacy	T1	4.46	0.49	.20*	-.02	(.82)						
4. Positive fantasies	T1	0.00	0.90	.25**	.06	-.05	(.77)					
5. Start-up ^a	T2	0.37	0.49	.07	.09	.05	.06	-				
6. Survival ^b	T3	0.55	0.50	-.03	.25†	.21	-.32*	-.40**	-			
7. Value creation ^a	T3	0.00	0.95	.03	.17†	.12	-.05	.21*	.28*	(.89)		
8. Gender	T1	0.33	0.47	-.17*	.04	-.29**	-.13	-.09	.08	.13	-	
9. Entrepreneurial experience	T1	0.55	0.50	.04	.01	.11	-.03	.11	.07	.13	-.28**	-
10. Education	T1	4.22	1.23	.12	.00	-.11	.21*	.02	.02	.01	-.02	-.10

Note: Sample size n = 139 if not indicated otherwise. ^a sample size n = 100. ^b sample size n = 55. Scale reliabilities in the diagonal.

† p < .10; * p < .05; ** p < .01.

Table 4.2

Entrepreneurial intention regressed on entrepreneurial self-efficacy.

	Entrepreneurial intention					
	Model 1			Model 2		
	Unstandardized Coefficient	SE	β	Unstandardized Coefficient	SE	β
Intercept	4.13	0.23		3.37	0.45	
Gender	-0.15 [†]	0.08	-.17	-0.10	0.08	-.12
Entrepreneurial experience	0.00	0.07	.00	0.00	0.07	.00
Education	0.04	0.03	.11	0.46	0.03	.13
Entrepreneurial self-efficacy				0.15*	0.07	.18
	R ²	.04		.07		
	F	1.93		2.46*		

Note: Sample size n = 139. [†] p < .10; * p < .05; ** p < .01.

The coefficient for entrepreneurial self-efficacy was positive and significant ($\beta = 0.18$; $p < .05$). This finding supports our hypothesis that higher levels of entrepreneurial self-efficacy are associated with stronger entrepreneurial intentions (Hypothesis 3).

At T2, we ascertained whether or not our participants had started-up a business in the previous six months. To test our hypothesis regarding start-up, we calculated binary logistic regressions and used start-up at T2 as dependent variable. We calculated three different models entering the control variables in the first step, the main effects in the second step, and the interaction term between entrepreneurial intention and action planning in the third step. Table 4.3 presents the results of the three binary logistic regression models. The three models in Table 4.3 examine the probability of having started-up a business six months after our first measurement wave. Model 1 included the control variables. Model 1 did not explain the probability of starting-up a business significantly better than a model with the intercept alone (change in deviance: $\chi^2 = 1.66$, ns.). The control variables of gender, entrepreneurial experience, and education did not significantly predict start-up. In Model 2, we entered the main effects of entrepreneurial intention, action planning, entrepreneurial self-efficacy, and positive fantasies. Model 2 did not predict the probability of start-up significantly better than Model 1 (change in deviance: $\chi^2 = 0.95$, ns.). None of the main effects was significant. We thus did not find support for Hypothesis 4a stating that entrepreneurial self-efficacy predicts start-up or Hypothesis 5a stating that positive fantasies have a negative effect on start-up. Model 3 presents the full model. The full model predicted the probability of start-up significantly better than Model 2 (change in deviance: $\chi^2 = 4.99$, $p < .05$) and it correctly classified two out of three participants as having or having not started-up a business (hit rate of 66%). The interaction term between entrepreneurial intention and action planning had a significant effect on the probability of having started-up a business⁴. To illustrate the

⁴ We also ran a model with the same specifications as model 3 based on only the 71 participants who were interviewed at T2 and without the 29 participants who were retrospectively added by using their responses at T3. The model revealed the same pattern of results. We did not find support for our hypotheses regarding the main effects of entrepreneurial self-efficacy and positive fantasies but we found a significant interaction between entrepreneurial intention and action planning ($p < .01$). The nature of the interaction effect was the same as the interaction effect based on the sample of 100 participants that we display in Figure 2.

Table 4.3

Binary logistic regression of start-up at T2.

	Start-up at T2					
	Model 1		Model 2		Model 3	
	Unstandardized Coefficient	SE	Unstandardized Coefficient	SE	Unstandardized Coefficient	SE
Intercept	-0.09	1.39	-1.38	3.57	-0.53	3.64
Gender	-0.50	0.52	-0.49	0.55	-0.39	0.57
Entrepreneurial experience	0.26	0.44	0.26	0.44	0.36	0.46
Education	-0.05	0.19	-0.08	0.19	0.03	0.20
Entrepreneurial intention			0.18	0.69	-0.35	0.78
Action planning			0.27	0.40	0.37	0.46
Entrepreneurial self- efficacy			-0.02	0.48	0.01	0.50
Positive fantasies			0.09	0.23	0.07	0.24
Entrepreneurial intention x Action planning					2.76*	1.34
Nagelkerke's R ²	.02		.04		.10	
Hit rate	63%		62%		66%	
Deviance	126.30		125.35		120.36	
Change in Deviance (χ^2)	1.66		0.95		4.99*	

Note: Sample size n = 100. † p < .10; * p < .05; ** p < .01.

nature of the interaction we followed recommendations by Jaccard (2005). On the basis of the full model, we predicted the probability of starting-up a business using values of one standard deviation above and below the mean for the variables of entrepreneurial intention and action planning. The probabilities are plotted in Figure 4.2. Figure 4.2 shows that in case of high levels of action planning, the probability of starting-up a business increased with increasing levels of entrepreneurial intention (probability of 28% for low entrepreneurial intention vs. probability of 47% for high entrepreneurial intention). In case of low levels of action planning, the probability of start-up decreased with increasing levels of entrepreneurial intention (probability of 43% for low entrepreneurial intention vs. probability of 17% for high entrepreneurial intention). This finding supports Hypothesis 1 which states that there is a positive effect of entrepreneurial intention on start-up in case of high levels of action planning but not in case of low levels of action planning.

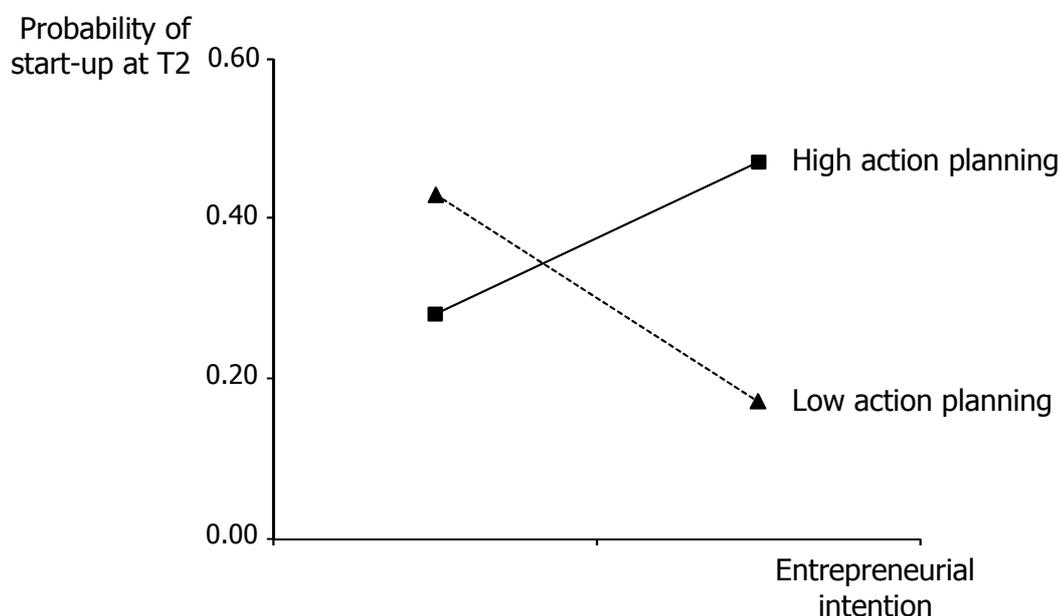


Figure 4.2. The moderating effect of action planning on the relationship between entrepreneurial intention and start-up at T2.

At T3, we assessed survival of businesses during the 30-months period of our study. Again, we used binary logistic regressions and calculated three different models. The three models shown in Table 4.4 examine the probability of survival as a function of our control variables, the four predictor variables, and the interaction between entrepreneurial intention and action planning. Model 1 shows that the results for the control variables alone. The change in deviance revealed that Model 1 was significantly better in predicting the likelihood of survival than a model with the intercept alone (change in deviance: $\chi^2 = 11.44$, $p < .05$). The control variable of time lag of start-up since T1 was a significant predictor. The later the businesses were started-up, the more likely survival was at T3. The other control variables of gender, education, and entrepreneurial experience were not statistically significant in predicting the probability of survival. Model 2 presents the main effects of our four predictor variables. Model 2 predicted the probability of survival significantly better than Model 1 (change in deviance: $\chi^2 = 15.04$, $p < .01$) and it correctly classified four out of five participants as having survived or failed (hit rate of 83%). In line with Hypothesis 4b, which states that entrepreneurial self-efficacy has a positive effect on survival, we found the coefficient of entrepreneurial self-efficacy to be positive and significant. We also found a significant effect of positive fantasies on survival. The coefficient was negative. This finding supports Hypothesis 5b which states that positive fantasies are detrimental for survival. In addition to the main effects of entrepreneurial self-efficacy and positive fantasies, we also found a significant main effect of action planning on survival. This finding indicates the action planning had a positive effect on survival independent of entrepreneurial intention. To test Hypothesis 2a, which states that action planning moderates the relationship between entrepreneurial intention and survival, we entered the interaction term between entrepreneurial intention and action planning into the equation (Model 3). We found that including the interaction term in Model 3 led to a marginally better model fit (change in deviance: $\chi^2 = 3.09$, $p < .10$). However, the coefficient for the interaction term was not significant. Hypothesis 2a was thus not supported by our data.

Table 4.4

Binary logistic regression of survival at T3.

	Survival at T3					
	Model 1		Model 2		Model 3	
	Unstandardized Coefficient	SE	Unstandardized Coefficient	SE	Unstandardized Coefficient	SE
Intercept	4.22	2.63	-24.96	8.86	-31.29	11.02
Time lag of start-up	0.37*	0.19	0.69*	0.35	0.95*	0.43
Gender	0.40	0.81	1.34	1.15	1.45	1.24
Entrepreneurial experience	0.23	0.66	0.85	0.86	1.48	1.03
Education	0.22	0.28	0.60	0.40	0.84†	0.46
Entrepreneurial intention			-0.31	1.22	-0.16	1.44
Action planning			2.30*	1.13	2.09†	1.26
Entrepreneurial self-efficacy			2.26*	0.98	2.68*	1.19
Positive fantasies			-0.95*	0.45	-1.25*	0.55
Entrepreneurial intention x Action planning					4.88	3.08
Nagelkerke's R ²	.26		.53		.57	
Hit rate	67%		83%		83%	
Deviance	59.96		44.92		41.87	
Change in Deviance (χ^2)	11.44*		15.04**		3.05†	

Note: Sample size n = 55; † p < .10; * p < .05; ** p < .0

At T3, we also ascertained the value created by our participants in the previous 24 months. We calculated three regression analyses with value creation at T3 as dependent variable. The results are displayed in Table 4.5. Table 4.5 shows that the control variables of gender, entrepreneurial experience, and education had no significant effect on value creation (Model 1). In Model 2, we entered the main effects. Neither entrepreneurial self-efficacy nor positive fantasies had significant effects on value creation. Thus, our findings do not support hypotheses 4c and 5c which state that entrepreneurial self-efficacy has a positive and positive fantasies have a negative effect on value creation. Although not hypothesized, we found a significant main effect of action planning on value creation. The coefficient was positive ($\beta = 0.23$; $p < .05$). This finding indicates that nascent entrepreneurs who show higher levels of action planning in the pre-startup phase are more likely to create value than nascent entrepreneurs who show low levels of action planning. To test hypothesis 2b that action planning moderates the effect of entrepreneurial intention on value creation we entered the interaction term into the equation (Model 3). The interaction term was a marginally significant predictor of value creation ($\beta = 0.20$; $p < .10$). To illustrate the nature of the interaction, we followed recommendations by Aiken and West (1991) and plotted values of value creation at T3 for one standard deviation above and below the mean of entrepreneurial intention and action planning (see Figure 4.3). The illustration supports hypothesis 2b. There is a positive effect of entrepreneurial intention on value creation in case of high levels of action planning but not in case of low levels of action planning.

4.5 Discussion

In this study, we built on theories of action regulation (Frese, 2009; Karoly, 1993) to develop a better understanding of the factors that contribute to the successful transition from nascent to mature entrepreneurship. The question why some nascent entrepreneurs successfully set-up a business while others fail in this endeavor is still of central importance to the field of entrepreneurship (Johnson, Parker, & Wijbenga, 2006). Previous research demonstrated that initiating a high-rate of start-up activities is important to succeed in the process that leads to the creation of new organizations

Table 4.5

Value creation at T3 regressed on main effects and interaction between entrepreneurial intention and action planning.

	Value creation at T3								
	Model 1			Model 2			Model 3		
	Unstandardized Coefficient	SE	β	Unstandardized Coefficient	SE	β	Unstandardized Coefficient	SE	β
Intercept	-0.16	0.30		-1.13	0.76		-0.97	0.75	
Gender	-0.03	0.11	-.03	-0.02	0.11	-.02	-0.00	0.11	-.01
Entrepreneurial experience	0.08	0.10	.09	0.08	0.09	.09	0.09	0.09	.10
Education	-0.00	0.04	-.01	-0.00	0.04	-.01	0.01	0.04	.03
Entrepreneurial intention				0.09	0.15	.07	0.00	0.15	.00
Action planning				0.18*	0.09	.23	0.21*	0.09	.26
Entrepreneurial self-efficacy				0.03	0.10	.03	0.03	0.10	.03
Positive fantasies				-0.01	0.05	-.03	-.01	0.05	-.03
Entrepreneurial intention x Action planning							0.44†	0.24	.20
R ²	.01			.07			.11		
F	0.31			1.03			1.35		

Note: Sample size n = 100; † p < .10; * p < .05; ** p < .0

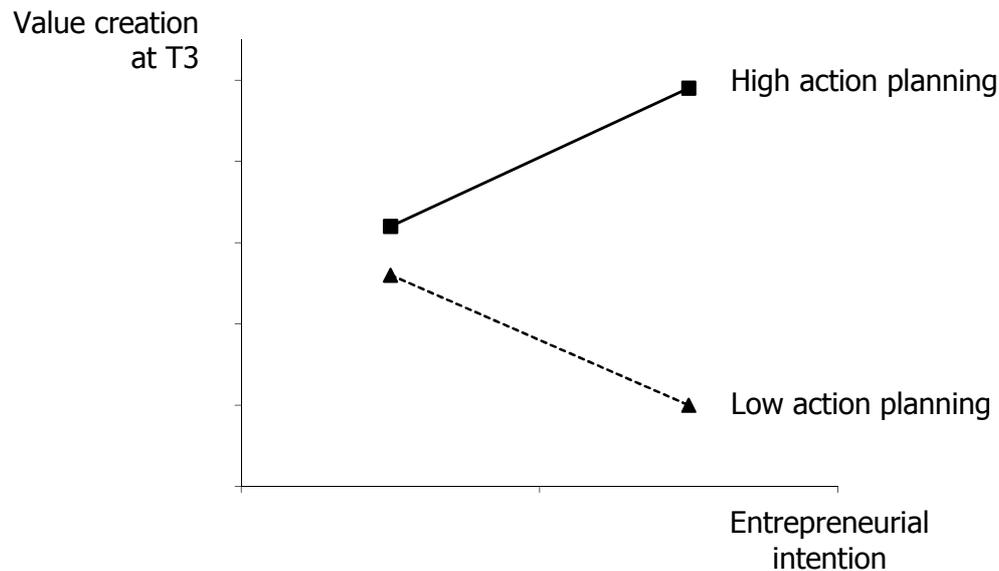


Figure 4.3. The moderating effect of action planning on the relationship between entrepreneurial intention and value creation at T3

(e.g., Carter et al., 1996; Gatewood et al., 1995; Lichtenstein et al., 2007). We sought to contribute to the existing literature by investigating self-regulatory mechanism that facilitate initiating and maintaining action. We focused on two cognitively based factors that have motivational effects: action planning and goal-referent thinking in terms of positive fantasies. We also included goal-referent thinking in terms of ability expectations (i.e., self-efficacy) in our model to demonstrate the exploratory value of positive fantasies over and above such expectations.

Our findings supported our general assumption that self-regulatory mechanisms play an important role in the entrepreneurial process. Action planning moderated the effect of entrepreneurial intention on start-up and on value creation. There was only a positive effect of entrepreneurial intention on the two entrepreneurial success measures in case of high levels of action planning. In addition, we found significant main effects of action planning on the entrepreneurial success measures of survival and value creation. We measured these entrepreneurial success measures 30 months after our initial measurement wave. This means that action planning has a positive effect on long-term outcomes independent of entrepreneurial intention. We also found significant

effects for goal-referent thinking in terms of entrepreneurial self-efficacy and positive fantasies. Entrepreneurial self-efficacy was significantly related to entrepreneurial intention and it predicted survival. In contrast to positive expectations in terms of entrepreneurial self-efficacy, positive fantasies were detrimental for entrepreneurial success. The analyses revealed a significant negative effect of positive fantasies on the likelihood of survival.

Our findings have several theoretical implications. We demonstrate the usefulness of adopting an action theory perspective to explain entrepreneurial success and failure (cf., Frese, 2009). Acknowledging that entrepreneurship requires action (McMullen & Shepherd, 2006), a more detailed examination of the single steps in the action sequence might advance our understanding of the entrepreneurial process. We focused on the interplay between the first two steps in the action sequence: forming intentions and implementing the intentions by developing action plans. Including action plans into our theoretical considerations yielded a model with superior predictive value compared to a model that was based on entrepreneurial intentions alone. In our study, action planning had significant effects in the form of moderating or main effects on all three entrepreneurial success measures. This finding extends previous theoretical notions that ascribed a central role to entrepreneurial intentions (Bird, 1988; Krueger et al., 2000; Zhao et al., 2010). Our results suggest that entrepreneurial intentions are only one step in the action sequence. Entrepreneurial intentions contribute to entrepreneurial success only in case of high levels of action planning. These results suggest that action planning has a functional value in the venture creation process by helping nascent entrepreneurs implement their intentions and initiate entrepreneurial action.

The functional value of action planning in the entrepreneurial process becomes also evident considering the positive main effects of action planning on long-term entrepreneurial success measures. Action planning significantly predicted survival and value creation. These findings suggest that a high level of action planning in the pre-launch phase is an important prerequisite for creating a sustainable and financially successful organization. Previous research provided evidence that action planning in the post-launch phase contributes to post-launch success in terms of value creation and business growth (Frese et al., 2007). We extend this research by showing that action

planning in one phase has sustaining effects that go beyond this phase. There are positive effects of action planning across different entrepreneurial phases which points to the importance of action planning for entrepreneurial success in the long-run. Action planning is important for successful transition from the pre-launch phase into the post-launch phase and, because of its future-oriented nature, action planning is also an important preparatory mechanism to influence, at an early stage, the performance of the business at later stages.

Our study also contributes to the debate about the positive and negative aspects of planning in the entrepreneurial process. Some scholars argued that planning leads to more rigidity and less flexibility which impairs the ability to adapt to environmental changes (Bresser & Bishop, 1983). Accordingly, entrepreneurship scholars questioned a positive effect of planning on entrepreneurial success and concluded that nascent entrepreneurs should rather focus on start-up activities that add visible substance to the business than on planning (Carter et al., 1996; Honig, 2004; Honig & Karlsson, 2004). However, other scholars advocated planning as having several positive effects on entrepreneurial success. For example, planning has a symbolic function legitimizing the company and improving communication with external stakeholders; preparing a plan contributes to learning and facilitates gaining new insights; and planning increases efficiency because of its anticipatory value (Castrogiovanni, 1996). A recent meta-analysis sought to dissolve this debate and found a mean effect size of .20 for planning on entrepreneurial success (Brinckmann, Grichnik, & Kapsa, 2010). We think that in this discussion, it is important to distinguish between different types of planning. Liao and Gartner (2006) showed that two thirds of nascent entrepreneurs make informal or unwritten plans and only one third develops standard business plans in a formalized format. We argued that action plans (which are distinct from formal business plans) facilitate the initiation of action and provide a guideline for the operational steps necessary to achieve a goal. Our approach is in line with an action theory perspective (Frese, 2009; Frese et al., 2007) as well as with other recent research that argued that planning is an important precursor to action as it provides a framework for the correct sequence and timing of action (Delmar & Shane, 2003; Shane & Delmar, 2004). Our study focuses on informal action plans and we thus provide new insights at one end of

the broad spectrum of research on planning in the entrepreneurship domain. Distinguishing between different forms of planning in theory development and providing more fine-grained definitions of plans would contribute to a more detailed understanding of the beneficial and detrimental effects of different forms of planning on entrepreneurial success (Honig & Karlsson, 2004; Liao & Gartner, 2006).

We also sought to contribute to the literature regarding goal-referent thinking as a second self-regulatory mechanism that is important for goal attainment. Not only different forms of planning might have different effects, but also different forms of goal-referent thinking should exert different influences on entrepreneurial success. In our study, entrepreneurial self-efficacy had positive effects while positive fantasies had detrimental effects. In general, these findings provide evidence for recent notions in the entrepreneurship literature that emphasized the importance of entrepreneurs' cognitions in the entrepreneurial process (cf., R. K. Mitchell et al., 2007). Our results show that entrepreneurs' cognitions are important for action initiation and entrepreneurial success in terms of start-up and survival.

Our findings regarding entrepreneurial self-efficacy are in line with previous research that found similar positive effects of entrepreneurs' expectations and beliefs about their capabilities to perform entrepreneurial tasks (e.g., C. C. Chen et al., 1998; De Clercq & Arenius, 2006; Markman et al., 2002; Townsend et al., 2010). Our findings regarding positive fantasies, however, provide new insights into potential detrimental effects of thinking positively in the entrepreneurial process. Oettingen and Mayer (2002) argued that positive fantasies seduce individuals to mentally enjoy certain ideas instead of showing effort and persistence to implement them. Similarly, Parker and Belghitar (2006) note that some nascent entrepreneurs might be "lethargic dreamers" (p. 96) who consider themselves to be entrepreneurs but who take little concrete actions. Our findings suggest that positively fantasizing about the future has negative effects. There is a significant negative effect on survival. This suggests that indulging in positive fantasies may lead to unrealistic expectations regarding the upcoming tasks of a business owner. In a different research area, people with unrealistic expectations about a job were shown to develop less preparatory coping mechanisms to deal with challenges of a new job and are more likely to leave an organization when they are confronted with

reality (Wanous, 1978). Nascent entrepreneurs who imagine a positive future might be surprised by difficulties awaiting new business owners and the “reality shock” might lower their intention to persevere and to continue running the business. The negative function of positive fantasies might also explain the finding that a high degree of optimism might be dysfunctional for entrepreneurs (Hmieleski & Baron, 2009). Possibly, excessive optimism may stem from such positive fantasies. Oettingen and Mayer (2002) consider optimism to be a form of generalized expectations about the future and optimism is thus different from fantasies. However, research showed that high optimism may lead to unrealistic expectations and reconstructing past experiences (Geers & Lassiter, 2002). Thus, optimism might be less based on past, accurate experiences but rather on people’s tendency to construct a desirable and pleasant future independent of realistic forecasts.

Some of our findings need further discussion. We found a high probability to start-up a business among nascent entrepreneurs with low entrepreneurial intention and low action planning (see Figure 4.2). This may be a group of people who follow an opportunistic approach as described by Frese et al. (2000). These people are characterized by a high situational responsiveness. They neither predetermine a specific goal nor a plan to achieve the goal but they act whenever an opportunity arises. Following an opportunistic approach implies that goals are determined by opportunities and planning is not done beforehand but when the situation requires it. These people act quickly when an opportunity arises without having previously specified a goal or plan. An opportunistic approach means that there is a high planning and action overlap which is also characteristic of improvisation or bricolage as described by Baker et al. (2003). Such a strategy is particularly successful in uncertain environments (Baker et al., 2003; Frese et al., 2000). This might explain why we find an increased probability for these people to start-up a business in our study.

4.5.1 Strengths and Limitations

A limitation of our study might be our sample. We chose the context of Uganda because of the importance of entrepreneurship as a livelihood strategy in developing countries such as Uganda. This means that the generalization of our results might be

limited to the developing world with a high degree of necessity entrepreneurship. However, this happens to be a large part of the world (Acs et al., 2008). We found that action planning was an important factor in models explaining entrepreneurial success. The effect of planning may vary across different cultural contexts (Brinckmann et al., 2010). Future research that compares the effect of action planning across different contexts would advance our understanding of the differential effects of planning in the entrepreneurial process (cf., Rauch, Frese, & Sonnentag, 2000).

We also chose Uganda because of a particular combination of contextual factors. In Uganda, the general base rate of people starting-up a business is very high. In fact, it is the second highest in the world (Walter et al., 2005). At the same time, the pressure for developing plans is lower in Uganda which means that some entrepreneurs start a business without preparing a plan. The high rate of nascent entrepreneurs in combination with a wide range of planning behavior among nascent entrepreneurs provided a better basis for testing our theory.

With regard to our sample, we also have to note that our analyses of survival are based on a subsample that might be considered relatively small. Although we agree with Combs (2010) that it is of greater theoretical and practical relevance to have small samples and big effects than vice versa, the small sample size regarding our dependant variable of survival might have created power problems. Specifically, we did not find a significant interaction effect of entrepreneurial intention and action planning on survival. Particularly the detection of interaction effects suffers from power problems (G. H. McClelland & Judd, 1993).

A possible limitation of our study might also be the operationalization of our dependant variables of survival and value creation. With regard to survival, we did not distinguish between different reasons for closing the business. Participants might have closed the business because of failure or because they found a better opportunity (which can also be employment). However, we think that our operationalization of survival offers interesting insights even though it does not strictly distinguish between organizational failure and other reasons for discontinuing the business. If some participants closed a business because they had found a better opportunity, it also means that their business did not suffice and other opportunities promised to be of greater

value. Thus, our operationalization includes aspects of whether people were able to successfully run their businesses and whether they found an opportunity that met their expectations and that provided sufficient income. Both aspects reflect being entrepreneurially successful and we therefore think that our operationalization of survival is sufficiently content valid.

With regard to value creation, we have to note that part of our measure for value creation was based on the participants' subjective estimates about their revenues in the previous two years. Obtaining more objective data (e.g., accountancy-based) is generally difficult in the small business domain but particularly so in an African setting. Business records might not reflect the actual performance of the businesses (Sapienza et al., 1988). In Africa, business owners often include personal expenses to reduce business profits (Bradford, 2007). Additionally, many small businesses in Africa but also elsewhere have no accounting system in place (Shinder, 1997; Wall et al., 2004). We therefore relied on subjective estimates. Our approach is justified by research showing that managers and chief executives have a comprehensive overview of the performance figures of their businesses and their subjective estimates are valid measures (Wall et al., 2004). To further increase the accuracy of our measurement, we employed the method of life history calendar. This method improves recall and thus enhances the validity and reliability of retrospectively assessed data (Freedman et al., 1988). We think that this method assisted us in obtaining more accurate data on when and how much revenue the participants had generated with their businesses. Furthermore, our measure of value creation also included data on number of employees which is usually less susceptible to biases. Number of employees is an appropriate indicator of business success (Weinzimmer, Nystrom, & Freeman, 1998). Our measure of value creation including generated revenue and number of employees was internally consistent indicating that we had a valid measure for the performance of the businesses.

A particular strength of our study is its longitudinal design. We followed our participants over a 30-months period and conducted three measurement waves. We were thus able to investigate in more detail the emergence of organizations and the process that leads to the value creation. Due to the longitudinal design, we were able to

determine the causal effect of self-regulatory mechanisms on three different measures of entrepreneurial success.

Finally, we consider our operationalization of action planning to be a strength of our study. Many studies that investigated the effect of planning on entrepreneurial success relied on relatively crude operationalizations of planning using for example one item measures that ask whether participants have or have not completed a business plan (e.g., Delmar & Shane, 2003; Honig & Karlsson, 2004). Such a measure provides no detailed information on the quality of a plan which makes questionnaire measures more subjective than interviews. We used standardized interviews to assess the elaboration of participants' action planning. This method makes it possible to probe participants' statements and to get a detailed assessment of participants' approach towards how they plan to achieve their goals. For example, affirmation of the question whether the participants intended to look for facilities was probed by using prompts, such as "What do you mean by...?", until it was clear whether or not the participant had a plan of how and when he or she wanted to execute the sub-steps necessary to achieve the goal. The standardized interview in combination with a standardized rating procedure is particularly useful and highly valid when investigating aspects of action regulation (Frese et al., 2007).

4.5.2 Practical Implications and Conclusions

Successful transition from nascent to mature entrepreneurship depends on the individual entrepreneur and the actions he or she initiates (Carter et al., 1996). An important determinant of action is having the intention to perform the activity but intentions alone are not sufficient for initiating actions. Our study provides evidence that further self-regulatory mechanisms are necessary. For example, nascent entrepreneurs have to furnish their intentions with action plans to be successful. By furnishing their entrepreneurial intentions with high levels of action planning, nascent entrepreneurs can significantly increase the probability of starting a business. Outlining a development path and setting milestones helps getting started and provides guidance how to proceed in the venture creation process. Because of the difficulty and complexity of starting a business, nascent entrepreneurs should be particularly encouraged to

develop detailed action plans. Research showed that in case of difficult and non-routine tasks the beneficial effects of plans become even stronger (Gollwitzer & Brandstätter, 1997). Furthermore, our research shows that action planning does not only contribute to entrepreneurial success in the short-term but also in the long-term. Action planning in the pre-launch phase plays an important role for survival and value creation once the business is running. Due to the preparatory function, the positive effects of action planning last beyond initial goal attainment of start-up and contribute to later entrepreneurial success. Planning prepares for up-coming threats and increases readiness for action when opportunities emerge (Gollwitzer, 1999). These long-term effects are of practical relevance but it is also important to keep them in mind when theoretically debating the positive and negative aspects of planning for entrepreneurship. Planning may yield immediate and future returns. In summary, entrepreneurial intentions are effectively enhanced by detailed action planning.

Our study also suggests that nascent entrepreneurs should be careful to distinguish between different beneficial and detrimental thoughts regarding the start-up and management of a business. In general, research suggests that entrepreneurs are inclined to have overly positive thoughts about the future (Hmieleski & Baron, 2009). Having positive thoughts is beneficial if they are grounded in past experience and if they are indicator for specific entrepreneurial capabilities and performance levels a nascent entrepreneur is able to achieve. High levels of entrepreneurial self-efficacy led to higher probabilities of survival. However, we also showed that positive thoughts in the form of positive fantasies are detrimental for survival. Therefore, nascent entrepreneurs should employ methods of mental contrasting. Mentally contrasting the positive fantasies with the current state and considering up-coming jolts or setbacks should reverse the negative effects of positive fantasies and lead to stronger goal commitment (Oettingen, 2000). In conclusion, self-regulatory mechanisms provide nascent entrepreneurs with effective means to successfully start and run their ventures.

CHAPTER 5

General Discussion

In this dissertation, I sought to investigate entrepreneurship from a psychological perspective and work on the notion that “entrepreneurship is fundamentally personal” (Baum, Frese, Baron et al., 2007, p. 1). Building on psychological theories that describe people’s cognitions and actions, I put a particular focus on the cognitive factors of creativity and goal-referent thinking as well as on the behavioral factors of action planning and active information search to examine the effects of individual factors on entrepreneurial success. In three different empirical studies within different environmental contexts, the findings showed that psychological factors are significantly related to different entrepreneurial outcomes. Specifically, we found main effects of creativity and active information search on opportunity identification. We also found that creativity interacts with active information search in the opportunity identification process and that creativity interacts with the type of information people have available for the generation of business ideas. The findings suggest that an active information search leverages the full potential of people’s creativity and highly creative people should seek diverse information to come up with business ideas. Furthermore, we found that action planning plays an important role for the entrepreneurial outcomes of start-up, survival, and venture growth. Action planning moderated the effect of entrepreneurial intention on start-up over a six-month period, action planning had direct effects on survival and value creation over a 30-month period, and it also moderated the effect of entrepreneurial intention on value creation over a 30-month period. Finally, we found that goal-referent thinking in terms of positive fantasies had negative effects on survival over a 30-month period.

5.1 General Theoretical Implications

The findings have several theoretical implications. First, psychological factors play a significant role in the opportunity identification and exploitation process. Recently, entrepreneurship scholars noted that the psychology of the entrepreneur has only been rudimentary studied and called for research developing and testing theoretical models with a focus on psychological success factors (Baum, Frese, Baron et al., 2007). In particular, it is important to investigate psychological factors that are more proximal to entrepreneurial performance than personality traits (Rauch & Frese, 2007). This dissertation focused on cognitive and behavioral factors that are conceptually closely related to entrepreneurial actions and thus, of particular interest for the scholarly domain of entrepreneurship (R. A. Baron, 2007a). By developing and testing models that include the cognitive processes of creativity and goal-referent thinking as well as the behavioral factors of active information search and action planning, this dissertation contributed to a better theoretical understanding of the psychological mechanisms underlying successful entrepreneurship. I acknowledge that psychological factors alone cannot fully explain entrepreneurial success and that, additional to psychological factors, there are multiple organizational, institutional and, environmental factors influencing entrepreneurship (Baum et al., 2001; Frese, 2009; Hmieleski & Baron, 2009). However, as it takes human cognitions and actions to identify and exploit opportunities, psychological factors are central to the field of entrepreneurship.

Second, this dissertation adopted a process perspective on entrepreneurship. Recent theoretical considerations emphasized that the entrepreneurial process consists of different phases (R. A. Baron, 2007b). In line with this theoretical conception, the dissertation developed and tested different theoretical models to explain different entrepreneurial outcomes that are important in the respective phases of the entrepreneurial process. Specifically, entrepreneurial outcomes investigated in this dissertation were business idea generation, opportunity identification, start-up, survival, and venture growth. Also in line with the process perspective on entrepreneurship (R. A. Baron, 2007b), I examined different sets of predictors to explain why some people are more successful than others in achieving the respective entrepreneurial outcomes. In general, the findings showed that both cognitive and behavioral factors play an

important role in each phase of the entrepreneurial process. Cognitive and behavioral factors had direct as well as interaction effects on entrepreneurial outcomes. The theoretical models presented in this dissertation put a stronger focus either on cognitive or on behavioral factors depending on the particular phase that was under examination. While a stronger focus was put on cognitive factors in the processes leading to the identification of business ideas and business opportunities, behavioral factors were more in the foreground in the processes leading to the exploitation of business opportunities. Thus, this dissertation adds to theoretical conceptions emphasizing the particular importance of cognitive factors for opportunity identification and of behavioral factors for opportunity exploitation (R. A. Baron, 2006; McMullen & Shepherd, 2006; Shane & Venkataraman, 2000).

Third, this dissertation is among the first empirical studies in the entrepreneurship literature to investigate the entrepreneurs' action-related cognitions in terms of positive fantasies. Positive fantasies had a negative effect on survival of new ventures. This contributes to the entrepreneurship literature insofar as entrepreneurship scholars called for research on new psychological concepts that are closely related to activities important for the start-up and operation of new ventures (R. A. Baron, 2007a; Baum, Frese, Baron et al., 2007). However, in line with the process perspective on entrepreneurship, the findings also indicate that it is necessary to take a differentiated perspective on potential predictors of entrepreneurship. The design of the study presented in chapter 4 allowed us to examine the differentiated effects of cognitive and behavioral factors on three different entrepreneurial outcomes over a longer period of time within one sample of entrepreneurs. Positive fantasies had an impact on survival but not on value creation. These results suggest that the post-launch outcomes of value creation and survival are not on a single dimension. The process underlying value creation might be different from the process underlying survival. Psychological factors important for one entrepreneurial outcome might be less important for another entrepreneurial outcome and different processes are in place regarding different outcomes. Thus, it is important to conduct more fine-grained analyses of entrepreneurial success not only across but also within the different phases of the entrepreneurial process. Depending on the specific entrepreneurial outcome that entrepreneurship

researchers are interested in, different sets of predictors must be considered. Taking a differentiated perspective on the set of relevant predictors for different entrepreneurial outcomes across and within the phases of the entrepreneurial process might be complex but also the most promising approach to enhance our understanding of entrepreneurship. Entrepreneurs fulfill a multifaceted and complex task and entrepreneurship research should reflect this complexity.

5.2 General Practical Implications

By taking a psychological perspective on entrepreneurship, the main focus of this dissertation is on the entrepreneur. An entrepreneur identifies and exploits opportunities and, mainly, he or she establishes and manages new ventures for the general purpose of profit and growth (Gartner, 1985; Shane & Venkataraman, 2000). Entrepreneurs themselves consider their own decisions and actions to be the decisive reasons for their firm's success (e.g., Sexton, 2001). This dissertation underlines these considerations by showing that the entrepreneurs' cognitions and actions have a significant impact on their entrepreneurial success. This means that to a high degree entrepreneurs are masters of their own fates and that they can take considerably control over the performance levels they achieve. This dissertation shows that entrepreneurs can make use of several self-regulatory means to enhance their success in opportunity identification and exploitation. First, chapter 2 provides evidence that an active information search directly contributes to opportunity identification and subsequent venture growth and additionally, active information search enhances the positive effect of one's level of creativity on opportunity identification. This means that active information search has a doubly positive effect. Entrepreneurs can enhance their success by searching more actively for information. A broader information base increase the likelihood of having available the necessary information to "connect the dots" and come up with a viable business idea (R. A. Baron, 2006, p. 106; Shane, 2003). Second, chapter 3 shows that depending on the levels of creativity, entrepreneurs should look for different types of information. In case of high levels of creativity, entrepreneurs should not constrain their search to one specific domain but look for diverse information from many different domains. By acquiring diverse sets of information, they make full use of their creative potential and

generate numerous and original business ideas. In case of low levels creativity, entrepreneurs might benefit from a search in a more constrained way and focus on the domains they are experts in. This would ensure that they can connect the new information to their existing knowledge base and that they generate feasible business ideas because the expertise would help them to successfully implement the idea (Fiet, 2002). Third, chapter 4 demonstrates that entrepreneurs should take considerable time to elaborate on their action plans to set-up a business. Planning the different steps in the launch phase increases the likelihood of successfully setting-up a new venture. Additionally, developing action plans also helps entrepreneurs sustain long-term success. This means that action planning has positive short- and long-term effects on entrepreneurial success. Finally, chapter 4 also indicates that entrepreneurs should avoid indulging in positive fantasies, and instead, mentally contrast the envisioned positive future with the current state. Mentally contrasting the status quo with a desired positive future state increases the motivation to act and helps implementing one's goals (Oettingen et al., 2001). In conclusion, given that entrepreneurs are in control of the decisions they make and the actions they take, there are several means for entrepreneurs to take charge and to attain the desired entrepreneurial outcomes. Consultants, trainers, and entrepreneurs themselves might benefit from the dissertation's findings and use them to further contribute to the positive effects of entrepreneurship, such as technology transfer, employment, and wealth creation.

REFERENCES

- Acs, Z. J., Desai, S., & Hessels, J. (2008). Entrepreneurship, economic development and institutions. *Small Business Economics*, *31*(3), 219-234.
- Acs, Z. J., & Varga, A. (2005). Entrepreneurship, agglomeration and technological change. *Small Business Economics*, *24*(3), 323-334.
- Adeboye, T. (1997). Models of innovation and sub-Saharan Africa's development tragedy. *Technology Analysis & Strategic Management*, *9*(2), 213-235.
- Ahuja, G., & Lampert, C. M. (2001). Entrepreneurship in the large corporation: A longitudinal study of how established firms create breakthrough inventions. *Strategic Management Journal*, *22*(6-7), 521-543.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179-211.
- Aldrich, H. E., & Auster, E. R. (1986). Even dwarfs started small: Liabilities of age and size and their strategic implications. In B. M. Staw & L. L. Cummings (Eds.), *Research in Organizational Behavior* (Vol. 8, pp. 165-198). Greenwich, CT: JAI Press.
- Alissa, I. (1972). Stimulus generalization and over-inclusion in normal and schizophrenic subjects. *Journal of Clinical Psychology*, *34*, 182-186.
- Amabile, T. M. (1983). The Social Psychology of Creativity: A Componential Conceptualization. *Journal of Personality and Social Psychology*, *45*(2), 357-376.
- Arthur, W., & Day, D. V. (1994). Development of a Short-Form for the Raven Advanced Progressive Matrices Test. *Educational and Psychological Measurement*, *54*(2), 394-403.
- Baker, T., Miner, A. S., & Eesley, D. T. (2003). Improvising firms: bricolage, account giving and improvisational competencies in the founding process. *Research Policy*, *32*(2), 255-276.
- Bandura, A. (1989). Human Agency in Social Cognitive Theory. *American Psychologist*, *44*(9), 1175-1184.
- Baron, R. A. (1998). Cognitive mechanisms in entrepreneurship: Why and when entrepreneurs think differently than other people. *Journal of Business Venturing*, *13*(4), 275-294.
- Baron, R. A. (2004). The cognitive perspective: a valuable tool for answering entrepreneurship's basic "why" questions. *Journal of Business Venturing*, *19*(2), 221-239.
- Baron, R. A. (2006). Opportunity recognition as pattern recognition: How entrepreneurs "connect the dots" to identify new business opportunities. *Academy of Management Perspectives*, *20*(1), 104-119.

-
- Baron, R. A. (2007a). Behavioral and cognitive factors in entrepreneurship: Entrepreneurs as the active element in new venture creation. *Strategic Entrepreneurship Journal*, 1(1-2), 167-182.
- Baron, R. A. (2007b). Entrepreneurship: A Process Perspective. In J. R. Baum, M. Frese & R. A. Baron (Eds.), *The Psychology of Entrepreneurship* (pp. 19-39). Mahwah, NJ: Lawrence Erlbaum.
- Baron, R. A., & Ward, T. B. (2004). Expanding entrepreneurial cognition's toolbox: Potential contributions from the field of cognitive science. *Entrepreneurship Theory and Practice*, 28(6), 553-573.
- Baron, R. M., & Kenny, D. A. (1986). The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182.
- Baughman, W. A., & Mumford, M. D. (1995). Process-Analytic Models of Creative Capacities - Operations Influencing the Combination-and-Reorganization Process. *Creativity Research Journal*, 8(1), 37-62.
- Baum, J. R., Frese, M., & Baron, R. A. (2007). *The Psychology of Entrepreneurship*. Mahwah, NJ: Lawrence Erlbaum.
- Baum, J. R., Frese, M., Baron, R. A., & Katz, J. A. (2007). Entrepreneurship as an Area of Psychology Study: An Introduction. In J. R. Baum, M. Frese & R. A. Baron (Eds.), *The Psychology of Entrepreneurship* (pp. 1-18). Mahwah, NJ: Lawrence Erlbaum.
- Baum, J. R., & Locke, E. A. (2004). The relationship of entrepreneurial traits, skill, and motivation to subsequent venture growth. *Journal of Applied Psychology*, 89(4), 587-598.
- Baum, J. R., Locke, E. A., & Smith, K. G. (2001). A multidimensional model of venture growth. *Academy of Management Journal*, 44(2), 292-303.
- Baumol, W. J. (1968). Entrepreneurship in Economic Theory. *American Economic Review*, 58(2), 64-71.
- Bird, B. (1988). Implementing Entrepreneurial Ideas - the Case for Intention. *Academy of Management Review*, 13(3), 442-453.
- Bledow, R., Frese, M., Anderson, N., Erez, M., & Farr, J. L. (2009). A Dialectic Perspective on Innovation: Conflicting Demands, Multiple Pathways, and Ambidexterity. *Industrial and Organizational Psychology: Perspectives on Science and Practice*, 2(3), 305-337.
- Bohrnstedt, G. W., & Marwell, G. (1978). The reliability of products of two random variables. In K. F. Schuessler (Ed.), *Sociological Methodology* (pp. 254-273). San Francisco, CA: Jossey-Bass Inc.
- Bollen, K. A. (1989). *Structural equations with latent variables*. New York: Wiley.
- Bond, M. H., Leung, K., Au, A., Tong, K. K., de Carrasquel, S. R., Murakami, F., et al. (2004). Culture-level dimensions of social axioms and their correlates across 41 cultures. *Journal of Cross-Cultural Psychology*, 35(5), 548-570.
- Boyd, N. G., & Vozikis, G. S. (1994). Self-Efficacy on the Development of Entrepreneurial Intentions and Actions. *Entrepreneurship Theory and Practice*, 18(4), 63-77.
- Bradford, W. D. (2007). Distinguishing economically from legally formal firms: Targeting business support to entrepreneurs in south Africa's townships. *Journal of Small Business Management*, 45(1), 94-115.
-

- Brandstätter, V., Heimbeck, D., Malzacher, J. T., & Frese, M. (2003). Goals need implementation intentions: The model of action phases tested in the applied setting of continuing education. *European Journal of Work and Organizational Psychology, 12*(1), 37-59.
- Brandstätter, V., Lengfelder, A., & Gollwitzer, P. M. (2001). Implementation intentions and efficient action initiation. *Journal of Personality and Social Psychology, 81*(5), 946-960.
- Bresser, R. K., & Bishop, R. C. (1983). Dysfunctional Effects of Formal Planning: Two Theoretical Explanations. *Academy of Management Review, 8*(4), 588-599.
- Brinckmann, J., Grichnik, D., & Kapsa, D. (2010). Should entrepreneurs plan or just storm the castle? A meta-analysis on contextual factors impacting the business planning-performance relationship in small firms. *Journal of Business Venturing, 25*(1), 24-40.
- Buame, S. K. (1996). *Entrepreneurship: A contextual perspective*. Lund: Lund University Press.
- Busenitz, L. W. (1996). Research on entrepreneurial alertness - Sampling, measurement, and theoretical issues. *Journal of Small Business Management, 34*(4), 35-44.
- Carland, J. W., Hoy, F., Boulton, W. R., & Carland, J. C. (1984). Differentiating entrepreneurs from small business owners: A conceptualization. *Academy of Management Review, 9*, 354-359.
- Carree, M. A., & Thurik, A. R. (2003). The impact of entrepreneurship on economic growth. In Z. J. Acs & D. B. Audretsch (Eds.), *Handbook of entrepreneurship research* (pp. 437-471). Boston, MA: Kluwer Academic Publishers.
- Carree, M. A., & Thurik, A. R. (2008). The lag structure of the impact of business ownership on economic performance in OECD countries. *Small Business Economics, 30*(1), 101-110.
- Carter, N. M., Gartner, W. B., & Reynolds, P. D. (1996). Exploring start-up event sequences. *Journal of Business Venturing, 11*(3), 151-166.
- Castrogiovanni, G. J. (1996). Pre-startup planning and the survival of new small businesses: Theoretical linkages. *Journal of Management, 22*(6), 801-822.
- Chen, C. C., Greene, P. G., & Crick, A. (1998). Does entrepreneurial self-efficacy distinguish entrepreneurs from managers? *Journal of Business Venturing, 13*(4), 295-316.
- Chen, C. S., Himsel, A., Kasof, J., Greenberger, E., & Dmitrieva, J. (2006). Boundless creativity: Evidence for the domain generality of individual differences in creativity. *Journal of Creative Behavior, 40*(3), 179-199.
- Christensen, P. R., Merrifield, P. R., & Guilford, J. P. (1953). *Consequences Form A-1*. Beverly Hills, CA: Sheridan Supply.
- Chudnovsky, D., Lopez, A., & Pupato, G. (2006). Innovation and productivity in developing countries: A study of Argentine manufacturing firms' behavior (1992-2001). *Research Policy, 35*(2), 266-288.
- Clapham, M. M., Cowdery, E. M., King, K. E., & Montang, M. A. (2005). Predicting work activities with divergent thinking tests: A longitudinal study. *Journal of Creative Behavior, 39*(3), 149-167.
- Collins, A. M., & Loftus, E. F. (1975). A spreading-activation theory of semantic processing. *Psychological Review, 82*, 407-428.

-
- Collins, C. J., Hanges, P. J., & Locke, E. A. (2004). The relationship of achievement motivation to entrepreneurial behavior: A meta-analysis. *Human Performance, 17*(1), 95-117.
- Colom, R., Rebollo, I., Palacios, A., Juan-Espinosa, M., & Kyllonen, P. C. (2004). Working memory is (almost) perfectly predicted by g. *Intelligence, 32*(3), 277-296.
- Combs, J. G. (2010). Big Samples and Small Effects: Let's Not Trade Relevance and Rigor for Power. *Academy of Management Journal, 53*(1), 9-13.
- Cooper, A. C., Folta, T. B., & Woo, C. (1995). Entrepreneurial Information Search. *Journal of Business Venturing, 10*(2), 107-120.
- Cortina, J. M., Chen, G., & Dunlap, W. P. (2001). Testing interaction effects in LISREL: Examination and illustration of available procedures. *Organizational Research Methods, 4*(4), 324-360.
- Daft, R. L., Sormunen, J., & Parks, D. (1988). Chief Executive Scanning, Environmental Characteristics, and Company Performance - an Empirical-Study. *Strategic Management Journal, 9*(2), 123-139.
- Daniels, L. (1999). *Alternatives for measuring profits and net worth of microenterprises (PNACH709)*. Washington, D.C.: Office of Microenterprise Development, Global Bureau, USAID (Assessing the impact of Microenterprise Services - AIMS).
- Davidsson, P. (1991). Continued entrepreneurship: Ability, need, and opportunity as determinants of small firm growth. *Journal of Business Venturing, 6*(6), 405-429.
- Davidsson, P., & Honig, B. (2003). The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing, 18*(3), 301-331.
- De Clercq, D., & Arenius, P. (2006). The role of knowledge in business start-up activity. *International Small Business Journal, 24*(4), 339-358.
- de Wit, G., & van Winden, F. A. A. M. (1989). An Empirical Analysis of Self-Employment in the Netherlands. *Small Business Economics, 1*(4), 263-272.
- Dean, D. L., Hender, J. M., Rodgers, T. L., & Santanen, E. L. (2006). Identifying quality, novel, and creative ideas: Constructs and scales for idea evaluation. *Journal of the Association for Information Systems, 7*(10), 646-698.
- Deary, I. J., Whalley, L. J., Lemmon, H., Crawford, J. R., & Starr, J. M. (2000). The stability of individual differences in mental ability from childhood to old age: Follow-up of the 1932 Scottish mental survey. *Intelligence, 28*(1), 49-55.
- Delmar, F., & Shane, S. (2003). Does business planning facilitate the development of new ventures? *Strategic Management Journal, 24*(12), 1165-1185.
- Delmar, F., & Wiklund, J. (2008). The effect of small business managers' growth motivation on firm growth: A longitudinal study. *Entrepreneurship Theory and Practice, 32*(3), 437-457.
- Department of Trade and Industry (1995). White Paper on National Strategy for the Development and Promotion of Small Business in South Africa. Pretoria, South Africa: Department of Trade and Industry.
- DeTienne, D. R., & Chandler, G. N. (2004). Opportunity Identification and its Role in the Entrepreneurial Classroom: A pedagogical Approach and Empirical Test. *Academy of Management Learning and Education, 3*(3), 242-257.
- Dimov, D. (2007a). Beyond the single-person, single-insight attribution in understanding entrepreneurial opportunities. *Entrepreneurship Theory and Practice, 31*(5), 713-731.
-

- Dimov, D. (2007b). From opportunity insight to opportunity intention: The importance of person-situation learning match. *Entrepreneurship Theory and Practice*, 31(4), 561-583.
- Eckhardt, J. T., & Shane, S. A. (2003). Opportunities and entrepreneurship. *Journal of Management*, 29(3), 333-349.
- Engle, R. W., Tuholski, S. W., Laughlin, J. E., & Conway, A. R. A. (1999). Working memory, short-term memory, and general fluid intelligence: A latent-variable approach. *Journal of Experimental Psychology-General*, 128(3), 309-331.
- Fiet, J. O. (2002). *Systematic Search for Entrepreneurial Discoveries*. Westport, CN: Praeger.
- Fiet, J. O. (2007). A prescriptive analysis of search and discovery. *Journal of Management Studies*, 44(4), 592-611.
- Fiet, J. O., Clouse, V. G. H., & Norton, W. I. (2004). Systematic search by repeat entrepreneurs. In J. Butler (Ed.), *Research in Entrepreneurship and Management* (pp. 1-27). Greenwich, CT: Information Age Publishing.
- Fiet, J. O., Nixon, R. D., Gupta, M., & Patel, P. C. (2006). Entrepreneurial Discovery by the Working Poor. *Journal of Developmental Entrepreneurship*, 11(3), 255-273.
- Fiet, J. O., Norton, W. I., & Clouse, V. G. H. (2007). Systematic search as a source of technical innovation: An empirical test. *Journal of Engineering and Technology Management*, 24(4), 329-346.
- Fiet, J. O., & Patel, P. C. (2008). Entrepreneurial discovery as constrained, systematic search. *Small Business Economics*, 30(3), 215-229.
- Freedman, D., Thornton, A., Camburn, D., Alvin, D., & Young-DeMarco, L. (1988). The Life History Calendar: A Technique for Collecting Retrospective Data. *Sociological Methodology*, 18, 37-68.
- Frese, M. (2007). The Psychological Actions and Entrepreneurial Success: An Action Theory Approach. In J. R. Baum, M. Frese & R. A. Baron (Eds.), *The Psychology of Entrepreneurship* (pp. 151-188). Mahwah, NJ: Lawrence Erlbaum.
- Frese, M. (2009). Toward a Psychology of Entrepreneurship – An Action Theory Perspective. *Foundations and Trends in Entrepreneurship*, 5(6), 435-494.
- Frese, M., Krauss, S. I., Keith, N., Escher, S., Grabarkiewicz, R., Luneng, S. T., et al. (2007). Business owners' action planning and its relationship to business success in three African countries. *Journal of Applied Psychology*, 92(6), 1481-1498.
- Frese, M., van Gelderen, M., & Ombach, M. (2000). How to plan as a small scale business owner: Psychological process characteristics of action strategies and success. *Journal of Small Business Management*, 38(2), 1-18.
- Frese, M., & Zapf, D. (1994). Action as the core of work psychology: A German approach. In H. C. Triandis, M. D. Dunnette & L. M. Hough (Eds.), *Handbook of Industrial and Organizational Psychology* (Vol. 4, pp. 271-340). Palo Alto, CA.: Consulting Psychologists Press.
- Fritsch, M. (2008). How does new business formation affect regional development? Introduction to the special issue. *Small Business Economics*, 30(1), 1-14.
- Gaglio, C. M. (2004). The role of mental simulations and counterfactual thinking in the opportunity identification process. *Entrepreneurship Theory and Practice*, 28(6), 533-552.
- Gaglio, C. M., & Katz, J. A. (2001). The psychological basis of opportunity identification: Entrepreneurial alertness. *Small Business Economics*, 16(2), 95-111.

-
- Gartner, W. B. (1985). A Conceptual Framework for Describing the Phenomenon of New Venture Creation. *Academy of Management Review*, 10(4), 696-706.
- Gatewood, E. J., Shaver, K. G., & Gartner, W. B. (1995). A Longitudinal-Study of Cognitive-Factors Influencing Start-up Behaviors and Success at Venture Creation. *Journal of Business Venturing*, 10(5), 371-391.
- Geers, A. L., & Lassiter, G. D. (2002). Effects of affective expectations on affective experience: The moderating role of optimism-pessimism. *Personality and Social Psychology Bulletin*, 28(8), 1026-1039.
- Gist, M. E., & Mitchell, T. R. (1992). Self-Efficacy: A Theoretical Analysis of Its Determinants and Malleability. *Academy of Management Review*, 17(2), 183-211.
- Gollwitzer, P. M. (1999). Implementation intentions - Strong effects of simple plans. *American Psychologist*, 54(7), 493-503.
- Gollwitzer, P. M. (2006). Open questions in implementation intention research. *Social Psychological Review*, 8(1), 14-18.
- Gollwitzer, P. M., & Brandstätter, V. (1997). Implementation intentions and effective goal pursuit. *Journal of Personality and Social Psychology*, 73(1), 186-199.
- Gollwitzer, P. M., Fujita, K., & Oettingen, G. (2004). Planning and Implementation of Goals. In R. Baumeister & K. Vohs (Eds.), *Handbook of self-regulation: Research, theory and applications* (pp. 211-228). New York: Guilford Press.
- Gollwitzer, P. M., & Sheeran, P. (2006). Implementation intentions and goal achievement: A meta-analysis of effects and processes. *Advances in Experimental Social Psychology*, 38, 69-119.
- Gottfredson, L. S. (1997). Why g matters: The complexity of everyday life. *Intelligence*, 24(1), 79-132.
- Greve, A., & Salaff, J. W. (2003). Social networks and entrepreneurship. *Entrepreneurship-Theory and Practice*, 28(1), 1-22.
- Guilford, J. P. (1950). Creativity. *American Psychologist*, 5, 444-454.
- Hambrick, D. C. (2007). Upper echelons theory: An update. *Academy of Management Review*, 32(2), 334-343.
- Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, 9(2), 193-206.
- Hart, P. E., & Oulton, N. (1996). Growth and size of firms. *Economic Journal*, 106(438), 1242-1252.
- Heckhausen, H., & Gollwitzer, P. M. (1987). Thought Contents and Cognitive-Functioning in Motivational Versus Volitional States of Mind. *Motivation and Emotion*, 11(2), 101-120.
- Henley, A. (2007). Entrepreneurial aspiration and transition into self-employment: evidence from British longitudinal data. *Entrepreneurship and Regional Development*, 19(3), 253-280.
- Heunks, F. J. (1998). Innovation, creativity and success. *Small Business Economics*, 10(3), 263-272.
- Hills, G. E., Lumpkin, G. T., & Singh, R. P. (1997). Opportunity Recognition: Perceptions and Behaviors of Entrepreneurs. In P. Reynolds, W. D. Bygrave, N. M. Carter, P. Davidsson, W. B. Gartner, C. M. Mason & P. P. McDougall (Eds.), *Frontiers of Entrepreneurship Research* (pp. 168-182). Babson Park, MA: Babson College.
-

-
- Hills, G. E., & Shrader, R. C. (1998). Successful Entrepreneurs' Insights into Opportunity Recognition. In P. D. Reynolds, W. D. Bygrave, C. M. Mason, N. M. Carter, G. D. Meyer, S. Manigart & K. G. Shaver (Eds.), *Frontiers of Entrepreneurship Research* (pp. 30-43). Babson Park, MA: Babson College.
- Hmieleski, K. M., & Baron, R. A. (2009). Entrepreneurs' Optimism and New Venture Performance: A Social Cognitive Perspective. *Academy of Management Journal*, 52(3), 473-488.
- Hoffman, K., Parejo, M., Bessant, J., & Perren, L. (1998). Small firms, R & D, technology and innovation in the UK: a literature review. *Technovation*, 18(1), 39-55.
- Honig, B. (2004). Entrepreneurship Education: Toward a Model of Contingency-Based Business Planning. *Academy of Management Learning & Education*, 3(3), 258-273.
- Honig, B., & Karlsson, T. (2004). Institutional forces and the written business plan. *Journal of Management*, 30(1), 29-48.
- Hu, L.-T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1-55.
- Isaksen, S. G., Dorval, K. B., & Treffinger, D. J. (2000). *Creative Approaches to Problem Solving: A Framework for Change* (2nd ed.). Dubuque, IA: Kendall/Hunt.
- Jaccard, J. (2005). *Interaction effects in logistic regression*. Thousand Oaks: Sage.
- Jaccard, J., Wan, C. K., & Turrisi, R. (1990). The Detection and Interpretation of Interaction Effects between Continuous-Variables in Multiple-Regression. *Multivariate Behavioral Research*, 25(4), 467-478.
- Johnson, P. S., Parker, S. C., & Wijbenga, F. (2006). Nascent entrepreneurship research: Achievements and opportunities. *Small Business Economics*, 27(1), 1-4.
- Jöreskog, K. G., & Sörbom, D. (2001). *LISREL 8: user's reference guide*. Lincolnwood, IL: SSI Scientific Software International.
- Jöreskog, K. G., & Sörbom, D. (2002). *PRELIS 2: user's reference guide*. Lincolnwood, IL: SSI Scientific Software.
- Kaish, S., & Gilad, B. (1991). Characteristics of Opportunities Search of Entrepreneurs Versus Executives: Sources, Interests, General Alertness. *Journal of Business Venturing*, 6(1), 45-61.
- Karoly, P. (1993). Mechanisms of Self-Regulation: A Systems View. *Annual Review of Psychology*, 44, 23-52.
- Keh, H. T., Nguyen, T. T. M., & Ng, H. P. (2007). The effects of entrepreneurial orientation and marketing information on the performance of SMEs. *Journal of Business Venturing*, 22(4), 592-611.
- Kessler, A., & Frank, H. (2009). Nascent Entrepreneurship in a Longitudinal Perspective The Impact of Person, Environment, Resources and the Founding Process on the Decision to Start Business Activities. *International Small Business Journal*, 27(6), 720-742.
- Kiggundu, M. N. (2002). Entrepreneurs and Entrepreneurship in Africa: What is Known and What Needs to be Done. *Journal of Developmental Entrepreneurship*, 7(3), 239-258.
- Kirchhoff, B. A. (1991). Entrepreneurship's contribution to economics. *Entrepreneurship Theory and Practice*, 16(2), 93-112.
-

- Kirkpatrick, S. A., & Locke, E. A. (1996). Direct and indirect effects of three core charismatic leadership components on performance and attitudes. *Journal of Applied Psychology, 81*(1), 36-51.
- Kirzner, I. M. (1979). *Perception, Opportunity, and Profit*. Chicago: University of Chicago Press.
- Kirzner, I. M. (1997). Entrepreneurial discovery and the competitive market process: An Austrian approach. *Journal of Economic Literature, 35*(1), 60-85.
- Kirzner, I. M. (2009). The alert and creative entrepreneur: a clarification. *Small Business Economics, 32*(2), 145-152.
- Koellinger, P., Minniti, M., & Schade, C. (2007). "I think I can, I think I can": Overconfidence and entrepreneurial behavior. *Journal of Economic Psychology, 28*(4), 502-527.
- Kolvereid, L., & Isaksen, E. (2006). New business start-up and subsequent entry into self-employment. *Journal of Business Venturing, 21*(6), 866-885.
- Krauss, S. I., Frese, M., Friedrich, C., & Unger, J. M. (2005). Entrepreneurial orientation: A psychological model of success among southern African small business owners. *European Journal of Work and Organizational Psychology, 14*(3), 315-344.
- Kristof, A. L. (1996). Person-organization fit: An integrative review of its conceptualizations, measurement, and implications. *Personnel Psychology, 49*(1), 1-49.
- Krueger, N. F., Reilly, M. D., & Carsrud, A. L. (2000). Competing models of entrepreneurial intentions. *Journal of Business Venturing, 15*(5-6), 411-432.
- Liao, J. W., & Gartner, W. B. (2006). The effects of pre-venture plan timing and perceived environmental uncertainty on the persistence of emerging firms. *Small Business Economics, 27*(1), 23-40.
- Lichtenstein, B. B., Carter, N. M., Dooley, K. J., & Gartner, W. B. (2007). Complexity dynamics of nascent entrepreneurship. *Journal of Business Venturing, 22*(2), 236-261.
- Lichtenstein, B. B., Dooley, K. J., & Lumpkin, G. T. (2006). Measuring emergence in the dynamics of new venture creation. *Journal of Business Venturing, 21*(2), 153-175.
- Locke, E. A., & Baum, J. R. (2007). Entrepreneurial Motivation. In J. R. Baum, M. Frese & R. A. Baron (Eds.), *The Psychology of Entrepreneurship* (pp. 93-112). Mahwah, NJ: Lawrence Erlbaum.
- Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation - A 35-year odyssey. *American Psychologist, 57*(9), 705-717.
- Lowe, R. A., & Ziedonis, A. A. (2006). Overoptimism and the performance of entrepreneurial firms. *Management Science, 52*(2), 173-186.
- Lumpkin, G. T., & Dess, G. G. (1996). Clarifying the entrepreneurial orientation construct and linking it to performance. *Academy of Management Review, 21*(1), 135-172.
- Ma, H. H. (2006). A synthetic analysis of the effectiveness of single components and packages in creativity training programs. *Creativity Research Journal, 18*(4), 435-446.

-
- Maas, G., & Herrington, M. (2008). *Global Entrepreneurship Monitor South African Report 2007*. Cape Town, South Africa: UCT Graduate School of Business.
- MacKey, A. (2008). The Effect of CEOs on Firm Performance. *Strategic Management Journal*, 29(12), 1357-1367.
- MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods*, 7(1), 83-104.
- Mahemba, C. M., & De Bruijn, E. J. (2003). Innovation Activities by Small and Medium-sized Manufacturing Enterprises in Tanzania. *Creativity and Innovation Management*, 12(3), 162-173.
- Markman, G. D., Balkin, D. B., & Baron, R. A. (2002). Inventors and New Venture Formation: the Effects of General Self-Efficacy and Regretful Thinking. *Entrepreneurship Theory and Practice*, 27(2), 149-165.
- McClelland, D. C. (1967). *The achieving society*. London: The Free Press.
- McClelland, G. H., & Judd, C. M. (1993). Statistical Difficulties of Detecting Interactions and Moderator Effects. *Psychological Bulletin*, 114(2), 376-390.
- McCrae, R. R., Arenberg, D., & Costa, P. T. (1987). Declines in Divergent Thinking with Age - Cross-Sectional, Longitudinal, and Cross-Sequential Analyses. *Psychology and Aging*, 2(2), 130-137.
- McGrath, R. G. (1996). *Options and the entrepreneur: toward a strategic theory of wealth creation*. Paper presented at the Academy of Management Conference, Cincinnati, OH.
- McMullen, J. S., & Shepherd, D. A. (2006). Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur. *Academy of Management Review*, 31(1), 132-152.
- McPherson, M. A. (1998). *Zimbabwe: A third nationwide survey of micro and small enterprises*. Washington, D.C.: U.S. Agency for International Development.
- Mead, D. C., & Liedholm, C. (1998). The dynamics of micro and small enterprises in developing countries. *World Development*, 26(1), 61-74.
- Mednick, S. A. (1962). The associative basis of the creative process. *Psychological Review*, 69(3), 220-232.
- Mitchell, J. R., & Shepherd, D. A. (2010). To thine own self be true: Images of self, images of opportunity, and entrepreneurial action. *Journal of Business Venturing*, 25(1), 138-154.
- Mitchell, R. K., Busenitz, L. W., Bird, B., Gaglio, C. M., McMullen, J. S., Morse, E. A., et al. (2007). The central question in entrepreneurial cognition research 2007. *Entrepreneurship Theory and Practice*, 31(1), 1-27.
- Mitchell, R. K., Busenitz, L. W., Lant, T., McDougall, P. P., Morse, E. A., & Smith, J. B. (2002). Toward a Theory of Entrepreneurial Cognition: Rethinking the People Side of Entrepreneurship Research. *Entrepreneurship Theory and Practice*, 27(2), 93-104.
- Mobley, M. I., Doares, L. M., & Mumford, M. D. (1992). Process Analytic Models of Creative Capacities: Evidence for the Combination and Reorganization Process. *Creativity Research Journal*, 5(2), 125-155.
- Morris, J. L., & Fargher, K. (1974). Achievement drive and creativity as correlates of success in small enterprises. *Australian Journal of Psychology*, 26(3), 217-222.
-

- Mueller, P. (2007). Exploiting Entrepreneurial Opportunities: The Impact of Entrepreneurship on Growth. *Small Business Economics*, 28(4), 355-362.
- Mumford, M. D., Baughman, W. A., Maher, M. A., Costanza, D. P., & Supinski, E. P. (1997). Process-based measures of creative problem-solving skills: IV. Category combination. *Creativity Research Journal*, 10(1), 59-71.
- Mumford, M. D., Baughman, W. A., Supinski, E. P., & Maher, M. A. (1996). Process-based measures of creative problem-solving skills: II. Information encoding. *Creativity Research Journal*, 9(1), 77-88.
- Mumford, M. D., & Gustafson, S. B. (1988). Creativity Syndrome: Integration, Application, and Innovation. *Psychological Bulletin*, 103(1), 27-43.
- Mumford, M. D., Marks, M. A., Connelly, M. S., Zaccaro, S. J., & Johnson, J. F. (1998). Domain-based scoring of divergent-thinking tests: Validation evidence in an occupational sample. *Creativity Research Journal*, 11(2), 151-163.
- Mumford, M. D., Mobley, M. I., Uhlman, C. E., Reiter-Palmon, R., & Doares, L. M. (1991). Process Analytic Models of Creative Capacities. *Creativity Research Journal*, 4(2), 91-122.
- Neisser, U., Boodoo, G., Bouchard, T. J., Boykin, A. W., Brody, N., Ceci, S. J., et al. (1996). Intelligence: Knowns and unknowns. *American Psychologist*, 51(2), 77-101.
- Newbert, S. L. (2005). New firm formation: A dynamic capability perspective. *Journal of Small Business Management*, 43(1), 55-77.
- Ngowi, A. B., Iwisi, D. S., & Mushi, R. J. (2002). Competitive strategy in a context of low financial resources. *Building Research and Information*, 30(3), 205-211.
- Nijstad, B. A., & Stroebe, W. (2006). How the group affects the mind: A cognitive model of idea generation in groups. *Personality and Social Psychology Review*, 10(3), 186-213.
- Nijstad, B. A., Stroebe, W., & Lodewijkx, H. F. M. (2003). Production blocking and idea generation: Does blocking interfere with cognitive processes? *Journal of Experimental Social Psychology*, 39(6), 531-548.
- Oettingen, G. (2000). Expectancy effects on behavior depend on self-regulatory thought. *Social Cognition*, 18(2), 101-129.
- Oettingen, G., & Mayer, D. (2002). The motivating function of thinking about the future: Expectations versus fantasies. *Journal of Personality and Social Psychology*, 83(5), 1198-1212.
- Oettingen, G., Pak, Y. J., & Schnetter, K. (2001). Self-regulation of goal setting: Turning free fantasies about the future into binding goals. *Journal of Personality and Social Psychology*, 80(5), 736-753.
- Oyelaran-Oyeyinka, B., Laditan, G. O. A., & Esubiyi, A. O. (1996). Industrial innovation in Sub-Saharan Africa: The manufacturing sector in Nigeria. *Research Policy*, 25(7), 1081-1096.
- Parker, S. C., & Belghitar, Y. (2006). What happens to nascent entrepreneurs? An econometric analysis of the PSED. *Small Business Economics*, 27(1), 81-101.
- Parnes, S. J., Noller, R. B., & Biondi, A. M. (1977). *Guide to creative action*. New York: Charles Scribner's Sons.
- Perttula, M., & Sipila, P. (2007). The idea exposure paradigm in design idea generation. *Journal of Engineering Design*, 18(1), 93-102.
- Porter, M. E. (1980). *Competitive Strategy*. New York: Free Press.

-
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods Instruments & Computers*, 36(4), 717-731.
- Rauch, A., & Frese, M. (2007). Let's put the person back into entrepreneurship research: A meta-analysis on the relationship between business owners' personality traits, business creation, and success. *European Journal of Work and Organizational Psychology*, 16(4), 353-385.
- Rauch, A., Frese, M., & Sonnentag, S. (2000). Cultural differences in planning/success relationships: A comparison of small enterprises in Ireland, West Germany, and East Germany. *Journal of Small Business Management*, 38(4), 28-41.
- Reynolds, P. D. (2007). New Firm Creation in the United States: A PSED I Overview. *Foundations and Trends in Entrepreneurship*, 3(1), 1-149.
- Reynolds, P. D., Bosma, N., Autio, E., Hunt, S., De Bono, N., Servais, I., et al. (2005). Global Entrepreneurship Monitor: Data collection design and implementation 1998-2003. *Small Business Economics*, 24(3), 205-231.
- Reynolds, P. D., & Curtin, R. T. (2008). Business Creation in the United States: Panel Study of Entrepreneurial Dynamics II Initial Assessment. *Foundations and Trends in Entrepreneurship*, 4(3), 155-307.
- Robinson, K. C., & McDougall, P. P. (2001). Entry barriers and new venture performance: A comparison of universal and contingency approaches. *Strategic Management Journal*, 22(6-7), 659-685.
- Robson, P. J. A., Haugh, H. M., & Obeng, B. A. (2009). Entrepreneurship and innovation in Ghana: enterprising Africa. *Small Business Economics*, 32(3), 331-350.
- Rogerson, C. M. (2000). Emerging from Apartheid's Shadow: South Africa's Informal Economy. *Journal of International Affairs*, 53(2), 673-695.
- Romijn, H., & Albaladejo, M. (2002). Determinants of innovation capability in small electronics and software firms in southeast England. *Research Policy*, 31(7), 1053-1067.
- Roper, S. (1997). Product innovation and small business growth: A comparison of the strategies of German, UK and Irish companies. *Small Business Economics*, 9(6), 523-537.
- Rosenbusch, N., Brinckmann, J., & Bausch, A. (in press). Is innovation always beneficial? A meta-analysis of the relationship between innovation and performance in SMEs. *Journal of Business Venturing*.
- Runco, M. A. (2004). Creativity. *Annual Review of Psychology*, 55, 657-687.
- Runco, M. A., & Chand, I. (1995). Cognition and Creativity. *Educational Psychology Review*, 7(3), 243-267.
- Runco, M. A., Dow, G., & Smith, W. R. (2006). Information, experience, and divergent thinking: An empirical test. *Creativity Research Journal*, 18(3), 269-277.
- Rushton, J. P., Skuy, M., & Ann Bons, T. (2004). Construct validity of raven's advanced progressive matrices for African and non-African engineering students in South Africa. *International Journal of Selection and Assessment*, 12(3), 220-229.
- Santanen, E. L., Briggs, R. O., & De Vreede, G. J. (2004). Causal relationships in creative problem solving: Comparing facilitation interventions for ideation. *Journal of Management Information Systems*, 20(4), 167-197.
-

- Sapienza, H. J., Smith, K. G., & Gannon, M. J. (1988). Using subjective evaluations of organizational performance in small business research. *American Journal of Small Business*, 12, 45-53.
- Satorra, A., & Bentler, P. M. (1994). Corrections to test statistics and standard errors in covariance structure analysis. In A. von Wye & C. C. Clogg (Eds.), *Latent variable analysis: Applications for developmental research* (pp. 399-419). Newbury Park, CA: Sage.
- Scheier, M. F., & Carver, C. S. (1992). Effects of Optimism on Psychological and Physical Well-Being - Theoretical Overview and Empirical Update. *Cognitive Therapy and Research*, 16(2), 201-228.
- Schmidt, F. L., & Hunter, J. (2004). General mental ability in the world of work: Occupational attainment and job performance. *Journal of Personality and Social Psychology*, 86(1), 162-173.
- Schumpeter, J. A. (1934). *The theory of economic development*. Cambridge, MA: Harvard University Press.
- Schwens, C., & Kabst, R. (2009). How early opposed to late internationalizers learn: Experience of others and paradigms of interpretation. *International Business Review*, 18(5), 509-522.
- Schwens, C., & Kabst, R. (in press). Internationalization of young technology firms: A complementary perspective on antecedents of foreign market familiarity. *International Business Review*.
- Scott, G., Leritz, L. E., & Mumford, M. D. (2004). The effectiveness of creativity training: A quantitative review. *Creativity Research Journal*, 16(4), 361-388.
- Seifert, C. M., Meyer, D. E., Davidson, N., Patalano, A. L., & Yaniv, I. (1995). Demystification of Cognitive Insight: Opportunistic Assimilation and the Prepared-Mind Perspective. In R. J. Sternberg & N. Davidson (Eds.), *The Nature of Insight* (pp. 65-124). Cambridge: MIT Press.
- Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology - An introduction. *American Psychologist*, 55(1), 5-14.
- Sexton, D. L. (2001). Wayne Huizenga: Entrepreneur and wealth creator. *Academy of Management Executive*, 15(1), 40-48.
- Sexton, D. L., & Bowman, N. (1985). The Entrepreneur: A Capable Executive and More. *Journal of Business Venturing*, 1(1), 129-140.
- Shane, S. (2000). Prior knowledge and the discovery of entrepreneurial opportunities. *Organization Science*, 11(4), 448-469.
- Shane, S. (2003). *A General Theory of Entrepreneurship: The Individual-Opportunity Nexus*. Northampton, MA: Edward Elgar Publishing, Inc.
- Shane, S., & Delmar, F. (2004). Planning for the market: business planning before marketing and the continuation of organizing efforts. *Journal of Business Venturing*, 19(6), 767-785.
- Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25(1), 217-226.
- Sheeran, P., Webb, T. L., & Gollwitzer, P. M. (2005). The interplay between goal intentions and implementation intentions. *Personality and Social Psychology Bulletin*, 31(1), 87-98.

-
- Shepherd, D. A., & DeTienne, D. R. (2005). Prior knowledge, potential financial reward, and opportunity identification. *Entrepreneurship Theory and Practice*, 29(1), 91-112.
- Shinder, L. (1997). Entrepreneurs in Zimbabwe's informal sector. *Development*, 40(3), 57-61.
- Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods*, 7(4), 422-445.
- Shrout, P. E., & Fleiss, J. L. (1979). Intraclass Correlations: Uses in Assessing Rater Reliability. *Psychological Bulletin*, 86(2), 420-428.
- Simonton, D. K. (1989). Chance-configuration theory of scientific creativity. In B. Ghohson, W. R. Shadish, jr., R. A. Neimeyer & A. C. Houts (Eds.), *Psychology of Science: Contributions to Metascience*. Cambridge: Cambridge University Press.
- Simonton, D. K. (2003). Scientific creativity as constrained stochastic behavior the integration of product, person, and process perspectives. *Psychological Bulletin*, 129(4), 475-494.
- Singh, R. P., Hills, G. E., & Lumpkin, G. T. (1999). *New Venture Ideas and Entrepreneurial Opportunities: Understanding the Process of Opportunity Recognition*. Paper presented at the USASBE/SBIDA Annual National Conference, San Diego, California.
- Smith, T. (1996). *Accounting for growth: Stripping the camouflage from company accounts*. London: Random House.
- Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equations models. In S. Leinhardt (Ed.), *Sociological methodology* (pp. 290-312). San Francisco: Jossey-Bass.
- Stajkovic, A. D., & Luthans, F. (1998). Self-efficacy and work-related performance: A meta-analysis. *Psychological Bulletin*, 124(2), 240-261.
- Statistics South Africa (2000). *Measuring poverty in South Africa*. Pretoria, South Africa: Statistics South Africa.
- Statistics South Africa (2009). *Quarterly Labour Force Survey: Quarter 1, 2009*. Pretoria, South Africa: Statistics South Africa.
- Sternberg, R. J., & Kalmar, D. A. (1997). When will the milk spoil? Everyday induction in human intelligence. *Intelligence*, 25(3), 185-203.
- Sternberg, R. J., & Kaufman, J. C. (1998). Human abilities. *Annual Review of Psychology*, 49, 479-502.
- Stevenson, H. H., & Jarillo, J. C. (1990). A paradigm of entrepreneurship: Entrepreneurial management. *Strategic Management Journal*, 11, 17-27.
- Stewart, W. H., & Roth, P. L. (2001). Risk propensity differences between entrepreneurs and managers: A meta-analytic review. *Journal of Applied Psychology*, 86(1), 145-153.
- Tang, J., Murphy, P. J., Chadha, R., & Zhu, R. (2007). *Entrepreneurial Alertness, Technological Innovations, and New Product and Service Development: Evidence from Two Studies*. Paper presented at the 27th Babson Kauffman Entrepreneurship Research Conference.
- Thornhill, S. (2006). Knowledge, innovation and firm performance in high- and low-technology regimes. *Journal of Business Venturing*, 21(5), 687-703.
-

- Townsend, D. M., Busenitz, L. W., & Arthurs, J. D. (2010). To start or not to start: Outcome and ability expectations in the decision to start a new venture. *Journal of Business Venturing*, 25(2), 192-202.
- Tripoli, A. M. (1998). Planning and Allocating: Strategies for Managing Priorities in Complex Jobs. *European Journal of Work and Organizational Psychology*, 7(4), 455-476.
- Ucbasaran, D., Westhead, P., & Wright, M. (2008). Opportunity identification and pursuit: Does an entrepreneur's human capital matter? *Small Business Economics*, 30(2), 153-173.
- Unger, J. M., Keith, N., Hilling, C., Gielnik, M. M., & Frese, M. (2009). Deliberate practice among South African small business owners: Relationships with education, cognitive ability, knowledge, and success. *Journal of Occupational and Organizational Psychology*, 82(1), 21-44.
- Unger, J. M., Rauch, A., Frese, M., & Rosenbusch, N. (2006). *Human capital and entrepreneurial success: A meta-analytic review*. Paper presented at the 26th Babson Kauffman Entrepreneurship Research Conference.
- van Praag, C. M., & Cramer, J. S. (2001). The roots of entrepreneurship and labour demand: Individual ability and low risk aversion. *Economica*, 68(269), 45-62.
- van Praag, C. M., & Versloot, P. H. (2007). What is the value of entrepreneurship? A review of recent research. *Small Business Economics*, 29(4), 351-382.
- van Stel, A., Carree, M. A., & Thurik, A. R. (2005). The effect of entrepreneurial activity on national economic growth. *Small Business Economics*, 24(3), 311-321.
- Wall, T. D., Michie, J., Patterson, M., Wood, S. J., Sheehan, M., Clegg, C. W., et al. (2004). On the validity of subjective measures of company performance. *Personnel Psychology*, 57(1), 95-118.
- Walter, T., Balunywa, W., Rosa, P., Sserwanga, A., Barabas, S., & Namatovu, R. (2004). *Uganda 2003 GEM National Report*. Kampala: Makerere University Business School.
- Walter, T., Rosa, P., Barabas, S., Balunywa, W., Sserwanga, A., Namatovu, R., et al. (2005). *Uganda 2004 GEM Report*. Kampala: Makerere University Business School.
- Wanous, J. P. (1978). Realistic Job Previews - Can a Procedure to Reduce Turnover Also Influence Relationship between Abilities and Performance. *Personnel Psychology*, 31(2), 249-258.
- Ward, T. B. (2004). Cognition, creativity, and entrepreneurship. *Journal of Business Venturing*, 19(2), 173-188.
- Ward, T. B., Smith, S. M., & Finke, R. A. (1999). Creative Cognition. In R. J. Sternberg (Ed.), *Handbook of Creativity* (pp. 189-212). Cambridge: Cambridge University Press.
- Weinzimmer, L. G., Nystrom, P. C., & Freeman, S. J. (1998). Measuring organizational growth: Issues, consequences and guidelines. *Journal of Management*, 24(2), 235-262.
- Weisenfeld, U. (2003). Engagement in Innovation Management: Perceptions and Interests in the GM Debate. *Creativity and Innovation Management*, 12(4), 211-220.
- Weisenfeld, U., Nissen, D., & Gassert, K. (2003). The role of knowledge and information in innovation: the case of genetic engineering. *International Journal of Technology Management*, 26(5-6), 640-654.

- Welling, H. (2007). Four mental operations in creative cognition: The importance of abstraction. *Creativity Research Journal*, 19(2-3), 163-177.
- West, M. A., & Farr, J. L. (1990). Innovation at work. In M. A. West & J. L. Farr (Eds.), *Innovation and creativity at work: Psychological and organizational strategies* (pp. 3-13). Chichester: John Wiley.
- Wiley, J. (1998). Expertise as mental set: The effects of domain knowledge in creative problem solving. *Memory & Cognition*, 26(4), 716-730.
- Williams, L. J., Edwards, J. R., & Vandenberg, R. J. (2003). Recent advances in causal modeling methods for organizational and management research. *Journal of Management*, 29(6), 903-936.
- Wong, P. X., Ho, Y. P., & Autio, E. (2005). Entrepreneurship, innovation and economic growth: Evidence from GEM data. *Small Business Economics*, 24(3), 335-350.
- Woodman, R. W., & Schoenfeldt, L. F. (1990). An Interactionist Model of Creative Behavior. *Journal of Creative Behavior*, 24(4), 279-290.
- Yaniv, I., Meyer, D. E., & Davidson, N. S. (1995). Dynamic Memory Processes in Retrieving Answers to Questions - Recall Failures, Judgments of Knowing, and Acquisition of Information. *Journal of Experimental Psychology-Learning Memory and Cognition*, 21(6), 1509-1521.
- Zacharakis, A. L., & Meyer, G. D. (1998). A lack of insight: Do venture capitalists really understand their own decision process? *Journal of Business Venturing*, 13(1), 57-76.
- Zhao, H., & Seibert, S. E. (2006). The big five personality dimensions and entrepreneurial status: A meta-analytical review. *Journal of Applied Psychology*, 91(2), 259-271.
- Zhao, H., Seibert, S. E., & Hills, G. E. (2005). The mediating role of self-efficacy in the development of entrepreneurial intentions. *Journal of Applied Psychology*, 90(6), 1265-1272.
- Zhao, H., Seibert, S. E., & Lumpkin, G. T. (2010). The Relationship of Personality to Entrepreneurial Intentions and Performance: A Meta-Analytic Review. *Journal of Management*, 36(2), 381-404.
- Zhou, J. (2008). New Look at Creativity in the Entrepreneurial Process. *Strategic Entrepreneurship Journal*, 2(1), 1-5.