

Entrepreneurial Success: The Role of Human Capital and Learning

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To my Mother Anneliese

To my Brother Christian

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"For it is like a man, going into another country, who called his own servants, and entrusted his goods to them. To one he gave five talents, to another two, to another one; to each according to his own ability. Then he went on his journey. Immediately he who received the five talents went and traded with them, and made another five talents. In like manner he also who got the two gained another two. But he who received the one went away and dug in the earth, and hid his lord's money. "Now after a long time the lord of those servants came, and reconciled accounts with them. He who received the five talents came and brought another five talents, saying, 'Lord, you delivered to me five talents. Behold, I have gained another five talents besides them.' "His lord said to him, 'Well done, good and faithful servant. You have been faithful over a few things, I will set you over many things. Enter into the joy of your lord.' "He also who got the two talents came and said, 'Lord, you delivered to me two talents. Behold, I have gained another two talents besides them.' "His lord said to him, 'Well done, good and faithful servant. You have been faithful over a few things, I will set you over many things. Enter into the joy of your lord.' "He also who had received the one talent came and said, 'Lord, I knew you that you are a hard man, reaping where you did not sow, and gathering where you did not scatter. I was afraid, and went away and hid your talent in the earth. Behold, you have what is yours.' "But his lord answered him, 'You wicked and slothful servant. You knew that I reap where I didn't sow, and gather where I didn't scatter. You ought therefore to have deposited my money with the bankers, and at my coming I should have received back my own with interest. Take away therefore the talent from him, and give it to him who has the ten talents. For to everyone who has will be given, and he will have abundance, but from him who has not, even that which he has will be taken away. Throw out the unprofitable servant into the outer darkness, where there will be weeping and gnashing of teeth.'"

Matt 25:14-30

Abstract

This dissertation reports three studies. Study 1 meta-analytically assesses magnitude, moderators, and mediators of human capital success relationships in entrepreneurship. Study 2 shifts the focus to the acquisition and effects of current entrepreneurial knowledge. Study 3 examines the role of entrepreneurial knowledge in the context of owner self-efficacy beliefs.

The first study (Chapter 2) analyzed human capital from a learning perspective and meta-analytically integrated results from two decades of human capital research in entrepreneurship. While most reviews conclude that human capital is related to success there have been conflicting findings. Magnitude, best estimate of the relationship, and the processes from human capital investments to success are unknown. Based on 67 studies ($N = 21,597$) we found a significant but small relationship between human capital and success ($r_c = .10$). Moderator analysis yielded higher relationships for human capital related to entrepreneurial tasks compared to human capital with low task relatedness, for human capital conceptualized as knowledge/skills compared to human capital conceptualized as experience/schooling (human capital proxies), for young compared to old businesses, in less developed countries compared to developed countries, and for success measured as size compared to growth and profit. Human capital as knowledge/skills and human capital in young business yielded the highest average relationship with success ($r_c = .17$ and $r_c = .19$, respectively). We further compared the validity of three approaches to entrepreneurial success: Schooling, cognitive ability, resource-based view. Cognitive ability and variables attributable to the resource-based view produced higher success relationships than schooling. Finally, we tested a mediational model of human capital. Meta-analytic path analyses showed indirect effects from experience/schooling and cognitive ability to knowledge/skills to success. Findings are relevant, lenders, policy makers, educators, and the entrepreneurs themselves and may guide researchers in their variable selection and choice of measurements.

The second study (Chapter 3) examines antecedents and outcomes of deliberate practice activities in entrepreneurship. Deliberate practice consists of individualized self-regulated and effortful activities aimed at improving one's current performance level. Interview and questionnaire data from 90 South African business owners showed a direct impact of deliberate practice on entrepreneurial knowledge as well as an indirect effect on business growth via entrepreneurial knowledge. Cognitive ability and education were identified as antecedents of

deliberate practice. The study emphasises the importance of continuous learning efforts in entrepreneurship.

The third study (Chapter 4) examines the role of entrepreneurial knowledge and perceived self-efficacy for small business growth. Questionnaire and interview data from 280 Zimbabwean small businesses owners were analyzed. Structural equation models showed significant effects of entrepreneurial knowledge on financial and employment growth. While there was only a marginal effect of self-efficacy on financial and no effect of self-efficacy on employment growth the data showed interaction effects of entrepreneurial knowledge and self-efficacy for both growth indicators. The relationship of self-efficacy with financial and employment growth was stronger for business owners with higher entrepreneurial knowledge. Findings are interpreted as detrimental effects of overconfidence, the discrepancy between what owners know and what they believe they are capable of. The study adds to the understanding of potentially negative effects of self-efficacy on performance.

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CHAPTER 1

Introduction

Researchers from various disciplines agree about the significance of successful entrepreneurship for desired outcomes such as job creation, wealth, innovation, and societal economic development (e.g. Autio, 2005; Birch, 1987; Kirzner, 1997; Frese, 2000). It is therefore important to better understand the factors that contribute to small business success. One area of research that is receiving growing attention, by academics and practitioners, is the importance of learning and knowledge (e.g. Harrison & Leitch 2005; Reuber & Fisher, 1994; Grant, 1996; Zahra & George, 2002; Shane, 2000; cf. Sonnentag & Frese, 2002). This is also reflected in a recent special issue on entrepreneurial learning in the *Entrepreneurship Theory and Practice* journal which emphasises the role of learning in organizational adaptation and flexibility in conditions of change and uncertainty. Knowledge helps owners to detect business opportunities (Shane, 2000) and represents a source of competitive advantage (e.g. Levinthal & March, 1991; Senge, 1990; Zahra & George, 2002). Learning is the process that generates this knowledge. Because knowledge in modern work environments has a limited shelf-life it needs to be constantly revised and updated (Reuber & Fisher, 1999). This requires continuous engagement in processes of learning. Knowledge and learning may play an even larger role in the future because of increasing knowledge intensive activities, rapid change and new requirements in the work place (cf. Honig, 2001; Pennings, Lee, & van Witteloostuijn, 1998; Bosma, van Praag, Thurik, & de Wit, 2004; Sonnentag & Frese, 2002).

Given the importance of learning to small business success it is surprising that empirical studies on how business owners learn and accumulate relevant knowledge are still rare (Agnal, 1999; Ravasi & Turati, 2005). The link between learning and entrepreneurial effectiveness is far from proven (Harrison & Leitch, 2005). Scholars therefore conclude that research on learning in entrepreneurship is still in its early stage (e.g. Ravasi & Turati, 2005).

The present dissertation seeks to contribute to a better understanding of the effects of knowledge in entrepreneurship and the learning process that generates knowledge. We first meta-analytically assess the impact of human capital attributes (experience, knowledge, and skills) on success and examine influences that moderate the relationships. Second, we use the concept of deliberate practice from expertise research comprising activities designed to im-

prove one's performance to explain how business owners learn and prepare themselves for future tasks and requirements. Third, we examine the role of entrepreneurial knowledge in the context of owners' self-efficacy beliefs.

1.1 Human Capital and Success

In Chapter 2 we summarize and integrate over two decades of human capital research in entrepreneurship. We conceive of human capital broadly as skills and knowledge that help to maintain and promote a business. While most narrative reviews conclude that human capital is related to success, there have been conflicting findings. These inconsistent findings need to be reconciled for a number of theoretical and practical reasons. Such a task cannot be addressed by yet another single study. We therefore apply meta-analytic tools to analyse those studies in entrepreneurship that have reported human capital success relationships to date. Meta-analysis has a number of advantages compared to narrative reviews. In their conclusions, narrative reviews often overemphasise single findings. Typically, narrative reviews do not consider differences in the sample sizes of single studies – nor do they allow to quantitatively address the weaknesses of individual studies. Meta-analysis provides a quantitative estimate of the population effect, allows for the correction of statistical artifacts, and allows identifying moderator variables (Hunter & Schmidt, 1990). A combination of meta-analyses and structural equation modeling further allows to analyze human capital from a process perspective and to test theoretical mediator variables.

Chapter 2 has three primary goals: First, we calculate the magnitude of the population effect of human capital on success. We provide an estimate of the overall effect correcting for measurement unreliability and sampling error. Second, we integrate human capital theory with a perspective of learning and derive and test theoretical moderators of the human capital success relationship. Third, in line with a perspective of learning we meta-analytically test a mediational model of human capital with knowledge/skills as a mediator between experience/schooling, cognitive ability and success.

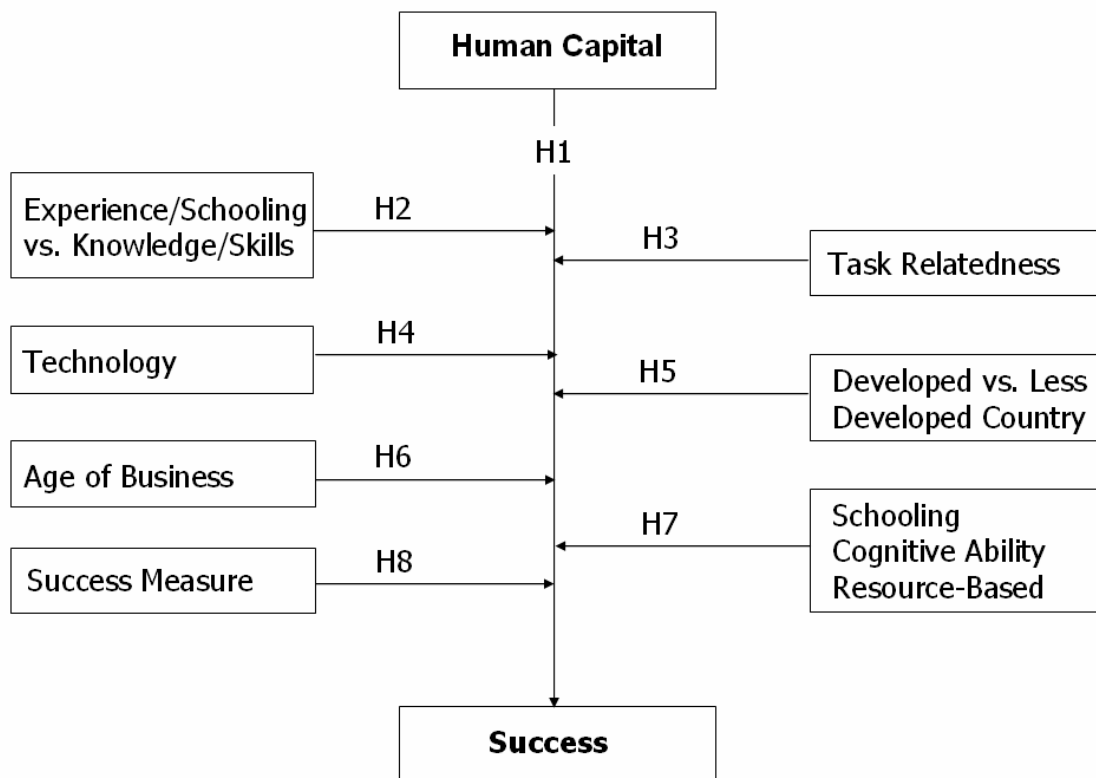
We assume a positive relationship between human capital and success. Human capital increases the owners' capability of performing generic entrepreneurial tasks of discovering and exploiting business opportunities (Shane & Venkataraman, 2000). Human capital helps owners to plan for future goals (Frese et al., 2006), to acquire other utilitarian resources such as financial and physical capital (Brush, Greene, & Hart, 2001), and it facilitates the acquisi-

tion of new knowledge and skills (cf. Ackerman & Humphreys, 1990; Hunter, 1986; Cohen & Levinthal, 1990).

Variety in human capital measurements, conceptualizations, and study contexts, however, also suggests the existence of moderating variables. Figure 1.1.1 summarises the variables addressed in Chapter 2. We assume higher success relationships for human capital measured as knowledge/skills compared to human capital measured as experience/schooling. Experience/schooling is frequently used to study human capital because it is much easier to operationalize. Education/experience represents an opportunity to acquire knowledge/skills but it does not necessarily lead to high knowledge and good skills. We therefore suggest that education/experience is a less valid indicator of human capital than knowledge/skills. We further assume higher success relationships for human capital with high task relatedness compared to human capital with low task relatedness. We explicate that human capital has to be successfully applied to current business tasks in order to lead to success. This process of transferring human capital to new situations should be easier if it is related to the tasks the

FIGURE 1.1.1

Theoretical Moderators of the Human Capital Success Relationship

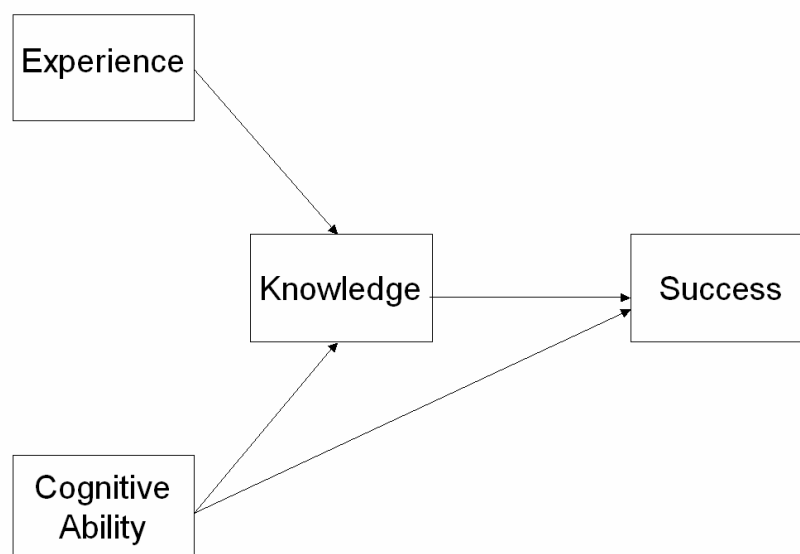


owner has to accomplish. Task-related human capital should therefore produce higher success relationships. Further moderators that were tested are: Technology (high versus low technology), developmental status (less developed versus developed countries), age of business (young versus old), success measure (growth, profit, size), and theoretical approach (schooling, cognitive ability, resource-based view).

In the first part of Chapter 2 we test moderators to assess the validity of different conceptualizations and measurements of human capital and the validity of human capital success relationships in different contexts. In the second part of Chapter 2 we test a mediational model of human capital to address the theoretical processes inherent in human capital theory (Figure 1.1.2). We build on the distinction between experience/education and knowledge/skills. Although often equated in the literature both are not the same. On a theoretical causal level knowledge and skills are acquired from experience and education in a process of learning. For example, leadership experience will help an individual to acquire leadership skills. An individual attending a business school will acquire entrepreneurial knowledge. Knowledge/skills will help the owner to be more successful. The effect from experience/schooling on success should thus be indirect via knowledge/skills. We also test an indirect and a direct effect of cognitive ability on success (Figure 1.1.2).

FIGURE 1.1.2

**Theoretical Mediational Model of Human Capital:
Cognitive Ability, Experience, Knowledge, and Success**



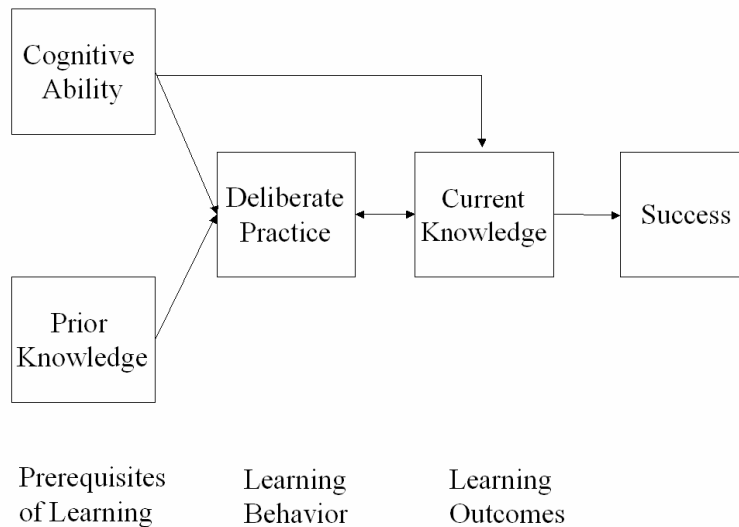
1.2 Deliberate Practice

Chapter 3 takes up one aspect of human capital: The process of learning. Whereas Chapter 2 determines *whether* human capital is related to success, along with the magnitude and contingencies of such effects, Chapter 3 addresses the question *how* business owners acquire new knowledge and skills. We apply the concept of deliberate practice from expertise research. Deliberate practice consists of individualized self-regulated and effortful activities aimed at improving one's current performance level (Ericsson, Krampe, & Tesch-Roemer, 1993). We identify such activities in entrepreneurship and test relationships with knowledge and success. We suggest a cognitive model of learning (Figure 1.2) conceptualising cognitive ability and education as prerequisites of learning, deliberate practice as learning behaviour, and current knowledge and success as outcomes of learning. In addition to testing the relationship between current knowledge and success, we examine indirect effects: From deliberate practice via current knowledge to success, from education and cognitive ability to current knowledge (via deliberate practice), and from education and cognitive ability to success (via deliberate practice and current knowledge). In our testing of indirect effects from education to knowledge and success we build on our distinction between education and knowledge/skills accentuated in Chapter 2.

Deliberate practice in entrepreneurship consists of activities such as professional reading, exploring new strategies, mental simulation, asking customers for feedback, and consulting colleagues or experts. These activities qualify as deliberate practice if they are performed on a regular basis and with a goal of competence improvement. Previous research has shown direct effects of deliberate practice on performance (cf. Ericsson et al., 1993; Sonnentag & Kleine, 2000). Although the effects have been explained by increased knowledge and skills this effect has not been tested. Our study addresses the mediating mechanism of acquiring knowledge. We argue that deliberate practice facilitates informative feedback and helps acquiring current knowledge about business trends, new technologies, ways of marketing products etc.. Regularly performed deliberate practice activities further lead to proceduralization of acquired knowledge and skills (Anderson, 1982). Knowledge, on the other hand, affects the owners' capacity to recognize (Shane, 2000; Simon, Houghton, & Savelli, 2003) and evaluate valuable business opportunities and to develop ideas into new products or services (Ravasi & Turati, 2005). Knowledge further reduces ambiguity and facilitates decision making - particularly in situations of uncertainty which characterize entrepreneurship - and should thus lead to success.

FIGURE 1.2

**Model of Learning:
Prerequisites of Learning, Learning Behavior, and Learning Outcomes**



The study is based on the notion that knowledge and learning are central for small businesses and their success (Burgelman, 1990; Grant, 1996; Levinthal & March, 1991; Senge, 1990; Zahra & George, 2002). The application of deliberate practice may help to understand the active role of the business owner as a learner. The study is an alternative approach to understand high performance. The approach does not rest on the early accounts of talent (cf. Galton, 1979). It neither attributes success solely to past investments in human capital. Instead, deliberate practice emphasises personal development together with the owner's own initiative. Deliberate practice therefore promises to be a concept with important theoretical and practical implications.

1.3 Knowledge and Self-Efficacy

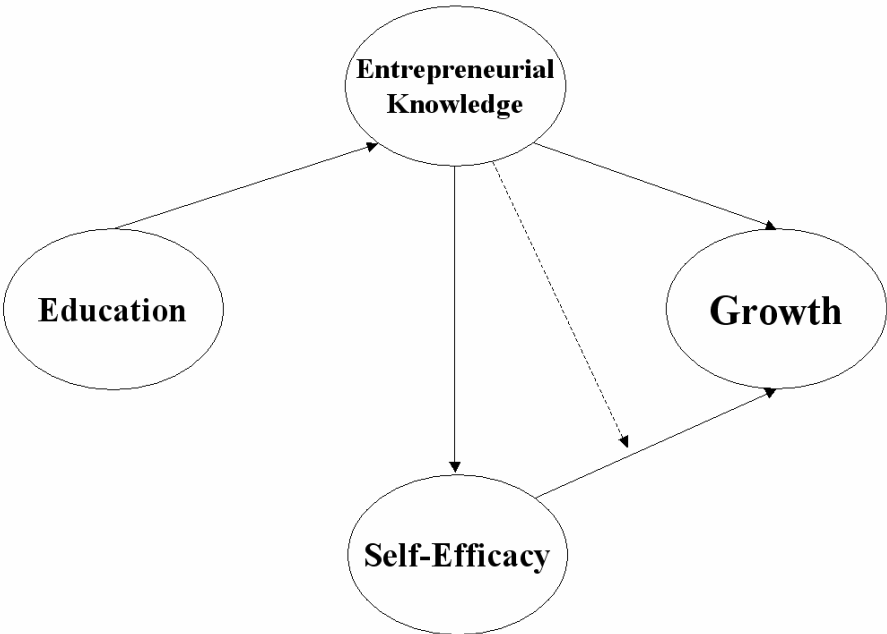
Chapter 4 examines the role of entrepreneurial knowledge and perceived self-efficacy for small business growth. We ask the question how entrepreneurial knowledge interacts with self-efficacy to predict growth. In order to be successful, business owners need to be proactive, take initiatives, and be persistent in the pursuit of goals. While knowledge assists to decrease uncertainty, to think through action alternatives (Minniti & Bygrave, 2001; Reuber &

Fisher, 1999), and to implement decisions well, owners also have to believe that they possess the capabilities to successfully perform entrepreneurial tasks. Such beliefs refer to individuals` self-efficacy, the “belief in one`s capabilities to organize and execute the courses of action required to produce given attainments” (Bandura, 1997, p.3). Bandura`s (1977) concept of self-efficacy is often thought to be one of the theoretically and practically most useful concepts of modern psychology.

Chapter 4 makes three contributions. First, we seek to replicate some of the findings presented in Chapter 3 in a different context using a larger sample. We extend the findings to also include employment growth as a dependent variable. Second, we determine the independent effects of entrepreneurial knowledge and self-efficacy. Third and most importantly, we examine interactions between entrepreneurial knowledge and self-efficacy. We argue that self-efficacy effects will be stronger if owners` entrepreneurial knowledge is higher.

Figure 3 depicts the theoretical model used in Chapter 4. We examine the relationship of cognitive resources (cognitive ability and education) with entrepreneurial knowledge and

FIGURE 1.3
Theoretical Mediation Model:
Cognitive Resources, Entrepreneurial Knowledge, Self-efficacy and Growth



the indirect effect of cognitive resources on growth (financial and employment growth) via entrepreneurial knowledge. The simultaneous examination of entrepreneurial knowledge and self-efficacy allows us to assess the independent impact of both variables. This is important because self-efficacy effects may merely reflect actual differences in the individual's capacity to perform certain tasks well (Vancouver, Thompson, Tischner, & Putka, 2002). Alternatively, if there is no relationship between actual knowledge and self-efficacy believes self-efficacy without the appropriate knowledge may misdirect individuals in their actions and may thus even have detrimental performance effects. This notion prompted us to examine interaction effects between self-efficacy and entrepreneurial knowledge. We argue that entrepreneurial knowledge moderates the relationship between self-efficacy and success. The more knowledge an owner possesses the higher the relationship between self-efficacy and success.

The chapters of this dissertation can be read independently of each other. For a better readability each chapter contains a separate list of references.

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CHAPTER 2

Human Capital and Entrepreneurial Success:

A Meta-Analytical Review

Human capital attributes - including education, experience, knowledge, and skills - have long been argued to be a critical resource for success in small business (e.g. Florin, Lubatkin, & Schulze, 2003; Pfeffer, 1994; Sexton & Upton, 1985). Researchers' interest in human capital is reflected in numerous studies applying the concept to entrepreneurship (e.g. Chandler & Hanks, 1998; Davidsson & Honig, 2003; Rauch, Frese, & Utsch, 2005). In practice, in their evaluation of firm potential, venture capitalists have traditionally attached a high importance to the experiences of entrepreneurs (Stuart & Abetti, 1990). In fact, management skills and experience are the most frequently used selection criteria of venture capitalists (Zacharakis & Meyer, 2000). Recently, researchers have argued, that human capital may play an even larger role in the future because of increasing knowledge intensive activities in most work environments (cf. Honig, 2001; Pennings, Lee, & van Witteloostuijn, 1998; Bosma, van Praag, Thurik, & de Wit, 2004; Sonnentag & Frese, 2002).

However, while the interest in human capital continues and most narrative reviews concluded that human capital is related to success (e.g. Rauch & Frese, 2000; cf. Reuber & Fisher, 1994), there have been conflicting findings empirically and the magnitude of the human capital success relationship is still unknown. For example, Reuber and Fisher's (1994) review identified eight studies reporting eleven significantly positive effects, eleven non-significant effects, and two significantly negative effects. Relationships between human capital and success have been described as "spotty and difficult to interpret" (Reuber & Fisher, 1994, p. 370), "somewhat inconclusive" (Honig, 2001, p.579), "mixed" (Florin, Lubatkin, & Schulze, 2003, p. 375), and "inconclusive on the whole" and difficult to compare across studies (Reuber, Dyke, & Fischer, 1994, p.75). A recent study concludes, that venture capitalists "appear to make a common attribution error overemphasizing startups' human capital when making their investment decisions" (Baum & Silverman, 2004, p. 411).

The literature to date remains largely fragmented with studies differing in the conceptualisations and measurements of human capital, the choice of success indicators, and the study contexts such as industry, country, and the age of business. So far, the field of entrepre-

neurship research has failed to adequately explain the differential effects of human capital attributes and to provide a framework to explicate why and what kind of human capital should be related to success. Part of this failure may be connected to a gap in human capital theory: the omission of addressing the process of learning (cf. Davidsson & Honig, 2003), more specifically, the acquisition and transfer of knowledge.

In this study, we address the human capital success relationship by meta-analytically integrating the results of two decades of human capital research. Meta-analysis has some advantages compared to narrative reviews. Meta-analysis provides a quantitative estimate of the population effects, allows for the correction of statistical artefacts, and allows to identify moderator variables (Hunter & Schmidt, 1990). Combining meta-analysis and structural equation modeling further allows to simultaneously test multiple variable relationships. We apply meta-analyses and path-analyses to examine the theoretical processes inherent in human capital theory.

The study contributes to the literature in at least four important ways. First, we determine the magnitude of the overall effect of human capital on success. Second, we apply a learning theory perspective of human capital and identify conditions that moderate the relationship between human capital and success. Third, we compare the validity of three influential approaches: Schooling, resource-based view, and cognitive ability. Finally, we test a mediational model of human capital from experience and cognitive ability to knowledge to success.

Knowledge about the magnitude, moderators, and mediators of human capital effects has important theoretical and practical implications. It is important for lenders, policy makers, educators, and the entrepreneurs themselves. The application of meta-analysis represents an important step towards evidence-based entrepreneurship (Rauch, 2006) and a practical tool for theory development.

2.1 The Concept of Human Capital

Human capital theory was originally developed to estimate employees' income distribution from their investments in human capital (Becker, 1964; Mincer, 1958). The theory has been adopted by entrepreneurship researchers and has stimulated a considerable body of directly related research (e.g. Chandler & Hanks, 1998; Davidsson & Honig, 2003; Rauch,

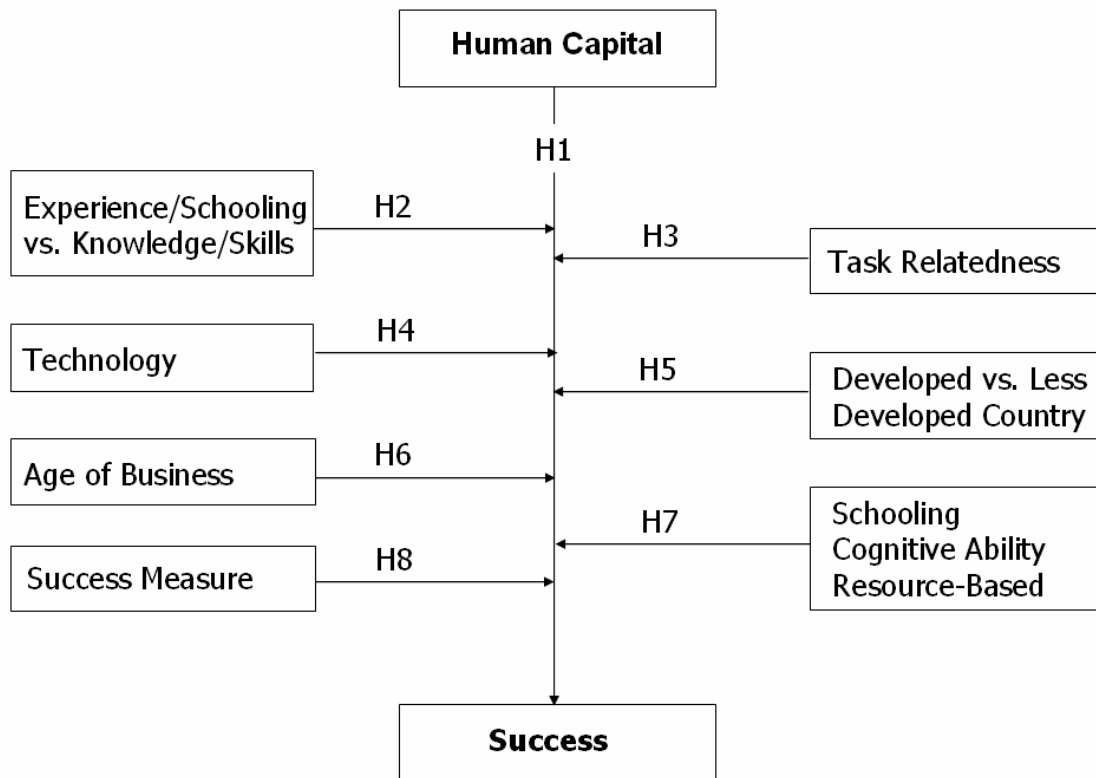
Frese, & Utsch, 2005) and led to an even larger number of studies that merely include human capital into their prediction models.

At first sight, human capital appears to be a simple concept. In its empirical use, however, the concept of human capital is fairly complex. Researchers have used a large spectrum of variables - all signifying human capital: Formal education, training, employment experience, start-up experience, owner experience, parent's background, skills, knowledge and others. Following Becker (1964) we define human capital as skills and knowledge that individuals acquire through investments in schooling, on-the-job training, and other types of experience.

Taking up Becker's definition we propose a learning perspective of human capital: We distinguish between human capital conceptualized as experience/schooling (in the following referred to as experience) and knowledge/skills as the result of experience (in the following referred to as knowledge).

We assume a positive overall effect of human capital variables on success. Inconsistencies in previous findings, variety in human capital conceptualizations, measurements, and study contexts, however, warrant a moderator approach to the study of human capital effects. Figure 2 includes potential moderators of human capital success relationships. In line with a learning perspective of human capital we compare the effects of human capital conceptualized as knowledge with human capital conceptualized as experience and examine task relatedness as a moderator. We further examine the moderating influence of contextual variables: Technology (high versus low), country (developed versus less developed), and age of business (young versus old). We consider differential effects of variables associated with different theoretical perspectives: Schooling, cognitive ability, resource-based view. Finally, we test the moderating role of different success measures.

In the last part of this study, we build on the distinction between experience and knowledge to derive a theoretical model of human capital explicating the processes inherent in human capital theory.

FIGURE 2.1**Theoretical Moderators of the Human Capital Success Relationship****2.2 Human Capital and Success**

Human capital theory argues that human capital leads to success (Becker, 1964). In order to develop and grow a venture, organizations have increasingly invested in the human capital of its key decision-makers (Barney, 1995). Human capital increases the owners' capability of performing generic entrepreneurial tasks of discovering and exploiting business opportunities (Shane & Venkataraman, 2000). On the one hand, prior knowledge increases owners' entrepreneurial alertness (cf. Westhead, Ucbasaran, & Wright, 2005) preparing them to discover specific opportunities that are not visible to other people (Shane, 2000; Venkataraman, 1997). On the other hand, human capital affects owners' approaches to exploit opportunities (Shane, 2000; cf. Chandler & Hanks, 1994). Human capital is positively related to planning activities which in turn positively impact success (Frese et al., 2006). Additionally, knowledge is helpful for acquiring other utilitarian resources such as financial and physical

capital (Brush, Greene, & Hart, 2001). Human capital is also a prerequisite for learning and assists in the accumulation of new knowledge and skills (cf. Ackerman & Humphreys, 1990; Hunter, 1986). Taken together, owners with higher human capital should be more efficient in running their business than owners with lower human capital.

Hypothesis 1: There is a positive relationship between human capital and success.

2.3 Human Capital from a Learning Perspective

We use a learning theoretical perspective to the understanding of human capital effects. Such a perspective is useful because it helps to theoretically dismantle cause and effects of human capital attributes and to theoretically derive moderators and mediators of the human capital success relationship.

Although learning processes have been acknowledged from the onset of human capital theory (Mincer, 1958; Becker, 1964) a black box approach was used and the black box was not really filled with meaningful constructs. So far, human capital researchers have paid little attention to the psychological processes and mechanisms that lead to human capital effects (cf. Davidsson & Honig, 2003). We address this gap and build our theory on the assumption that, effectively, human capital theory is a learning theory. A better understanding of the relationship between human capital and success requires an analysis of the processes explaining why human capital attributes should lead to success. These processes are acquisition and transfer of human capital (cf. Sohn, Doane, & Garrison, 2006; Reuber & Fisher, 1994).

Acquisition is the transformation from experience to knowledge and skills. Experience should not be equated with knowledge because experience may or may not lead to higher knowledge (Sonnetag, 1998). Human capital theory does not explicate the distinction between human capital as experience and human capital as knowledge. It is useful, however, in order to explain differential effects of human capital on success (the identification of moderator variables) and to derive a psychological theory of human capital (including the identification of mediator variables).

Human capital theory also does not address the process of transfer of human capital. The theory simply states that human capital “investments improve knowledge, skills, or health, and thereby raise money or psychic incomes” (Becker, 1964, p. 1). From a learning

theoretical point of view human capital has to be successfully transferred to the business owners' situation in order to increase success. This transfer process should be easier if human capital is related to the current tasks of the business owner. It is therefore useful to distinguish between human capital that is task-related and human capital that is non task-related. Task-related human capital is human capital that relates to the current tasks of the business owner (e.g. owner experience, start-up experience, entrepreneurial knowledge). Non task-related human capital is human capital that does not relate to current tasks of the business owner (e.g. general education, employment experience).

Analysing human capital from a learning perspective allows us to derive two important moderators of the relationship between human capital and success: Human capital as knowledge versus human capital as experience and task-related versus non task-related human capital.

2.3.1 Knowledge versus Experience

Human capital refers to knowledge and skills acquired through experience (Becker, 1964). Hence, theoretically, human capital is the result of experience. Most researchers in entrepreneurship, however, have used experience or education in their analyses of human capital effects (Rauch, Frese, & Utsch, 2005). Such variables have also been referred to as proxies or surrogates of human capital because they do not assess human capital directly. While it is reasonable to assume that experience leads to accumulated knowledge, the fact that they are not the same will be consequential for the magnitude of resulting effects. "The use of such surrogates requires the unrealistic and misleading assumption that all individuals learn at the same rate and that all situations labelled in a particular way are equally rich learning environments" (Reuber & Fisher, 1994, p. 373).

Whether human capital experience leads to knowledge depends on characteristics of the person and the environment (cf. Quiñones, Ford, & Teachout, 1995; Gagné, 1985). "It is possible that two individuals can be sent to start separate businesses and thus have equal experiences. However, the outcomes can be dramatically different" (Quinones et al., 1995, p. 905). Reflective orientation (a focus on understanding the meaning of ideas and situations that help transfer concrete experience into new information and knowledge; Kolb, 1984) and metacognitive activities (activities to control one's cognitions; Ford, Smith, Weissbein, Gully,

& Salas, 1998) are only two examples of many person variables that facilitate the transformation of experience into knowledge (cf. Kolb, 1984; Keith & Frese, 2005).

Moreover, the use of the same labels of experience does not mean that they are in fact the same. For example, education is often measured as the years of schooling. Yet, what has been learned (knowledge as the result of experience) may strongly depend on characteristics of the school (business school or not, ranking of a university etc.). In conclusion, human capital conceptualized as experience may reveal only little about the knowledge and skills that a person actually possesses. Human capital conceptualised as knowledge does not entail the problems and ambiguousness of experience variables. Knowledge should therefore yield higher and more consistently positive relationships with success.

Hypothesis 2: The relationship between human capital and success is higher for human capital measured as knowledge than human capital measured as experience.

2.3.2 Task-Relatedness of Human Capital

Human capital can only lead to higher performance if it is applied and successfully transferred to the owners' tasks in the current business. Tasks in entrepreneurship that concern all business owners include environmental scanning, selecting opportunities, and formulating strategies for exploitation of opportunities, organization, management, and leadership (Mintzberg & Waters, 1982; Chandler & Jansen, 1992). Successful task accomplishment requires human capital that is matched to these tasks (West & Noel, 2002). Task relatedness of human capital is high if it is process specific (related to the processes and daily tasks of running a business) and content specific (related to the industry the owner is in). Owners with high task related human capital possess better knowledge of customers, suppliers, products, and services within the context of their business (Gimeno, Folta, Cooper, & Woo, 1997). Such task related human capital helps in the detection and exploitation of new business opportunities. Task related human capital should therefore be more strongly related to success.

Human capital that is related to the tasks in the current business context also facilitates the acquisition of new knowledge. The more similar prior knowledge is to new knowledge, the easier the absorption of the new knowledge (Cohen & Levinthal, 1990).

Overall, research in entrepreneurship appears to support our arguments. Related industry experience was positively related to business growth (Lerner & Almor, 2002). In another study, owners were found to be more successful if their current business was similar to past operations (Srinivasan, Woo, & Cooper, 1994). Not all studies, however, have yielded clear-cut results (e.g. Chandler, 1996), thereby reinforcing the need for meta-analysis.

Taken together, transfer should be easier for human capital that is related to current tasks of the entrepreneurs.

Hypothesis 3: The relationship between human capital and success is higher for human capital related to entrepreneurial tasks than for human capital that is not related to entrepreneurial tasks.

2.3.3 Context as a Moderator of the Human Capital - Success Relationship

Human capital and learning are important in rapidly changing work environments (cf. Howard, 1995; Sonnentag & Frese, 2002). Such environments appear frequently in high technology industries. Business owners in these industries have to continually adapt to new technological developments and increased customer demands. They quickly have to assess and act upon new business opportunities. Human capital helps in the acquisition of new knowledge and skills and enables business owners to make better and faster decisions (e.g. Reuber & Fisher, 1999). Because owners in high technology industries are more confronted with dynamism and changing environments than owners in low technologies human capital should be more important in high technology industries.

Hypothesis 4: The relationship between human capital and success is higher in high technology industries than in low technology industries.

Human capital can create competitive advantage if it is heterogeneous, rare, and immobile (cf. Barney, 1991). The benefits of human capital are therefore likely to vary depending on the heterogeneity, rareness, and immobility of the context in which the owner operates. Taken to the extreme - if all owners possessed the same human capital, there would be no competitive advantage. Human capital is more heterogeneous and rare in less developed

countries compared to developed countries. It is therefore more likely to create competitive advantage in the developing world.

Human capital should produce higher effect sizes in the developing world for methodological reasons as well. Human capital heterogeneity in the developing world implies higher variances of human capital compared to the developed world. Higher variances are known to make it easier to detect relationships. Researchers have previously suggested similar explanations for failure to find relationships between education and success. Lerner, Brush, and Hisrich (1997) explained the lack of relationship between education and success in Israeli business owners by the high and relatively uniform level of education in the country with little variance.

Hypothesis 5: The relationship between human capital and success is higher in less developed than in developed countries.

Human capital has been argued to be especially important in young businesses (Davidsson & Honig, 2003). Owners of young businesses are typically confronted with many different and potentially new tasks. They have to respond to new situations that may require immediate decisions and actions. Routines and strategies, however, have yet to be developed (cf. Bantel, 1998). Thus, accomplishing daily tasks in the business, solving problems, and making entrepreneurial decisions (e.g. decisions to act upon business opportunities) pose especially high cognitive challenges to owners of young businesses. High human capital assists such owners to learn new tasks and to adapt to new situations (Weick, 1996). In contrast, owners of older businesses have routines and established practices to resort to. Over the years, variables other than the owners' human capital may become more important. Owners' human capital should therefore be more important in the first business years than during later stages.

Hypothesis 6: The relationship between human capital and success is higher for younger business than for older businesses.

2.3.4 Three Approaches to Success: Schooling, Cognitive Ability, Resource-Based View

Researchers interested in the effects of human capital attributes have used different conceptual frameworks for human capital: Schooling (general human capital theory), cognitive ability, resource-based view. Each approach emphasizes a different class of variables as the key factor to success.

General human capital approaches emphasize schooling as the most important human capital attribute (Becker, 1964). The theory acknowledges the influence of cognitive ability but predicts incremental effects of schooling. Schooling is the most widely studied human capital attribute in entrepreneurship with many reviews reporting positive success relationships.

Cognitive ability approaches offer an alternative view concerning the importance of human capital attributes. Individuals with high cognitive ability are assumed to invest more in their human capital (Becker, 1964) and to be better learners (cf. Kanfer & Ackerman, 1989). The ability approach has gained popularity in work and organizational psychology providing researchers with one of the most important predictors of job performance (e.g. Hunter, 1986; Ree, Earles, & Teachout, 1994). Cognitive ability is particularly important for the accomplishment of complex tasks requiring the processing of new information. Such tasks are characteristic of entrepreneurship. Surprisingly, very few studies have examined cognitive ability effects in entrepreneurship. The few studies that did, have tended to report positive effects (Frese et al., 2006, Van Praag & Cramer, 2001; Ray & Singh, 1980).

In contrast to the schooling and cognitive ability literature with their emphasis on broad capabilities, the resource-based view accentuates resources that are valuable, rare, imperfectly imitable, and specialized (Barney, 1991). The approach emphasizes firm-specific human resources that can not be easily duplicated in the market (Boxall & Steeneveld, 1999). Such resources create competitive advantage. According to the resource-based view neither schooling nor cognitive ability qualify as specialized, imperfectly imitable resources. A recent study concludes that specific human resources such as industry specific experience are more important for success than schooling (Bosma, van Praag, Thurik, & de Wit, 2004).

The validity of the three approaches has been compared indicating superiority of the resource-based view (Rauch, Unger, Skalicky, & Frese, 2005). The present study extends previous findings by meta-analytically comparing the approaches across studies.

Hypothesis 7: The relationship between human capital and success varies across different approaches: Schooling, cognitive ability, resource-based view.

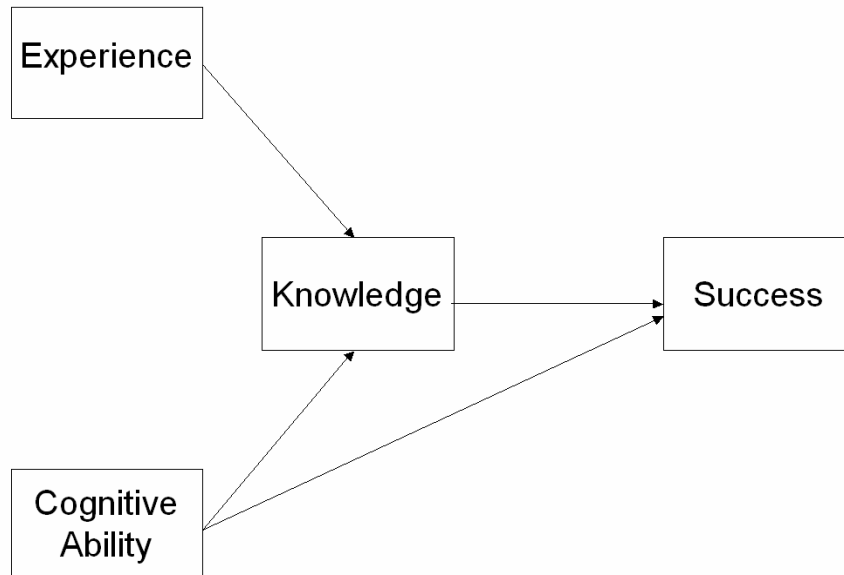
2.3.5 Human Capital and Success: Measurement of Success

Previous research suggests that success is a multidimensional construct (e.g. Combs, Crook, & Shook, 2005). We therefore hypothesize differences in the magnitude of the human capital success relationships depending on the measurement of success. We distinguish between size, growth, and return oriented measures. Because the literature does not allow sound a priori postulations concerning the relative magnitude of effects depending on the choice of success criterion we have an explorative research question.

Research Question: The relationship between human capital and success varies depending on the measurement of success (size, growth, profits).

2.3.6 A Mediational Model of Human Capital

So far we have addressed theoretical moderators of human capital success relationships. We developed hypotheses about the magnitude of different human capital variables and the magnitude of human capital relationships under different contextual conditions. Knowledge about the magnitude of human capital relationships, however, does not tell us anything about the processes inherent in human capital success relationships. What is the relationship between experience and knowledge? Is there an indirect effect of experience to knowledge to success? What is the role of cognitive ability? In the remaining section we assume a process perspective of human capital and address potential mediators in human capital success relationships. Figure 2.2 includes our proposed model of human capital.

FIGURE 2.2**Theoretical Mediational Model: Cognitive Ability, Experience, Knowledge, and Success**

Experience and knowledge have been used in previous studies to analyse human capital success relationships (e.g. Rauch et al., 2005; Gimeno et al., 1997). Although often equated in the literature both are not the same (cf. Reuber & Fisher, 1994). On a theoretical causal level knowledge is acquired from experience in a process of learning. Experiences represent opportunities to acquire knowledge. Increased knowledge in turn leads to higher success. Work experience and education, for example, lead to knowledge and skills that enable business owners to find opportunities and to cope with problems better and therefore be more successful (e.g. Cooper, Gimeno-Gascon, & Woo, 1994). A mediation from experience to knowledge to success has previously been reported by Reuber and Fisher (1994). The study, however, was solely based on self-report measures of knowledge thereby posing questions to the validity of the findings. An analysis of the mediation effect across different studies therefore appears warranted.

In our discussion of moderator variables we have hypothesized positive relationships between experience and success and between knowledge and success. Explicating the process between experience, knowledge, and success we now propose two additional hypotheses:

Hypothesis 8: Experience is positively related to knowledge.

Hypothesis 9: Experience has an indirect effect on success, which is mediated by knowledge.

Early in human capital theorizing, cognitive ability has been discussed as a correlate of human capital (Becker, 1964). Individuals with higher cognitive ability tend to invest more in human capital than individuals with less cognitive ability. According to Becker (1964), however, the effects of cognitive ability and human capital on success are distinguishable. It is important therefore to assess the relationship between cognitive ability and human capital as well as the independent success relationships of both constructs.

A number of researchers have established that cognitive ability helps in the acquisition of work-related knowledge and skills (Hunter, 1986; Schmidt et al., 1986). Cognitive ability was also found to be a good predictor of training success (Jensen, 1998; Schmidt & Hunter, 1998). In addition to a positive direct relationship between cognitive ability and success (hypothesized earlier in this chapter) we now add two additional hypotheses which explicate the process between cognitive ability, knowledge, and success:

Hypothesis 10: Cognitive ability is positively related to knowledge.

Hypothesis 11: Cognitive ability has an indirect effect on success, which is mediated by knowledge.

2.4 Method

2.4.1 Selection Criteria

We focused on studies defining entrepreneurship as business ownership and active management (Stewart & Roth, 2001). To be included studies were required to report a correlation between an indicator of human capital and a measure of entrepreneurial success or a statistic that allowed the transformation into a correlation measure. To avoid ambiguity in the dependent variable we decided not to include studies reporting firm dissolution unless 'failure' was stated as the reason for closure. Studies that only reported significant effects were excluded.

2.4.2 Collection of Studies

We used a number of strategies to identify studies reporting relationships between human capital and entrepreneurial success: First, we initiated a computer-based literature search in specialized databases such as PsycINFO (1987-2006), ABI/Inform (1971-2006), EBSCO (Business Source Elite, 1985-2006), SSCI (Social Science Citation Index, 1972-2006), EconLit (1969-2005), and ERIC (Expanded Academic Index, 1985-2005). We used variations of keywords of entrepreneurship (e.g. entrepreneur, business owner, small business, venture, small firm), of human capital (e.g. human capital, education, schooling, knowledge, skills, ability, competence) and of entrepreneurial success (e.g. success, performance, growth, profit, income, size, sales, ROI, ROA, ROS). Second, we manually searched relevant journals such as the *Journal of Business Venturing* (1995-2006), *Entrepreneurship Theory and Practice* (1985-2006), *Journal of Small Business Management* (1985-2006), *Academy of Management Journal* (1985-2006), *Journal of Applied Psychology* (1985-2006), *Administrative Science Quarterly* (1985-2006), and the *Entrepreneurship and Regional Development* (1985-2006). A third strategy searched conference proceedings of the Academy of Management (1984-2005) and the Babson College Kaufman Foundation Research Conference (1981-2004). Finally, we examined the reference lists of studies and theoretical articles.

Our search resulted in 326 studies. Sixty-seven studies met the selection criteria reporting 480 effect sizes. The most common reason for excluding studies was that correlations or transferable statistics were not reported. We also contacted 82 authors and received 48 replies yielding 8 usable correlation matrices or data files. The majority of the authors either indicated that the data were no longer available to them or that they were not able to produce a correlation matrix due to time constraints.

2.4.3 Variable Coding

We coded task relatedness of human capital (high: start-up experience, industry experience, management experience, management skills; low: general education, work experience), whether human capital was conceptualized as experience (e.g. years of work experience, start-up experience, years of schooling) or as knowledge (e.g. entrepreneurial knowledge, business skills, social skills), and whether studies referred to either of the three approaches “schooling”, “cognitive ability”, “resource-based view” (as specific industry experi-

ence). We further coded the study context. The country of the businesses under investigation was coded as belonging to the developed or less developed part of the world (countries, territories receiving development assistance and aid in 2003; cf. Organisation for Economic Cooperation and Development). We further coded whether the business operated in a high technology sector (e.g. computer and biotechnology industry) or a low technology sector (e.g. gastronomy, wood manufacturing). We classified businesses as young businesses if they existed for less than 8 years and as old businesses if they existed for more than 8 years (cf. Bantel, 1998 and McDougall & Robinson, 1990). Measures of entrepreneurial success were classified into groups of growth, profit, and size oriented measures.

2.4.4 Analytical Approaches

Our analysis was based on the meta-analytic procedures developed by Hunter and Schmidt (1990). Effect sizes were based on Pearson product-moment correlations (r). When r was not reported but other statistics were available (e.g. t -test, χ -square etc.) we converted these values into the r -statistic (using Schwarzer, 1989). Whenever studies reported multiple indicators we averaged the effects per study. In order to utilize all information possible without violating sample independence (Petitti, 2000) we also averaged effects across those studies that were based on the same sample thus including them only once into the analysis.

For estimating the overall relationship between human capital and success we computed the sample weighted average effect across all studies. We corrected dependent and independent variables for measurement unreliability. The average reliability was $r = .769$ for human capital (based on 51 coefficients from 20 studies) and $r = .774$ for success (based on 27 coefficients from 15 studies).

To determine whether the effect was different from zero, we computed a 95% confidence interval around the estimated population correlation. A 95% confidence interval excluding zero indicates that we can be 97,5% sure that the average true correlation is nonzero (2,5% of average correlations would lie beyond the upper limit of the interval; cf. Judge, Heller, & Mount, 2002). To estimate the severity of publication bias we further conducted file drawer analyses according to Rosenthal (1979) which indicate the number of studies necessary to make a potential finding insignificant.

We took several steps to test moderator hypotheses. We first examined homogeneity of all study effects. Homogeneity was assessed applying Hunter and Schmidt's (1990) 75%

rule and calculating 95% credibility intervals. Effects are considered homogenous if more than 75% of the observed effects' variance is explained by sampling error variance and if the 95% credibility interval does not include zero. If the effects were heterogeneous moderators could be tested. We took care not to underestimate effect heterogeneity. To assess heterogeneity we therefore did not take the average effect size of each study but randomly selected one effect from each study. This ensured that effect heterogeneity *within* studies was also considered. The existence of a moderator was indicated if effect subgroups were homogenous and if homogeneity averaged across the moderator subgroups was higher than homogeneity of the overall effects. To examine the statistical significance of the difference between each moderator pair we calculated z-statistics.

A 95% credibility interval excluding zero around a positive correlation indicates that 97,5 % of the individual correlations in the meta-analysis excluded zero (2,5% are zero or less and 2,5% are beyond the upper limit of the interval; cf. Judge et al., 2002). It is important to report both confidence and credibility intervals. While confidence intervals estimate variability in the mean correlation, credibility intervals estimate variability in the individual study correlations. Confidence intervals tell us whether an estimated effect is different from zero. Credibility intervals are an indicator of effect homogeneity across studies.

We used a combination of structural equation modeling and meta-analytic techniques to test the mediational model of human capital (Viswesvaran & Ones, 1995). A number of researchers have recently recommended and used such approaches for theory testing (e.g. Colquitt, LePine, & Noe, 2000; Shadish, 1996; Viswesvaran & Ones, 1995). First, we conducted meta-analyses to create an intercorrelation matrix of all variable relationships. Each cell in the matrix was obtained from a separate meta-analysis. In a second step, the intercorrelation matrix was analyzed path-analytically using maximum likelihood estimation (LISREL 8; Joeresskog & Soerboom, 1996). Since the sample sizes differed across the cells we had to determine an overall sample size. We calculated the matrix sample size as the harmonic mean¹. This approach was recommended by Viswesvaran and Ones (1995) and was used in previous meta-

¹ The formula for the harmonic mean is $k/(1/n_1 + 1/n_2 + \dots + 1/n_k)$ with k = number of correlations in the matrix and n = sample sizes of studies (Colquitt, LePine, & Noe, 2000).

analytic path-analyses (e.g. Colquitt, LePine, & Noe, 2000). In structural equation modeling the sample size is used to test the significance of path-coefficients. It is also needed for assessing some overall model fit indices (e.g. chi-squared values).

2.5 Results

Our results supported Hypothesis 1 which proposed a positive overall relationship between human capital and success (Table 2.1). The sample weighted and reliability corrected overall effect across studies was $r_c = .10$. The 95% confidence interval did not include zero (Table 2.1). File drawer analysis according to Rosenthal (1979) indicated a required number of $K = 5.778$ studies with zero effects to make the effect insignificant. Heterogeneity of the effects for the overall relationship between human capital and success pointed to the existence of moderating variables. Sampling error estimated from a series of randomly selected effects explained 21,64 % of the overall variability across the 64 studies and 480 effects. The credibility interval included zero (Table 2.1).

Next, we tested moderator hypotheses. The success relationship was higher for knowledge ($r_c = .172$) than for experience ($r_c = .091$) supporting Hypothesis 2. The variance due to sampling error increased substantially. Both credibility intervals included zero suggesting further moderating influences.

Task relatedness moderated the relationship between human capital and success. In support of Hypothesis 3, human capital indicators that were related to entrepreneurial tasks showed higher relationships than indicators of human capital with low task relatedness ($r_c = .119$, and $.075$, respectively). Neither confidence interval included zero. As indicated by the increased percentage of variance due to sampling error homogeneity was higher compared to the overall study effects. The percentage did not reach the 75% criterion suggesting that further moderators exist.

According to Hypothesis 4, technology influences the effect size. In contrast to this Hypothesis human capital relationships with success were equally strong in high ($r_c = .128$) and in low technology industries ($r_c = .130$). Effects in the group of high technology businesses were homogeneous; effects in the low technology group remained heterogeneous.

Hypothesis 5 postulated a higher human capital-success relationship for businesses operating in less developed countries than for businesses in developed countries. The moderator effect was significant with a human capital-success relationship of $r_c = .132$ in less devel-

TABLE 2.1

Results of Meta-Analysis on Human Capital and Success

Variable	<i>k</i>	<i>N</i>	<i>r_c</i>	<i>r</i>	<i>s_r²</i>	<i>s_e²</i>	% variance due to sampling error	95% confidence interval	95% credibility interval	Critical z-value
<i>H₁: Overall</i>	64	21.597	.100	.077	.006	.003	52,10	.058 to .095	-.025 to .178	
Random	64	21.597	.076	.059	.011	.003	21,64	.033 to .084	-.115 to .233	
<i>H₂: Knowledge vs. Experience^a</i>										
Knowledge	22	2.722	.172	.135	.019	.008	42,21	.078 to .338	-.069 to .338	2.07*
Experience	59	20.674	.091	.071	.005	.003	53,28	.053 to .090	-.026 to .169	
<i>H₃: Task Relatedness</i>										
High	46	15.212	.119	.092	.005	.003	59,26	.072 to .113	.004 to .181	1.92*
Low	43	18.232	.075	.061	.007	.002	33,37	.036 to .086	-.073 to .195	
<i>H₄: Industry</i>										
High technology	7	1.338	.128	.100	.003	.005	182,82	.060 to .139	n.a.	0.04
Low technology	22	6.263	.130	.101	.006	.003	56,62	.068 to .133	-.000 to .202	
<i>H₅: Developed vs. Less Developed</i>										
Developed	42	16.359	.086	.066	.004	.002	58,13	.046 to .086	-.017 to .150	1.74*
Less-developed	21	5.177	.132	.103	.007	.004	55,48	.066 to .139	-.008 to .214	
<i>H₆: Age of Business</i>										
Old	13	7.406	.053	.041	.003	.002	81,54	.016 to .066	-.004 to .085	2.95**
Young	17	2.094	.193	.149	.015	.006	38,78	.082 to .217	-.041 to .339	
<i>H₇: Three Approaches</i>										
Schooling	43	18.254	.084	.065	.007	.002	31,62	.039 to .091	-.074 to .204	-2.17* ^b
Cognitive ability	9	1.154	.234	.192	.003	.007	24,78	.080 to .304	-.100 to .484	1.57 ^c
Resource-based	42	14.646	.128	.100	.009	.003	31,25	.084 to .116	-.054 to .254	1.78 ^{†d}
<i>Research Question₁: Success Measure</i>										
Size	40	14.079	.116	.089	.004	.003	71,88	.073 to .106	.024 to .154	1.84* ^e
Growth	32	10.619	.069	.054	.009	.003	34,47	.022 to .086	-.094 to .202	0.79 ^f
Profit	21	12.655	.049	.037	.004	.002	43,57	.010 to .064	-.054 to .128	-3.12** ^g

Note. *k* = number of samples, *n* = sample size $\sum n_i$, *r_c* = reliability corrected and sample size weighted mean effect size, *r* = sample size weighted mean effect size, *s_r²* = variance in effect sizes, *s_e²* = sampling error variance, critical z-value: statistic based on test for significance of difference in effect sizes - one tailed for directional, two tailed for non-directional hypotheses. [†] *p* < .10, * *p* < .05., ** *p* < .01. ^a Including knowledge/skills and experience/schooling, ^b Schooling versus cognitive ability, ^c Cognitive ability versus resource-based view, ^d Resource-based view versus schooling, ^e Size versus growth, ^f Growth versus profit, ^g Profit versus size,

oped compared to $r_c = .086$ in developed countries. Although sampling error accounted for an increased percentage of variance, effects in both groups remained heterogeneous.

We hypothesised age of business to moderate the human capital-success relationship (Hypothesis 6). In support of Hypothesis 6, human capital effects were higher in young businesses ($r_c = .193$) than in old business ($r_c = .053$). The 75% criterion suggested homogeneity in the group of old business and heterogeneity in the group of young businesses. The credibility intervals included zero indicating that further moderators may exist.

Results from the comparison of schooling, cognitive ability, and resource based approaches were in line with Hypothesis 7, which postulated differences in variable effects. associated with the respective approach. Cognitive ability and resource based effects ($r_c = .234$ and $.128$, respectively) were higher than effects from schooling ($r_c = .084$). Cognitive ability showed marginally higher effects than resource based variables. All effects remained heterogeneous suggesting the existence of further moderators.

Finally, the relationship between human capital and success varied with the choice of success measurements used in the studies (Research Question 1). The relationship for size ($r_c = .116$) was higher than for growth ($r_c = .069$) and profit ($r_c = .049$). There was no difference in effects between growth and profit oriented measures of success. While the variation in the effects was homogenous for size, it remained heterogeneous for growth and profit.

Table 2.2 displays the meta-analytical population estimates for the relationships between experience, knowledge, cognitive ability, and success. All correlations were positive and significant ($p < .01$). As was already shown in the calculation of moderators, experience, cognitive ability, and knowledge were each positively related to success. Experience and cognitive ability each had a positive effect on knowledge. Cognitive ability was positively related to experience. The confidence intervals were particularly wide for variable relationships with cognitive ability.

The hypotheses proposed in our mediational model of human capital were tested simultaneously using structural equation modeling (Figure 2.3). We tested direct effects by examining parameter estimates of respective paths in the model and indirect effects using Sobel's first-order solution (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). The first model (Figure 2.3a) was computed from the meta-analyzed mean effects of respective variables (taken from Table 2.2). The model showed good fit ($\chi^2 [1, n = 1.529] = 0.36, p = .55$; comparative fit index = 1.00; goodness-of-fit index = 1.00; root-mean-square error of approximation = .000). Experience and cognitive ability showed positive relationships with

knowledge supporting Hypothesis 8 and 10, respectively. In support of Hypothesis 9 and 11, experience and cognitive ability had positive indirect effects on success ($p < .01$).

TABLE 2.2
**Meta-Analytic Correlations for Experience, Knowledge,
Cognitive Ability and Success**

	1	2	3	4
	<i>r_c</i> (95% CI)	<i>r_c</i> (95% CI)	<i>r_c</i> (95% CI)	<i>r_c</i> (95% CI)
1. Success				
<i>k, n</i>	—			
2. Knowledge	.17 (.08, .34)			
<i>k, n</i>	22, 2.722	—		
3. Experience	.09 (.05, .09)	.24 (.17, .30)		
<i>k, n</i>	59, 20.674	16, 1.830	—	
4. Cognitive ability	.23 (.08, .30)	.23 (.11, .36)	.36 (.08, .48)	
<i>k, n</i>	9, 1.154	8, 954	8, 954	—

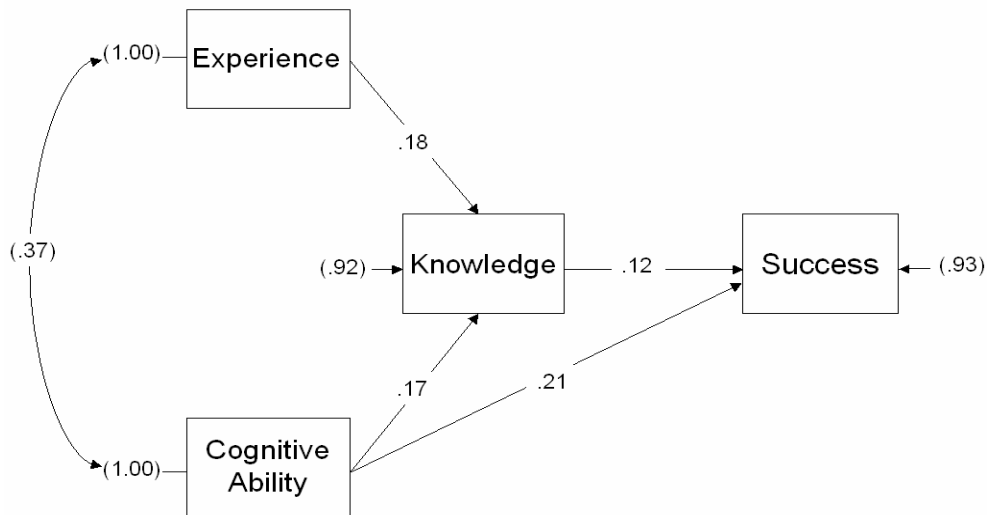
Note. K = number of samples, n = sample size r_c = mean correlation corrected for unreliability in both values; CI = 95% confidence interval around r_c ; ^a knowledge/skills; ^b experience/schooling.

Figure 2.3b includes the same model based on the limits of the lower 95% confidence interval. The model showed equally good fit ($\chi^2 [1, n = 1.529] = 0.87, p = .35$; comparative fit index = 1.00; goodness-of-fit index = 1.00; root-mean-square error of approximation = .000). As in the first model, all hypothesized relationships were supported ($p < .01$ for all direct and indirect effects; $p < .05$ for the indirect effect of cognitive ability on success).²

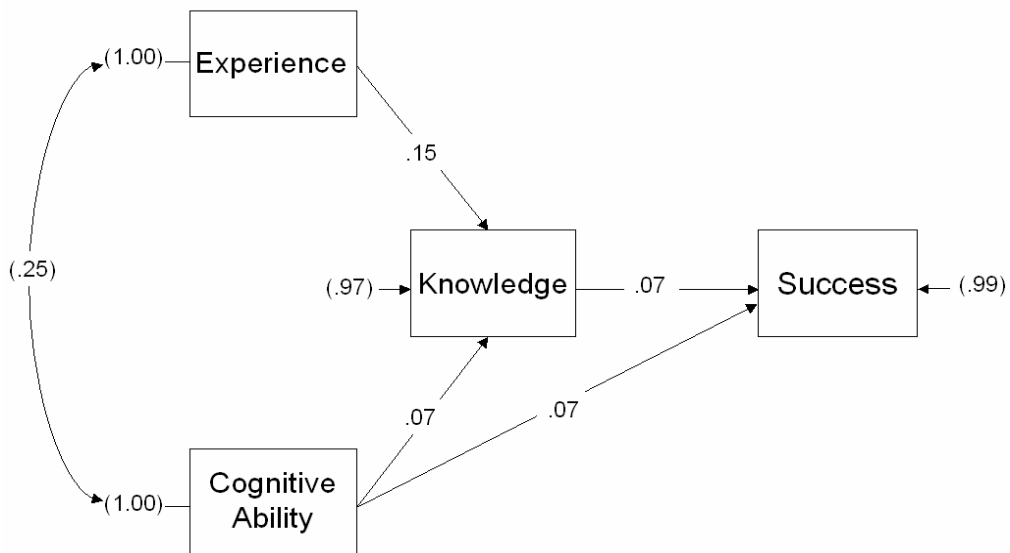
² We also computed a model with the upper 95% confidence intervals of the meta-analyzed correlations. The model showed good fit ($\chi^2 [1, n = 1.529] = 20.24, p = .00$; comparative fit index = .98; goodness-of-fit index = .99) with the exception of the root-mean-square error of approximation (RMSEA = .11).

FIGURE 2.3

**Mediational Model of Human Capital:
From Experience and Cognitive Ability to Knowledge to Success ^a**



(a) Path coefficients estimated from meta-analytic mean effects. Fit statistics: $\chi^2 (1, n = 1.529) = 0.36, p = .55$; independence model: $\chi^2 (6, n = 1.529) = 514.86$; comparative fit index = 1.00; goodness-of-fit index = 1.00; root-mean-square error of approximation = .000; * $p < .05$; ** $p < .01$.



(b) Path coefficients estimated from lower limits of meta-analytic confidence intervals. Fit statistics: $\chi^2 (1, n = 1.529) = 0.87, p = .35$; independence model: $\chi^2 (6, n = 1.529) = 183.04$; comparative fit index = 1.00; goodness-of-fit index = 1.00; root-mean-square error of approximation = .000; * $p < .05$; ** $p < .01$.

2.6 Discussion

We meta-analytically integrated over 20 years of human capital research in entrepreneurship. Our analysis is based on 67 studies with an overall sample size of 21,597 entrepreneurs. The magnitude of the population effect between human capital and success was estimated to be $r_c = .10$. We therefore conclude that there is a positive overall relationship between human capital and success. The effect, however, was surprisingly low given the attention the concept of human capital has received in the entrepreneurship literature. Success relationships of human capital are smaller than those of personality ($r_c = .153$; Rauch & Frese, 2006) or entrepreneurial orientation ($r_c = .272$; Rauch, Wiklund, Lumpkin, & Frese, 2005). As a second important result, we found human capital effects to be heterogeneous thereby confirming the assumption that human capital is not a unitary construct (cf. Reuber & Fisher, 1994). A number of variables moderated the success relationship. The effects remained positive and distinct from zero under all moderating conditions. Equally important, under certain conditions human capital effects can be as high as $r_c = .17$ (for knowledge) and as low as $r_c = .05$ (if success is measured as growth), thus demonstrating the usefulness of a moderator approach to human capital.

Moderators divide into three groups: Those that were derived from learning theory (task-relatedness and experience versus knowledge), those that were context related (developed versus less developed countries, high versus low technology, younger versus older businesses), and moderators related to measurement (choice of success measure). Success relationships were higher for human capital related to entrepreneurial tasks ($r_c = .119$), for human capital conceptualized as knowledge ($r_c = .172$), for human capital in less developed countries ($r_c = .132$) and in younger businesses ($r_c = .193$) and if success was measured as size ($r_c = .116$).

The study underlines the usefulness of analysing human capital from a learning theory perspective. Referring to the processes of acquisition and transfer of human capital we distinguished human capital conceptualized as experience and human capital as knowledge and task related from other human capital. Consistent with arguments from learning theory and research on transfer we found task related human capital to be more strongly related to success than human capital that was not related to entrepreneurial tasks. The finding suggests that human capital related to current tasks can be applied more effectively than non task related human capital. Familiarity with industry products, processes, and markets, for example, will

increase routinization, enhance decision making, and ultimately, success (Baum, Bird, & Chardavoyne, 2003).

Human capital conceptualised as knowledge was more strongly related to success than human capital conceptualized as experience. Human capital as knowledge allows a comparison of what owners have acquired from experience. Human capital as experience, in contrast, is confounded by other influences. Experience may capture what will have been learned. Experience, however, also includes variance due to individual differences and the richness of the learning environment (Reuber & Fisher, 1994). Our findings underline researchers' call for using measurements that are direct indicators of human capital such as knowledge and skill (e.g. Rauch et al. 2005).

Findings concerning the effect of context were mixed. Human capital effects varied in magnitude depending on the developmental status of the context in which the business owners operated. Human capital appears to produce stronger competitive advantages in less developed countries compared to developed countries. However, the conclusion that human capital is less important in developed countries would be premature. We suggest that our findings are in large parts due to a ceiling effect in developed countries. Higher variance in developed countries would have produced similar effects. Low variance may thus obscure true effects (for researchers to find a correlation between smoking and cancer they need people who smoke and people who do not smoke).

Age of business moderated the relationship between human capital and success. Effects were stronger in young compared to old businesses. Human capital is thus critical during the initial years of operating a business. During the first years, entrepreneurial tasks are typically new to the owner. Owners who have acquired human capital through previous business experience may be already familiar with basic entrepreneurial tasks and therefore be more successful. Highly educated owners may be able to better learn the new tasks in the business and to better adapt to the role as a business owner. Over the years owners with low human capital also gain entrepreneurial experience and develop routines. In these later stages the advantage of high human capital is therefore likely to decrease.

Our analysis yielded no difference of human capital effects between owners of high and low technology businesses. Whereas this seems puzzling at first there may be some sound explanations. Partly, the result may be an effect of self-selection and a resulting ceiling effect. Entry into the high technology sector is likely to be easier for owners with high human capital. As a consequence, human capital in high technologies should be on a high level alto-

gether. In contrast, human capital may vary more strongly in low technology industries – partly because of lower entry barriers – thereby increasing variance in human capital and with it the likelihood of statistically detecting effects. At the same time low technology industries are also affected by environmental changes and technological advances. Hence, high levels of human capital may also create relative competitive advantages in low technology industries. A number of studies examining the utilization and effects of new technological inputs in farming seem to offer support for this explanation (e.g. Lockheed, Jamison, & Lau, 1980, in Honig, 2001). Yet another possibility is a three way interaction (which we could not test because of lack of studies). Specific human capital could be more important in high technology than in low technology industries. Finally, it should be noted that our moderator test was based on a very small number of high technology studies ($K = 7$) suggesting our finding should be interpreted carefully.

Human capital effects were stronger when success was measured as size compared to growth and profit. This was surprising, as in business administration, size measures barely represent an indicator of financial success. While we acknowledge arguments against the use of size measures, there may also be good arguments in support of size. For example, size is positively related to survival (Hannan & Freeman, 1977). Moreover, size is important in economic terms contributing to national product and employment. Finally, size avoids the “snapshot” character of growth or return measures which are often measured at one specific point in time only. While growth (cf. Covin & Slevin, 1997) and profits are essential success criteria in entrepreneurship, they may fluctuate more strongly than size. In contrast, size may signify accumulated success or growth since start-up – at least for business owners who are also founders of their firm (cf. Frese et al., 2006). For example, during a period of ten years a business owner may have an annual increase in employment ranging from five to thirty percent. Randomly conducted studies will find very different effects. In contrast, size may reflect accumulated growth over the period of ten years. Human capital may represent a competitive advantage for the respective business owner in each consecutive year. Thus, the effect of human capital accumulates over time. Any measure of growth taken at one point in time may therefore be less significant in explaining the effects of human capital.

Our results from the comparison of three competing approaches to entrepreneurial success provided strongest support for cognitive ability and the resource-based view. The predictive validity was highest for cognitive ability, followed by resource-based variables, and schooling. Human capital attributes according to the resource-based view are firm spe-

cific. Such resources are difficult to imitate by competitors and may thus produce competitive advantage. Because such resources are also highly task related they are more likely to be successfully transferred to future tasks. The reason for the effects of cognitive ability on success may be very different. Nothing about cognitive ability is specific. Rather, cognitive ability facilitates all cognitive processes and is most likely to be useful in a wide spectrum of performance situations (Hunter, 1986; Kanfer & Ackerman, 1989). The comparatively low effect of schooling may be due to the fact that schooling produces neither of the advantages of resource-based variables nor of cognitive ability (at least not to the same extent). To great parts knowledge acquired in school is general knowledge which may only be applicable to some entrepreneurial tasks. Schooling may increase analytic thinking and other general skills, but may not be as widely applicable as cognitive ability.

Our finding only partly supports previous research (Rauch et al., 2005) in which the resource based view produced the highest correlations but no effect was found for cognitive ability. The different findings demonstrate how meta-analysis can arrive at different conclusions than studies based on single samples. However, we would also like to point out the small number of studies in the cognitive ability subgroup. We only found 9 samples including measures of cognitive ability. Our conclusions concerning cognitive ability are therefore preliminary. The classification of effects according to the three approaches also barely increased the homogeneity in the respective groups. Thus, other moderators remained.

In the last section of this study, we tested a mediational model of human capital. The findings were consistent with the proposed model. Knowledge fully mediated the relationship between experience and success. The finding is in line with a learning perspective of human capital and confirms the usefulness of differentiating between experience as a frequently used indicator of human capital and knowledge as the results of such experience. Business owners appear to acquire knowledge by transforming experience into knowledge and skills (cf. Kolb 1984) which in turn leads to success. Although the identified effect from experience to knowledge to success has been suggested by a number of researchers (e.g. Davidsson & Honig, 2003; Reuber & Fisher, 1994) our study is the first to adequately address this claim.

Cognitive ability was identified as a partial mediator between experience and success. In addition to an indirect effect, cognitive ability also showed a direct effect on success. The finding suggests that cognitive ability facilitates the acquisition of knowledge which in turn leads to higher success (cf. Hunter, 1986). The total effect on success, however, can not solely be explained by increased knowledge. Cognitive ability also impacts success in a more direct

way - for example by speeding up decision making (Ackerman & Humphreys, 1990), facilitating problem solving, or a better planning of business goals (Frese et al. 2006).

2.6.1 Limitations

While meta-analysis is an answer to many problems inherent in narrative reviews of the literature it is not a remedy to all problems. Potential limitations include scope, influence of confounding variables, and publication bias. We took great care to counteract potential problems. First, we limited our analysis to the population of active owners or co-partners with main responsibility in the business and to human capital attributes included in the literature that can be experientially acquired. Second, we controlled for potentially confounding variables and found no difference between owner individual level human capital and owner leading team level human capital³. Similarly, there was no difference between dichotomous and continuous variables and between small and medium-sized firms. Third, file drawer analysis indicated that publication bias was not a problem. Moreover, we included many studies that merely used human capital as control variables and thus had no agenda on behalf of researchers, reviewers, or editors for positive relationships.

Other potential limitations are more directly linked to limitations of included primary studies. None of the primary studies included a survivor bias. Findings are therefore limited to surviving firms. Rather than biasing the results towards higher effects, this may in fact have led to a more conservative estimation of the human capital success relationship. Owners with low human capital are more likely to fail (e.g. Bruederl, Preisendoerfer, & Ziegler, 1992). Such unsuccessful owners may therefore not be included into research.

Finally, failure in primary studies to report adequate statistical information is a common problem for researchers conducting meta-analysis. We do not intend to add to this critique. Rather, we noticed a strong increase in studies reporting such statistics with the year of

³ Reported in eight studies.

publication. This is a positive signal for meta-analysts and the field of research as a whole. However, other problems remain. A considerable number of studies was based on the same samples. More importantly, none of the researchers included this information in their articles. Using effects from dependent samples in meta-analysis can seriously distort results (Petitti, 2000). Such practices may also influence conclusions from narrative reviews. It is therefore essential, to indicate whether data have been previously published elsewhere. We detected multiple publications by comparing similarity of research groups, country of origin, and sample size and entered the average of respective effects as one piece of information.

2.6.2 Implications for Future Research

Although moderator analysis in our study considerably increased homogeneity of effects there still remained large portions of variance that could not be accounted for by sampling error. Thus, we suggest continuing the search for moderating conditions of the human capital success relationship. Effects might vary depending on sample characteristics such as the definition of who is to be called an entrepreneur (Reuber & Fisher, 1994). Effects are also likely to increase if human capital is measured at a higher level of specificity (e.g. number of times performing a task) as was found in previous meta-analysis of employees' work experience (Quiñones et al., 1995). These moderators and others could not be tested in this analysis because of insufficient studies in entrepreneurship or because of lack of information in the available articles. Individual studies should thus address these issues.

Future research should build on our learning perspective of human capital to further explicate the processes that lead to the acquisition of knowledge and skills from experience. Learning goals and learning behaviour may play an important role in this context. In the face of rapidly changing environments, knowledge is likely to have a decreasing shelf-life (Reuber & Fisher, 1999). Some skills and knowledge will even have to be unlearned. Thus, a firm's willingness, effort, and capability to learn fast and continually are likely to be a key to sustained competitive advantage. Besides learning behaviour, other human capital aspects may become more relevant such as the construct of adaptive expertise (Smith, Ford, & Kozlowski, 1997) or the stream of experience (e.g. events that happen, which Reuber and Fisher (1999) contrast to the stock of experience). Moreover, researchers should consider formative models of human capital and examine the value of different combinations of human capital (cf. Reuber & Fisher, 1999).

Finally, our study may guide practitioners in their evaluation of small businesses and may resolve some of the controversies surrounding investment decisions and human capital criteria. Venture capitalists are well advised to carefully choose from the pool of available human capital indicators. Our analysis suggests the use of some alternative human capital indicators that have not received much attention in research nor in practice. In particular, our analysis suggests that knowledge is the best evaluation criterion as it represented the best correlate of entrepreneurial success. Future studies could build on our distinctions of human capital to directly assess incremental validities of different types of human capital. In addition to other criteria, selected human capital indicators may increase the accuracy of prediction models and help investors in their selection decisions.

2.6.3 Conclusion

To our knowledge, this meta-analysis provides a useful estimate of the relationship between human capital and performance in entrepreneurship. We explained the positive relationship and the existence of moderators by mechanisms derived from learning theory and proposed a mediational model of human capital. The results were consistent with our theoretical assumptions. We encourage future research to further explicate theoretical processes of learning and to shift the focus to asking how business owners learn from experience. We believe that our study is a good example of how research can use meta-analysis to build evidence-based entrepreneurship. Meta-analytic tools will help establish the validity of constructs across populations and provide directions for research and practice.

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CHAPTER 3

Deliberate Practice in Entrepreneurship: Relationships with Education, Cognitive ability, Knowledge, and Success

Learning and knowledge are central for small businesses and their success (Burgelman, 1990; Grant, 1996; Levinthal & March, 1991; Senge, 1990; Zahra & George, 2002). From a resource based view, learning and the ability to change are among the most important capabilities that firms can possess (Barney, Wright, & Ketchen, 2001). It is therefore surprising that research on learning in entrepreneurship is still in its early stage (Ravasi & Turati, 2005). In particular, empirical studies on how business owners learn and accumulate relevant knowledge are still rare (Agnal, 1999; Ravasi & Turati, 2005). We seek to address this gap by developing and testing a cognitive model of learning in small firms that focuses on the main actor in the business: the owner (cf. Baum & Locke, 2004; Frese et al., 2005; Reuber & Fisher, 1999).

By applying the concept of deliberate practice from expertise theory (Ericsson, Krampe, & Tesch-Roemer, 1993) we add to previous research an emphasis on the active role of the business owner as a learner. Deliberate practice consists of individualized self-regulated and effortful activities aimed at improving one's current performance level (Ericsson et al., 1993). We identify such activities in entrepreneurship and test relationships with knowledge and success. We also investigate antecedents of deliberate practice. In doing so, we aim at contributing to a better understanding of the process of learning in entrepreneurship.

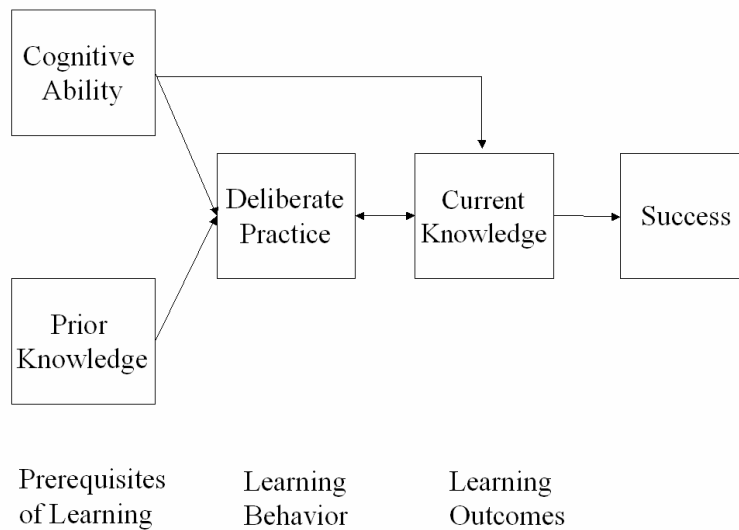
3.1 Deliberate Practice Applied to Entrepreneurship

Research on expertise development (Ericsson et al., 1993; Ericsson & Lehmann, 1996) emphasizes the role of deliberate practice for the acquisition of outstanding performance. Deliberate practice comprises individualized self-regulated activities with an explicit goal of competence improvement. Such regular activities are “specifically designed to improve the current level of performance” (Ericsson et al., 1993: 368). The framework of expertise development proposed by Ericsson et al. (1993) is in contrast to early accounts of expertise, which attributed exceptional performance almost solely to innate abilities (i.e., talent; Galton, 1979). Viewing performance as largely determined by self-directed continuous learning efforts, Ericsson and his colleagues strongly argue in favor of environmental influences on performance. A growing body of literature suggests that activities of deliberate practice facilitate remarkable environmental adaptation and learning across different domains (Ericsson, 1996; Ericsson et al., 1993; Ericsson & Lehmann, 1996). Recent studies with teachers (Dunn & Shriener, 1999) and insurance agents (Sonnentag & Kleine, 2000) showed that individuals engage in deliberate learning activities in the context of work as well. Such activities are different across domains varying according to the specific requirements in a domain. In the context of work, deliberate practice comprises a wide range of activities such as mental simulation, seeking feedback, professional reading, consulting experts or exploring new strategies (cf. Sonnentag & Kleine, 2000).

Two arguments suggest that deliberate practice may be an important concept in the domain of entrepreneurship as well. The first argument pertains to the importance of adaptability (Ford, 1997) in entrepreneurship, known as the capability to adjust one's skills and knowledge in the face of novel situations or requirements. The changing nature of work (Howard, 1995), technological developments and increased customer demands (Thayer, 1997) require business owners to engage in continuous learning. The increasing necessity to learn within work environments (Sonnentag, Niessen, & Ohly, 2004) affects all modern organizations, but business owners in an even more profound way than employees or managers in larger organizations. Managers typically receive training, instruction, and coaching to acquire necessary knowledge and skills. The organization helps in identifying learning needs and in initiating appropriate actions (cf. Steers, 1991). Business owners, in contrast, have to carry out all these tasks by themselves, and thus, need to assume a more proactive posture towards learning.

Our second argument involves the importance of learning throughout the entrepreneurial processes of exploring, discovering and pursuing new business opportunities (cf. Kirzner, 1997, & Schumpeter, 1934; Minniti & Bygrave, 2001; Shane & Venkataraman, 2000). Knowledge affects the owner's capacity to recognize (Shane, 2000; Simon, Houghton, & Savelli, 2003), and evaluate valuable business opportunities and to develop the initial idea into a new product or service (Ravasi & Turati, 2005). After the discovery of a potential opportunity, when faced with ambiguity and uncertainty, relevant knowledge enables business owners to make better decisions and take more knowledgeable actions (Minniti & Bygrave, 2001; Reuber & Fisher, 1999). The process from the initial intuition to the launch of a new product incorporates a learning process in which the owner plays the key role. In summary, continuous learning appears to be of particular importance for successful task-accomplishments in entrepreneurship. Business owners need to engage in continuous learning to be able to adapt to changing environments and to reduce uncertainty and ambiguity throughout the pursuit of new ventures. The concept of deliberate practice as a set of continuous individualized learning activities offers a way to a better understanding of actual learning in small business.

By emphasizing the role of deliberate practice in entrepreneurship, we propose a cognitive model of learning (Figure 3.1). In this model we distinguish between cognitive abilities and the owner's prior knowledge (as prerequisites of learning), deliberate practice (as actual learning behavior), and current knowledge and success (as learning outcomes). We model success (as an economic outcome of learning) as business growth. Business growth has been referred to as the essence of entrepreneurship (Covin & Slevin, 1997) and may thus well reflect outstanding performance in entrepreneurship.

FIGURE 3.1**Model of Learning: Prerequisites of Learning, Learning Behavior, and Learning Outcomes**

Our study makes two contributions to the literature. First, we add to a better understanding of the learning process by simultaneously examining and modeling the specific impact of cognitive ability, the owners' prior knowledge, and learning behavior on current entrepreneurial knowledge and success. Previous research on expertise development assessed the impact of deliberate practice on performance but did not consider the impact of cognitive abilities or the mediating effect of domain specific knowledge. We include cognitive ability due to its assumed importance for learning at work (Sonnetag, Niessen, & Ohly, 2004) and well-documented relationships with performance (Schmidt, Hunter, & Outerbridge, 1986). Studies in work environments, on the other hand, examined both, the impact of cognitive ability as well as the mediating effect of knowledge but did not include current learning behavior (Schmidt et al., 1986).

Second, we contribute to an understanding of the business owner as an active learner. Our model is distinct from previous models of entrepreneurial learning. Whereas we agree that business owners learn from past experience (e.g., Reuber & Fisher, 1994) and specifically from positive and negative consequences of past decisions leading to an update of choice probabilities (Minniti & Bygrave, 2001) our emphasis is somewhat different. Owners learn *from* the past. But they also learn *for* the future. Owners learn *from* success. But they also learn *for* success. While owners may look back, observing the consequences of past decisions they also look ahead, anticipate developments, gather information and develop new necessary

skills. Learning in entrepreneurship incorporates repetition and incremental optimization (Ravasi & Turati, 2005) but it also goes beyond. In this study, we are interested in how owners learn for present and future tasks, how they build their competencies and acquire new knowledge. We thereby view business owners as proactive agents of their own learning and development.

3.1.1 Deliberate Practice, Knowledge, and Success

Deliberate practice has been associated with superior performance in a number of different domains such as sports (Starkes, Deakin, Allard, Hodges, & Hayes, 1996), music (Ericsson et al., 1993), and chess (Charness, Krampe, & Mayr, 1996). In music, for example, where deliberate practice consists of practicing alone at the instrument, high performance was associated with the accumulated time of deliberate practice (Ericsson et al., 1993).

Recently, deliberate practice was also found to be positively related to performance in the insurance business as a domain of work (Sonnentag & Kleine, 2000). In contrast to studies in arts and sports, only the current amount of deliberate practice showed positive relationships with performance whereas no relationship was found for accumulated deliberate practice. Compared to music and sports, environmental change, dynamism, and uncertainty are more pronounced in work settings. Existing knowledge and skills may therefore quickly become obsolete (Reuber & Fisher, 1999). In work contexts, previously acquired skills, practices and routines may even have to be unlearned. As a consequence, knowledge and skills at work do not mount up in the way they do in some of the domains in which deliberate practice was studied.

We assume that current deliberate practice is positively related to performance in entrepreneurship. More precisely, deliberate practice is assumed to increase skills and knowledge which then in turn affects performance (cf. Ericsson et al., 1993; Sonnentag & Kleine, 2000). This indirect effect has not yet been tested empirically.

The explicit goal of competence improvement and the continuous effort incorporated in deliberate practice help explain the presumed relationships of deliberate practice with knowledge and success. Goals, in general, have self-regulatory functions facilitating self-monitoring and informative feedback of one's task-accomplishment (Frese & Zapf, 1994; Locke & Latham, 1990). Conscious monitoring as implied in deliberate practice (Ericsson et al., 1993) allows individuals to recognize feedback and to better realize when there is a prob-

lem. In a study by VandeWalle, Brown, Cron, and Slocum (1999) sales representatives with a higher learning goal orientation (a habitual goal preference in achievement settings to develop competence), acquired new skills and knowledge, which in turn positively impacted their performance. Similarly, mastery orientation in training led to increased planning, monitoring, and corrective behavior. This in turn significantly contributed to the acquisition of new knowledge (Ford, Smith, Weissbein, Gully, & Salas, 1998). Further, being continuously engaged in deliberate practice leads to proceduralization of acquired knowledge and skills (Anderson, 1982). This process helps transform declarative factual knowledge into more readily applicable, practical knowledge and routines.

Acquired knowledge in turn is associated with high performance. Differences between average and high performers are attributed to a higher amount of accessible knowledge (Chi, Glaser, & Rees, 1982), in particular to a higher level of domain related declarative and procedural knowledge (Glaser, 1984). Positive relationships between knowledge and performance were also found in work environments (Schmidt et al. 1986) and in a training experiment including complex decision-making tasks (Ford et al., 1998). The importance of knowledge in entrepreneurship has been accentuated by a number of researchers from different research traditions (e.g., Barney et al., 2001; Cohen & Levinthal, 1990; Davidsson & Honig, 2003; Rauch, Frese, & Utsch, 2005). Business owners need to be informed about new techniques and procedures in their domain of expertise. They need to understand current customer needs and need to adapt to changing regulations. Moreover, they need to continuously collect and evaluate information to perceive and later exploit valuable business opportunities (cf. Shane & Venkataraman, 2000). Taken together, our theoretical arguments lead to the following hypotheses:

Hypothesis 1a: Deliberate practice is positively related to entrepreneurial knowledge.

Hypothesis 1b: Entrepreneurial knowledge is positively related to success.

Hypothesis 1c: Deliberate practice has an indirect effect on success, which is mediated by entrepreneurial knowledge.

3.1.2 Cognitive Ability and Education as Prerequisites of Learning

Figure 3.1 depicts cognitive abilities and prior knowledge as antecedents of learning. We examine education as prior knowledge.

Education. The positive relationship between education and business success is empirically well established (Chapter 2; Rauch & Frese, 2000). Researchers agree that education leads to knowledge and skills that enable business owners to find opportunities and to cope with problems better and therefore be more successful (e.g. Cooper, Gimeno-Gascon, & Woo, 1994). Unfortunately, however, most often researchers do not distinguish between education and its presumed outcome: knowledge. Education is simply used as a proxy for knowledge. This is problematic because such an approach overlooks individual differences in learning. All individuals are implicitly expected to learn equally well from experience. Clearly, this is not the case (e.g. Ford et al. 1998). In the present study we want to explicate the causal claim from education as an experience measure via current entrepreneurial knowledge to success. Along with other researchers we assume positive effects of education on current knowledge and business success. However, we assume these effects to be indirect. As previous knowledge assists in the accumulation of new knowledge (Davidsson & Honig, 2003), and education incorporates ongoing learning activities that may help individuals develop superior learning strategies, we assume education to be positively related to deliberate practice. In sum, we propose the following hypotheses:

Hypothesis 2a: Education is positively related to deliberate practice.

Hypothesis 2b: Education has an indirect effect on entrepreneurial knowledge via deliberate practice.

Hypothesis 2c: Education has an indirect effect on business growth via deliberate practice and entrepreneurial knowledge.

Cognitive ability. Cognitive ability is a consistent predictor of skills and performance in a number of domains (e.g., Schmidt & Hunter, 1998; Schmidt, et al., 1986; Ree, Earles, & Teachout, 1994). Cognitive ability is particularly important for the acquisition of knowledge and skills (Hunter, 1986; Schmidt et al., 1986) and in complex tasks that require individuals to process new information (Hunter & Hunter, 1984; Kanfer & Ackerman, 1989). Since

changing work requirements make learning and skill acquisition a continuous necessity, cognitive ability is argued to become increasingly important for performance at work (Sonnentag & Frese, 2002). Surprisingly, little research has been done concerning the effects of cognitive ability in entrepreneurship. One exception is a study by Frese and co-workers (Frese et al., 2006) who found positive relationships between cognitive ability and success among Southern African business owners. A number of studies in other domains have demonstrated effects of cognitive ability on performance (Schmidt et al., 1986). Training studies furthermore identified general cognitive ability as a good predictor of training success (Jensen, 1998; Schmidt & Hunter, 1998). Increasing the acquisition of knowledge and skills (Hunter, 1986) cognitive ability therefore may also be understood as a prerequisite of learning. Deliberate practice includes conscious intellectual regulation of action (Frese & Zapf, 1994) and constrains working memory. Business owners with higher cognitive ability may thus have more favorable initial conditions to engage more effectively in deliberate practice. Taken together, we hypothesize direct and indirect effects:

Hypothesis 3a: Cognitive ability is positively related to deliberate practice.

Hypothesis 3b: Cognitive ability is positively related to entrepreneurial knowledge.

Hypothesis 3c: Cognitive ability has an indirect effect on entrepreneurial knowledge, which is mediated by deliberate practice.

Hypothesis 3d: Cognitive ability has an indirect effect on business growth, which is mediated by entrepreneurial knowledge.

3.2 Methods

3.2.1 Sample

The sample comprises 90 business owners from Cape Town (South Africa) and its surrounding suburbs. Fifty business owners were drawn from a sample from 1999 (Frese et al., 2005) who we contacted again in 2003. We followed two strategies for drawing the second portion of our sample. To be able to include businesses that are usually not accessible via public registers we used a random walk procedure in the hives and markets around Cape Town: The interviewers called on the business sites and carried out an interview on the spot

or made an appointment if the owner was preoccupied. To cover more up-market businesses we randomly sampled from members in the database of the Western Cape Business Opportunities Forum (WECBOF). Since multiple analyses of variance did not reveal differences between the two samples along the variables of interest we merged them into one sample of 90 business owners. As a sign of gratitude participants were given a pen with the University logo and were promised to receive a short feedback report of the main study results.

All participants were founders and owners of their business and ran the business on a day-to-day basis. In order to exclude people who just bridged a period of unemployment and to get adequate reports on experiences and success we further required participants to have operated their businesses for at least one year and, additionally, to have at least one employee (two participants from the 1999 sample had lost their employees). We included only black (31%) and so-called colored (69%) business owners (the term 'colored' is still used as a self-descriptive term for people of mixed African and white background although this term is becoming 'politically incorrect'). Of the total sample, 86% were male. On average owners were 45 years of age (s.d. = 9.28). Participants had been to school for 12 years on average (s.d. = 3.10). The majority (69%) of the businesses were formal (registered and tax-paying). Fifty per cent were engaged in manufacturing, the other half belonged to the service and trade sector (tertiary sector). A proportion of 46% had founded their firms before 1994. Almost one fourth had been in existence for less than three years. The great majority of the owners (78%) had between one and 10 employees (Mean = 13, Median = 4). The average starting capital corrected for inflation was 65.053 South African Rands (an equivalent of approximately 8.780 USD).

3.2.2 Procedure

We used a structured interview as our main instrument. All interviews took place at the owners' workplace. On average, the interviews lasted 165 minutes. Interviewers were two psychology majors in their final year of their MA studies. They received a thorough interviewer training, which included practical exercises on interviewing techniques as well as coding and rating exercises. This training - in modified forms - has been successfully applied in a number of research projects in Africa since 1998 (Frese, 2000). As part of the training the author accompanied both interviewers throughout their first week of the study to give them specific feedback on their interview conduct and the rating. During the interview, the interview-

ers wrote down participants' answers as verbatim as possible. These written accounts were rated by two independent raters. An elaborate coding scheme providing explicit rating anchors as well as regular feedback interviews helped provide good interrater reliabilities computed as intraclass-coefficients for factual (ICC[1,1]) and Likert (ICC[1,2]) items (Shrout & Fleiss, 1979) ranging between .96 and 1.00. After the interview the participants filled out a questionnaire capturing practical business knowledge.

3.2.3 Measures

Deliberate practice. We took several steps to develop our measurement of deliberate practice. Since we did not know about activities that can be performed as deliberate practice in entrepreneurship beforehand (cf. Sonnentag & Kleine, 2000), we first conducted two pilot studies in Mombasa/Kenya and Cape Town/South Africa. Altogether, we interviewed 35 business owners to test whether any of the deliberate practice activities identified in other domains were applicable to entrepreneurship. During the interviews we first asked business owners for any activities they could think of that resulted in learning and the accumulation of knowledge and skills. We asked questions like “what do you do to improve your skills and knowledge as a business owner” or “over the years as a business owner, how did you increase your knowledge; how did you become a better business owner?” or “whenever you decided to do something differently in your business, what was the situation that led to these decisions?”. If the owners answered with a concrete activity we asked them how often they performed the activity and whether they did it on a regular basis. The interviewers wrote down the answers in a report, which was then analyzed. A number of owners reported being deliberately engaged in activities conducted to improve their business, their own skills or their knowledge. Some owners described these activities in more abstract ways as “a mindset of constant learning” or as “always having a wondering mind”. When asked how they put this into action or what they actually did they reported “regularly going through the store to see everything with the eyes of the customer” or to “try out new things and see if they work or not” or “going on conventions” or “to go to other business owners to see how others do their jobs or make their products.” We later made a list of those activities, which were performed with an explicit goal of competence enhancement, which did not primarily serve the purpose of accomplishing work tasks and which were performed on a regular basis. We compared these activities with deliberate practice activities previously identified by Sonnentag and Kleine (2000) and Dunn

and Shriner (1999) in other work settings. We found six of our activities to be identical with those found by Sonnentag and Kleine (2000) for insurance agents: private conversation, firm meetings, exploring new strategies, mental simulation, asking customers for feedback, and consulting colleagues or experts. Additionally, we found four activities which had not previously been reported in the literature: attending workshops/trainings, professional reading, observing others, and controlling/checking. Since during our pilot studies owners repeatedly stated to be regularly engaged in one or more of these activities and with a clear learning goal we added these activities to our final set of deliberate practice activities.

For the present study, we wrote the ten activities down on cards, which we presented to the owners during the course of the interview. Card by card, we asked the owners to indicate whether or not they perform the activity, whether they do it on a regular basis, and whether they do it to improve their skills and knowledge. We then asked the owners to give us a concrete example of what they did in the past and to indicate what they learned by performing the activity.

Our final measures are quality and quantity of deliberate practice ($r_{it} = .89$). Quantity was measured as the sum of all activities owners carried out as deliberate practice. Based on Sonnentag and Kleine (2000), activities were only rated as deliberate practice if they were primarily carried out to enhance owners' knowledge and skills, if the activity went beyond task accomplishment, and if owners were able to give a concrete example. Given these criteria raters agreed perfectly whether an activity was performed as deliberate practice or not ($ICC[1,1] = 1$). Quality of deliberate practice was measured as evidence of learning and was rated on a 5-point Likert scale. For each identified deliberate practice activity interviewers assessed how much the owners had learned ($ICC[1,2]$ ranged between .95 and .98).

Entrepreneurial knowledge. We measured entrepreneurial knowledge with three tests: Declarative business knowledge, procedural marketing knowledge, and business knowledge structure (overall $\alpha = .75$). We focused on general entrepreneurial knowledge as relevant across multiple industries since we were interested in relationships and implications applicable to entrepreneurship as a domain.

Declarative business knowledge was a multiple-choice test taken from Krauss (2003), which we adapted to the South African context with the help of local experts. The final version included 20 items. Some items covered more general business practice knowledge (e.g., "which is the best method of checking on business progress?"). Other items were specific to

the South African context and covered current business knowledge (e.g., “who should contribute to the unemployment insurance fund [UIF]”). We aggregated items to form an index.

As all business owners have to apply practical marketing knowledge, we developed a situational interview scenario to test participants` procedural marketing knowledge. In this scenario we asked the owners to take the role of a manager in a beverage company (none of the interviewees owned a beverage company). They were presented with the task to acquire all information necessary to decide whether or not to introduce a new product (a diet lemonade called “lemon delight”) as well as all information needed if they decided to go ahead. Borrowing from the literature (Kotler, 2002) we developed the following categories for a coding scheme: development of the market, market participants, trade, consumers, producers, marketing instruments, distribution channels, storage and transport of products, and the product environment. We formed a scale for procedural marketing knowledge ($\alpha = .96$) equally weighting three single measures: number of correct ideas over all categories (knowledge quantity), completeness of the participant’s approach (knowledge quality, e.g., most important categories were covered) and an overall impression of the participants marketing knowledge given by the interviewers (ICCs ranged between .96 and .99).

Following Goldsmith and Kraiger (1997) we further developed a card-sorting test for measuring participants` knowledge structure of business related concepts. Based on Oxford (2003) and results from the pilot study, we chose four concepts (customer relationship, human resources, management, bookkeeping) with between four and five subcomponents. We only chose those subcomponents, which local experts had correctly assigned to the 4 broader categories in our pilot studies. The card-sorting test was part of the interview. Participants were asked to sort 19 cards into themes of concepts that belonged to each other (e.g., customer needs, back-up service, market research, advertising, branding had to be sorted together to represent customer relationship). The final score for knowledge structure reflected correct category identification (if three subcomponents were correctly sorted into one pile) and the correct assignment of subcomponents to belonging categories ($ICC[1,1] = 1$).

Cognitive ability. We used 12 selected matrices from the Raven Progressive Intelligence Test (Snow & Swanson, 1992). These matrices were selected during the pilot study and were chosen based on item-total correlations, item difficulties and their approximation of a normal distribution. The test was applied as part of the interview. We first explained principles for solving the matrices and presented 5 sample matrices for practice with increasing dif-

ficuity. Correct solutions of the 12 test matrices were taken as the measure for cognitive ability ($\alpha = .74$).

Education. We formed a two-item index to measure the owners' education. The index combined number of years of formal education and the highest degree owners had obtained ($r_{it} = .87$).

Business growth. The latent variable business growth reflected percentage development of customers, sales, and profits for the years between 2000 and 2003 ($\alpha = .89$). We asked for each year's development and computed separate growth rate indicators for customers, sales, and profits, respectively.

Initial starting capital. We were only interested in the success variance attributable to knowledge, deliberate practice, intelligence and education. We therefore controlled for the influence of a firm's initial starting capital. The initial starting capital, also discussed in the literature as a liability of smallness (e.g., Bruederl, Preisendoerfer & Ziegler, 1992), was measured in South African Rands and corrected for inflation.

3.2.4 Method of Analysis

For inspection of zero-order relationships among the constructs, we used overall scales. To test our overall hypothesized model of entrepreneurial knowledge and business growth as well as single hypotheses regarding direct and indirect effects we applied structural equation modeling (LISREL 8; Joereskog & Soerbom, 1996). For identification of latent variables we split the overall scales into at least two indicator variables: Cognitive ability was operationalized by two parallel tests (odd-even). We used the two measures years and highest degree of formal education as indicators of the owners' education. Quality and quantity of deliberate practice were indicators of the latent variable deliberate practice. We used the three knowledge tests declarative and procedural knowledge and knowledge structure as indicators of entrepreneurial knowledge. Finally, the latent variable business growth was operationalized by the separate average percentage development of customer, sales, and profits over the past three years.

The indicator variable quality of deliberate practice yielded a negative but insignificant error variance ($t = -0.38$). Such impossible parameters (heywood cases) may occur in correctly specified models if the true population parameter is close to zero and if only two

variables serve as indicators for a latent variable (Anderson & Gerbing, 1984). We dealt with this problem by fixing the variance to zero (Bollen, 1989).

3.3 Results

Table 3.1 presents the descriptive statistics and zero-order correlations for the variables in the study. Reliabilities are displayed in the diagonal computed as Cronbach's alphas (for scales with more than two variables) and correlations (for scales with two variables).

Our overall scale of knowledge was significantly related to business growth. The three predictor variables deliberate practice, education, and cognitive ability showed significant relationships with both business growth and entrepreneurial knowledge. The only exception was the relationship between cognitive ability and business growth. Deliberate practice, education, and cognitive ability were interrelated with correlations ranging between $r = .37$ and $.48$. Starting capital was significantly related to knowledge but showed no relationship with business growth.

TABLE 3.1
Descriptive Statistics and Intercorrelations^a

Variables and Scales	Mean	s.d.	1	2	3	4	5
1. Business growth	16.08	31.54	(.89)				
2. Entrepreneurial knowledge ^b	.01	.82	.22*	(.75)			
3. Deliberate practice ^b	.00	.97	.27**	.65**	(.89**)		
4. Education ^b	.00	1.93	.29**	.33**	.48**	(.87**)	
5. Cognitive ability	6.97	2.71	.07	.41**	.37**	.39**	(.76)
6. Starting capital	6505 ^c	22085 ^c	.11	.21*	.23*	.10	-.04

^a Figures in parentheses are Cronbach's alphas or correlations for scales with less than three items.

^b z-standardized data.

^c South African Rands, (000).

* $p < .05$

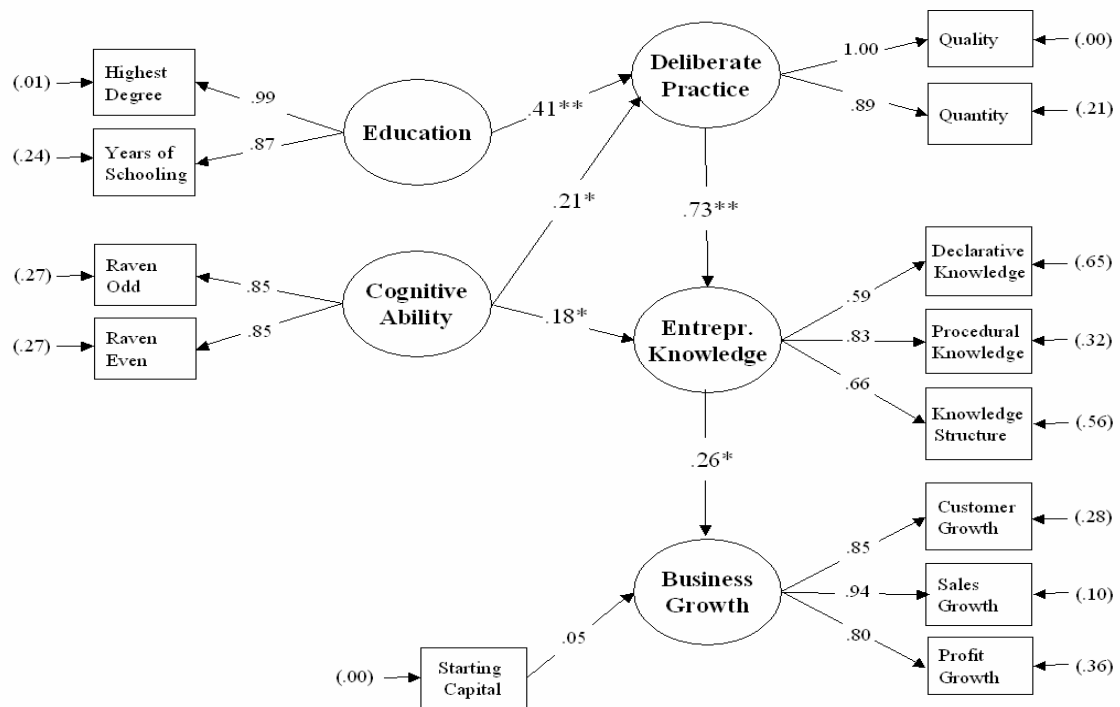
** $p < .01$

The hypotheses were tested simultaneously using structural equation modeling (Figure 3.2). We tested direct effects by examining parameter estimates of respective paths in the model and indirect effects using Sobel's first-order solution (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). All hypotheses were directional and were tested one sided.

The model fitted the data well ($\chi^2 [61, n = 90] = 62.56, p = .42$; comparative fit index = .99; goodness-of-fit index = .90; root-mean-square error of approximation = .017). In support of our first hypothesis, deliberate practice showed a strong positive effect on entrepreneurial knowledge ($p < .01$). Entrepreneurial knowledge was positively related to business growth ($p < .05$), confirming Hypothesis 1b. Deliberate practice also showed an indirect effect on business growth via entrepreneurial knowledge (Hypothesis 1c; $p < .05$). Education was significantly related to deliberate practice supporting Hypothesis 2a ($p < .01$). Both indirect effects - education on knowledge via the mediator deliberate practice ($p < .05$), as well as the indirect effect of education on business growth via deliberate practice and knowledge ($p < .05$) - were significant, supporting Hypotheses 2b and 2c. Cognitive ability showed a positive relationship with deliberate practice (Hypotheses 3a; $p < .05$) and with entrepreneurial knowledge (Hypothesis 3b; $p < .05$). Deliberate practice mediated the relationship between cognitive ability and entrepreneurial knowledge (Hypothesis 3c; $p < .05$). Entrepreneurial knowledge mediated the relationship between cognitive ability and business growth (Hypothesis 3d; $p < .05$).

FIGURE 3.2

Effects of Education and Cognitive Ability to Deliberate Practice to Knowledge and Business Growth (Standardized Parameter Estimates from Structural Equation Model)^a



^a Fit statistics: $\chi^2 (61, n = 90) = 62.56, p = .42$; independence model: $\chi^2 (78, n = 90) = 894.99$; comparative fit index = .99; goodness-of-fit index = .90; root-mean-square error of approximation = .017; * $p < .05$; ** $p < .01$.

3.4 Discussion

In this study, we applied the concept of deliberate practice adopted from research on expertise to the domain of entrepreneurship. We developed a cognitive model of learning in small business focusing on the business owner. Our findings are consistent with the proposed cognitive model. The results thereby indicate the usefulness of deliberate practice for entrepreneurship theory and practice. Deliberate practice was shown to have a strong direct effect on entrepreneurial knowledge as well as an indirect effect on business growth. Business owners with higher cognitive ability and education engaged more in deliberate practice. Education also showed positive indirect effects on business growth. Cognitive ability was positively related to deliberate practice and to knowledge and had an indirect effect on business growth. Our findings add to previous research in a number of ways.

First, we extend the applicability of deliberate practice to the domain of entrepreneurship. Relationships of deliberate practice with success largely confirmed relationships found in other domains. While previous research has usually been based on single measures of expertise, mostly in the form of subjective performance ratings, we separately assessed cognitive (e.g., knowledge) and financial outcome variables as indicators of high performance. This allowed us to further specify the process between deliberate practice and performance and to test the mediating effect of entrepreneurial knowledge. While such mechanisms have previously been suggested (Sonnetag & Kleine, 2000; Ericsson et al., 1993) they have not yet been investigated empirically. Additionally, by adding business growth as a dependent variable we further extend the relationships of deliberate practice to also incorporate economic outcomes.

Second, our emphasis on *current* deliberate practice activities is distinct from traditional expertise research, which emphasized *past* deliberate practice (Ericsson et al., 1993). Current deliberate practice appears to be specifically important in the context of work (cf. Sonnetag & Kleine, 2000). As another difference, deliberate practice at work does not involve highly repetitive elements. Corresponding to the multitude of tasks and requirements in contexts of work – and particularly in entrepreneurship – individuals will have to be mindfully engaged in a variety of different activities.

Third, our study contributes to a growing body of psychological individual level approaches to entrepreneurial success (cf. Frese et al., 2005; Baum & Locke, 2004). With cognitive ability, education, deliberate practice, and knowledge we examined a number of individual difference variables, which significantly explained variance in business growth. Our study thus demonstrates the impact of the owner on business success and shows the usefulness of individual-based psychological approaches to entrepreneurship.

3.4.1 Future Research Directions

There are at least two open questions to be addressed in future research. In this study we examined cognitive antecedents of deliberate practice. With regard to the extraordinary effort inherent in deliberate practice it will be particularly interesting to examine potential motivational prerequisites of deliberate practice such as learning orientation, learning motivation or personal initiative. Another issue concerns the role of learning and metacognitive skills. Metacognitive skills involve skills of planning, monitoring, and evaluation of one's progress

during task completion (cf. Schraw & Moshman, 1995). The positive relationship between education and deliberate practice may be a result of learning and metacognitive skills acquired during the period of education. Deliberate practice may similarly lead to non-content related by-products. As argued in studies on instruction (Glaser & Bassok, 1989) outcomes of practice are likely to take the form of metacognitive changes and skills. It is equally plausible that metacognitive skills are in fact the core skill behind deliberate practice.

3.4.2 Limitations and Strengths

As with all empirical studies, this study has limitations. First, measuring success in small business is difficult (Wiklund, 1998; Krauss, Frese, Friedrich, & Unger, 2005). We measured business growth as the separate percentage development of sales, profit, and customers in the years 2000-2003. These measures were self-report measures and not objective measures in the sense of exact profitability ratios. Exact profitability measures are difficult to obtain in small and micro business (Daniels, 1999). This is especially true in Africa where standard book-keeping is uncommon (Shinder, 1997). We tried to circumvent these difficulties by asking for growth ratios instead of absolute figures. Business growth is believed to be essential to entrepreneurship (Covin & Slevin, 1997) and sales growth in particular has often been viewed as the best indicator of business success (Davidsson & Wiklund, 2000). By adding to sales growth the indicators percentage growth of profits and the number of customers we were able to obtain a reliable measure and to model a single factor construct of business growth. Through our approach we are confident to have captured important aspects of small business success.

Second, the cross-sectional design is a limitation. We argue that the quantity and quality of deliberate practice that business owners engage in lead to the generation of entrepreneurial knowledge and in turn to business growth. However, reverse causation is possible. Longitudinal analyses are needed to provide insights into the causality of relationships between deliberate practice, entrepreneurial knowledge and business growth. Note, however, that the causal path from deliberate practice to entrepreneurial knowledge to business growth is consistent with the literature on deliberate practice (e.g., Plant, Ericsson, Hill, & Asberg, 2005) and is in line with experimental research on the effects of learning goals (Dweck & Leggett, 1988).

Third, the small sample size of this study is a shortcoming, particularly when using structural equation modeling. A number of Monte Carlo studies, however, suggest that structural equation modeling can be used with small samples (Hoyle & Kenny, 1999). Hoyle and Kenny (1999) showed that technical problems nearly disappeared with samples approaching 100 or with higher reliabilities of the mediator and therefore recommend at least 100 cases. Biased parameter estimates, on the other hand, most often occurred when the unreliability of the mediator was ignored. Such bias is eliminated in latent variable modeling where measures are corrected for unreliability. Moreover, MacKinnon, Warsi, and Dwyer (1995) found that, when the independent variable is continuous, there is little bias in the estimation of the standard error with samples as small as 10 and 25.

Fourth, in our study we chose to study small and micro business owners in Africa with at least one employee. This poses two possible limitations for the generalization of our results. (a) The results may not apply to larger firms. As discussed in other individual based approaches to entrepreneurship (e.g., Frese et al., 2006) we argue that the larger the firm the less influential the owner's impact on business outcomes. (b) The results may also not apply in the same way to one-man businesses, which constitute a large portion of businesses in Africa (Mead & Liedholm, 1998).

Fifth, we believe our measurements of entrepreneurial knowledge to be a particular strength of the study. Previous research on human capital in entrepreneurship has repeatedly criticized the common use of proxy measures for knowledge and skills (e.g., Rauch et al., 2005). We assessed entrepreneurial knowledge with three objective tests: declarative business practice knowledge, procedural marketing knowledge, and knowledge structure. This allowed us to capture aspects of entrepreneurial 'know-how', 'know-what' as well as the cognitive organization in memory. The fact that we explicitly measured entrepreneurial knowledge also allowed us to model the process of knowledge accumulation and with it the function of deliberate practice, education and cognitive ability. Previously, education and cognitive ability along with a number of other variables have typically been summed under the rather elusive concept of human capital to signify knowledge and skills.

3.4.3 Conclusions and Practical Implications

Our findings indicate that deliberate practice may be a valuable predictor of entrepreneurial knowledge and business growth in small businesses. The findings have a number of practical implications. First, business owners - in order to be successful - need to learn. The study represents good news for the business owner. Our findings suggest that the acquisition of expertise and business growth largely remains in the responsibility of the owners themselves to deliberately engage in a variety of quality learning activities. Given business owners high need for autonomy (Lumpkin & Dess, 1996; cf. Schumpeter, 1934), the concept of deliberate practice suggests a particularly suitable, widely applicable – albeit effortful – answer to both entrepreneurs' needs and realities. Second, business owners need to learn how to learn. Consultants and policy makers can assist owners develop more efficient learning practices in order to promote success in small businesses. Owners can thereby be equipped with a more general tool, which may help them acquire new skills and cope with changing entrepreneurial environments. Third, our findings may have implications for selection and assessment of business owners. If shown to predict business success in the long run, credit providers and venture capitalists may directly assess entrepreneurial knowledge and owners learning ability. Finally, our findings may have implications for skill acquisition and performance at work in general. Our study and previous studies in the context of work (cf. Sonnentag & Kleine, 2000) indicate that individuals engage in deliberate practice activities in work environments. Individuals differ with respect to the amount and quality with which they perform such activities. These differences show relationships with domain specific knowledge and with work performance. Although uncertainty and dynamism may be more pronounced in entrepreneurship they become increasingly characteristic of modern workplaces (cf. Howard, 1995, & Sonnentag & Frese, 2002). The framework of deliberate practice may offer a promising individual level answer to organizations' needs to quickly and repeatedly adapt to changes in the workplace.

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CHAPTER 4

To know or to believe you can? The Role of Entrepreneurial Knowledge and Self-Efficacy for Small Business Growth

Small and micro businesses are important for creating jobs and wealth (Autio, 2005; Birch, 1987). They contribute largely to societal economic development and growth (e.g. Birch, 1987; Kirzner, 1997). The small business sector is even more important for the development of third world economies (Frese & de Kruif, 2000). They provide a source of income for 25% of all people of working age in third world countries (Mead & Liedholm, 1998) and thereby prevent widespread starvation in large parts of the developing world (cf. Frese & de Kruif, 2000). To increase the micro business sector is one of the best strategies to foster economic growth in these countries (Birch, 1987). It is therefore important to understand the factors that enhance financial as well as employment growth of small businesses, especially in the developing world. In this study we focus on the psychological resources of the main actor in the business: the owner.

The main purpose of our study is to add to an understanding of learnable resources of the business owner. We (1) investigate the role of entrepreneurial knowledge and self-efficacy - the believe to execute actions well - for growth in small businesses and (2) develop a model of business growth using individual based psychological variables of the business owner.

Our study extends existing research in the following ways. First, we test the separate effects of entrepreneurial knowledge as an objective cognitive variable of the owner and self-efficacy as the subjective belief of the owner about such entrepreneurial knowledge and skills on small business growth. Second, we investigate the interaction between self-efficacy and entrepreneurial knowledge, more specifically, the influence of entrepreneurial knowledge on the relationship between self-efficacy and growth. Third, we examine the indirect effects of education and cognitive ability on business growth by introducing entrepreneurial knowledge as a direct measure of human capital. As an overall contribution, our study adds to a better understanding of entrepreneurship and small business growth in the developing world as a largely underrepresented population in entrepreneurship research.

4.1 Knowledge and Self-Efficacy in Entrepreneurship

Performance has been described as a function of an individual's knowledge, skills, and motivation (Campbell, 1990; Bird, 1989). Knowledge in turn is determined by person characteristics such as abilities, education, and personality. Previous research also showed interactions between cognitive and motivational constructs (Bell & Kozlowski, 2002). The framework of the resource-based view and self-regulatory theories suggest that two constructs are particularly relevant for the study of entrepreneurship: Entrepreneurial knowledge as a cognitive variable and self-efficacy as a variable with motivational implications.

The resource-based view of the firm has recently been extended to also include small businesses (e.g. Alvarez & Busenitz, 2001; Barney, Wright, & Ketchen, 2001). A firm's competitive advantage is linked to the entrepreneur's expanding knowledge base helping the entrepreneur to better explore and exploit new business opportunities. Increased focus is devoted to the founder "who possesses much of the technical and managerial knowledge that makes-up the tangible and intangible assets of the firm" (Alvarez & Busenitz, 2001 p. 766). Cognitive ability (cf. Schmidt, Hunter, & Outerbridge, 1986) and formal education (Davidsson & Honig, 2003) are among the components assisting in the accumulation of current knowledge.

Self-efficacy, a key construct in self-regulatory theories, is essential to mobilize and sustain the effort necessary to succeed, especially in challenging situations and under risk and uncertainty (Bandura & Locke, 2003). Such environments are characteristic of entrepreneurship. Overwhelming evidence confirms the importance of self-efficacy for performance at work in general (Stajkovic & Luthans, 1998) and more recently for success in entrepreneurship (Rauch & Frese, 2006). A theoretical model of self-efficacy (Gist & Mitchell, 1992) suggests that efficacy perceptions themselves are influenced by objective knowledge, motivation, and task characteristics. Differences in self-efficacy may thus merely reflect actual differences in the individual's capacity to perform certain tasks well (cf. Gist, 1987; Vancouver, Thompson, Tischner, & Putka, 2002). If self-efficacy beliefs are in part based on individuals' assessments of their own knowledge and their actual capacity, it is important to determine the independent effect of self-efficacy on performance.

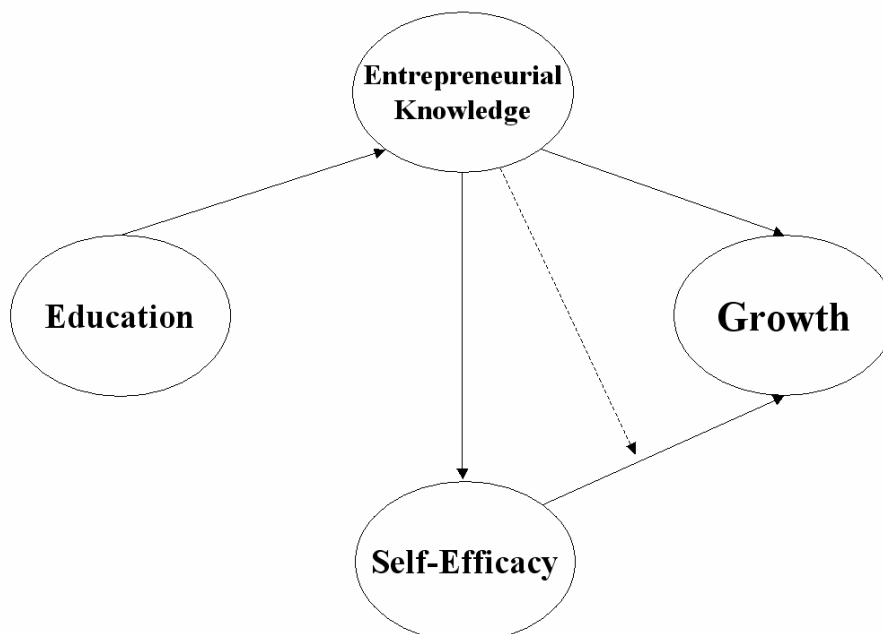
However, if self-efficacy beliefs are not based upon actual knowledge, this may have other important implications for performance. High self-efficacy without the appropriate knowledge may misdirect individuals in their actions and may thus even have detrimental per-

formance effects. Previous research in entrepreneurship has linked self-efficacy to entrepreneurial intention (Zhao, Seibert, & Hills, 2005) underlining its importance for decision making processes (cf. Busenitz & Barney, 1997). High self-efficacy may impact entrepreneurial action and facilitate decision making but may not always positively impact success. This may be especially true in situations of high risk that require sound entrepreneurial knowledge. In this study, we therefore assume an additional, alternative point of view to self-efficacy and suggest a contingent approach to the study of self-efficacy.

Figure 1 includes our theoretical model and the main hypotheses of our study. According to our model growth is influenced by cognitive resources and entrepreneurial knowledge as cognitive determinants of growth and self-efficacy as a variable with motivational implications. The relationship between self-efficacy and growth depends on levels of entrepreneurial knowledge. In the following we provide theoretical arguments for the hypothesis shown in the model.

FIGURE 1

**Theoretical Mediation Model:
Cognitive Resources, Entrepreneurial Knowledge, Self-efficacy and Growth**



4.1.1 Entrepreneurial Knowledge, Self-Efficacy and Business Growth

Entrepreneurial knowledge is declarative knowledge on rules, regulations, and standards in a given legal business environment. A number of reasons suggest that basic entrepreneurial knowledge is important for small business growth in general and specifically in the developing world. When discovering potential business opportunities, owners typically face complexity and uncertainty (Busenitz & Barney, 1997). Relevant knowledge assists owners to make good decisions, to take well-thought out actions (Minniti & Bygrave, 2001; Reuber & Fisher, 1999), and to implement their decisions well and within the legal boundaries of their environment. Basic business knowledge is low among Zimbabwean business owners (Kapoor, Mugwara, & Chidavaenzi, 1997). All the more knowledge may create competitive advantage for these owners. Basic entrepreneurial knowledge for instance is needed when business owners take on the transition of becoming a formal business - a prerequisite for growth in Zimbabwe (Harrison, 2000). Positive relationships between domain specific knowledge and performance in other work environments (Schmidt et al., 1986) and training experiments including complex decision-making tasks (Ford, Smith, Weissbein, Gully, & Salas, 1998) support our hypothesized role of entrepreneurial knowledge for growth in small business.

Hypothesis 1: Entrepreneurial knowledge is positively related to growth.

Business owners need to believe that they possess the capabilities to successfully perform entrepreneurial tasks. Such capability-beliefs refer to individuals' self-efficacy, the "belief in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p.3). Owners who believe they can perform specific tasks well are not only likely to be more proactive and to take more initiatives. Once engaged in a task, high self-efficacy beliefs will also increase perseverance and effort on task-performance (Bandura, 1997). This in turn will increase the likelihood of successful task performance. Self-efficacy and perseverance during entrepreneurial and managerial tasks is especially important in small business. Owners typically work alone and have no one to tell them what to do. They have to deal with uncertainties with regard to the outcomes of new strategies, the development and introduction of new products, financial decisions etc. (cf. Busenitz & Barney, 1997). Typically business owners have to overcome a number of barriers before their efforts finally pay off. The owners who truly believe in their entrepreneurial capabilities take

more initiatives, engage in more challenging tasks and sustain more effort to achieve positive outcomes. The self-efficacy-performance link has been found in various domains (Stajkovic & Luthans, 1998) - most recently in the domain of entrepreneurship with regard to business success (Rauch & Frese, 2006).

Hypothesis 2: Self-efficacy is positively related to growth.

Differences in subjective self-efficacy should correspond to differences in individual's actual capacities to perform related tasks well (Gist, 1987; Vancouver, Thompson, Tischner, & Putka, 2002). Efficacy perceptions should be higher for individuals with higher objective knowledge and skills.

Hypothesis 3: Self-efficacy is positively related to entrepreneurial knowledge.

4.1.2 Interactions between Self-Efficacy and Entrepreneurial Knowledge

Entrepreneurial knowledge is important for the relationship between self-efficacy and success. Owners with high self-efficacy are more motivated and more likely to take more actions than owners with low self-efficacy. If such owners are also low on entrepreneurial knowledge their actions may lack the necessary know-how to succeed. Their activities may not rest on solid business knowledge but may rather create too much risk for the business. Entrepreneurial knowledge without self-efficacy on the other hand will remain passive knowledge - knowledge that largely remains unused and is not put into action. We therefore hypothesize an interaction effect of self-efficacy and entrepreneurial knowledge. Only if self-efficacy beliefs are in accordance with related entrepreneurial knowledge can self-efficacy be positively related to growth.

Hypothesis 4: Entrepreneurial knowledge moderates the relationship between self-efficacy and growth: The higher owners' entrepreneurial knowledge the more positive the relationship between self-efficacy and growth.

4.1.3 Cognitive Resources and Entrepreneurial Knowledge as a Mediator

Business owners typically deal with complex tasks and new information. Such tasks require new knowledge and information processing. High cognitive ability and knowledge acquired through prior education should help owners to process information and acquire new relevant knowledge well. Cognitive ability has been found to be a consistent predictor of skills and performance in a number of domains (e.g., Schmidt & Hunter, 1998; Schmidt, et al., 1986; Ree, Earles, & Teachout, 1994). Training studies also identified general cognitive ability as a good predictor of training success (Jensen, 1998; Schmidt & Hunter, 1998). In entrepreneurship, where studies including cognitive ability are still rare, cognitive ability should therefore be related to success via knowledge.

Hypothesis 5a: Cognitive ability is positively related to entrepreneurial knowledge.

Hypothesis 5b: Cognitive ability has an indirect effect on growth via entrepreneurial knowledge.

The positive relationship between education and business success is empirically well established (Rauch & Frese, 2000). Researchers agree that education leads to knowledge and skills enabling business owners to find opportunities and to cope with problems better and therefore be more successful (e.g., Cooper, Gimeno-Gascon, & Woo, 1994). Unfortunately, however, education is often simply used as a proxy for knowledge. Whereas we agree that education should be positively related to knowledge it is important to distinguish between education as an opportunity to better acquire skills and knowledge and the presumed outcome of education - knowledge itself. Only this distinction allows the testing of the mediation effect: from education to knowledge to success. More highly educated business owners are likely to have more general knowledge. They should thus be able to acquire specific entrepreneurial knowledge more easily, which should help them to be more successful.

Hypothesis 6a: Education is positively related to entrepreneurial knowledge.

Hypothesis 6b: Education has an indirect effect on growth via entrepreneurial knowledge.

4.2 Methods

4.2.1 Sample

We sampled 280 indigenous business owners in Zimbabwe in the cities and industrial hives of Harare and Bulawayo and in the rural areas around Murewa. The sample included the two major ethnic groups Shona and Ndebele (refusal rate was 30%). Of the 280 participants, 101 owners were contacted again as part of a longitudinal sample (Krauss, 2003)⁴; 179 owners were contacted for the first time between 2000 and 2001. The sampling procedure was identical for both waves. We included business owners who had founded their own firm, had at least one employee, managed their firms on a day-to-day basis, and had been in business for more than one year. The selection allowed us to exclude people who just bridged a period of unemployment and to obtain adequate success data.

We randomly selected and contacted up-market businesses via public registries. We also included businesses from the informal sector (businesses that are not registered and/or do not pay tax), which represent the majority of small businesses in Zimbabwe. Such businesses are typically located in the home-industries near high density housing areas and are not accessible via public registries. We therefore used a “random” walk procedure: Interviewers were assigned constricted areas in the home-industries and asked all business owners in that area for immediate participation. Appointments were only made if the owner was preoccupied. All participants received the equivalent of five US\$ for participating in the study.

Of the total sample 12% were female. On average, owners were 34 years of age ($SD = 5.87$). They had been to school for 11 years on average ($SD = 2.59$) and had typically completed their O-levels (53%). The majority (62%) of the owners operated their businesses in

⁴ This subsample of $n = 101$ was also used by Krauss, Frese, Friedrich, & Unger (2005) together with data from South Africa to investigate the nature of entrepreneurial orientation. The whole sample of $n = 280$ was also used in Frese et al. (2006) together with samples from South Africa and Namibia in a study on action planning and success. In contrast to Frese et al. the present study focuses explicitly on the relationships between self-efficacy, entrepreneurial knowledge and business growth and the contingent value of self-efficacy.

the informal sector. Industries in the sample were manufacturing (40% with 12% in wood manufacturing), construction (5%), retail/trade (38%), and services (38%). The large majority of owners (72%) had between one and three employees ($M = 4.75$; $SD = 11.81$).

4.2.2 Procedure

We used a questionnaire and a structured interview as our main instruments. On average the interviews lasted 135 minutes. Interviewers were a doctoral student of psychology, two psychology majors in their final year of their master studies, and four local interviewers. A thorough training with the interviewers included practical exercises on interviewing techniques as well as coding and rating exercises. The participants filled out the questionnaire after the interview.

4.2.3 Measures

Entrepreneurial knowledge. We measured entrepreneurial knowledge using a 21-item multiple choice test taken from Krauss (2003)⁵. The test had been specifically developed for the Zimbabwean context in close cooperation with local experts. Items covered general business practice knowledge (e.g. “which is the best method of checking on business progress?” or “why is advertising important?”).

Self-efficacy. We measured self-efficacy as a specific scale of self-efficacy beliefs (cf. Bandura, 1997). Owners indicated how confident they were to do specific managerial and entrepreneurial tasks well (7 items; e.g. pricing of products, convincing customers to buy products, keeping overview over financial affairs; $\alpha = .83$)⁶.

⁵ The test was validated by Krauss (2003) on the basis of $n = 85$ business owners who represent a sub-sample of the current study.

⁶ The measure was also used in Frese et al. (2006) in a three country study on action planning and success.

Cognitive ability. We employed the Connecting Numbers Test (Oswald & Roth, 1978) as a short measure of cognitive performance speed. We measured the time to finish the four tasks of this test (and reverse scored the scale; $\alpha = .96$)⁷.

Education. We formed a two-item index to measure the owners' education. The index combined number of years of formal education and the highest degree owners had obtained ($r_{it}=.63$).

Financial growth. We asked for percentage development of customers, sales, and profits for the years between 1998 and 2001 ($\alpha =.88$). We asked for each year's development and computed separate growth rate indicators for customers, sales, and profits, respectively⁸.

Employment growth. We asked for the current number of employees and the number of employees 3 years before the interview was done counting part-time workers as half. A ratio of current employees divided by the number of employees in 1998 indicated relative employment growth. In moderated hierarchical regression analysis we statistically controlled for the number of employees in 1998 and used the number of employees 2001 as the dependent variable to examine employment growth.

Control variables. We used the following variables as control because they have previously been related to success: Starting capital⁹, age of business, and industry (dichotomized variables).

4.2.4 Method of Analysis

We analyzed zero-order relationships among the constructs by using overall scales. To test our hypothesized model of entrepreneurial knowledge, self-efficacy, and business growth as well as single hypotheses regarding direct and indirect effects we applied structural equa-

⁷ The measure was also used in Frese et al. (2006) in a three country study on action planning and success.

⁸ The measure was also used in Frese et al. (2006) in a three country study on action planning and success.

⁹ Data on starting capital were only available for the longitudinal sub-sample from Krauss (2003). Variable relationships with starting capital are therefore based on data from 101 owners. All other relationships are based on the whole sample of $n = 280$.

tion modelling (LISREL 8; Joereskog & Soerbom, 1996). Moderators were tested with moderated hierarchical regression analyses. We included control variables if they showed significant zero-order relationships with the respective dependent variables. This procedure allowed a more favorable ratio of participants to variables.

To identify latent variables we split the overall scales into at least two indicator variables: Cognitive ability was operationalized by two indicators. Each indicator was the average of two original test items. Years and highest degree of formal education were used as indicators of the owners' education. The single self-efficacy items were split into parcels of two and three items and used as indicators of the latent construct self-efficacy. The items from the entrepreneurial knowledge test were split into three equal item parcels, averaged, and taken as indicators of entrepreneurial knowledge. Business growth was operationalized by the separate average percentage development of customer, sales, and profits over the past three years. Finally, employment growth and industry (dichotomized variable) were manifest variables with one indicator each.

4.3 Results

Table 4.1 presents descriptive statistics and zero-order correlations for the variables in the study. The diagonal includes reliabilities computed as Cronbach's alphas (for scales with more than two variables) and correlations (for scales with two variables). Both success measures financial growth (including profit, sales, customer development) and employment growth correlated significantly. The number of employees at T1 and T2 were interrelated and showed relationships with entrepreneurial knowledge and education. While entrepreneurial knowledge showed significant relationships with financial growth and employment growth, self-efficacy was unrelated to employment growth and correlated only marginally with financial growth.

There was no relationship between self-efficacy and entrepreneurial knowledge. Hypotheses 3, which predicted a positive relationship between self-efficacy and entrepreneurial knowledge is therefore not supported. Since the relationship between entrepreneurial knowledge and self-efficacy was nearly zero the path between the two variables was no longer considered in further analysis. Neither of the control variables (industry, age of business, and starting capital) was significantly related to financial nor to employment growth. The only exception was the industry retail/trade which correlated with employment growth.

TABLE 4.1
Descriptive Statistics and Intercorrelations^{a, b †}

Variables and Scales	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12
1. Financial growth	15.94	35.03	(.88)											
2. Employment t1	11.80	13.83	-.03	—										
3. Employment t2	4.75	11.81	.15*	.76**	—									
4. Employment growth	0.18	1.03	.32**	-.06	.22**	—								
5. Entrepreneurial knowledge	0.68	0.13	.19**	.22**	.22**	.14*	(.62)							
6. Self-efficacy	84.50	11.63	.12 [†]	-.07	-.02	-.02	.03	(83)						
7. Education ^c	0.00	1.00	.17**	.29**	.32**	.11	.38**	.00	(.63)					
8. Cognitive ability	114.76	38.98	.10	-.04	.07	.14*	.16*	.09	.28*	(.96)				
9. Manufacturing: textiles	1.07	0.26	.02	.01	-.03	.02	-.04	.09	-.01	.00	—			
10. Manufacturing: wood	1.15	0.36	-.02	-.07	-.08	-.11	.00	-.02	-.15*	-.04	-.12	—		
11. Manufacturing: metal	1.21	0.41	-.07	-.03	.01	-.11	-.05	-.11	-.17*	-.10	-.14*	-.05	—	
12. Manufacturing: other	1.12	0.33	-.10	.05	.03	-.09	-.02	-.10	.06	-.06	-.10	.00	-.03	—
13. Construction	1.05	0.22	-.08	.20**	.25**	-.05	.05	-.10	-.02	-.03	-.07	-.01	.03	.25**
14. Trade: retail/trade	1.38	0.49	-.07	-.04	.00	.14*	.03	.00	.02	.00	-.07	-.16**	-.26**	-.11
15. Services	1.38	0.49	.10	.14*	.12	.07	.03	.03	.17**	-.05	-.13*	-.24**	-.13*	-.05
16. Other line of business	1.04	0.19	-.07	.04	-.01	-.04	.00	.09	-.03	.03	-.06	-.08	-.11	-.02
17. Age of business	6.04	5.87	-.10	.14*	.08	-.11	-.12	-.05	-.05	-.37*	.04	-.03	.11	.06
18. Starting capital in US\$ t1	9463	43031	-.08	.23*	.30**	.01	.10	.03	.18	-.08	-.05	-.09	.03	-.08

TABLE 4.1 (CONTINUED)

Variables and Scales	13	14	15	16	17	18
13. Construction	—					
14. Trade: retail/trade	-.09	—				
15. Services	-.12*	-.11	—			
16. Other line of business	-.05	-.08	-.08	—		
17. Age of business	-.01	.05	.13*	-.06	—	
18. Starting capital in US\$ t1	.10	-.03	.11	-.03	-.06	—

Figures in parentheses are Cronbach's alphas or correlations for scales with less than three items.

^b Sample size $n = 212-280$; for starting capital $n = 81-97$.

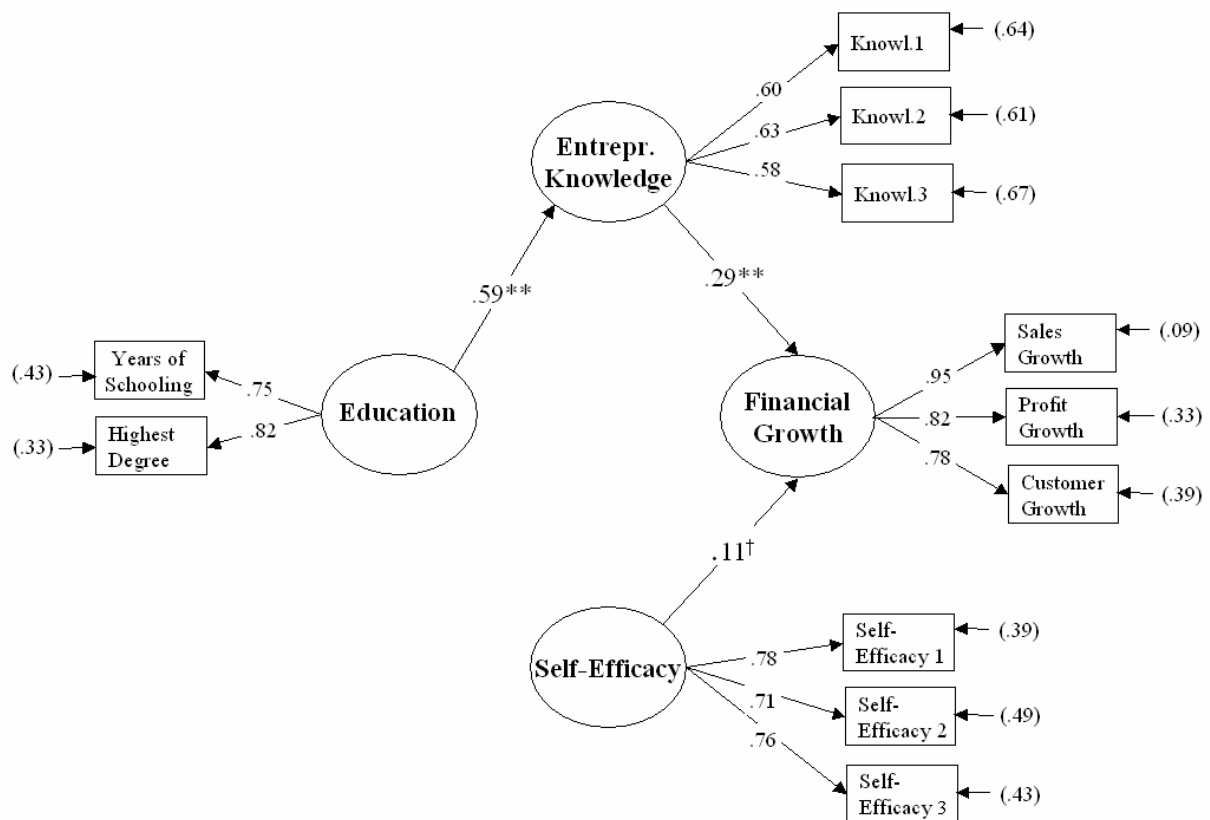
^c z-standardized data.

* $p < .05$

** $p < .01$

FIGURE 4.2

Effects of Self-Efficacy to Financial Growth and Education to Knowledge to Financial Growth (Standardized Parameter Estimates from Structural Equation Model) ^a



^a Fit statistics: $\chi^2 (41, n = 228) = 55.38, p = .07$; independence model: $\chi^2 (55, n = 228) = 962.06$; comparative fit index = .98; goodness-of-fit index = .96; root-mean-square error of approximation = .039; * $p < .05$; ** $p < .01$.

We tested our hypotheses simultaneously using structural equation modelling. We tested direct effects by examining parameter estimates of respective paths in the model and indirect effects using Sobel's first-order solution (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). All hypotheses were directional and were tested one sided.

The first model showed poor fit ($\chi^2 [61, n = 228] = 126.74, p = .00$; comparative fit index = .95; goodness-of-fit index = .92; root-mean-square error of approximation = .069). There was no relationship between cognitive ability and entrepreneurial knowledge (-.05; Hypothesis 5a) and no indirect effect between cognitive ability and financial growth via entrepreneurial knowledge (Hypothesis 5b). We therefore computed a new model and omitted the variable cognitive ability. The new model, displayed in Figure 4.2, showed a better fit compared to the first model ($\chi^2 [41, n = 228] = 55.38, p = .07$ independence model: $\chi^2 [55, n = 228] = 962.06$; comparative fit index = .98; goodness-of-fit index = .96; root-mean-square error of approximation = .039). Entrepreneurial knowledge was significantly related to financial growth supporting our first Hypothesis ($p < .01$). Self-efficacy showed a positive relationship with financial growth. However, this relationship was only marginally significant ($r = .11; p < .10$) yielding only weak support for Hypothesis 2. Education had a positive effect on entrepreneurial knowledge (Hypothesis 6a; $p < .01$). The relationship between education and financial growth was mediated by entrepreneurial knowledge (Hypothesis 6b; $p < .01$).

In a third model we tested our hypothesis with regard to employment growth. The majority of fit indices indicated poor model fit ($\chi^2 [48, n = 196] = 85.89, p = .00$; independence model: $\chi^2 [66, n = 196] = 774.59$; comparative fit index = .95; goodness-of-fit index = .93; root-mean-square error of approximation = .064). In this model cognitive ability once again showed a non-significant relationship with entrepreneurial knowledge (Hypothesis 5a).

Eliminating cognitive ability improved the model fit (Figure 3; $\chi^2 [32, n = 208] = 30.19, p = .56$; independence model: $\chi^2 [45, n = 208] = 478.22$; comparative fit index = 1.00; goodness-of-fit index = .97; root-mean-square error of approximation = .000). In support of

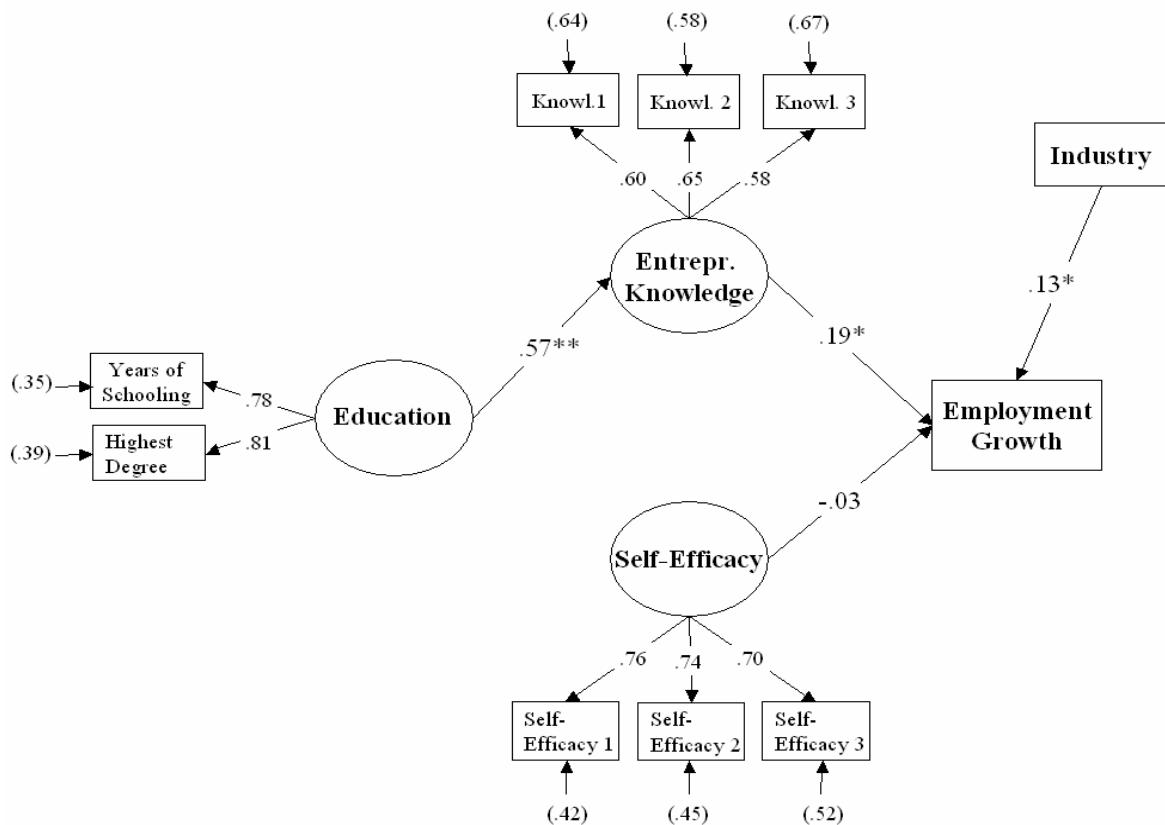
Hypothesis 1, the relationship between entrepreneurial knowledge and employment growth was significant ($p < .01$). There was no relationship between self-efficacy and employment growth. Hypothesis 2 was therefore not supported when examining employment growth. Education had an indirect effect on employment growth via entrepreneurial knowledge yielding further support for Hypothesis 6b.

To test the interaction effect of self-efficacy and knowledge on financial and employment growth (Hypothesis 4) we performed hierarchical moderated regression analysis (Aiken

& West, 1991). For the analysis of the criterion financial growth we included education in the first step, followed by self-efficacy and knowledge in a second step, and the moderator term self-efficacy x entrepreneurial knowledge in the final step. The results are presented in Table 4.2. In line with Hypothesis 4 the interaction effect of self-efficacy and entrepreneurial knowledge was significant ($\Delta R^2 = .03, p < .05$). As displayed in Figure 4.4 the relationship between self-efficacy and financial growth was the strongest for owners with high entrepreneurial knowledge. In contrast, the same relationship was negative for business owners with low entrepreneurial knowledge. Owners with low perceived self-efficacy showed similarly low growth rates regardless of their level of entrepreneurial knowledge. Growth was lowest for owners with combinations of low self-efficacy and high entrepreneurial knowledge on the one hand and high self-efficacy and low entrepreneurial knowledge on the other hand.

FIGURE 4.3

Effects of Self-Efficacy to Employment Growth and Education to Knowledge to Employment Growth (Standardized Parameter Estimates from Structural Equation Model)



^a Fit statistics: $\chi^2 (32, n = 208) = 30.19, p = .56$; independence model: $\chi^2 (45, n = 208) = 478.22$; comparative fit index = 1.00; goodness-of-fit index = .97; root-mean-square error of approximation = .000; * $p < .05$; ** $p < .01$.

TABLE 4.2

Interactions of Self-Efficacy and Entrepreneurial Knowledge on Financial and Employment Growth (Hierarchical Regression Analysis, Standardized Regression Coefficients)

	Financial growth ^b		Employment growth ^c	
Controls ^a				
Industry: retail/trade			-.04	-.03
Number of employees T1			.58**	.60**
Cognitive and motivational variables				
Education	.14*	.15*	.23**	.23**
Entrepreneurial knowledge	.14*	.13	.03	.02
Self-efficacy	.12	.12	-.01	.00
Interaction term				
Entrepr. know. x self-efficacy		.17**		.10*
	R2	.07**	.10**	.48**
	ΔR2	.03*	.49**	.01*

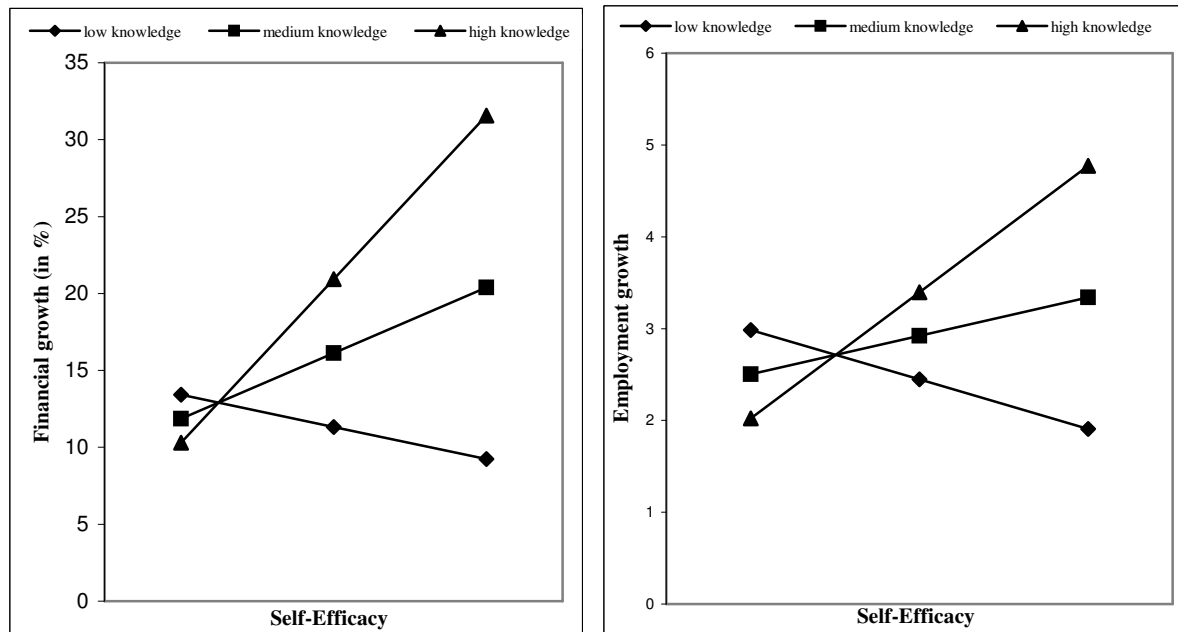
^a Control variables were included if they correlated significantly with the dependent variables

^b $n = 214$, ^c $n = 194$, * $p < .05$ ** $p < .01$

We performed the same moderator analysis for employment growth. As a control variable we included employment three years before the interview to be able to interpret current employment as growth. We also added the control variable industry (retail/trade) which had a significant correlation with employment growth. The interaction effect on employment growth was significant ($\Delta R^2 = .01$, $p < .05$) showing a similar effect of entrepreneurial knowledge as in the analysis of financial growth (Figure 4.4). The relationship between self-efficacy and employment was positive for owners with high entrepreneurial knowledge and negative for owners with low entrepreneurial knowledge. Owners with combinations of low self-efficacy/low knowledge showed stronger employment growth than those with combinations of high self-efficacy/low entrepreneurial knowledge.

FIGURE 4.4

Entrepreneurial Knowledge as Moderator of the Relationship between Self-Efficacy and Growth



4.4 Discussion

The study shows the importance of specific entrepreneurial knowledge for growth in small businesses. In structural equation models we found entrepreneurial knowledge to be related to financial and employment growth. There was only a marginal direct effect of self-efficacy on financial growth and no relationship at all with employment growth. The most critical finding was the interaction between entrepreneurial knowledge and self-efficacy. A positive effect of self-efficacy was conditional on the level of entrepreneurial knowledge. The relationships between perceived self-efficacy and both growth indicators were positive for owners with high entrepreneurial knowledge and slightly negative for those with low entrepreneurial knowledge. We further identified education to be an antecedent of entrepreneurial knowledge with an indirect effect on growth.

Our findings extend previous research on growth and human resources in small businesses in the following ways. First, our study addressed the question whether and how entrepreneurial knowledge and self-efficacy contribute to small business growth. We tested the separate effects of self-efficacy and entrepreneurial knowledge. While entrepreneurial knowl-

edge was important for financial and employment growth, self-efficacy effects were contingent on levels of entrepreneurial knowledge. To our knowledge, this is the first study to demonstrate such an effect. Second, our study moves beyond the common practice in entrepreneurship to use proxy measures of knowledge (most commonly found in the human capital literature). The study is one of the first to use a specific knowledge test for small business owners. This allowed us to test an indirect effect of education as prior knowledge via specific entrepreneurial knowledge on growth. As a final contribution, our study addresses the gap of research on small businesses in the developing world. Although arguments for such studies are overwhelming (cf. Frese, 2000), they remain rare.

4.4.1 Theoretical Implications

The role of the owner is central to the successful operation of *small* businesses. This assertion is in line with a growing body of research on psychological individual level approaches to success of small businesses (e.g. Baum & Locke, 2004; Krauss et al. 2005). Our study further underlines the usefulness of such approaches. In particular, our findings demonstrate the importance of education and specific entrepreneurial knowledge for small business growth. We argue that such owner resources are a critical asset to the extent that business owners manage their businesses and make all the important decisions themselves (cf. Slevin & Covin, 1995, cf. Saffu & Manu, 2004). We believe that psychological individual based approaches to entrepreneurial success will continue to make important theoretical and practical contributions to the field.

While a number of meta-analyses report impressive positive findings concerning the contribution of self-efficacy to human function (e.g. Stajkovic & Luthans, 1998) our study creates a somewhat different picture. The low overall relationships of self-efficacy with growth also modify findings from previous analyses in entrepreneurship (e.g. Baum & Locke, 2004; Rauch & Frese, 2006; Zhao et al. 2005) and thus warrant further explanation. We discuss the findings with respect to the interaction between self-efficacy and entrepreneurial knowledge and previous studies with negative effects of self-efficacy.

The interaction effect between entrepreneurial knowledge and self-efficacy showed a positive relationship of self-efficacy for owners with high entrepreneurial knowledge. Thus, under certain conditions, self-efficacy had a positive impact on growth in our study, as well. Negative effects only existed if owners showed a combination of little entrepreneurial knowl-

edge and high self-efficacy. We interpret this effect as a result of overconfidence; a negative discrepancy between subjective self-efficacy beliefs and objective knowledge. Overconfidence refers to the failure to know the limits of one's knowledge (Russo & Schoemaker, 1992). So far, the literature in entrepreneurship has neglected considering negative effects and has only discussed positive effects of overconfidence (Busenitz & Barney, 1997; Zhao et al. 2005). Our research suggests that business owners may not be successful if they have high self-efficacy beliefs but lack the necessary knowledge to carry out entrepreneurial tasks well.

Although positive relationships between self-efficacy and performance are generally accepted, researchers have started to question the unconditional value of self-efficacy and to advocate a more differential analysis (Vancouver et al., 2002). In experimental studies under conditions of feedback ambiguity self-efficacy showed zero relationships at the between-person level and negative effects on performance at the within-person analysis (Vancouver et al., 2002). Vancouver and colleagues intentionally produced overconfidence (resulting in higher errors) by manipulating self-efficacy. We argue that overconfidence also existed in our study, but that it resulted as a natural phenomenon via individual differences in self-efficacy and domain knowledge (high self-efficacy and low entrepreneurial knowledge). We believe that both studies include inflated capacity beliefs and share the finding of a negative impact of miscalibration. According to Vancouver et al. and the present study self-efficacy should increase performance to the degree that such beliefs are justified and based on actual capacities. If self-efficacy beliefs are not based on actual knowledge/skills, their otherwise positive effects decrease and may even turn negative. In our study there was no relationship between self-efficacy and entrepreneurial knowledge. A number of owners may thus not accurately perceive their knowledge and skills (either over- or underestimating what they actually know and what they are capable of).

Our theoretical model hypothesized positive indirect effects of cognitive resources on growth via entrepreneurial knowledge which were partially supported. An indirect effect was found for education as a cognitive resource of the owner. The effect was mediated by entrepreneurial knowledge. Our model also included a relationship for cognitive ability which was not supported by the data. Structural equation models estimate paths as unique variance of respective variables partialling for the effects of other included variables. The findings may therefore be a result of shared explained variance in the dependent variable growth. Specifically, cognitive ability has conceptual overlap with education. When examined simultaneously, cognitive ability may only have limited incremental validity.

Finally, the measure of entrepreneurial knowledge is a specific strength of our study. Researchers of previous studies have suggested to develop such direct measures of skills and knowledge (Rauch & Frese, 2000; Rauch, Frese, & Utsch, 2005). The introduction of entrepreneurial knowledge allowed the testing of mediation hypotheses and is one step forward towards a better understanding of processes between distal cognitive resources and success. Our findings suggest that better educated business owners – through prior general knowledge – develop more entrepreneurship specific knowledge. This entrepreneurial knowledge in turn increases business growth.

4.4.2 Practical Implications

Our findings have a number of policy implications and implications for assessment and training.

First, the importance of education for business growth is obvious. Our findings are in line with human capital theory. Owners who go to school longer and achieve higher levels of education have businesses which grow more strongly than those with less education.

Second, a somewhat unexpected implication concerns the conceptualisation and use of trainings in entrepreneurship. While a number of researchers (e.g. Bandura, 1986; Eden & Aviram, 1993) discuss the use of self-efficacy trainings as a general tool to boost performance our study suggests such trainings in entrepreneurship may only benefit owners who already possess high knowledge and skills. Trainings should thus be carefully applied; either by selecting participants with high knowledge and skills or, ideally, by also including training of specific entrepreneurial knowledge.

Third, the variables included in the study can be used for assessment of business owners by banks or other credit providers. Whereas education has frequently been used as a criterion, to our knowledge, this has not been the case for specific knowledge. Our findings suggest that the variable may represent a good alternative evaluation criterion. It may become especially valuable to prevent credit providers to decide in favor of owners who present themselves as successful and highly confident about their abilities, but lack actual entrepreneurial knowledge. The consideration of such information for investment decisions may lead to better predictions of success. This in turn may increase investors' confidence in future decisions and ultimately lead to more investment via increased trust and reduced risks.

4.4.3 Limitations and Future Research

First, we chose financial growth as one of our measures of small business growth. The measurement was not based on objective measures in the sense of exact profitability ratios. Exact profitability ratios, however, are difficult to obtain (Daniels, 1999), especially in Africa where standard book-keeping is uncommon (Shinder, 1997). We therefore asked participants for growth ratios instead of absolute figures. Employment growth as our second measure of growth, however, was as near to an objective measure as one can get. Employment growth yielded similar results and thereby strengthened the validity of our findings. A number of researchers have suggested the use of different success measures (e.g. Wicklund & Shephard, 2005; Murphy, G.B., Trailer, J.W. & Hill, R.C., 1996).

Second, there are limits to the generalization of our findings. Our models may not apply to larger firms. The impact of the owner on business outcomes may be weaker in large firms. This has been suggested by previous individual based approaches to entrepreneurship (e.g. Frese et al., 2005; cf. Lerner & Almor, 2001).

Third, future research should pay closer attention to the link between education and entrepreneurial knowledge. While our data support a mediation effect from education to knowledge to growth it remains unclear *how* better educated business owners accumulate such knowledge. Such processes may include better learning strategies or intentional learning.

Finally, our study did not address other moderators besides entrepreneurial knowledge nor did we examine possible causes of self-efficacy. However, we could show that self-efficacy was unrelated to entrepreneurial knowledge. There were also no relationships of industry or starting capital with self-efficacy. The individual development of self-efficacy in entrepreneurship and a better understanding of overconfidence phenomena remain important tasks for future research. For a deeper understanding of self-efficacy, more attention should be paid to the conditions under which self-efficacy effects can be neutralized or even detrimental for success.

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CHAPTER 5

Conclusion

This dissertation was based on the premise that knowledge and learning are critical for success in small business. Some arguments for the importance of knowledge and learning were taken directly from entrepreneurship research. Knowledge and learning help in the discovery and exploitation of business opportunities (e.g. Shane, 2000; Shane & Venkataraman, 2000). Other arguments are linked to the changing nature of work, technological developments and increased customer demands that may affect employees and small business owners in similar ways (Howard, 1995; Thayer, 1997).

In order to contribute to the evidence base in entrepreneurship research we conducted three studies that address the effects of knowledge and learning of small business owners. We started with an analysis of human capital effects: Is human capital in fact related to small business success? Are there differences in the effects for different types and measurements of human capital? Is human capital more important in contexts of highly knowledge-based industries or in countries that are less developed? We then addressed the process of learning: How do business owners learn? How do owners acquire knowledge and skills? And what person characteristics facilitate learning? In our last contribution we add another aspect to our analysis: Is it important what business owners believe about their capabilities? How do such self-efficacy beliefs and objective knowledge interact with regard to success?

In this concluding chapter we briefly summarize and comment on the main results of this dissertation. Subsequently, we highlight some of the practical and theoretical implications.

First, we conclude that there is a positive relationship between human capital and success in entrepreneurship. We reported positive relationships in individual studies (Chapter 3: $r = .29$ for knowledge and $.22$ for education; Chapter 4: between $r = .14$ and $.19$ for knowledge and $r = .11$ and $.17$ for education depending on measurements of success) and on an aggregate level across previous studies in entrepreneurship (Chapter 2: $r_c = .10$). The meta-analytically estimated overall relationship between human capital and success was surprisingly small given the received importance of human capital in entrepreneurship. Other variables such as personality ($r_c = .15$, Rauch & Frese, 2006) and entrepreneurial orientation ($r_c = .27$, Rauch &

Frese, 2006) appear to be better predictors of entrepreneurial success. It is also important, however, to look at human capital success relationships under specific moderating conditions that alter the magnitude of the overall relationship.

In our second contribution, we identified moderators of the human capital success relationship (Chapter 2). Human capital conceptualized as knowledge/skills yielded higher success relationships than human capital conceptualized as experience/schooling. Knowledge/skills represent the best estimate of the human capital success relationship ($r_c = .17$). Task relatedness was another important moderator. Task related human capital showed stronger effects than non-task related human capital. The most important context related moderator was age of business. The human capital success relationship was higher in younger businesses ($r_c = .19$). Human capital effects were stronger in less developed countries. This is an important finding for scientists interested in entrepreneurship research in the developing world. It is important to note, that the relationship between human capital and success was positive under all moderating conditions. This is not trivial, because prior knowledge may also lead to rigidity and inflexibility (Auto, Locke, & Smith, 2000). In changing environments knowledge may also quickly become obsolete requiring the owner to unlearn (Reuber & Fisher, 1999).

We also compared human capital effects with cognitive ability. Cognitive ability yielded a higher success relationship compared to schooling and resource-based human capital variables. Cognitive ability should therefore be included in individual based models of entrepreneurial success. It should also be noted, however, that the estimated effect for cognitive ability was based on a small number of studies and that there was large variation in the magnitude of the individual effects. The credibility interval included zero and only 24,78% of the observed effects' variance could be explained by sampling error. Future studies should thus consider moderating influences of the relationship between cognitive ability and success. Low relationships between cognitive ability and success in Study 2 and 3 ($r = .07$ and $.10$, respectively) suggest that the developmental status of a country may moderate the relationship. Both studies were carried out in developing countries. The effects found in South Africa (Chapter 3) were slightly below the 95% confidence interval. The averaged effect in Zimbabwe was slightly above the lower bound of the 95% confidence interval.

Third, we proposed a mediational model of human capital and examined indirect effects from experience/schooling to knowledge/skills to success and from cognitive ability to knowledge/skills to success. We found empirical evidence for this model on an aggregate

level across studies using meta-analytic path analyses (Chapter 2) and in individual studies applying structural equation modelling (Chapters 3 and 4). We suggest a causal interpretation of the indirect effects from experience/schooling to knowledge/skills to success. Experience/schooling refers to the past of the business owner and affects knowledge/skills and success over the long run. Nevertheless, longitudinal designs are needed to confirm this interpretation.

In our fourth contribution, we built on the mediational model and directly addressed the process of learning - the acquisition of entrepreneurial knowledge. We introduced deliberate practice as a set of individualized activities to improve one's competence (Chapter 3). Our results suggest that business owners learn and accumulate knowledge by regularly and deliberately engaging in activities of competence improvement. Education and cognitive ability were important antecedents of deliberate practice. Education and cognitive ability had an impact on knowledge via deliberate practice and influenced success via deliberate practice and knowledge.

Finally, we clarified the role of entrepreneurial knowledge in the context of self-efficacy beliefs (Chapter 4). The relationship between self-efficacy and success was dependent upon levels of entrepreneurial knowledge. The relationship was higher the more entrepreneurial knowledge owners possessed. The results thereby point to a conditional effectiveness of self-efficacy. Self-efficacy should thus best be viewed in context of objective capabilities such as knowledge or skills.

The studies reported in this dissertation have a number of practical and theoretical implications. Results are important for researchers, venture capitalists, policy makers, educators, and the business owners themselves.

First, venture capitalists use human capital indicators as criteria to evaluate a firm's potential (Zacharakis & Meyer, 2000). Knowledge/skills showed the highest predictive validity. Venture capitalists are advised to use such direct measures instead of proxies of human capital (e.g. experience). Lenders should also consider the use of cognitive ability batteries which, to date, are more typically applied in personal selection procedures of employees. Human capital indicators appear to be particularly useful for evaluating businesses in less developed countries. They are thus helpful criteria for organizations allocating micro-credits in the developing world.

It is equally important, however, to comment on the limits to using human capital indicators in evaluation decisions. The relationships between human capital and success re-

ported in this dissertation were small. It appears that venture capitalists may indeed overemphasise new firms' human capital when making their investment decisions (Baum & Silverman, 2004). However, it is not possible to find the one and only a priori predictor of success – especially in entrepreneurship. Most researchers and practitioners have used and will continue to use multiple predictors of entrepreneurial success. As with most other variables, the role of human capital will lie in its incremental value of explaining business success in prediction models.

Second, our findings are important for educators and policy makers. All three studies showed a positive impact of education on success. More importantly, the success relationship was stronger for task related human capital. Policy makers should thus facilitate the promotion of specific knowledge that is directly related to entrepreneurship. Equally important, specific work experience showed stronger relationships than general education. Formal education should thus include more practical “hands on” experience. Prospect business owners are likely to benefit more strongly from education modules that are modelled on the dual educational system (consisting of alternate phases of lectures and guided practice experience).

Finally, the dissertation represents one step towards the development of evidence based entrepreneurship (Frese, Schmidt, Bausch, Rauch, & Kabst, 2005). We used meta-analytic techniques to establish the status of the concepts of human capital in entrepreneurship (cf. Rauch & Frese, 2006). The study concluded more than two decades of human capital research in entrepreneurship. Findings may assist researchers in their choice of variables, measurements and control variables. Although a number of moderators could be identified, remaining heterogeneity in the effects strongly suggests the need for more rigorous contingent approaches to human capital success relationships. To be practically beneficial, an evidence-based approach for the domain of entrepreneurship requires further meta-analyses that specify the size and generalizability of other effects of concepts discussed in the literature. Based on the existing evidence, manuals for interventions should be developed that include explicit recommendations for practitioners and entrepreneurs (Rauch & Frese, 2006).

Another step towards evolving evidence based entrepreneurship is the development of cumulative evidence from individual studies as well as the examination of new individual difference concepts (cf. Rauch & Frese, 2006). Deliberate practice (Chapter 3) represents such a concept that promises to be theoretically and practically useful. The present dissertation is among the first to address the relationship between learning as a process and knowledge as the outcome of that process (Harrison & Leitch, 2005). Deliberate practice is a widely appli-

cable concept because it comprises individually designed activities. It is particularly useful in entrepreneurship where tasks are heterogeneous and requirements and individual challenges are subject to constant change. Deliberate practice is practically useful because it can easily be trained. The idea of deliberate practice can be integrated into formal education programmes, taught in specifically designed trainings, or passed on in educational books.

The concept of deliberate practice is consistent with an emerging view of business owners as proactive agents of their own learning and development; agents that are continually learning and developing in relation to their business and the wider environment (Cope, 2005). Business owners will have to learn from the past. Even more importantly, however, they have to learn for the future. Learning in entrepreneurship is therefore retrospective and prospective. An examination of learning behaviour such as deliberate practice will focus more strongly on the latter - the prospective - aspect of learning.

“We have entered the knowledge age and the new currency is learning – it is learning, not knowledge itself which is critical” (Dixon, 1994, p. 1).

The ability to learn may thus indeed be among the most important capabilities that business owners can possess (cf. Barney, Wright, & Ketchen, 2001). We encourage owners to fully utilize their “talents” and to engage in activities of learning and competence improvement.

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APPENDIX

A1	Coding Scheme (Study 1)	A2
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A1 Coding Scheme (Study 1)

Moderator Variable	Level of Moderator	Description	Example
Task-relatedness	High	Human capital indicators specific to entrepreneurial tasks of founding, developing, and operating a business.	Start-up experience, management experience, industry experience, entrepreneurial competence, opportunity recognition skill, organizing skill, industry skill, business degree, new resource skill, business skill, entrepreneurial knowledge, parents in business, perceived specific skill
	Low	Human capital indicators that are <i>not</i> specific to entrepreneurial tasks of founding, developing, and operating a business.	Education, educational level, years as employee, large firm experience, work experience, job experience, perceived general skill
Knowledge vs. experience	Knowledge	Results of learning experience. Measures reflecting what the <i>owner has acquired</i> in the past.	Business skill, entrepreneurial knowledge, opportunity recognition skill, organizing skill, industry skill, new resource skill, perceived general skill, social skill, organization skill, decision skill, technical skill, expertise
	Experience	Measures reflecting an opportunity to learn, a learning experience. Measures of what the owner <i>did</i> in the past.	Industry experience, management experience, education, educational level, years as employee, work experience

A1 Coding Scheme: Study 1 (continued)

Moderator Variable	Level of Moderator	Description	Example
Developmental status	Less developed	Countries receiving official development assistance or aid (including territories in transition). Source: OECD Development Assistance Committee (DAC)	Zimbabwe, Namibia, South Africa, India, Poland, Croatia, Ghana, Jamaica, China, Israel/Palestine, Fiji
	Developed	Non recipients of developmental aid.	United States, Germany, United Kingdom, Sweden, Spain, Netherlands
Industry	High technology	Industries representing the new economy/knowledge	Biotechnology, telecommunication, computer technology
	Low technology	Traditional industries.	Manufacturing, retail/trade, gastronomy, construction, tourism
Age of business	Young	< 8 years	
	Old	> 8 years	

A1 Coding Scheme: Study 1 (continued)

Moderator Variable	Level of Moderator	Description	Example
Three approaches	Schooling	Measures reflecting formal education of the owner.	Years of education, educational level, business degree
	Cognitive ability	Measures of general mental ability and information processing speed.	Connecting numbers test, Raven, Wechsler digit span, Raven Advanced Progressive Matrices
	Resource-based view	Measures of specific, idiosyncratic experience and entrepreneurship specific knowledge and skills.	Industry experience, entrepreneurial knowledge, industry skills, entrepreneurial skills
Success measurement	Size-oriented	Measures indicating size of the business.	Number of employees, sales, equipment value
	Growth-oriented	Measures indicating growth of the business.	Sales growth, profit growth, customer growth, employment growth
	Profit-oriented	Measures indicating business outcomes in terms of profit, personal income, or return.	Profit, income, ROA, ROI, ROE

A2 Measurement Instrument (Study 2)

Interview of small scale business entrepreneurs / business owners South Africa 2003

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Michael Gielnik, University of Giessen
Christine Hilling, University of Giessen

Interviews done by the University of Giessen

Start / Introduction

- "Can I talk to the owner?"
- "For how long do you own this business now?"
- "Can you tell me, how many employees you employ here in this business?" (Min. 1 employee, max. 50 employees)

"I would like to ask you to participate in a research project on business owners. It is not supported by anyone here in South Africa; it is conducted by a German university. We are interested in how owners of a small business run their business. Of particular interest is how you learn as a business owner. It is not only about financial issues. We are also interested in how you go about things, for example, deal with employees, make decisions about your products, marketing, etc."

"All of the information that you give us will be kept absolutely confidential."

"The interview will take about 2 hours. All of those interviewed found it interesting to participate, because it gives you a chance to think about how you have done things and it may give you ideas of how to be more effective in the future. If you are interested in the results, we will send you a short report of our research, after we have finished our study."

"We would appreciate it, if we could write down things during the interview."

Before you begin

- ⇒ make sure that background sounds are reduced as far as possible.
- ⇒ note: - the subject number (your personal number plus running number of this person) on all pages of your notes!
 - your name
 - date
 - time of interview start and after you've finished the time of interview end
- ⇒ questions marked with **(F)**: Fact information, no detailed report necessary
- ⇒ questions marked with **(D)**: Detailed description of the subject's words necessary - also and particularly his / her examples.

1. General Information

- 1. (F) Are you Mr. / Mrs. X?
- 1.1.1 (F) Are you the person who was interviewed by two of our colleagues from the University of Gießen in 1999? → if “yes” go to 1.2
- 1.1.2 (F) Is the owner who was interviewed still active in the business?
- 1.2 (F) Are you the owner of this business?
- 1.2.1 (F) Are there any other owners?
- 1.3 (F) Did you start this business yourself?
- 1.4 (F) When did you start your business?
- 1.5 (F) How many employees do you have at the moment?
- 1.5.1 (F) How many of your employees are full-time employees?

!!! If you notice that the business doesn't exist for at least one year or the owner doesn't have a minimum of one employee, **stop** the interview at this point. Sometimes it may be useful to actually see the employee or ask the employee as well. (This does not apply to longitudinal subjects.)

- 1.6 (D) Which line of business are you in?
Please describe your products.
- 1.7.1 (F) How many hours do you work per week?
- 1.7.2 (F) How many months do you work per year?
- 1.8 (F) How much money did you have to start your business?
- 1.8.1 (F) How much of that was your own?
- 1.9.1 (F) Are you a member of the chamber of commerce?
- 1.9.2 (F) Are you member of a co-operative?
- 1.9.3 (D) Are you member of any other association society or club that helps you to enhance your business? Please specify.
- 1.10.1 (F) Are you registered? Do you pay tax? → if "no" go to 2.1
- 1.10.2 (F) When did you become registered?

2. Human Capital

- 2.1 (F) For how many years did you go to school?
- 2.1.1 (F) What's your highest degree of formal education?
- 2.2 (F) Have you ever received training concerning entrepreneurship or self-employment? → if “no” go to 2.3
- 2.2.1 (F) What was it?
- 2.3 (F) Have you ever been self-employed before you started this business? → if "no" go to 2.4

- 2.3.1 (F) What line of business were you in? (What were your products?)
- 2.3.2 (F) For how long did you run that business?
- 2.4 (F) Have you ever been employed before you started this business? → if "no" go to 2.5
- 2.4.1 (F) What line of business were you in?
- 2.4.2 (F) For how long did you work as an employee? Are you currently employed?
- 2.4.3 (F) Can you give me all positions that you have had in your previous job(s)?
- 2.5.1 (D) Is there any other person in your family or among your friends, who is a business owner as well? Who is it?

!!! Show answer scale I

- 2.5.2 (F) How close are / were you to that person?
- 2.6 (F) What is your age?
- 2.7 (F) What is your first language?

3. Procedural Knowledge – Introduction of a new product

- 3.0 In the following section we have a little game for you. Please imagine for a moment that you are the business owner in this game.
You are in the beverage industry and you want to introduce a new product. The product is called ‘Lemon De-Light’ and it is a diet lemonade.
Your next task is to decide whether you want to introduce the new product or not.
- 3.1 (D) What information do you need?

!!! You need to know whether a statement can be assigned clearly to one category. Be sure not to suggest concreteness. (Ask: What do you mean? Why would you do this? But never ask for examples or specific details!)

The following statements require further inquires!

Statement	Ask
Need to know if there is a niche, gap in the market, if product is new in the market.	How do you want to find out that there is a niche, gap in the market?
Send out teams.	Why do you send out teams?
I want to get information.	What information would you like to get?
Advertising, promotion, marketing, make it transparent.	What do you mean, what would you do?
Hand out free samples, prototypes.	Why would you hand out free samples, prototypes?
I have to know what my target group is.	Why do you want to know what your target group is?
Know your product properly.	What do you mean by this?

!!! If subject stops, ask: “What else, what further information do you need?”

!!! If subject stops for a second time: “Suppose you decide to go ahead and to introduce the product to the market. You want to find an effective way to do so. What information do you need?”

!!! If subject stops for a third time, summarize what subject said and ask: “Is there anything left, anything else you would like to know before you make your decision to introduce the product in an efficient way?”

!!! Do not summarize before subject has stopped for a third time and do not ask for a fourth time if subject stops again!

4. Learning Behaviour and Activities applied as Deliberate Practice

4.0 At this point we would like to talk about things that you do to become a better business owner.

Prompts:

- “I can imagine that today you are able to do / handle the tasks in your business a lot better than you did a year or two years ago. What exactly did you do to improve yourself in that sense?”
- “What do you do on a regular basis to improve your competence constantly?”
- “What do you do to become an expert e.g. in the field of Marketing and Sales?”
- “When you think of the time when you started your business and now, you have certainly become a better business owner”

!!! Show **cards with learning activities**

4.1.0 In the following I want to present you a number of activities that might be helpful to improve your competence. Please, tell me whether or not you do any of these activities. Please, look at the cards!

1. Attending Seminars, Workshops, Courses
2. Professional Reading
3. Exploring New Strategies
4. Observing Others
5. Asking for Feedback (Customer)
6. Consulting Colleagues or Experts
7. Private Conversation
8. Mental Simulation
9. Firm Meetings
10. Controlling / Checking (What is happening in my company?)

Following questions for each activity that is performed by the participant:

4.1.1 **(D)** Can you give me an example?

4.1.2 **(F)** How often do you perform this activity?

(Prompt: Please give me a rough figure that I can image how often this happens. Is it once a day or once a year or somewhere in between?)

4.1.3 / 4 **(D)** What have you learned from doing this activity? (important: evidence of learning, concreteness)

!!! Ask once: “Anything else you learn from performing this activity?”

!!! Show **answer scale I**

- 4.1.5 (F) How much do you learn from doing this activity?
 4.1.6 (F) How difficult do you find performing this activity?
 4.1.7 (F) How enjoyable do you find performing... (repeat activity here)?

The following statements require further inquiries!

Statement	Ask
Listen to Customers / Suppliers	Do you approach the clients / suppliers and ask them or is it rather that they approach you or, respectively, you hear by chance what they are saying?
Keep track of everything, must know your business, being up-to-date, always stay in front,	What do you do to...?
Look at gaps in the market	What do you do to find gaps in the market, to look at gaps in the market?
I talk to people	Whom do you talk to? Why, what for?
You are supposed to know what people want	How do find out what people want?
Change the place where I sell my items	‘Make clear whether subject goes always to the same places or really tries out new places (changes between two places vs. sells always at other places to see where to sell best)

5. Dealing with Learning Opportunities

5.0 In the following I want to present you a number of common situations. Please try to imagine yourself in each of the following situation:

5.1.1/2 (D) Please imagine the first situation: your employees are not working properly. How would you tackle this problem? Please give me all your thoughts, actions and ideas.

(Prompt: I am interested in the way you deal with problems. So how would you handle the problem that your employees are not working properly?)

!!! Once: What else would you do to solve this problem?

5.1.3 (F) Has this ever happened to you? → If “no” go to 5.2.1

5.1.3.1 (F) How often does it happen? (Prompt: Once a day or once a year or somewhere in between?)

!!! Show **answer scale II**

5.1.4 (F) In the future would you know at once how to solve the problem or would you have to think about a solution first?

5.1.5 (F) In the future do you think you can foresee such a problem or not? (Prompt: Do you think you know in advance when this problem will arise again?)

5.2.1/2 (D) Please imagine the second situation: you recognize that your number of customers decreases. What would you do to solve this problem?

(Prompt: I am interested in the way you deal with problems. So how would you handle the problem that the number of your customer decreases?)

!!! Once: What else would you do to solve this problem?

The following statements require further inquiries!

Statement	Ask
find out what is the problem in my business, find out what is not selling,	How do you want to find out?

5.2.3 (F) Has this ever happened to you? → if “no” go to 5.2.4

5.2.3.1 (F) How often does it happen? (Prompt: Once a day or once a year or somewhere in between?)

!!! Show **answer scale II**

5.2.4 (F) In the future would you know at once how to solve the problem or would you have to think about a solution first?

5.2.5 (F) In the future do you think you can foresee such a problem or not? (Prompt: Do you think you know in advance when this problem will arise again?)

5.3.0 Please, think of a situation (problem, barrier, constraint), in which you have learned something important from! What was it?

5.3.1 (D) How did you manage / tackle this situation?

5.3.2 (D) What have you learned from this situation?

!!! Once per question: “Anything else?”

5.3.3.1 (F) Was this the first time you had to deal with such a situation? → if “yes” go to 5.4.4

5.3.3.2 (F) How often did it happen before? (Once a day or once a year or somewhere in between?)

!!! Show **answer scale II**

5.3.4 (F) Did you know at once the necessary actions you had to take or did you not know at once all the necessary steps you had to take?

5.3.5 (F) Could you foresee the problem before it happened or did it happen out of the blue?

6. Knowledge Structure

!!! Spread out **cards with business keywords**

- 6.0 At this point I want to show you 20 cards with words on them. Please sort these cards into piles. You can make 3, 4, 5, or 6 piles. Whether you build 3, 4, 5, or 6 piles is completely up to you. We are interested in your opinion which cards are related to each other. Which cards do you think belong together? Please sort all cards which are related into one pile.
(Prompt: Look at each card and decide which of the cards have something in common. Then, sort these cards into one pile. Go on with the remaining cards. Sort every card into one pile.)

7. Employees

- 7.1.1 - 4 (F) How many employees, excluding yourself, did you have during 2000, 2001, 2002 and now? (full-time, part-time or apprentices)

	2000	2001	2002	2003
full-time				
part-time / apprentice				

- !!! You need to write down the numbers for each year separately. Use "X" if the business wasn't founded then and "0" if there were no employees in that particular year; count family members only if they are paid and have a regular job in the business.

8. Expertise

Now we'll talk about another area:

- 8.1 (D) If you could start your business again as you did in the year ..., what would you do differently? (also important: concreteness, evidence of learning)

!!! Show **answer scale III**

- 8.2.1.1 (F) How do you think other colleagues in your line of business see you as a business owner? Do others think you know a lot in the field of marketing and sales?
- 8.2.1.2 (F) How often do other business owners ask you for advice in this field? (Prompt: Is it once a day, once a year or somewhere in between?)
- 8.2.2.1 (F) How do you think other colleagues in your line of business see you as a business owner? Do others think you know a lot in the field of Production and Product Development?
- 8.2.2.2 (F) How often do other business owners ask you for advice in this field? (Prompt: Is it once a day, once a year or somewhere in between?)

9. Success

Before starting: Assure the subject of confidentiality! (This is just between you and me!)

!!! Show answer scale III

9.1 (F) Has the number of customers from 2000 to 2001 increased, decreased, or did it stay the same? Compared to the previous year, has the number of your customers increased or decreased? (%; same procedure for the comparison of 2001 to 2002 and from 2002 to 2003)

!!! Show answer scale III

9.2. (F) Have the sales from 2000 to 2001 increased, decreased, or did they stay the same? Compared to the previous year, has the amount of sold goods increased or decreased? (%; same procedure for the comparison of 2001 to 2002 and from 2002 to 2003)

!!! Show answer scale III

9.3 (F) Has your profit from 2000 to 2001 increased, decreased, or did it stay the same? Compared to the previous year, has your profit increased or decreased? (%; same procedure for the comparison of 2001 to 2002 and from 2002 to 2003)

9.4 (F) How much of your profit do you monthly take out of your business for yourself? (%)

Now show **answer scale IV**

- 9.5 (F) How successful do you think others say you are as a business owner?
- 9.6 (F) How successful are you as a business owner compared to your competitors?
- 9.7 (F) How satisfied are you with your work as a business owner? (☹...☺...☺)
- 9.8 (F) How satisfied are you with your current income? (☹...☺...☺)

9.9 Make a table for average, low, and high months and fill in together with participant

	Number of Months	Sales Level
Average		
Low		
High		

When you think of last year's sales:

- 9.9.1 (F) How many month did you have average sales?
- 9.9.2 (F) What is the sales level (ZAR) in months of average sales?
- 9.9.3 (F) How many month did you have low sales?
- 9.9.4 (F) What is the sales level (ZAR) in months of low sales?
- 9.9.5 (F) How many months did you have high sales?
- 9.9.6 (F) What is the sales level (ZAR) in months of high sales?

When you think of last week (if it is more appropriate to the subject, use last month and divide numbers by four when rating):

- 9.10.1 (F) What were your sales (ZAR) during the past week/month?
- 9.10.2 (F) What were your expenses (ZAR) during the past week/month?
- 9.10.3 (F) How much profit (ZAR) did you make past week/month?
- 9.10.4 (F) Was the past week a good, a bad, or an average week?
- 9.11.1 (F) How much money did you spend altogether on equipment (tools, machinery, vehicles, computers, furniture etc.)?
- 9.11.2 (F) If you sold that today, how much would it be worth?
- 9.11.3 (F) If you bought that today, how much would you have to pay for it?

10. Intelligence

Now we want to do a little game with you, it is like a puzzle. You see the image on the top and there is always one piece missing in the lower right corner. At the bottom there are some options and you have to figure out which one fits in the missing place. There is only one right option, the others are all wrong. To figure out which one is right we can give you the hint that there is always a rule from the top to the bottom line and from the left to the right column. If you figure out the rule that applies to the image, you will know which piece is missing.

11. Business Questionnaire

12. Questionnaire (EO, Learning Motivation, Learning Self-Efficacy)

Note down the end of interview time!

Answer Scale I South Africa 2003

How close are / were you to that person?

not at all close				very close
1	2	3	4	5

From performing this activity I learn...

very little				a lot
1	2	3	4	5

When I perform this activity I find it...

very easy				very difficult
1	2	3	4	5

When I perform this activity I find it...

not at all enjoy- able				very enjoyable
1	2	3	4	5

Answer Scale II
South Africa 2003

In the future would you know at once how to solve the problem or would you have to think first?

I would know at once what to do.				I would have to think first.
1	2	3	4	5

In the future this situation...

can be foreseen.				will happen out of the blue.
1	2	3	4	5

Did you know at once how to solve this problem or did you have to think first?

I knew at once what to do.				I had to think first.
1	2	3	4	5

This situation...

could be foreseen.				happened out of the blue.
1	2	3	4	5

**Answer Scale III
South Africa 2003**

Colleagues think I know a lot in the field of ...

true				false
1	2	3	4	5

2000	2001	2002	2003
increase	increase	increase	increase
decrease	decrease	decrease	decrease
same	same	same	same

0% — 10% — 20% — 30% — 40% — 50% — 60% — 70% — 80% — 90% — 100%

**Answer Scale IV
South Africa 2003**








1) How successful do you think others say you are as a business owner?

not at all successful () 1	not that successful () 2	medium successful () 3	somewhat successful () 4	very successful () 5
-----------------------------------	---------------------------------	-------------------------------	---------------------------------	-----------------------------








2) How successful are you as a business owner compared to your competitors?

not at all successful () 1	not that successful () 2	medium successful () 3	somewhat successful () 4	very successful () 5
-----------------------------------	---------------------------------	-------------------------------	---------------------------------	-----------------------------

3) How satisfied are you with your work as a business owner?

						
() -3	() -2	() -1	() 0	() 1	() 2	() 3

4) How satisfied are you with your current income?

						
() -3	() -2	() -1	() 0	() 1	() 2	() 3

Cards: Deliberate Practice Activities

**Attending Seminars,
Workshops, Courses**

Professional Reading

**Exploring New
Strategies /
Trying out Things**

Observing Others

**Asking for Feedback
(Customer)**

**Consulting Colleagues
or Experts**

Private Conversation

**Mental Planning /
Simulation**

Firm Meetings

**Controlling / Chec-
king**

Cards: Structured Recall/Knowledge Structure

Planning

Working Capital

Income

Bookkeeping

Cash-Flow

Costs

Controlling

Goal Setting

Decision Making

Delegation

Advertising

Training

Branding

Market Research

Customer Needs

Back-Up Service

Labour Law

Manpower Requirements

Recruitment

External Evaluation Sheet

External Evaluation South Africa 2003
--

To be filled in by interviewer!		
Subject No:	Date:	Interviewer:

1. How successful do you think is the person in question as a business owner in comparison with his/her competitors?

most successful business owner	belongs to the 10% most successful business owners	belongs to the upper 25% of successful business owners	belongs to the more successful half of business owners	belongs to the less successful half of business owners
()	()	()	()	()

2. How successful do you think is the person in question as a business owner in comparison with his/her competitors?

not at all successful	not that successful	medium successful	somewhat successful	very successful
()	()	()	()	()

3. How much does the person in question know in the area of Marketing and Sales?

knows very little				knows a lot
()	()	()	()	()
1	2	3	4	5

4. How much does the person in question know in the area of Production and Product Development?

knows very little				knows a lot
()	()	()	()	()
1	2	3	4	5

note: Multiple answers are possible!

5. What is your relationship to the person/business owner in question?

- a) () I am a neighbour.
- b) () I am the manager of the business site / industrial hive.
- c) () I am the manager of the growth point.
- d) () I am a competitor.
- e) () I am an employee.
- f) () I am a family member.
- g) () I am a member of the same co-operative.
- h) () I work at the chamber of commerce.
- i) () We are both members of the chamber of commerce.
- j) () I am a friend.
- k) () other: _____.

6. How long do you know each other? Please give an approximation of months and years.

Interviewer's Evaluation Sheet

Interview of small scale business owners South Africa 2003		
Interviewer evaluation		
subject no.:	rater:	rater (1st, 2nd, ...):
interviewer:	date:	

		1	2	3	4	5
1	understood the questions	didn't ()	()	()	()	understood ()
2	S was interested in participating	not at all ()	()	()	()	definitely ()
3	estimate of IQ	low ()	()	()	()	high ()
4	subject's gender	male ()	female ()			
5	interview was done in	English ()	mainly English ()			
6	S was also subject in 1999	no ()	yes ()			
7	S participated in the pre-study	no ()	yes ()			
8	S is WECBOF member	no ()	yes ()			
9	estimate of time pressure (incl. how hard/easy it is to get an appointment)	low ()	()	()	()	high ()
10	interview was broken off at some point	no ()	yes ()			
11	3rd world business vs. 1st world business	3rd world ()	()	()	()	1st world ()
12	general impression of entrepreneurial success	low ()	()	()	()	high ()
13	sureness of interviewer of his/her judgement (on entrepreneurial success)	low ()	()	()	()	high ()
14	standard of equipment	low ()	()	()	()	high ()
15	business is located in a growth point or business site	no ()	yes ()			
16	S is Expert in the area of Marketing and Sales	low ()	()	()	()	high ()
17	S is Expert in the area of Production and Product Development	low ()	()	()	()	high ()
18	behaves actively / passively	passive ()	()	()	()	active ()
19	ambitiousness	low ()	()	()	()	high ()
20	autonomous drive	low ()	()	()	()	high ()
21	innovativeness	low ()	()	()	()	high ()
22	level of initiative	low ()	()	()	()	high ()

A2 Measurement Instrument (Study 2)

23	risk taking	low ()	()	()	()	high ()
24	competitive aggressiveness	low ()	()	()	()	high ()
25	learning orientation	low ()	()	()	()	high ()

		1	2	3	4	5
26	emotional stability	low ()	()	()	()	high ()
27	achievement orientation	low ()	()	()	()	high ()
28	personal integrity	low ()	()	()	()	high ()
29	energetic behaviour	low ()	()	()	()	high ()
30	interaction with employees (hostile vs. friendly)	hostile ()	()	()	()	friendly ()
31	authoritarianism (power distance towards employees)	low ()	()	()	()	high ()
32	wants to look good	low ()	()	()	()	high ()
33	underplays vs. exaggerates his achievements	underplays ()	()	()	()	exaggerates ()
34	linkage to formal sector	not present ()	()	()	()	present ()
35	passive vs. active coping	passive ()	()	()	()	active ()
36	learned helplessness	low ()	()	()	()	high ()
37	externalisation of responsibility (e.g. lack of capital, government, bad luck)	low ()	()	()	()	high ()
38	externally / internally controlled	externally ()	()	()	()	internally ()
39	S seemed to invent Deliberate Practice Activities	low ()	()	()	()	high ()
40	learns slowly vs. learns quickly	slowly ()	()	()	()	quickly ()
41	S sees problems as challenges / opportunities to learn	low ()	()	()	()	high ()
42	estimation of structuredness of knowledge	low ()	()	()	()	high ()
43	S was motivated to fill in the questionnaire	low ()	()	()	()	high ()
44	S understood the questionnaire	not at all ()	()	()	()	very well ()

Finish Time:

THE BUSINESS QUESTIONNAIRE

INSTRUCTIONS

Please answer the questions below. Read the whole problem carefully and then chose the answer which you believe is the best one. Please choose only one answer for every problem.

1. Profit is determined by:

- | | |
|---|---|
| * | a) Business income minus expenses. |
| | b) Business income minus wages. |
| | c) Business income minus advertising costs. |

1. Market research is important for:

- | | |
|---|--|
| * | a) Determining whether or not your products or services will sell. |
| | b) Recruiting employees. |
| | c) Keeping within the law. |
| | d) Creating new demands in the market. |

2. Which is the best method of checking on business progress?

- | | |
|---|--------------------------------------|
| * | a) Inspecting the business accounts. |
| | b) Number of customers. |
| | c) Volume of sales. |

3. Why is advertising important?

- | | |
|---|--|
| * | a) The public learns about your product. |
| | b) You can be proud of your business. |
| | c) It helps you get loans. |

4. A sale is completed when:

- | | |
|---|---------------------------------|
| * | a) Agreement has been reached. |
| | b) Only when money has changed. |

5. Which of the following is a business expense?

- | | |
|---|--|
| | a) Donations to charity. |
| * | b) Repairs to plumbing on the business premises. |
| | c) Payment for tax advice. |

d) Paying for a party to which customers are invited.

6. Companies are taxed on income on the rate of:

- a) 25%
 b) 30%
 c) 35%

7. Who should contribute to the Unemployment Insurance Fund (UIF)

- a) Only workers older than 24 years.
 b) Every worker who earns more than R2,400 per month.
 c) All workers who work for at least 24 hours a month.

8. If business is bad:

- a) A borrower may reschedule payment of the debt.
 b) A borrower may only reschedule payment of the debt with the agreement of the lender.

9. Which of the following could be a source of finance for business expansion?

- a) Loan from bank.
 b) Government subsidy.
 c) The Compensation Fund of South Africa.

10. Collateral for a loan is required:

- a) To protect the interests of the lender.
 b) To keep certain people from entering business.

11. When is an employer not legally permitted to dismiss an employee?

- a) Because of participation in a procedural strike.
 b) Because of stealing company goods.
 c) In case of not performing duties properly.

12. Turnover is determined by:

- a) Volume of sales.
 b) Sales multiplied by price per unit
 c) Profit plus taxes.

13. Which information does not need to be included in the accounting records?

- | | |
|-------------------------------------|--|
| <input type="checkbox"/> | a) The assets and liabilities of the company, cash-receipts and payments, and details of goods purchased and sold. |
| <input type="checkbox"/> | b) A fixed-assets register and annual stock-taking (inventory) statements. |
| <input checked="" type="checkbox"/> | c) The cash-flow index and conditions of repayment. |

14. The price of a service or item should be based on:

- | | |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | a) Direct materials, labour, and overheads. |
| <input type="checkbox"/> | b) Direct materials, taxes, and wages. |
| <input type="checkbox"/> | c) Volume of sales and turnover. |

15. Who receives all the net profit or loss from the business?

- | | |
|-------------------------------------|--|
| <input checked="" type="checkbox"/> | a) Owner of a Sole Proprietorship |
| <input type="checkbox"/> | b) Proportionately the member of a Close Corporation depending on the number of members. |
| <input type="checkbox"/> | c) Proportionately the member of a Private Company depending on the number of members. |

16. Which statement about balance sheets is true?

- | | |
|-------------------------------------|--|
| <input type="checkbox"/> | a) It provides the reader with information about profits and losses of the business. |
| <input type="checkbox"/> | b) If the debts top the amount of capital resources, the balance sheet will be negative. |
| <input checked="" type="checkbox"/> | c) The sum of assets equals the sum of liabilities. |

17. Which statement concerning advertising in daily newspapers is true?

- | | |
|-------------------------------------|--|
| <input type="checkbox"/> | a) Definitely, the reader will read your commercial when he has bought the newspaper. |
| <input type="checkbox"/> | b) Definitely, you reach your target group. |
| <input checked="" type="checkbox"/> | c) Definitely, the reader can review the information in the commercial as long as he wants to. |

18. Which statement is true? A good relationship to one customer is helpful because:

- | | |
|-------------------------------------|--|
| <input type="checkbox"/> | a) It proves that you have run good commercials. |
| <input type="checkbox"/> | b) You do not have to look for new customers. |
| <input checked="" type="checkbox"/> | c) The customer can recommend you to prospects. |

19. The break-even point gives you information about:

- | | |
|-------------------------------------|--|
| <input type="checkbox"/> | a) The point in time you will be out of stock and you need new materials or resources. |
| <input checked="" type="checkbox"/> | b) The point at which the turnover equals all the costs for material, labour, and overheads. |
| <input type="checkbox"/> | c) The point where the machines run at the necessary capacity to make them profitable. |

To be filled in by the interviewer:	subject number: interviewer: date:
--	--

Please fill in this questionnaire by ticking the correct answer as shown in the following example. Be cautious to answer every question. If you have any further questions, please ask the interviewer.

Example:

You answer question by ticking the correct answer. Here, a person has answered that the statement „I am taller than most other people“ is very false for him/her.

	applies not at all to me			applies definitely to me	
I am taller than most other people.	-- (X) 1	- () 2	+/- () 3	+ () 4	++ () 5

If you do not understand a question, please make a cross before that question – thank you!

Do the following statements apply to you?

	Strongly agree				Strongly disagree
lersel1 Learning has never been one of my strengths.	() 1	() 2	() 3	() 4	() 5
lersel2 I believe I can develop new methods to handle changing aspects of my job.	() 1	() 2	() 3	() 4	() 5
lersel3 Even though it may be difficult, I know that I am able to learn necessary things for my job.	() 1	() 2	() 3	() 4	() 5
lersel4 I am confident that I can gain skills or knowledge while performing my job.	() 1	() 2	() 3	() 4	() 5
lersel5 If I were offered a job in a field which I didn't know much about, I think I could learn to do the job well.	() 1	() 2	() 3	() 4	() 5
lernmo1 I am very enthusiastic about learning new things.	() 1	() 2	() 3	() 4	() 5
lernmo2 I would participate in learning and development knowing there was no guarantee of a pay increase.	() 1	() 2	() 3	() 4	() 5
lernmo3 Learning new things is of little use to me because I have all the knowledge and skill I need to successfully perform my job.	() 1	() 2	() 3	() 4	() 5
lernmo4 I always look for opportunities to improve my skills.	() 1	() 2	() 3	() 4	() 5

A2 Measurement Instrument (Study 2)

lernmo5 I am willing to invest effort to improve skills and competencies related to my job as a business owner.	() 1	() 2	() 3	() 4	() 5
sexpms I have a lot of knowledge in the field of Marketing and Sales.	() 1	() 2	() 3	() 4	() 5
sexppd I have a lot of knowledge in the field of Production and Product Development.	() 1	() 2	() 3	() 4	() 5

	applies not at all to me	applies a little to me	medium	applies a lot to me	applies definitely to me
CmpA 1 I want to beat my competitors	() 1	() 2	() 3	() 4	() 5
CmpA 2 I attempt to push my competitors out of the market (e.g., by undercutting their price)	() 1	() 2	() 3	() 4	() 5
CmpA 4 When I compete with another business for a contract, I try to get the contract by any means necessary, even if I have to hurt him or her	() 1	() 2	() 3	() 4	() 5
CmpA 5 In our business area we are all working together even with my competitors	() 1	() 2	() 3	() 4	() 5
lrno 1 I try to learn systematically by reading relevant literature.	() 1	() 2	() 3	() 4	() 5
lrno 5 I learn from my competitors.	() 1	() 2	() 3	() 4	() 5
lrno 8 I get as much information as I can about business when watching TV or when reading newspapers, etc.	() 1	() 2	() 3	() 4	() 5
lrno12 Analyzing my mistakes can help me to improve my business.	() 1	() 2	() 3	() 4	() 5
lrno13 I frequently participate in business trainings.	() 1	() 2	() 3	() 4	() 5
lrno14 Critical comments by employees help me to improve my business.	() 1	() 2	() 3	() 4	() 5
lrno15 I go to my business / trade fairs to get to know about new technologies or developments in my industry.	() 1	() 2	() 3	() 4	() 5
lrno16 I scan the internet for business advice or new ideas.	() 1	() 2	() 3	() 4	() 5
React3 I only change things if I need to do it.	() 1	() 2	() 3	() 4	() 5
React4 I only change things if I have seen it work in similar businesses.	() 1	() 2	() 3	() 4	() 5

A2 Measurement Instrument (Study 2)

React6 I do things exactly how other people do them.	() 1	() 2	() 3	() 4	() 5
	applies not at all to me	applies a little to me	medium	applies a lot to me	applies definitely to me
React7 I do things only when they are really necessary to them.	() 1	() 2	() 3	() 4	() 5
React9 I always follow the advice of other people.	() 1	() 2	() 3	() 4	() 5
React11 I give up pursuing a target when I see that it does not work out.	() 1	() 2	() 3	() 4	() 5
React12 I adapt my business goals to those of my competitors.	() 1	() 2	() 3	() 4	() 5
React13 I only introduce change when there is no other way around it.	() 1	() 2	() 3	() 4	() 5

How do the following statements apply to you?

	very false					very true
exloc1 To a great extent my life is controlled by accidental happenings.	--- () 1	-- () 2	- () 3	+ () 4	++ () 5	+++ () 6
inloc1 When I make plans, I am almost certain to make them work.	--- () 1	-- () 2	- () 3	+ () 4	++ () 5	+++ () 6
exloc2 Often there is no chance of protecting my personal interest from bad luck happenings.	--- () 1	-- () 2	- () 3	+ () 4	++ () 5	+++ () 6
exloc3 When I get what I want, it's usually because I'm lucky.	--- () 1	-- () 2	- () 3	+ () 4	++ () 5	+++ () 6
exloc4 People like myself have very little chance of protecting our personal interests when they conflict with those of strong pressure groups.	--- () 1	-- () 2	- () 3	+ () 4	++ () 5	+++ () 6
exloc5 It's not always wise for me to plan too far ahead because many things turn out to be a matter of good or bad fortune	--- () 1	-- () 2	- () 3	+ () 4	++ () 5	+++ () 6
exloc6 Whether or not I get to be a leader depends on whether I'm lucky enough to be in the right place at the right time.	--- () 1	-- () 2	- () 3	+ () 4	++ () 5	+++ () 6
inloc2 I can pretty much determine what will happen in my life.	--- () 1	-- () 2	- () 3	+ () 4	++ () 5	+++ () 6
inloc3 I am usually able to protect my personal interests.	--- () 1	-- () 2	- () 3	+ () 4	++ () 5	+++ () 6
inloc4 When I get what I want, it's usually because I worked hard for it.	--- () 1	-- () 2	- () 3	+ () 4	++ () 5	+++ () 6

A2 Measurement Instrument (Study 2)

inloc5 My life is determined by my own actions.	---	--	-	+	++	+++
	() 1	() 2	() 3	() 4	() 5	() 6
exloc7 It's chiefly a matter of fate whether or not I have a few friends or many friends	---	--	-	+	++	+++
	() 1	() 2	() 3	() 4	() 5	() 6

	very seldom	seldom	medium	often	very often
ini2 Whenever something goes wrong, I search for a solution immediately.	() 1	() 2	() 3	() 4	() 5
ini3 Whenever there is a chance to get actively involved, I take it.	() 1	() 2	() 3	() 4	() 5
ini4 I take initiative immediately even when others do not.	() 1	() 2	() 3	() 4	() 5
ini5 I use opportunities quickly in order to attain my goals.	() 1	() 2	() 3	() 4	() 5
ini7 I am particularly good at realising ideas.	() 1	() 2	() 3	() 4	() 5

	strongly disagree strongly agree									
Ach 2 I spend considerable time making my business an example for excellence in our context (ach-beh)	() 1	() 2	() 3	() 4	() 5	() 6	() 7	() 8	() 9	() 10
Ach 3 I get excited when I am able to approach tasks in unusual ways. (ino-aff)	() 1	() 2	() 3	() 4	() 5	() 6	() 7	() 8	() 9	() 10
Ach 4 I enjoy being able to use old business concepts in new ways. (ino-aff)	() 1	() 2	() 3	() 4	() 5	() 6	() 7	() 8	() 9	() 10
Ach 5 I do every job as well as possible. (ach-beh)	() 1	() 2	() 3	() 4	() 5	() 6	() 7	() 8	() 9	() 10
Ach6 I make a conscientious effort to get the most out of my business resources. (ach-beh)	() 1	() 2	() 3	() 4	() 5	() 6	() 7	() 8	() 9	() 10
Ach 7 I get a sense of pride when I do a good job on my business projects. (ach-aff)	() 1	() 2	() 3	() 4	() 5	() 6	() 7	() 8	() 9	() 10
Ach 8 To succeed in business you must eliminate inefficiencies. (ach-cog)	() 1	() 2	() 3	() 4	() 5	() 6	() 7	() 8	() 9	() 10
Ach 9 I feel proud when I look at the results I have achieved in my business activities. (ach-aff)	() 1	() 2	() 3	() 4	() 5	() 6	() 7	() 8	() 9	() 10

A2 Measurement Instrument (Study 2)

Ach 11 To become successful in business you must spend some time every day developing new ideas. (ino-cog)	() 1	() 2	() 3	() 4	() 5	() 6	() 7	() 8	() 9	() 10
Ach 12 I make it a point to improve my business every day. (ach-beh)	() 1	() 2	() 3	() 4	() 5	() 6	() 7	() 8	() 9	() 10
Ach 13 It is important to continually look for new ways to do things in business. (ino-cog)	() 1	() 2	() 3	() 4	() 5	() 6	() 7	() 8	() 9	() 10
Ach 14 I often approach business tasks in novel ways. (ino-beh)	() 1	() 2	() 3	() 4	() 5	() 6	() 7	() 8	() 9	() 10
Ach 15 I feel good when I have worked hard to improve my business. (ach-aff)	() 1	() 2	() 3	() 4	() 5	() 6	() 7	() 8	() 9	() 10
Ach16 I enjoy finding good solutions for problems that nobody has looked at yet. (ino-aff)	() 1	() 2	() 3	() 4	() 5	() 6	() 7	() 8	() 9	() 10
Ach 17 I get real excited when I get new ideas to stimulate my business. (ino-aff)	() 1	() 2	() 3	() 4	() 5	() 6	() 7	() 8	() 9	() 10
Ach 18 It is important to approach business opportunities in unique ways. (ino-cog)	() 1	() 2	() 3	() 4	() 5	() 6	() 7	() 8	() 9	() 10
Ach 19 I usually seek out colleagues who are excited about exploring new ways of doing things. (ino-beh)	() 1	() 2	() 3	() 4	() 5	() 6	() 7	() 8	() 9	() 10
Ach22 I get a thrill out of doing new, unusual things in my business affairs. (ino-aff)	() 1	() 2	() 3	() 4	() 5	() 6	() 7	() 8	() 9	() 10

How confident are you that you can...

	Not at all sure										Very sure
Conf1 ...lead people well?	() 0%	() 10%	() 20%	() 30%	() 40%	() 50%	() 60%	() 70%	() 80%	() 90%	() 100%
Conf2 ...negotiate with fellow business men well?	() 0%	() 10%	() 20%	() 30%	() 40%	() 50%	() 60%	() 70%	() 80%	() 90%	() 100%
Conf3 ...negotiate with customers well?	() 0%	() 10%	() 20%	() 30%	() 40%	() 50%	() 60%	() 70%	() 80%	() 90%	() 100%
Conf4 ...keep an overview over your financial affairs well?	() 0%	() 10%	() 20%	() 30%	() 40%	() 50%	() 60%	() 70%	() 80%	() 90%	() 100%
Conf5 ...do the pricing of your products well?	() 0%	() 10%	() 20%	() 30%	() 40%	() 50%	() 60%	() 70%	() 80%	() 90%	() 100%
Conf6 ...communicate with other people well?	() 0%	() 10%	() 20%	() 30%	() 40%	() 50%	() 60%	() 70%	() 80%	() 90%	() 100%
Conf7 ...convince customers to buy products well?	() 0%	() 10%	() 20%	() 30%	() 40%	() 50%	() 60%	() 70%	() 80%	() 90%	() 100%
Conf8 ...deal with problems at work	()	()	()	()	()	()	()	()	()	()	()

A2 Measurement Instrument (Study 2)

well?	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Conf9 ...perceive business opportunities well?	() 0%	() 10%	() 20%	() 30%	() 40%	() 50%	() 60%	() 70%	() 80%	() 90%	() 100%
Conf10 ...do the marketing of your products well?	() 0%	() 10%	() 20%	() 30%	() 40%	() 50%	() 60%	() 70%	() 80%	() 90%	() 100%

	applies not at all to me	applies a little to me	medium	applies a lot to me	applies definitely to me
enviro1 My business environment makes it very difficult for me to make decisions.	() 1	() 2	() 3	() 4	() 5
enviro2 I can influence my business environment.	() 1	() 2	() 3	() 4	() 5
enviro3 Actions of competitors are quite easy to predict.	() 1	() 2	() 3	() 4	() 5
enviro4 I usually need a lot of information to make business decisions.	() 1	() 2	() 3	() 4	() 5
enviro5 Products / services quickly become obsolete in our industry.	() 1	() 2	() 3	() 4	() 5
enviro6 I can easily control my business environment.	() 1	() 2	() 3	() 4	() 5
enviro7 Consumer tastes are fairly easy to forecast in our industry.	() 1	() 2	() 3	() 4	() 5
enviro8 Many different aspects of my business environment influence the course of my company.	() 1	() 2	() 3	() 4	() 5

enviro9 Our firm must frequently change its products and practices to keep up with competitors.	() 1	() 2	() 3	() 4	() 5
enviro10 I have a lot of influence on my market.	() 1	() 2	() 3	() 4	() 5
enviro11 Technology changes more quickly in our industry than in other industries.	() 1	() 2	() 3	() 4	() 5

Thank you very much!

Guide for the Rating of the Marketing-Game

May 2003

Stimulus:

In the following section we have a little game for you. Please imagine for a moment that you are the business owner in this game. You are in the beverage industry and you want to introduce a new product. The product is called 'Lemon De-Light' and it is a diet lemonade. Your next task is to decide whether you want to introduce the new product or not. What information do you need?

Participants are expected to request information from four category groups: the market, the market participants, the use of marketing instruments, the environment. Answers shall be rated for number of relevant subcategories that are addressed, concreteness of ideas, completeness of desired information and general marketing knowledge.

- Number of relevant answers: Count number of ideas / statements / answers that correspond to a subcategory (content of categories). Different ideas within a subcategory count as one idea. For example, advertising in the media, sending out sales reps count as one for the subcategory "Ideas for Marketing".
- Concreteness: Does the subject give examples or describe in detail what he means? (e.g. "I have to know all about the market players, how many products are in the market, how well they sell, why they sell, who are the target groups" versus "I need to know who my competitors are")
- Completeness: How many of the categories for a complete approach to the task are covered?
- Marketing Knowledge: Give your general impression of the participants marketing knowledge (using all the above information and a weighting thereof)

Relevant Categories	Categories for Completeness	Content of Categories	Examples	
Market	1	Development of the beverage market		
		Development of the market for non-alcoholic beverages		
		Development of the market for diet beverages	<i>what is the growth in the particular product,</i>	
Participants of the Market	2	Competitors		
		Competitive Strength / Strength of Competition	<i>market share of all the players, if there is more than five, how many products in the market, how well do they sell, sales figures of other products</i>	
		Competitors` Reaction to Introduction	<i>competition will react and launch new product</i>	
		Strength of Program		
	<i>Not relevant for Completeness!</i>	Trade		
		Acceptance		
		Possible Marketing Functions upon introduction		
	3	Consumers		
		Price Conception	<i>price properly, price accordingly</i>	
		Consumer Needs and attitudes	<i>go to the streets, contact people, go to university / students, send out questionnaire, get feedback from clients, ask consumer</i>	
		Consumer Habits		
		Consumer Attitude towards Company as producer of diet lemonades		
	4	Producer		
Production Costs		<i>production costs</i>		
Marketing Costs				
	Existing capacity limits or financial restrictions	<i>have I enough machines to do the work, do I need new infrastructure</i>		

Instruments of Marketing	5	Ideas for Marketing	<i>You've got the outlets put it on the shelves, Model-shooting, look for the best name, send nice girls to clubs / shopping centres, branding</i>
		Selection of Media	<i>television, brochures, pamphlets, billboards, poster, newspaper</i>
		Price Range and Price Conditions as a marketing tool	<i>bargain price, less price for introduction</i>
		Form and Package	<i>appropriate package, labelling the product, how do we package this</i>
	6	Channels of Outlets and Distribution	<i>must be distributed, what outlets and channels to sell, where to sell bars or shops,</i>
	Storage and Transport	<i>how can I transport it, transport for delivering</i>	
Information about the environment	7	Duration of Food Trends	
		Regulations and food law	<i>SAB-Product, test to SA-Standards, how healthy is the food, is it harmful, aftereffects of the ingredients</i>

Other

- place, area, location
- people needed: bottling, representatives, marketing, quality checkers
- ingredients available on the markets
- labour intensive
- is it in the streamline of the company
-

The following statements require further inquires!

Statement	Ask
Niche, gap in the market, new in the market	How do you want to find out? How would you find out that there is a niche, gap in the market?
Send out teams	Why do you send out teams?
I want to get information	What information would you like to get?
Advertising, promotion, marketing, make it transparent	What do you mean, what would you do?
Free samples , Prototypes	Why would you hand out free samples, prototypes?
Know your product properly	What do you mean by this?
I have to know what my target group is.	Why do you want to know what your target group is?

Guide for the Rating of Deliberate Practice Activities

May 2003

Stimulus:

Show cards with potential Deliberate Practice Activities separately and ask:

1. Do you perform this activity in order to enhance your competencies?
2. Can you give me an example?
3. How often do you perform this activity?
4. What have you learned from doing this activity? (for each potential Deliberate Practice Activity)
5. How much do you learn from doing ...?
6. Do you find performing this activity difficult or not enjoyable or do you find it easy or enjoyable?

Activities identified from the Literature and the Pre-Study (as potential Deliberate Practice Activities)	Examples
Attending Seminars, Workshops, Courses	<i>Attending Seminars, Demonstrations of new products, I invite people to show what is new in the market, attending courses,</i>
Professional Reading	<i>Watching Videos, Media, getting Journals, reading business bulletins, brochures, read books, magazines, internet,</i>
Exploring New Strategies / Trial and Error	<i>try out new products or services, learn by trial and error, try out new designs and see people's reaction, change the set-up of goods and items, design new products, in my shop the customer always have new wishes and I always try to satisfy the new wishes, I tried to attract new customers by putting gifts into my shop,</i>
Observing Others	<i>we got to compare what is currently on the market, going abroad and looking for new ideas, visit conventions, walk around the shops, the fleet markets to look for opportunities, look what competitors are doing, watch how competition is doing, go to big companies and pick up what the current offer is, go out to different businesses to find out about prices, copy it from another company, stolen some ideas from bigger shops,</i>
Asking for Feedback (Customer)	<i>get feedback from the customers, asking existing clients, go to clients and talk about their needs, send out a questionnaire, ask consumer what they like, approach clients,</i>
Consulting of Colleagues or Experts	<i>talk to other leaders, do networking with other</i>

	<i>photographers, sharing ideas with students, chatting and listening to people, contact experts, talk with colleagues about prices and new styles, ask advices from the other guys in the market, phone experienced guys,</i>
Private Conversation	<i>talk to friends, meeting people in the pub, talk to my wife about business, talk to brother about business,</i>
Mental Planning / Simulation	<i>wondering mind, asking myself, thinking of new packages, new products, play in mind how to solve problems, strategize and think about things,</i>
Firm Meetings / Feedback from Employees	<i>staff meeting, brainstorming with employees,</i>
Controlling / Checking (What is happening in my company?)	<i>checking the stock to know what is selling</i>

The following statements require further inquiries!

Statement	Ask
Listen to Customers / Suppliers	Do you approach the clients / suppliers and ask them or is it rather that they approach you or, respectively, you hear by chance what they are saying?
Keep track of everything, must know your business, being up-to-date, always stay in front,	What do you do to...?
Look at gaps in the market	What do you do to find gaps in the market, to look at gaps in the market?
I talk to people	Whom do you talk to? Why, what for?
You are supposed to know what people want	How do find out what people want?
Change the place where I sell my items	'Make clear whether subject goes always to the same places or really tries out new places (changes between two places vs. sells always at other places to see where to sell best)

Rating:

1. Rating for each particular activity identified from the literature and the Pre-Study whether the subject performs this activity or not (no / yes – Rating). A “yes”-rating shall only be done:
 - a. when the subject performs the activity with the primary purpose to enhance his competence, skills, or knowledge **in business** or about new opportunities
 - b. when he is able to give a concrete example for this particular activity
 - c. when he performs the activity in order to enhance **his** competence (individual learning)
 - d. when the statement fits the category
 - e. when the activity is initiated by the business owner himself, the owner must proactively seek the information
 - f. when the activity goes beyond the daily business

2. Rating how regularly the subject performs each potential Deliberate Practice Activity he has mentioned (frequency per year).
3. Rating of concreteness of description of what subject has learned from performing potential Deliberate Practice Activity for each domain (Marketing and Sales, Product and Product Development, and Consumer Needs) (5-point-Likert).
4. Interviewer's estimation of subject's enhancement of competence, skills, or knowledge due to performing potential Deliberate Practice Activities in each domain (5-point-Likert).
5. Self-estimation of the subject of how much he learns by performing each activity. (5-point-Likert)
6. Indication of the subject how difficult or easy he finds performing the task. (5-point-Likert)
7. Rating of the overall effort the subject puts in to perform the potential Deliberate Practice Activities (5-point-Likert).

Examples

High effort in Deliberate Practice Activities (dpeff1):

In the area of marketing and sales I go around once a month ask existing clients where I can find probably new clients. This business has only been advertised by the word of mouth. Furthermore I get feedback from them, or leads, if a new business pops up. I get this kind of information also from the chamber of commerce or various organizations. I read the business bulletins from the chamber of commerce or organizations like WECBOF. We also go and try things inside, things we have seen and we convert here, we try out new products, new services. At the moment we are busy with a little pamphlet that we hand out to prospect clients. I look at gaps in the market, I walk around the shops, the fleet markets, always to look for opportunities. For example, once I have seen a picture frame, or some kind of plastic bag, and now we produce it, sometimes it becomes a fashion. I do also listen to all kind of people, I listen to my manufacturer, to some craft people or to people in the pub. I go there to find out what is happening and what can be done.

I have always a wondering mind, I call it a wandering mind. I sit down and wonder what else can we do and produce.

In the area of Product Development I got brochures from our association. I also take a trip to Europe to see what they are doing. I walk around and see what they are selling. I go there and look for new ideas and I visit conventions there.

I do also research on the toughness of materials. We test the materials how hard, how long they can run, and so, we establish our own standard.

Low effort in Deliberate Practice Activities (dpeff1):

I would like to do advertising, on TV, on radio, probably on T-Shirts, and I would like to go to school. Through business you learn, you ask people what they like. The consumer will tell you. I ask consumer. I ask how do these things look like, I ask those how buy things at my shop.

In the area of Product Development, I cannot say anything. I have to create employments for other people.

Definition of Mental Planning

Mental Planning is not a result and externally triggered by a difficult situation, but is initiated by the person and not forced as a reaction to a given situation. It is analyzing the business detached from a special situation.

Mental Planning: not a reaction to a given problem, does not happen as a result after a special situation;

Mental planning does occur before a special situation occurs to be well prepared and able to react immediately to a future problem, demand, challenges e.g. a introduction of a new product or business situation e.g. growth or a business meeting, initializing change or to be able to foresee future problems when introducing a new product. Mental planning is also analyzing the company to find gaps or flaws in order to find ways how to improve the efficiency of the company or special production steps.

To be well prepared for the future, generate new business opportunities

Definition of Controlling and Checking

Trying to control future problems, foresee risks and weaknesses. Check business data in order to plan the future development of the company.

Control the quality to find ways of improvement. Check the quality in order to detect mistakes. The goal must be an improvement of quality and not only to keep the quality standard. Control the staff to identify training needs in order to meet the demands and requirements of the business.

Control the stock in order to know what are the demands of the customer, what items are top-sellers and not only to know what materials to buy in the sense of stock control and not to simply restock only.

Coding Scheme Interview SA 2003

If you cannot code something for lack of information or because it is not necessary to code (e.g. because of branched question), use **X**.

0. Interview Information

0.1 k_sno	subject number		interviewer no. & 001 - max.				
0.2 k_area	business location	1 Blackheath	2 Athlone	3 Mitchell's Plain	4 Philippi	5 Cape Town	6 Other
0.3 k_intno	interviewer no.		01 = Christine 02 = Michael				
0.4 k_date	date of interview (d/m/y)						
0.5 k_time	total time of inter- view (minutes)						
0.6.1 k_rat1	rater 1						
0.6.2 k_rat2	rater 2						
0.6.3 k_rat3	rater 3						
0.6.4 k_rat4	rater 4						

1. General Information

1.0 k_name	Are you Mr. / Mrs. X	1 no	2 yes	
1.0.1 k_bla_co	black or coloured	1 black	2 coloured	
1.1.1 k_same	same person as 1999	1 no	2 yes	
1.1.2 k_active	owner still active in the business	1 no	2 yes	
1.2 k_owbus	owner of the busi- ness	1 no	2 yes	
1.2.1 k_othown	other business owners	1 no	2 yes (active)	3 yes (non-ac.)
1.3 k_selfes	business self- established	1 taken over	2 self- establ.	
1.4 k_est	year of establish- ment			
1.5 k_noemp1	current number of employees (over all)			
1.5.1 k_noemp2	number of full- time employees			
1.6.1 k_libu1	line of business manufacturing: textiles	1 no	2 yes	

1.6.2 k_libu2	line of business manufacturing: wood	1 no	2 yes												
1.6.3 k_libu3	line of business manufacturing: metal	1 no	2 yes												
1.6.4 k_libu4	line of business manufacturing: other	1 no	2 yes												
1.6.5 k_libu5	line of business construction	1 no	2 yes												
1.6.6 k_libu6	line of business trade: retail / trade	1 no	2 yes												
1.6.7 k_libu7	line of business trade: restaurants, bars, hotels, sha-beens	1 no	2 yes												
1.6.8 k_libu8	line of business services	1 no	2 yes												
1.6.9 k_libu9	line of business other	1 no	2 yes												
1.7.1 k_hours	number of working hours/week														
1.7.2 k_months	number of working months/year														
1.8 k_startc	starting capital														
1.8.1 k_ownper	How much of starting capital was own (%)														
1.9.1 k_chacom	member of chamber of commerce	1 no	2 yes												
1.9.2 k_coop	member of cooperative	1 no	2 yes												
1.9.3 k_club	club/society/assoc. to enhance business	1 no	2 yes												
1.10.1 k_formal	registered / pay tax	1 registered	2 pays taxes	3 tax & reg	4 does not know	5 no tax & not reg									
1.10.2 k_became	when registered														

2. Human Capital

2.1 k_eduyea	years of education														
2.1.1 k_edudeg	highest degree of formal education	0 none	1 standard 4	2 standard 5	3 standard 6	4 standard 7	5 standard 8	6 standard 9	7 O-Level / standard 10	8 A-Level / Matric	9 Technical	10 Bachelor	11 Diploma / Honest	12 Master	13 Ph.D / D.Sc
2.2 k_train	entrepreneurship training	1 no	2 yes												
2.2.1.1 train1	marketing	1 no	2 yes												
2.2.1.2 train2	finance	1 no	2 yes												
2.2.1.3 train3	customer relationship	1 no	2 yes												

2.2.1.4 train4	human resource / labour relations	1 no	2 yes						
2.2.1.5 train5	management	1 no	2 yes						
2.2.1.6 train6	sector specific	1 no	2 yes						
2.2.1.7 train7	others	1 no	2 yes						
2.3 k_earsel	self-employed before	1 no	2 yes	if "no", go to 2.4					
2.3.1 libusel	line of business self-employed before	0 none	1 same	2 other	3 both				
2.3.2 k_losel	how long self- employed before		months						
2.4 k_earemp	employed before and currently	1 no	2 yes before	3 yes currently	4 yes cur- rently and before	if "no", go to 2.5			
2.4.1 libuemp	line of business employed before	0 none	1 same	2 other	3 both				
2.4.2 k_loemp	how long em- ployed		months						
2.4.3.1 k_empce	position CEO	1 no	2 yes						
2.4.3.2 k_empma	position manager	1 no	2 yes						
2.4.3.3 k_empcl	position clerk	1 no	2 yes						
2.4.3.4 k_empwo	position worker	1 no	2 yes						
2.4.3.5 k_empho	position house worker	1 no	2 yes						
2.4.3.6 k_empot	position other	1 no	2 yes						
2.5.1 k_othfam	family member / friend bus. owner	0 none	1 parents	2 siblings	3 uncle/aunt	4 cousin	5 grand- parents	6 others	
2.5.2 howclos	how close								
2.6 age	age of subject								
2.7 k_lang	first language	1 Xhosa	2 Zulu	3 English	4 Afrikaans	5 Other			

3. Procedural Knowledge – Introduction of a new product

3.1.1 amount	number of rele- vant ideas								
3.1.2 complet	completeness of rel. categories	0 0/7	1 1/7	2 2/7	3 3/7	4 4/7	5 5/7	6 6/7	7 7/7
3.1.3 concret	concreteness of ideas	1 low	2	3	4	5 high	high: describes the information he needs in detail and gives many examples		
3.1.4 estmkno	est. of marketing knowledge	1	2	3	4	5			

4. Learning Behaviour and Activities applied as Deliberate Practice

4.1.1.1 attswc	attending seminars work-shops, courses	1 no	2 yes	rate “yes” only if subject performs activity to enhance the competence, skills, or knowledge and the example is sufficiently concrete		
4.1.2.1 attreg	how often attending seminars, work-shops, courses		Frequency per year			
4.1.3.1 homat	how much learning from attending seminars					
4.1.4.1 conat	concreteness of description of what subject has learned from attending seminars	1 low	2	3	4	5 high
4.1.5.1 eviat	evidence of learning attending seminars	1 low	2	3	4	5 high
4.1.6.1 hodat	how difficult attending seminars					
4.1.7.1 enjat	how enjoyable attending seminars					
4.1.8.1.1 areatms	competence enhancement in M & S	1 no	2 yes			
4.1.8.2.1 areatpd	competence enhancement in P & PD	1 no	2 yes			
4.1.8.3.1 areatot	competence enhancement in other areas	1 no	2 yes			
4.1.1.2 prore	professional reading	1 no	2 yes	rate “yes” only if subject performs activity to enhance the competence, skills, or knowledge and the example is sufficiently concrete		
4.1.2.2 proreg	how often professional reading		Frequency per year			
4.1.3.2 hompr	how much learning from prof. reading					
4.1.4.2 conpr	concreteness of description of what subject has learned from prof. reading	1 low	2	3	4	5 high
4.1.5.2 evipr	evidence of learning prof. reading	1 low	2	3	4	5 high
4.1.6.2 hodpr	how difficult professional reading					
4.1.7.2 enjpr	how enjoyable professional reading					

A2 Measurement Instrument (Study 2)

4.1.8.1.2 areprms	competence enhancement in M & S	1 no	2 yes			
4.1.8.2.2 areprpd	competence enhancement in P & PD	1 no	2 yes			
4.1.8.3.2 areprot	competence enhancement in other areas	1 no	2 yes			
4.1.1.3 explo	exploring new strategies	1 no	2 yes	rate "yes" only if subject performs activity to enhance the competence, skills, or knowledge and the example is sufficiently concrete		
4.1.2.3 exreg	how often exploring new strategies		Frequency per year			
4.1.3.3 homex	how much learning from exploring new strategies					
4.1.4.3 conex	concreteness of description of what subject has learned from exploring new strategies	1 low	2	3	4	5 high
4.1.5.3 eviex	evidence of learning exploring new strategies	1 low	2	3	4	5 high
4.1.6.3 hodex	how difficult exploring new strategies					
4.1.7.3 enjex	how enjoyable exploring new strategies					
4.1.8.1.3 areexms	competence enhancement in M & S	1 no	2 yes			
4.1.8.2.3 areexpd	competence enhancement in P & PD	1 no	2 yes			
4.1.8.3.3 arexot	competence enhancement in other areas	1 no	2 yes			
4.1.1.4 obser	observing others	1 no	2 yes	rate "yes" only if subject performs activity to enhance the competence, skills, or knowledge and the example is sufficiently concrete		
4.1.2.4 obreg	how often observing others		Frequency per year			
4.1.3.4 homob	how much learning from observing others					
4.1.4.4 conob	concreteness of descript..what subject learned from observing others	1 low	2	3	4	5 high
4.1.5.4 eviob	evidence of learning observing others	1 low	2	3	4	5 high

A2 Measurement Instrument (Study 2)

4.1.6.4 hodob	how difficult observing others					
4.1.7.4 enjob	how enjoyable observing others					
4.1.8.1.4 areobms	competence enhancement in M & S	1 no	2 yes			
4.1.8.2.4 areobpd	competence enhancement in P & PD	1 no	2 yes			
4.1.8.3.4 areobot	competence enhancement in other areas	1 no	2 yes			
4.1.1.5 askcu	asking for feedback (customer)	1 no	2 yes	rate "yes" only if subject performs activity to enhance the competence, skills, or knowledge and the example is sufficiently concrete		
4.1.2.5 askreg	how often asking for feedback (customer)		Frequency per year			
4.1.3.5 homas	how much learning from asking for feedback (cust.)					
4.1.4.5 conas	concreteness of description of what subject has learned from asking for feedback (cust.)	1 low	2	3	4	5 high
4.1.5.5 evias	evidence of learning asking for feedback (customer)	1 low	2	3	4	5 high
4.1.6.5 hodas	how difficult asking for feedback (customer)					
4.1.7.5 enjas	how enjoyable asking for feedback (customer)					
4.1.8.1.5 areasms	competence enhancement in M & S	1 no	2 yes			
4.1.8.2.5 areaspd	competence enhancement in P & PD	1 no	2 yes			
4.1.8.3.5 areasot	competence enhancement in other areas	1 no	2 yes			
4.1.1.6 consu	consulting colleagues or experts	1 no	2 yes	rate "yes" only if subject performs activity to enhance the competence, skills, or knowledge and the example is sufficiently concrete		
4.1.2.6 coreg	how often consulting colleagues or experts		Frequency per year			

4.1.3.6 homco	how much learning from consulting colleagues or experts					
4.1.4.6 conco	concreteness of description of what subject has learned from consulting colleagues or experts	1 low	2	3	4	5 high
4.1.5.6 evico	evidence of learning consulting colleagues/experts	1 low	2	3	4	5 high
4.1.6.6 hodco	how difficult consulting colleagues or experts					
4.1.7.6 enjco	how enjoyable consulting colleagues or experts					
4.1.8.1.6 arecoms	competence enhancement in M & S	1 no	2 yes			
4.1.8.2.6 arecopd	competence enhancement in P & PD	1 no	2 yes			
4.1.8.3.6 arecot	competence enhancement in other areas	1 no	2 yes			
4.1.1.7 prico	private conversation	1 no	2 yes			
4.1.2.7 prireg	how often private conversation		Frequency per year			
4.1.3.7 hompc	how much learning from private conversation					
4.1.4.7 conpc	concreteness of description of what subject has learned from private conversation	1 low	2	3	4	5 high
4.1.5.7 evipc	evidence of learning private conversation	1 low	2	3	4	5 high
4.1.6.7 hodpc	how difficult private conversation					
4.1.7.7 enjpc	how enjoyable private conversation					
4.1.8.1.7 arepcms	competence enhancement in M & S	1 no	2 yes			

rate "yes" only if subject performs activity to enhance the competence, skills, or knowledge and the example is sufficiently concrete

A2 Measurement Instrument (Study 2)

4.1.8.2.7 arepcpd	competence enhancement in P & PD	1 no	2 yes			
4.1.8.3.7 arepcot	competence enhancement in other areas	1 no	2 yes			
4.1.1.8 mplan	mental planning / simulation	1 no	2 yes	rate "yes" only if subject performs activity to enhance the competence, skills, or knowledge and the example is sufficiently concrete		
4.1.2.8 mpreg	how often mental planning / simulation		Frequency per year			
4.1.3.8 hommp	how much learning from mental planning / simulation					
4.1.4.8 conmp	concreteness of description of what subject has learned from mental planning / simulation	1 low	2	3	4	5 high
4.1.5.8 evimp	evidence of learning mental planning / simulation	1 low	2	3	4	5 high
4.1.6.8 hodmp	how difficult mental planning / simulation					
4.1.7.8 enjmp	how enjoyable mental planning / simulation					
4.1.8.1.8 arempms	competence enhancement in M & S	1 no	2 yes			
4.1.8.2.8 arempd	competence enhancement in P & PD	1 no	2 yes			
4.1.8.3.8 arempot	competence enhancement in other areas	1 no	2 yes			
4.1.1.9 firm	firm meetings	1 no	2 yes	rate "yes" only if subject performs activity to enhance the competence, skills, or knowledge and the example is sufficiently concrete		
4.1.2.9 fmreg	how often firm meetings		Frequency per year			
4.1.3.9 homfm	how much learning from firm meetings					
4.1.4.9 confm	concreteness of description of what subject has learned from firm meetings	1 low	2	3	4	5 high

A2 Measurement Instrument (Study 2)

4.1.5.9 evifm	evidence of learning firm meetings	1 low	2	3	4	5 high
4.1.6.9 hodfm	how difficult firm meetings					
4.1.7.9 enjfm	how enjoyable firm meetings					
4.1.8.1.9 arefmms	competence enhancement in M & S	1 no	2 yes	rate "yes" only if subject performs activity to enhance the competence, skills, or knowledge and the example is sufficiently concrete		
4.1.8.2.9 arefmpd	competence enhancement in P & PD	1 no	2 yes			
4.1.8.3.9 arefmot	competence enhancement in other areas	1 no	2 yes			
4.1.1.10 check	controlling / checking	1 no	2 yes			
4.1.2.10 ccreg	how often controlling / checking		Frequency per year			
4.1.3.10 homcc	how much learning from controlling / checking					
4.1.4.10 concc	concreteness of description of what subject has learned from controlling / checking	1 low	2	3	4	5 high
4.1.5.10 evicc	evidence of learning controlling / checking	1 low	2	3	4	5 high
4.1.6.10 hodcc	how difficult controlling / checking					
4.1.7.10 enjcc	how enjoyable controlling / checking					
4.1.8.1.10 areccms	competence enhancement in M & S	1 no	2 yes			
4.1.8.2.10 areccpd	competence enhancement in P & PD	1 no	2 yes			
4.1.8.3.10 areccot	competence enhancement in other areas	1 no	2 yes			
4.2 effovall	overall effort in performing Deliberate Pract. Activities	1 low	2	3	4	5 high

high: extraordinary effort regarding time and energy

5. Dealing with Learning Opportunities

5.1.1.1 noobs1	number observation / gathering info (sit. 1)	
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5.1.1.2 notho1	number of thoughts (sit. 1)						
5.1.1.3 noact1	number of actions (sit. 1)						
5.1.2 activ1	activeness of Problem Solving Activities (sit. 1)	1 low	2	3	4	5 high	<u>high</u> : activities show great level of activity of participant
5.1.3 evhap1	sit. 1 ever happened	1 no	2 yes				
5.1.3.1 often1	sit. 1 how often		Frequency per year				
5.1.4 rout1	routine vs. non-routine (sit. 1)						
5.1.5 anticip1	anticipated vs. randomly (sit. 1)						
5.2.1.1 noobs2	number observation / gathering info (sit. 2)						
5.2.1.2 notho2	number of thoughts (sit. 2)						
5.2.1.3 noact2	number of actions (sit. 2)						
5.2.2 activ2	activeness of Problem Solving Activities (sit. 2)	1 low	2	3	4	5 high	<u>high</u> : activities show great level of activity of participant
5.2.3 evhap2	sit. 2 ever happened	1 no	2 yes				
5.2.3.1 often2	sit. 2 how often		Frequency per year				
5.2.4 rout2	routine vs. non-routine (sit. 2)						
5.2.5 anticip2	anticipated vs. randomly (sit. 2)						
5.3.1.1 dealts	dealt efficiently with situation	1 low	2	3	4	5 high	
5.3.1.2 probor	dealt problem oriented	1 low	2	3	4	5 high	
5.3.2.1 conlear	concreteness what learned	1 low	2	3	4	5 high	
5.3.2.2 evilear	evidence of learning	1 low	2	3	4	5 high	
5.3.3.1 evhap	first time that it happened	1 no	2 yes				
5.3.3.2 often	how often happened before		Frequency per year				
5.3.4 rout	routine vs. non-routine						
5.3.5 anticip	anticipated vs. randomly						

6. Knowledge Structure

6.1 knostru	points in knowledge structure task	
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7. Employees

7.1.1 k_noem00	number of employees 2000	
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7.1.2 k_noem 01	number of employees 2001	
7.1.3 k_noem 02	number of employees 2002	
7.1.4 k_noem 03	number of employees 2003	

8. Expertise

8.1 k_dodiff	would do things differently	1 no	2 yes	if "no", got to 8.2		
8.1.1 k_conci	concreteness of ideas	1 low	2	3	4	5 high
8.1.2 k_learn	evidence of learning from experience	1 low	2	3	4	5 high
8.2.1.1 oexpms	others consider S has lots of knowledge in Marketing and Sales		Frequency per year			
8.2.1.2 givadms	how often S gives advice in Marketing and Sales					
8.2.2.1 oexppd	others consider S has lots of knowledge in Production and Prod. Develop.		Frequency per year			
8.2.2.2 givadpd	how often S gives advice in Production and Production and. Develop.					

9. Success

9.1.1 k_cus01	decrease / increase of customers 2000/2001	1 decrease	2 increase	3 same
9.1.1.1 k_cus01a	% decrease of customers 2000/2001			
9.1.1.2 k_cus01b	% increase of customers 2000/2001			
9.1.2 k_cus12	decrease / increase of customers 2001/2002	1 decrease	2 increase	3 same
9.1.2.1 k_cus12a	% decrease of customers 2001/2002			
9.1.2.2 k_cus12b	% increase of customers 2001/2002			
9.1.3 k_cus23	decrease / increase of customers 2002/2003	1 decrease	2 increase	3 same
9.1.3.1 k_cus23a	% decrease of customers 2002/2003			
9.1.3.2 k_cus23b	% increase of customers 2002/2003			
9.2.1 k_sal01	decrease / increase of sales 2000/2001	1 decrease	2 increase	3 same
9.2.1.1 k_sal01a	% decrease of sales 2000/2001			
9.2.1.2 k_sal01b	% increase of sales 2000/2001			
9.2.2 k_sal12	decrease / increase of sales 2001/2002	1 decrease	2 increase	3 same

9.2.2.1 k_sal12a	% decrease of sales 2001/2002			
9.2.2.2 k_sal12b	% increase of sales 2001/2002			
9.2.3 k_sal23	decrease / increase of sales 2002/2003	1 decrease	2 increase	3 same
9.2.3.1 k_sal23a	% decrease of sales 2002/2003			
9.2.3.2 k_sal23b	% increase of sales 2002/2003			
9.3.1 k_pro01	decrease / increase of profit 2000/2001	1 decrease	2 increase	3 same
9.3.1.1 k_pro01a	% decrease of profit 2000/2001			
9.3.1.2 k_pro01b	% increase of profit 2000/2001			
9.3.2 k_pro12	decrease / increase of profit 2001/2002	1 decrease	2 increase	3 same
9.3.2.1 k_pro12a	% decrease of profit 2001/2002			
9.3.2.2 k_pro12b	% increase of profit 2001/2002			
9.3.3 k_pro23	decrease / increase of profit 2002/2003	1 decrease	2 increase	3 same
9.3.3.1 k_pro23a	% decrease of profit 2002/2003			
9.3.3.2 k_pro23b	% increase of profit 2002/2003			
9.4 k_proout	% of profit taken out of business			
9.5 k_sucoth	Others say about success			
9.6 k_sucsel	How successful comp. to competitors			
9.7 k_satwor	Satisfied with work			
9.8 k_satinc	Satisfied with cur- rent income			
9.9.1 k_monav	No. of month: aver- age sales			
9.9.2 k_salav	Sales level: months of average sales			
9.9.3 k_monlo	No. of month: low sales			
9.9.4 k_sallo	Sales level: months of low sales			
9.9.5 k_monhi	No. of month: high sales			
9.9.6 k_salhi	Sales level: months of high sales			
9.10.1 k_lassal	Sales during last month			
9.10.2 k_lasexp	Expenses during last month			
9.10.3 k_laspro	Profit last month			
9.10.4 k_lasav	Was last month low, high, or average?	1 low	2 average	3 high

9.11.1 k_equip1	Money spent on equipment	
9.11.2 k_equip2	Value today 1	
9.11.3 k_equip3	Value today 2	

10. Intelligence

(Matrix 1-4 are for practice)

10.1 matrix1	Given answer for matrix 1	1 wrong	2 right	correct: 2
10.2 matrix2	Given answer for matrix 2	1 wrong	2 right	4
10.3 matrix3	Given answer for matrix 3	1 wrong	2 right	5
10.4 matrix4	Given answer for matrix 4	1 wrong	2 right	3
10.5 matrix5	Given answer for matrix 5	1 wrong	2 right	4
10.6 ma- trix16	Given answer for matrix 6	1 wrong	2 right	5
10.7 matrix7	Given answer for matrix 7	1 wrong	2 right	5
10.8 matrix8	Given answer for matrix 8	1 wrong	2 right	1
10.9 matrix9	Given answer for matrix 9	1 wrong	2 right	2
10.10 ma- trix10	Given answer for matrix 10	1 wrong	2 right	4
10.11 ma- trix11	Given answer for matrix 11	1 wrong	2 right	1
10.13 ma- trix13	Given answer for matrix 13	1 wrong	2 right	5

A3 Sample (Study 2)

Multiple Analyses of Variance

Variable		N	Mean	SD	F	P
Deliberate Practice	cross-sectional	40	0.08	1.06	0.45	.50
	longitudinal	50	-0.06	0.90		
	total	90	0.00	0.97		
Entrepreneurial Knowledge	cross-sectional	40	-0.17	0.93	3.52	.06
	longitudinal	50	0.15	0.70		
	total	90	0.01	0.82		
Growth	cross-sectional	40	20.48	39.01	1.41	.24
	longitudinal	50	12.56	23.80		
	total	90	16.08	31.54		
Education (years)	cross-sectional	40	12.80	2.88	4.32	.04
	longitudinal	50	11.46	3.17		
	total	90	12.06	3.10		
Cognitive Ability	cross-sectional	40	7.18	2.98	0.33	.57
	longitudinal	50	6.84	2.54		
	total	90	6.99	2.73		
Starting Capital	cross-sectional	40	40.103	124.222	0.91	.34
	longitudinal	50	84.940	274.516		
	total	90	65.052	220.847		

A4 Manual of Scales (Study 2)

1. Deliberate Practice	A-68
2. Entrepreneurial Knowledge	A-69
3. Human Capital	A-72
4. Cognitive Ability	A-73
5. Growth	A-73

1. Deliberate Practice

Scale: **Deliberate Practice (Quantity)**

Source: Self-developed

	Scale
Alpha	.649
Mean	15.67
SD	2.30
N	90

Item	Label	Scale	ITC	ICC
attswc	Attending Courses		.277	1.00
prore	Professional Reading		.423	1.00
explo	Exploring New Strategies		.295	1.00
obser	Observing Others		.117	1.00
askcu	Asking Customer for Feedback		.287	1.00
consu	Consulting Colleagues		.373	1.00
prico	Private Conversation		.219	1.00
msim	Mental Simulation		.464	1.00
Firm	Firm Meetings		.388	1.00
check	Controlling and Checking		.299	1.00

Scale: **Deliberate Practice (Quality)**

Source: Self-developed

	Scale
Alpha	.78
Mean	2.04
SD	0.60
N	90

Item	Label	Scale	ITC	ICC
eviat	Attending Courses	1-5	.508	.98
evipr	Professional Reading	1-5	.612	.92
eviex	Exploring New Strategies	1-5	.399	.95
eviob	Observing Others	1-5	.384	.96
evias	Asking Customer for Feedback	1-5	.598	.97
evico	Consulting Colleagues	1-5	.481	.95
evipc	Private Conversation	1-5	.215	.96
evims	Mental Simulation	1-5	.449	.97
evifm	Firm Meetings	1-5	.426	.95
evicc	Controlling and Checking	1-5	.352	.98

Scale: **Deliberate Practice (second order scale)**

Source: Self-developed

	Scale
R	.89
Mean	5.67
SD	2.30
N	90

Item	Label	Scale	ITC	ICC
xdpneu	Deliberate Practice Quantity (Sum activities)	factual		1.00
Xdp_evid	Deliberate Practice Quality (Evidence of Learning)	1-5		1.00

2. Entrepreneurial Knowledge

Scale: **Declarative Knowledge**

Source: Adopted from Krauss, S.I. (2003). *Psychological Success Factors of Small and Micro Business Owners in Southern Africa: A Longitudinal Approach*. Unpublished dissertation. University of Giessen, Department of Psychology.

	Scale
Alpha	.616
Mean	1.634
SD	0.144
N	88

Item	Label	Scale	ITC	ICC
busque1	Profit is determined by: a) Business income minus expenses. (*) b) Business income minus wages. c) Business income minus advertising costs.	multiple choice	.470	
busque2	Market research is important for: a) Determining whether or not your products or services will sell. (*) b) Recruiting employees. c) Keeping within the law	multiple choice	.472	
busque3	Which is the best method of checking on business progress: a) Inspecting the business accounts. (*) b) Number of customers. c) Volume of sales.	multiple choice	.104	
busque4	Why is advertising important? a) The public learns about your product. (*) b) You can be proud of your business. c) It helps you get loans.	multiple choice	.064	

busque5	A sale is completed when: a) Agreement has been reached. (*) b) Only when money has changed hands.	multiple choice	-.212	
busque6	Which of the following is a business expense? a) Donations to charity. b) Repairs to plumbing on the business premises. (*) c) Payment for tax advice. d) Paying for a party to which customers are invited.	multiple choice	.206	
busque7	Companies are taxed on income on the rate of: a) 25% b) 30% (*) c) 35%	multiple choice	.029	
busque8	Who should contribute to the Unemployment Insurance Fund (UIF)? a) Only workers older than 24 years. b) Every worker who earns more than R2,400 per month. c) All workers who work for at least 24 hours a month. (*)	multiple choice	.201	
busque9	When business is bad: a) All businesses may reduce wages to employees b) No business may reduce wages to employees without the agreement of employees or application to the Labour Relations Board. (*) c) Only unregistered businesses may reduce wages.	multiple choice	.147	
busque10	Which of the following could be source of finance for business expansion? a) Loan from bank. (*) b) Government subsidy. c) The National Social Security Authority	multiple choice	.127	
busque11	Collateral for a loan is required: a) To protect the interests of the lender. (*) b) To keep certain people from entering business.	multiple choice	.191	
busque12	When is an employer <u>not</u> legally permitted to dismiss an employee? a) Because of participation in a procedural strike. (*) b) Because of stealing company goods. c) In case of not performing duties properly.	multiple choice	.383	
busque13	Turnover is determined by: a) Volume of sales. b) Sales multiplied by price per unit. (*) c) Profit plus taxes.	multiple choice	.059	
busque14	Which information does <u>not</u> need to be included in the accounting records? a) The assets and liabilities of the company, cash-receipts and payments, and details of goods purchased and sold. b) A fixed-assets register and annual stock-taking (inventory) statements. c) The cash-flow index and conditions of repayment. (*)	multiple choice	.236	
busque15	The price of a service or item should be based on: a) Direct materials, labour, and overheads. (*) b) Direct materials, taxes, and wages. c) Volume of sales and turnover.	multiple choice	.601	

busque16	Who receives all the net profit or loss from the business? a) Owner of a Sole Proprietorship. (*) b) Proportionately the member of a Close Corporation depending on the number of members. c) Proportionately the member of a Private Company depending on the number of members.	multiple choice	.209	
busque17	Which statement about balance sheets is true? a) It provides the reader with information about profits and losses of the business. b) If the debts top the amount of capital resources, the balance sheet will be negative. c) The sum of assets equals the sum of liabilities. (*)	multiple choice	-.049	
busque18	Which statement concerning advertising in daily newspapers is true? a) Definitely, the reader will read your commercial when he has bought the newspaper. b) Definitely, you reach your target group. c) Definitely, the reader can review the information in the commercial as long as he wants to. (*)	multiple choice	.378	
busque19	A good relationship to one customer is helpful because: a) It proves that you have run good commercials. b) You do not have to look for new customers. c) The customer can recommend you to prospects. (*)	multiple choice	.411	
busque20	The break-even point gives you information about: a) The point in time you will be out of stock and you need new materials or resources. b) The point at which the turnover equals all the costs for material, labour, and overheads. (*) c) The point where the machines run at the necessary capacity to make them profitable.	multiple choice	.406	

Scale: **Procedural Knowledge**

Source: Self-developed

	Scale
Alpha	.957
Mean	0.000
SD	0.959
N	90

Item	Label	Scale	ITC	ICC
amount	Number of Relevant Ideas	factual	.924	.991
complet	Completeness of Relevant Categories	0-7	.892	.988
estmkno	Estimation of Marketing Knowledge	1-5	.911	.956

Scale: **Entrepreneurial Knowledge (second order scale)**

Source: Self-Developed

	Scale
Alpha	.754
Mean	0.006
SD	0.823
N	90

Item	Label	Scale	ITC	ICC
dec	Declarative Knowledge	factual	.574	
proc	Procedural Knowledge		.568	
knowstru	Structuredness of Knowledge	factual	.604	

3. Human Capital

Scale: **Education**

Source: Krauss, S.I. (2003). *Psychological Success Factors of Small and Micro Business Owners in Southern Africa: A Longitudinal Approach*. Unpublished dissertation. University of Giessen, Department of Psychology.

	Scale
Alpha	.931
Mean	0.000
SD	1.934
N	90

Item	Label	Scale	ITC	ICC
k_eduyea	Years of Education	factual	.871	
k_edudeg	Highest Degree of Education	0-13	.871	

4. Cognitive Ability

Scale: **Cognitive Ability**

Source: Adapted from Arthur, W., & Day, V.C. (1994). Development of a short form for the Raven Advanced Progressive Matrices test. *Educational and Psychological Measurement*, 54, 394-403.

	Scale
Alpha	.743
Mean	1.581
SD	0.0223
N	90

Item	Label	Scale	ITC	ICC
Matrix1	Matrix A8	factual	.111	
Matrix2	Matrix A11	factual	.152	
Matrix3	Matrix A12	factual	.343	
Matrix4	Matrix B10	factual	.398	
Matrix5	Matrix B11	factual	.524	
Matrix6	Matrix B12	factual	.439	
Matrix7	Matrix C7	factual	.418	
Matrix8	Matrix C11	factual	.430	
Matrix9	Matrix C12	factual	.377	
Matri10	Matrix D8	factual	.451	
Matri11	Matrix D9	factual	.546	
Matri12	Matrix E6	factual	.347	

5. Growth

Scale: **Growth**

Source: Krauss, S.I. (2003). *Psychological Success Factors of Small and Micro Business Owners in Southern Africa: A Longitudinal Approach*. Unpublished dissertation. University of Giessen, Department of Psychology.

	Scale
Alpha	.894
Mean	16.077
SD	31.537
N	90

Item	Label	Scale	ITC	ICC
grocus	Customer Growth 2000 – 2003	factual	.792	
grosal	Sales Growth 2000 – 2003	factual	.854	
gropro	Profit Growth 2000 – 2003	factual	.755	

A5 Measurement Instrument (Study 3)

Interview of Small Scale Entrepreneurs / Business Owners in Zimbabwe 2000

Prof. Dr. Michael Frese, University of Giessen
Prof. Dr. Christian Friedrich, Polytechnic of Administration of Giessen
Dipl.-Psych. Stefanie Krauß, University of Giessen
David Harrison, Human Resources, Harare

Interviews done by the University of Giessen and Human Resources

Start / Introduction

- "Can I talk to the owner?"
- "For how long do you own this business now?"
- "Can you tell me, how many employees you employ here in this business?" (Min. 1 employee, max. 50 employees)

"I would like to ask you to participate again in a research project on business owners. It is not supported by anyone here in Zimbabwe; it is conducted by a German university. We are interested in how owners of a small business run their business. Of particular interest is how you make decisions. It is not only about financial issues. We are also interested in how you go about things, for example, deal with employees, make decisions about your products, marketing, etc."

"All of the information that you give us will be kept absolutely confidential."

"The interview will take about 2 hours. To show our gratitude, we can give you 200 Zim\$. All of those interviewed found it interesting to participate, because it gives you a chance to think about how you have done things and it may give you ideas of how to be more effective in the future. If you are interested in the results, we will send you a short report of our research, after we have finished our study."

"We would appreciate it, if we could tape record the interview."

Before you begin

- ⇒ make sure that background sounds are reduced as far as possible.
- ⇒ note: - the subject number (your personal number plus running number of this person) on all pages of your notes!
 - your name
 - date
 - time of interview start and after you've finished the time of interview end
- ⇒ questions marked with **(F)**: Fact information, no detailed report necessary
- ⇒ questions marked with **(D)**: Detailed description of the subject's words necessary - also and particularly his / her examples.

1. General Information

- 1.0 (F) Are you Mr./Mrs. X?
- 1.1 (F) Are you the owner of this business?
- 1.1.1 (F) Are there any other owners? (active, inactive?)
- 1.1.2 (F) Were you the person I talked to last time, in 1998/99? →if "yes", go to 1.2
- 1.1.3 (F) Is the owner I talked to still active in the business? →if "yes", try to make a new appointment with the appropriate person!
- 1.1.4 (F) When did you take the business over? (day, month, year)
- 1.1.5 (F) How much did you pay for it?
- 1.1.6 (F) Are you a family member? →if "no", go to 1.2
- 1.1.7 (F) How are you related to the former owner?
- 1.2 (F) Did you start this business yourself?
- 1.3 (F) When did you start your business?
- 1.4 (F) How many employees do you have at the moment?
- 1.4.1 (F) How many of your employees are full-time employees?
- 1.4.2 (F) And how many are from your extended family?
- 1.5 (D) Which line of business are you in? Please describe your products.
- 1.6.1 (F) How many hours do you work per week?
- 1.6.2 (F) How many months do you work per year?
- 1.6.3 (F) What are the opening hours of your business? (per week)
- 1.7.1 (F) Are you a member of the chamber of commerce?
- 1.7.2 (F) Are you member of a co-operative?
- 1.7.3 (D) Are you member of any other association society or club that helps you to enhance your business? Please specify.
- 1.8 (F) Do you have a written business plan? →if "no" got to 2.
- 1.8.1 (D) What time period does your business plan cover?


2. Human Capital

- 2.1 (F) For how many years did you go to school?
- 2.1.1 (F) What's your highest degree of formal education?
- 2.2 (F) Have you ever received training concerning entrepreneurship or self-employment?
- 2.3 (F) Were you ever employed while you were a business owner? (When?)
- 2.4 (F) What is your age?

3. Targets, Goals, Strategies


"In the following we are interested in your goals for your business. (What are you most interested in? What targets do you have? What do you want to achieve in your business?)

We have written down a number of goals that have been shown to be important. We would like to know, **which ones are most important for your business** and which ones are least important. Please bring these cards into an order of importance. Start with the most important one, then select the second most important one, etc.

 Write down the ranking of the cards: G1 "show initiative", G2 "new marketing strategy", G3 "improve...", G4 "perform better than competitors", G5 "expanding", G6 "make more profit".

In the following, discuss the two most important goals (no.1 and no.2) in detail with regard to goal specificity, goal difficulty, and strategy.

3.1 (D) Can you tell me a bit more about your goals in this area (**point to goal no.1**); what do you want to achieve in this area? What do you aim for?

 Be sure not to suggest any specificity! If no answer, repeat the question twice - "what-question".


 Show **various answer scales**

Now pick out the three most specific and precise subgoals of goal card no. 1 and ask the following question for each subgoal separately (one after the other). If there are less than three subgoals, ask for as many goals as possible.

"You said you want to achieve XXX ..."; "One of your goals is XXX ..."

3.1.3 (D) How sure are you to achieve this goal?

0% — 10% — 20% — 30% — 40% — 50% — 60% — 70% — 80% — 90% —
 100%
 not at all sure very sure

 Don't stop until you know how specific and how difficult the goal is!


In the following discuss the strategies of goal no.1 in detail. You need to know:

- any / how much planning
- how much proactiveness
- how much reactiveness, so you can make a decision on "reactive", opportunistic", "complete planning", and "critical point planning".

3.3.1-10 (D) You have said:... (**repeat the goals and subgoals S has developed**). How do you go about to achieve this goal / these goals? or How do you reach this goal? or How do you do it?


(D) What have you already done to achieve this goal? (possibly ask this question twice; ask for examples)

(D) How have you done this in the past?

 Ask for concreteness, realism, planning and proactiveness **prompts**: What do you mean by? Can you give me an example? Can you give me an example for ...? Do you want to do it differently in the future, how? **general prompt**: repeat what S just said. **Don't say** e.g. "Are you planning this in detail?" **Don't stop until you know, which strategy is used here** (oppor, critp, compl, react)

Now the same for goal no.2

3.2 (D) Can you tell me a bit more about your goals in this area (**point to goal no.2**); what do you want to achieve in this area? What do you aim for?

 Be sure not to suggest any specificity! If no answer, repeat the question twice - "what-question".

 Show **various answer scales**

Now pick out the three most specific and precise subgoals of goal card no. 2 and ask the following question for each subgoal separately (one after the other). If there are less than three subgoals, ask for as many goals as possible.


"You said you want to achieve XXX ..."; "One of your goals is XXX ..."

3.2.3 (D) How sure are you to achieve this goal?

0% — 10% — 20% — 30% — 40% — 50% — 60% — 70% — 80% — 90% — 100%

not at all sure

very sure

 Don't stop until you know how specific and how difficult the goal is!


In the following discuss the strategies of goal no.2 in detail. You need to know:

- any / how much planning
- how much proactive
- how much reactive, so you can make a decision on "reactive", opportunistic", "complete planning" and "critical point planning".

3.4.1-10 (D) You have said:... (**repeat the goals and subgoals S has developed**). How do you go about to achieve this goal / these goals? or How do you reach the goal? or How do you do it?

(D) What have you already done to achieve this goal? (possibly ask this question twice; ask for examples)

(D) How have you done this in the past?

 Ask for concreteness, realism, planning and proactiveness **prompts**: What do you mean by? Can you give me an example? Can you give me an example for ...? Do you want to do it differently in the future, how? **general prompt**: repeat what S just said. **Don't say** e.g. "Are you planning this in detail?" **Don't stop until you know, which strategy is used here** (oppor, critp, compl, react)

4. Competition

- 4.1 (D) Do you offer anything that your competitors do not offer (e.g. a product, a special design, some special material, some service, some machine, anything)? (**prompt:** What exactly do you mean?; if no answer, repeat question.)
- 4.2 (D) Do your products or services fill a gap in the market? In what way?
- 4.3 (F) How many competitors do you have?
- 4.4 (D) Are they really competitors or are they really friends and colleagues?
- 4.5 (D) What is your relationship to your competitors? -- Do you want to beat them or are you nice to them? Do you attempt to push them out of your way or do you think of your competitors more in terms of the saying "live and let live"? (**prompts:** an example for "pushing them out of your way" is: You cut prices to undo your competitor you attempt to get a contract by any means, even if you have to hurt a competitor. An example for being nice to them is: You are in a way working together with your competitors.)

5. Innovativeness and Initiative

- 5.1 (D) Do you plan to change your product-mix or service-mix within the next six months or year? In what way? →If "no", go to 5.2
- 5.1.1 (D) Why do you plan to change your product mix?
- 5.2 (D) During the last two years, did you have a good or creative or innovative idea with regard to your business? What was this idea? (repeat if no answer or **prompt:** I mean an idea where you said to yourself: Yes, that was a really good idea - it helps my business).
→If "no", go to 5.3
- 5.2.3 / 5.2.4 (D) Was this your own idea or did you get it from someone else? Where did you get it from?
- 5.3 (D) "Now, I will present you a number of difficult situations. Tell me, what one could do in such a situation; use your creativity."

Present the first barrier of the first situation.

When the barrier is overcome, reply: "Pretend for a moment that this does not work." If the subject is not satisfied with this, give a more specific barrier. Be sure that S accepts the problem as a problem.

If a barrier is not overcome, don't present a new barrier. Repeat the question / barrier again. If there is no answer, don't go further, but start with a new situation. The same applies when the subject repeats (a bit of a variation) of a previous solution.: e.g. the first solution was "I ask the supervisor for help", after the subsequent barrier the subject answers "I look for another supervisor". Ask for a different solution "What else can one do?". If no new solution comes up, stop and start with a new situation.

Repeat the whole procedure 4 times max. per scenario. If the fourth barrier of a situation is overcome, ask the subject: "Have you got any further ideas?"

Write a **detailed protocol** of subject's answers and your barriers. **Write down both, your questions and the subject's answers!** After the interview, count on the basis of the protocol the number of barriers overcome.

0	1 ("pretend this doesn't work...")	2 ("pretend this doesn't work...")	3 ("pretend this doesn't work...")	4 ("pretend this doesn't work...")	5 ("any further ideas....")
no barrier overcome, refused to answer.	1 barrier overcome	2 barriers overcome	3 barriers overcome	4 barriers overcome	5 or more barriers overcome

- 5.3.1 (D) Pretend for a moment that you are out of money and that you cannot buy the necessary supplies. What do you do? (also important: activeness)
- 5.3.2 (D) Pretend for a moment that you are producing a product with a machine. This machine breaks down and your workers cannot fix it. What do you do? (also important: activeness)
- 5.3.3 (D) Pretend for a moment that your supplier for a certain item went out of business. You are under high pressure to finish an order and he is the only one who can supply you with this necessary item. What do you do? (also important: activeness)
- 5.3.4 (D) Pretend for a moment that your landlord tells you to move your shop within two months. What do you do? (also important: activeness)

6. Leadership and Employees



Show **various answer scales**

6.1.1 - 7 (D) How confident are you that you can:


- lead people well?
- negotiate with fellow business men well?
- negotiate with customers well?
- keep an overview over your financial affairs well?
- do the pricing of your products well?
- communicate with other people well?
- convince customers to buy products well?

6.2.1 - 3 (F) How many employees, excluding yourself, did you have during 1998, 1999, and now? (full-time, part-time or apprentices)

	1998	1999	2000
full-time			
part-time / apprentice			




You need to write down the numbers for each year separately. Use "X" if the business wasn't founded then and "0" if there were no employees in that particular year; count family members only if they are paid and have a regular job in the business.

- 6.3 (F) Do you or have you ever employed family members? (Write down whether currently or not!) → if "no", go to 6.4.1
- 6.3.1 (F) How are the employed family members related to you? (e.g. cousin, father, sister)
- 6.3.2 (D) How does / did it work?
- 6.4.1 (F) To whom should a man feel closest? To his wife or to his mother (father, brother)?
- 6.4.2 (F) If a man must choose between a job that he likes or a job which his parents prefer for him, which should he choose? The job he prefers or the job his parent prefer?
-  Show **various answer scales** and record each answer. Explain what the numbers 1 to 3 / 1 to 5 mean on the answer sheet.
- 6.4.3 (F) Kinship obligation 3
- 6.4.4 (F) Kinship obligation 4
- 6.4.5 (F) Kinship obligation 5


7. Difficulties / Problems and Environment

Now we'll talk about another area:

- 7.1 (D) If you could start your business again as you did in the year ..., what would you do differently? (also important: concreteness, evidence of learning)
- 7.2 Business environment: In the following we would like to know, what you think of your business environment.
-  Use **answer sheet A** and record each answer. Explain what the numbers 1 to 5 mean on the answer sheet.
- 7.2.1 simplicity/complexity
- 7.2.2 hostility & friendliness
- 7.2.3 stability & predictability
- 7.2.4 controllability
- 7.2.5 phase in business cycle
- 7.3 (D) What do you think is your main advantage in the market in comparison to your competitors? (important here: concreteness, answered to the point, how strong an advantage)
- 7.4 Imagine you had a friend who wanted to open a business just like yours. What would you advise your friend? Should he put money in a business like yours, or should he not?

8. Success

Before starting: assure the subject of confidentiality!!

-  Show **various answer scales**
- 8.1 (F) Has the number of customers from 1998 to 1999 increased, decreased, or did it stay the same? Compared to the previous year, has the number of your customers increased or decreased? (%; same procedure for the comparison of 1999 to 2000.)



Show **various answer scales**

- 8.2 (F) Have the sales from 1998 to 1999 increased, decreased, or did they stay the same? Compared to the previous year, has the amount of sold goods increased or decreased? (%; same procedure for the comparison of 1999 to 2000.)



Show **various answer scales**

- 8.3 (F) Has your profit from 1998 to 1999 increased, decreased, or did it stay the same? Compared to the previous year, has your profit increased or decreased? (%; same procedure for the comparison of 1999 to 2000.)
- 8.4 (F) Has your profit increased or decreased during the last 3 years? (%)
- 8.5 (F) How much of your profit do you monthly take out of your business for yourself? (%)
- 8.6 (F) Have you ever applied for a loan or asked family members or friends for a loan?
→ if "no", go to 8.7
- 8.6.0 (F) Did you get a loan? → if "no", go to 8.7
- 8.6.1-8.6.6

(F) Who gave you the loan?

(F) How big was your loan? (note down each loan separately)

- 8.6.7 (F) In what year did you get your loan? (note down each loan separately)



Now show **answer sheet B.**

- 8.7 (F) In all, how is the success of your business distributed in time



Now show **answer sheet C.**

- 8.8 (F) Do others say you are
- 8.9 (F) How successful are you as a business owner compared to your competitors?
- 8.10 (F) How satisfied are you with your work as a business owner? (☹...☺...☺)
- 8.11 (F) How satisfied are you with your current income? (☹...☺...☺)
- 8.12 (F) Please indicate which of the following two statements applies most to you. (business owner A & B)
- 8.13 (D) During the last year, did you ask somebody to help you out with money for your business?
- 8.14.1 (D) During the last year, could you always pay your employees the usual money or did you have to reduce it, delay it, or could you sometimes not pay? →if "no", got to 8.15
- 8.14.2 (F) How often did that happen?
- 8.14.3 (F) Did that also happen in 1998 or was it more frequently last year, in 1999?
- 8.15.1 (F) Do you have to pay more or less for supplies than last year? →if "equal" or "less", got to 8.16
- 8.15.2 (F) Can you increase the prices accordingly as you have to pay more for the supplies now?



now show **answer sheet D**

- 8.15.3 (F) Does your price increases lag behind of that of your suppliers? Please indicate in what way.
- 8.16 (F) Can you buy more or less for yourself this year in terms of food and other products compared to last year?
- 8.17.1 (F) Do you rent out rooms in your house? →if "no", got to 8.18
- 8.17.2 (F) Did you take on new tenants during the last year?
- 8.18 (F) Have you got electricity?
- 8.19 (F) Have you got a phone line?
- 8.20 (F) Are you in a business directory (e.g. Bold Ads Business Directory or Directory Publishers)?

When you think of last year's sales:

- 8.21.1 (F) How many months did you have average sales?
- 8.21.2 (F) What is the sales level (Z\$) in months of average sales?
- 8.21.3 (F) How many months did you have low sales?
- 8.21.4 (F) What is the sales level (Z\$) in months of low sales?
- 8.21.5 (F) How many months did you have high sales?
- 8.21.6 (F) What is the sales level (Z\$) in months of high sales?

When you think of last week (if it is more appropriate to the subject, use last month and divide numbers by four when rating!!):

- 8.22.1 (F) What were your sales (Z\$) during the past week/month?
- 8.22.2 (F) What were your expenses (Z\$) during the past week/month?
- 8.22.3 (F) How much profit (Z\$) did you make past week/month?
- 8.22.4 (F) Was the past week a good, a bad, or an average week?
- 8.23 (F) Have you got a business card?
- 8.24.1 (D) How do you do your book-keeping to know how much profit you make?
- 8.24.2 (D) What experiences and qualifications do you have (has the person who does your book-keeping) in book-keeping?
- 8.25.1 (F) Do you own the land you operate your business from?
- 8.25.2 (F) Do you own any other land?
- 8.26.1 (F) How much money did you spend altogether on equipment (tools, machinery, vehicles, computers, furniture etc.)?
- 8.26.2 (F) If you sold that today, how much would it be worth?
- 8.26.3 (F) If you bought that today, how much would you have to pay for it?
- 8.27 (F) How much do you pay all in all to your workers/ employees every month?
- 8.28 (F) How much did you pay in all for your supplies last month?
- 8.29.1 (F) Do you have a personal bank account? →if "no", go to 8.29.3

8.29.2 (F) Do you use your personal bank account for business, too?

8.29.3 (F) Do you have a bank account only for your business?

9. Vignettes

9.1 (D) What would happen if somebody would pay you good money to take over your firm and would make you the manager of the firm. You would have the same income as now. Would you accept it? Why? (also important: autonomy orientation)

9.2.1 (D) Pretend you have a friend who owns an informal business (**explain:** no tax, not registered). He is thinking of making it formal. That is he will be registered, pay tax, and will get a sale's tax number. What should he do?

9.2.2 (D) What would you say are the advantages and disadvantages (positive and negative points) of registration. (**repeat once:** Any further advantages or disadvantages?)

9.2.3 (D) What are the two most important reasons for businesses not to register?

9.3.1 (F) Are you registered? Do you pay tax?

→if "yes", got to 9.3.2

→if "no", got to 9.3.3

9.3.2 (F) When did you become registered?

9.3.3 (F) Why don't you become registered?

9.4 (F) ZVT Intelligence Test (short version)

"Now we would like to do a little quiz or puzzle. Do you mind participating?"

Show the sheet with the two exercises. "In this field (point to exercise one) you should connect the numbers in the correct order like you would count. 1, 2, 3, 4, etc. You should start at the "1" with your pen (demonstrate with the finger) and draw a line to number "2", then to number "3", from "3" to "4" and so forth. The next number can always be reached by a straight or diagonal line and is immediately neighbouring. The lines might also cross each other (show at the numbers 7,8,9, and 10).

The test is not about the beauty of your lines. What counts is speed. You should be as quick as possible under circumstances of highest demand. For that, you should first sit down comfortably. In order not to cover the numbers you should hold the pen at the far end. Now let's try **exercise 1**. When I tell you to, you start with number one and connect the numbers just as you count and as quickly as possible.

"Let's start!"

Check whether the instructions have been understood (explain again if not): "This should get a bit better. Please sit down comfortably and try to find a position that allows you to be even faster. Let's try it again with **exercise 2**."

"Let's start!"

"Now we want to do the same test with more numbers. If you make a mistake, correct it very quickly. Remember this is about being fast." Now give out **test matrices A-D**. Time measurement begins when the participant draws the first line and ends when number 90 is reached. Take down the times for the single matrices on the exercise and protocol sheet. There should be no breaks between the test matrices.

"Let's start!"

10. Modernism

- 10.1 (F) If you were to meet a person who lives in another country a long way off, could you understand his way of thinking? (Y/N)
- 10.2 (F) Do you think a man can be truly good without having any religion at all? (Y/N)
- 10.3 (F) Do you belong to any organisation such as e.g., social clubs, unions, church organisations, political groups, or other groups? If Yes, what are the names of all organisations you belong to.
- 10.4 (F) If there were no kinds of obstacles, how much schooling (in years) do you think children of people like yourself should have?
- 10.5 (F) Would you tell me, what are the biggest problems you see facing your country?
- 10.6 (F) In what country is Moscow?



now show **answer sheet E**

- 10.7 (F) Interests
- 10.8 (F) Newspaper information
- 10.9 (F) New ways of doing things
- 10.10 (F) Qualification
- 10.11 (F) Important for future
- 10.12 (F) Earthquakes
- 10.13 (F) Doing something about it
- 10.14 (F) Opinions

11. Other Issues

- 11.1 Do you mind if we take down your address again and if your address changed, would you give us your new address? In no case will anybody else be informed about anything you told us - it's completely confidential. And again, when you give us your address, we can send you a report on our results in about a year. (**Note down address, but not in the type-written protocol! Extra file!**)
- 11.2 What province is your business in?
- 11.3 Is it OK with you that we ask a third person about your business? (assure confidentiality again; show questionnaire if necessary)



Note down the end of interview time!

- 11.4 Give out the questionnaire.

12. Additional Observations

Write down **additional observations** during the time S fills in the questionnaire. Also fill in **interviewer evaluation** and **review** your own notes for completeness.

Interview of small scale entrepreneurs / business owners in Zimbabwe 2000
- various answer scales -

0% — 10% — 20% — 30% — 40% — 50% — 60% — 70% — 80% — 90% — 100%
 not at all sure very sure

1998	1999	2000
increase	increase	increase
decrease	decrease	decrease
same	same	same

100% - 75%----- 50% ----- 25% --- **SAME** ---25% -----50% -----75%--100%
DECREASE **INCREASE**

ko3/R

Suppose a young man works in a factory. He has barely managed to save a very small amount of money. Now his first cousin comes to him and tells him that he needs money badly since he has no work at all. How much obligation do you think the factory worker has to share his savings with his first cousin?

a strong obligation 1	a not so strong obligation 2	no obligation 3
---------------------------------	--	---------------------------

ko4/R

Now suppose in the story it was not his first cousin, but a distant cousin who came to the factory worker and said he had no money. How much obligation do you think the factory worker has to share his savings with his distant cousin?

a strong obligation 1	a not so strong obligation 2	no obligation 3
---------------------------------	--	---------------------------

ko5/R

Some people say that a boy should be taught to give preference to a friend or relative, even when others have a more rightful claim. Others say a boy should be taught not to break an important rule even for a friend or relative. Do you think a boy should be taught to give preference to a friend or relative:

always 1	usually 2	sometimes 3	rarely 4	never 5
--------------------	---------------------	-----------------------	--------------------	-------------------

**Interview of small scale entrepreneurs / business owners in Zimbabwe 2000
- answer sheet A -**

1) Simplicity vs. Complexity

cmplx

The environment can be seen as complex if a lot of things have to be taken into consideration and a lot of information is needed to do business (How difficult does your environment make it for you to decide something?). Can you show me on this scale, how complex your environment is?

very simple 1	2	3	4	5	6	very complex 7
-------------------------	---	---	---	---	---	--------------------------

2) Hostility vs. Friendliness

hosti

The environment can be seen as hostile, if there is a lot of pressure from competitors. Can you show me on this scale how hostile your environment is?

very little hostile 1	2	3	4	very hostile 5
---------------------------------	---	---	---	--------------------------

friend

The environment can be seen as friendly, if there are a lot of possibilities to do business and make investments. Can you show me on this scale, how friendly your environment is?

very little friendly 1	2	3	4	very friendly 5
----------------------------------	---	---	---	---------------------------

Can you show me on this scale how you would characterise the external environment within which your firm operates?

<small>hostil1</small> Very safe, little threat to the survival of my firm.	(1) (2) (3) (4) (5) (6) (7)	Very risky, a false step can mean my firm's undoing.
<small>hostil2</small> Rich in investment and marketing opportunities.	(1) (2) (3) (4) (5) (6) (7)	Very stressful, exacting, hostile; very hard to keep afloat.

3) Stability vs. Dynamics

dynami

The environment can be seen as dynamic, if it changes fast and future developments cannot be foreseen. Can you show me on this scale how dynamic your environment is?

very little dynamic 1	2	3	4	very dynamic 5
---------------------------------	---	---	---	--------------------------

predic

Could you show me on this scale how well it is possible to predict the future of your business environment?

very little predictable 1	2	3	4	very predictable 5
-------------------------------------	---	---	---	------------------------------

4) Controllability

cntrl

How much influence do you have on your business environment?

very little controllable 1	2	3	4	very controllable 5
--------------------------------------	---	---	---	-------------------------------

5) Business Cycle

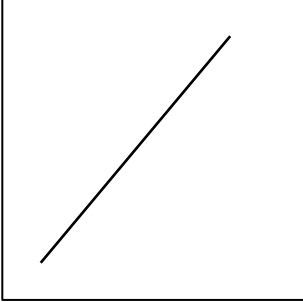
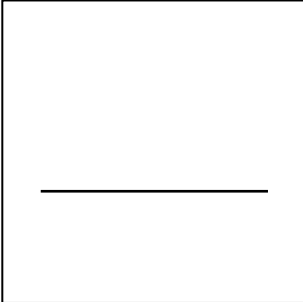
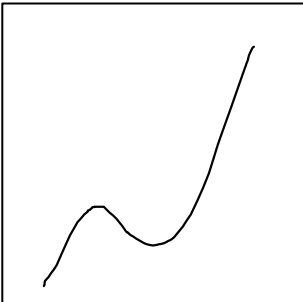
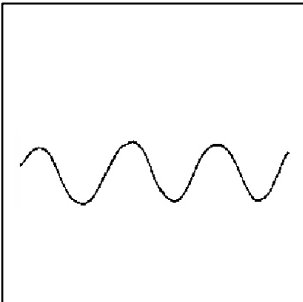
buseyc

Which of the following phases do you think your business is in?

- 1) () phase of economic slow-down/recession
- 2) () phase of stable business
- 3) () phase of growth

**Interview of small scale entrepreneurs / business owners in Zimbabwe 2000
- answer sheet B -**

In all, how is the success of your business distributed over time?
Please tick one.

<input type="checkbox"/> 1		<input type="checkbox"/> 2	
business develop- ment	Time		
<input type="checkbox"/> 3		<input type="checkbox"/> 4	
<input type="checkbox"/> 5		<input type="checkbox"/> 6	
<input type="checkbox"/> 7		<input type="checkbox"/> 8	

**Interview of small scale entrepreneurs / business owners in Zimbabwe 2000
- answer sheet C -**

sucoth

1) How successful do you think others say you are as a business owner?

not at all successful () 1	not that successful () 2	medium successful () 3	somewhat successful () 4	very successful () 5
-----------------------------------	---------------------------------	-------------------------------	---------------------------------	-----------------------------








sucsel

2) How successful are you as a business owner compared to your competitors?

not at all successful () 1	not that successful () 2	medium successful () 3	somewhat successful () 4	very successful () 5
-----------------------------------	---------------------------------	-------------------------------	---------------------------------	-----------------------------








satwor

3) How satisfied are you with your work as a business owner?

						
() -3	() -2	() -1	() 0	() 1	() 2	() 3

satinc

4) How satisfied are you with your current income?

						
() -3	() -2	() -1	() 0	() 1	() 2	() 3

In the following, please indicate on this scale for each pair of statement of business owners, which of the statements applies most to you.

I am

exactly like A () 1	more like A () 2	more like B () 4	exactly like B () 5
----------------------------	-------------------------	-------------------------	----------------------------

5) grogo1

Business owner A:

"I am satisfied as long as my business provides a living for my family and myself."

Business owner B:

"I am satisfied as long as my business keeps growing and becomes bigger."

6) moti1

Business owner A:

"I just do this business as long as I cannot find another, better job."

Business owner B:

"I really like to be a business owner on my own: I don't want another job."

7) grogo2

Business owner A:

"If I earn enough money for my family, that is good enough."

Business owner B:

"I want my business to grow as much as possible."

8) moti2_r

Business owner A:

"I am really interested in what I do now as a business owner; I would not like to do anything else."

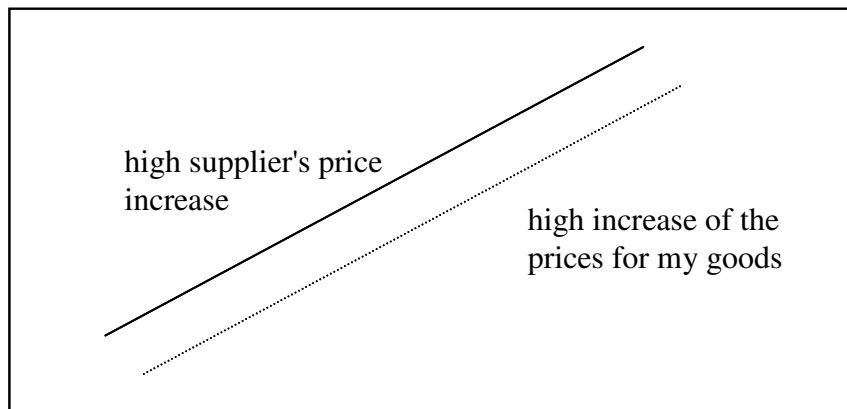
Business owner B:

"I don't care what exactly I work on as long as I earn money with it."

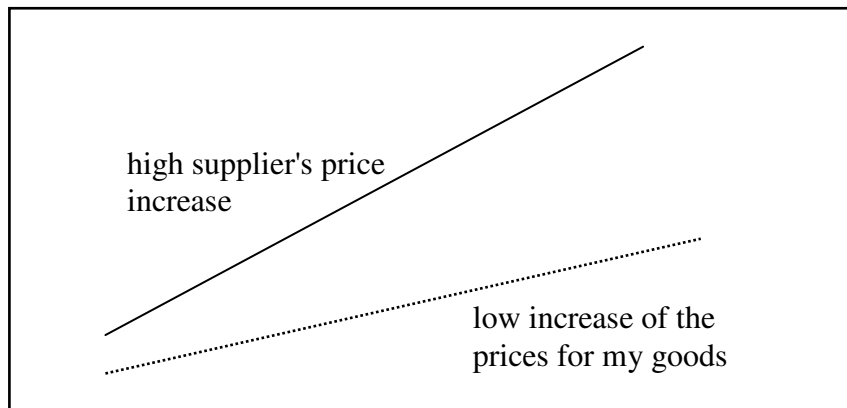
**Interview of small scale entrepreneurs / business owners in Zimbabwe 2000
- answer sheet D -**

Does your price increase lag behind of that of your suppliers? Please indicate in what way.

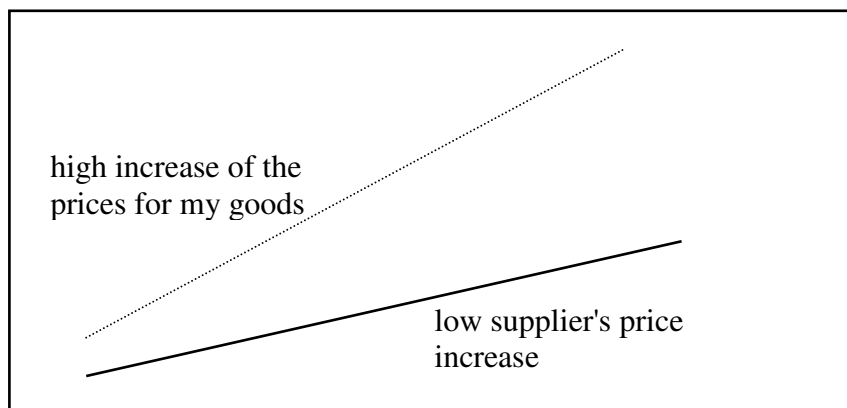
()
1



()
2



()
3



**Interview of small scale entrepreneurs / business owners in Zimbabwe 2000
- answer sheet E -**

mm10/R

Which one of these following news interests you most?

World events (in other countries) () 1	The nation () 2	My home town or village () 3	Sports () 4	Religious or tribal events, ceremonies or festivals () 5
---	----------------------------	---	------------------------	---

mm5/R

How often do you usually get news and information from newspapers?

Everyday () 1	Few times a week () 2	Occasionally () 3	Never () 4
----------------------	------------------------------	--------------------------	-------------------

ch3/R

While some people say that it is useful to discuss ideas about new and different ways of doing things, others think that it is not worthwhile since the traditional and familiar ways are best. Do you feel that thinking about new and different ways of doing things is:

always useful () 1	usually useful () 2	only useful at times () 3	rarely useful () 4
---------------------------	----------------------------	----------------------------------	---------------------------

ci13/R

What should most qualify a man to hold high office?

Coming from high family background () 1	Devotion to the old and time-honoured ways () 2	Being the most popular among the people () 3	High education and special knowledge () 4
--	--	---	--

ef11/R

Which is the most important for the future of this country?

The hard work of the people () 1	Good planning on the part of the government () 2	God's help () 3	Good luck () 4
---	---	----------------------------	---------------------------

ef14/R

Learned men in the universities are studying such things as what determines whether a baby is a boy or a girl and why there are earthquakes. Do you think that these studies are:

All very good () 1	All somewhat good () 2	All somewhat harmful () 3	All very harmful () 4
-------------------------------	-----------------------------------	--------------------------------------	----------------------------------

ac6/R

Have you ever gotten so highly concerned regarding some public issue that you wanted to do something about it?

frequently () 1	few times () 2	never () 3
----------------------------	---------------------------	-----------------------

fs3/R

Which of these opinions do you agree more with?

It is necessary for a man and his wife to limit the number of children to be born so they can take better care to those they do already have. () A	It is wrong for a man and wife purposely to limit the number of children. () B
---	---

THE BUSINESS QUESTIONNAIRE

INSTRUCTIONS

Please answer the questions below. Read the whole problem carefully and then chose the answer which you believe is the best one. Please choose only one answer for every problem.

20. Profit is determined by:

- | | |
|---|---|
| * | d) Business income minus expenses. |
| | e) Business income minus wages. |
| | f) Business income minus advertising costs. |

21. Market research is important for:

- | | |
|---|--|
| * | e) Determining whether or not your products or services will sell. |
| | f) Recruiting employees. |
| | g) Keeping within the law. |

22. National employment regulations must be observed by:

- | | |
|---|--------------------------------|
| * | a) All employers. |
| | b) Only registered businesses. |
| | c) Only tax paying businesses. |

23. Which is the best method of checking on business progress?

- | | |
|---|--------------------------------------|
| * | d) Inspecting the business accounts. |
| | e) Number of customers. |
| | f) Volume of sales. |

24. Why is advertising important?

- | | |
|---|--|
| * | d) The public learns about your product. |
| | e) You can be proud of your business. |
| | f) It helps you get loans. |

25. Business discounts given to friends and family:

- | | |
|---|-------------------------|
| * | a) Need to be recorded. |
|---|-------------------------|

b) Do not need to be recorded.

26. Unregistered businesses:

- * a) Are obliged to pay sales tax.
 b) Are not obliged to pay sales tax.

27. Which of the following statements is true?

- * a) Any business earning \$60,000 per annum is required to register for sales tax.
 b) Informal businesses earning less than \$60,000 per annum need not register for sales tax.
 c) Only formal businesses earning over \$60,000 per annum are required to register for sales tax.

28. When business is bad:

- a) All businesses may reduce wages to employees.
 * b) No businesses may reduce wages to employees without the agreement of employees or application to the Labour Relations Board.
 c) Only unregistered businesses may reduce wages.

29. A business contract is binding:

- * a) If both parties have agreed to clear terms.
 b) Only if both parties have agreed to clear terms in writing.

30. If you make an offer to sell a product or service and this offer is accepted by the other party:

- * c) You are legally bound to provide the product or service as agreed.
 d) You can change the terms if you feel it necessary.

31. Which of the following is a business expense?

- e) Donations to charity.
 * f) Repairs to plumbing on the business premises.
 g) Payment for tax advice.
 h) Paying for a party to which customers are invited.

32. A manufacturer must:

- * a) Replace or repair goods proven to be faulty when purchased.
 b) Does not need to compensate - it is the buyer's risk.

33. A sale is completed when:

- * d) Agreement has been reached.
 e) Only when money has changed hands.

34. Collateral for a loan is required:

- * d) To protect the interests of the lender.
 e) To keep certain people from entering business.

35. If business is bad:

- c) A borrower may reschedule payment of the debt.
 * d) A borrower may only reschedule payment of the debt with the agreement of the lender.

36. Informal, unregistered companies:

- a) Are not required to register for income tax purposes.
 * b) Are required to register for income tax purposes.

37. Employees in unregistered companies:

- * a) Must have PAYE deducted if their earnings are above \$30,000 per annum.
 b) Do not need to have PAYE deductions made by the employer.

38. Which of the following could be a source of finance for business expansion?

- * d) Loan from bank.
 e) Government subsidy.
 f) The National Social Security Authority.

39. Which of the following is a business expense?

- c) Proprietor pays for a haircut.
 d) Proprietor buys lunch.
 * e) Proprietor pays for an advertisement of the business.

Subject No.:	
Interviewer No.:	
Date:	

A	
B	
C	
D	
Σ	

EXERCISE 1:

TASK: Please link the numbers in their serial order:

1-2-3-4-5-6

START

1	2	4	5	6
19	20	3	7	9
	END			
18	16	13	10	8
17	14	15	12	11

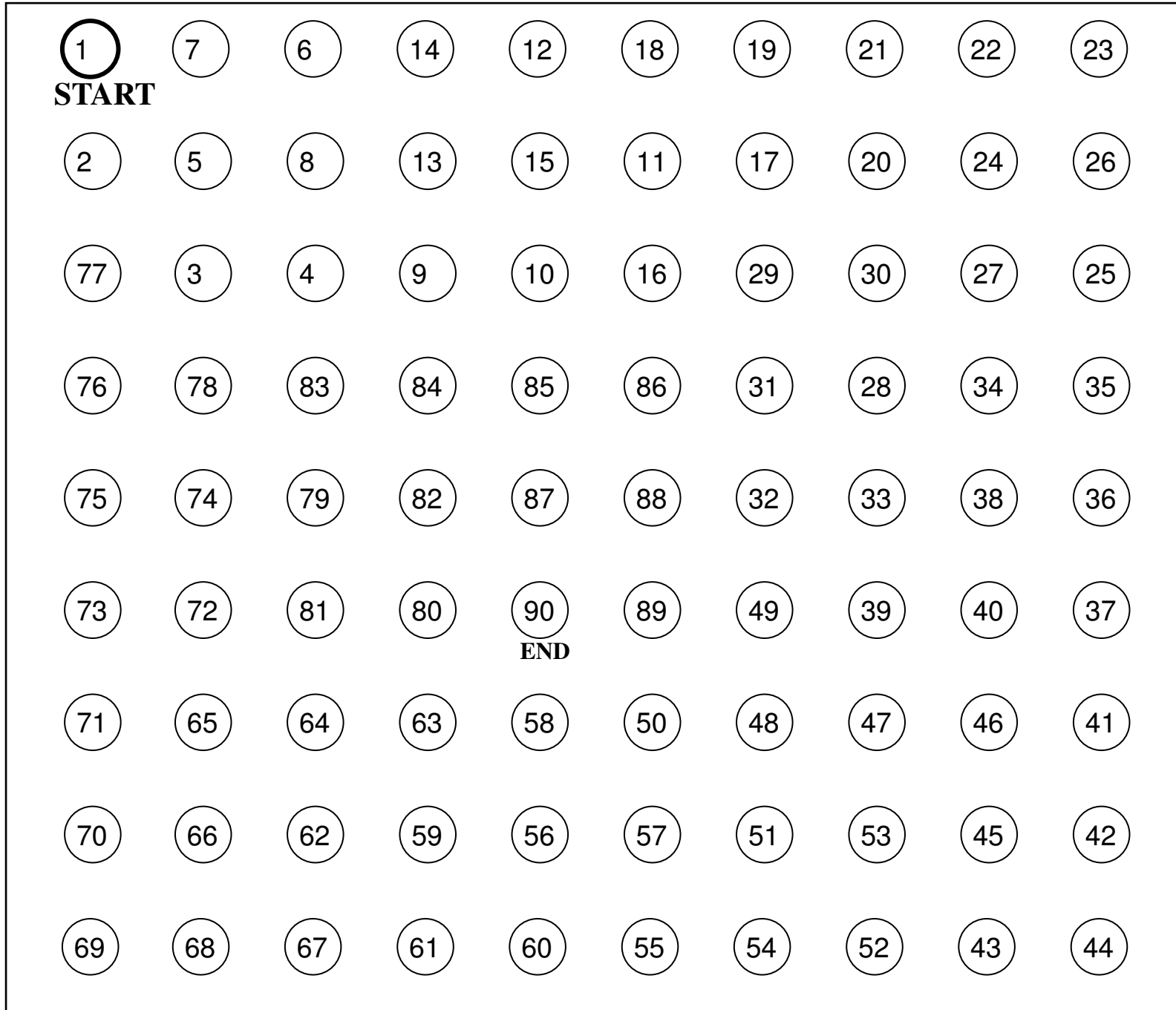
EXERCISE 2:

TASK: Please link the numbers in their serial order:

1-2-3-4-5-6

START

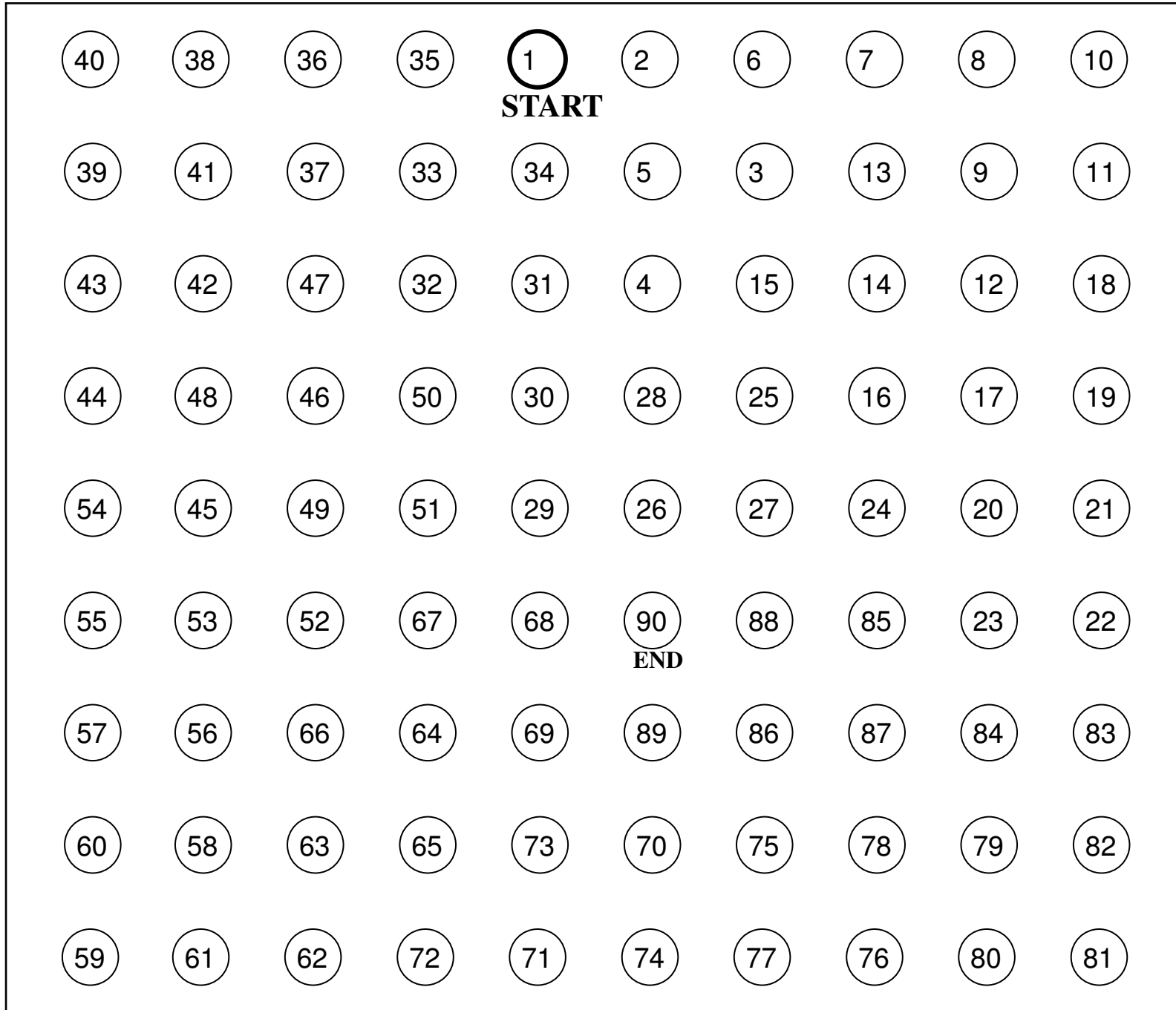
1	2	4	5	6
19	20	3	7	9
	END			
18	16	13	10	8
17	14	15	12	11



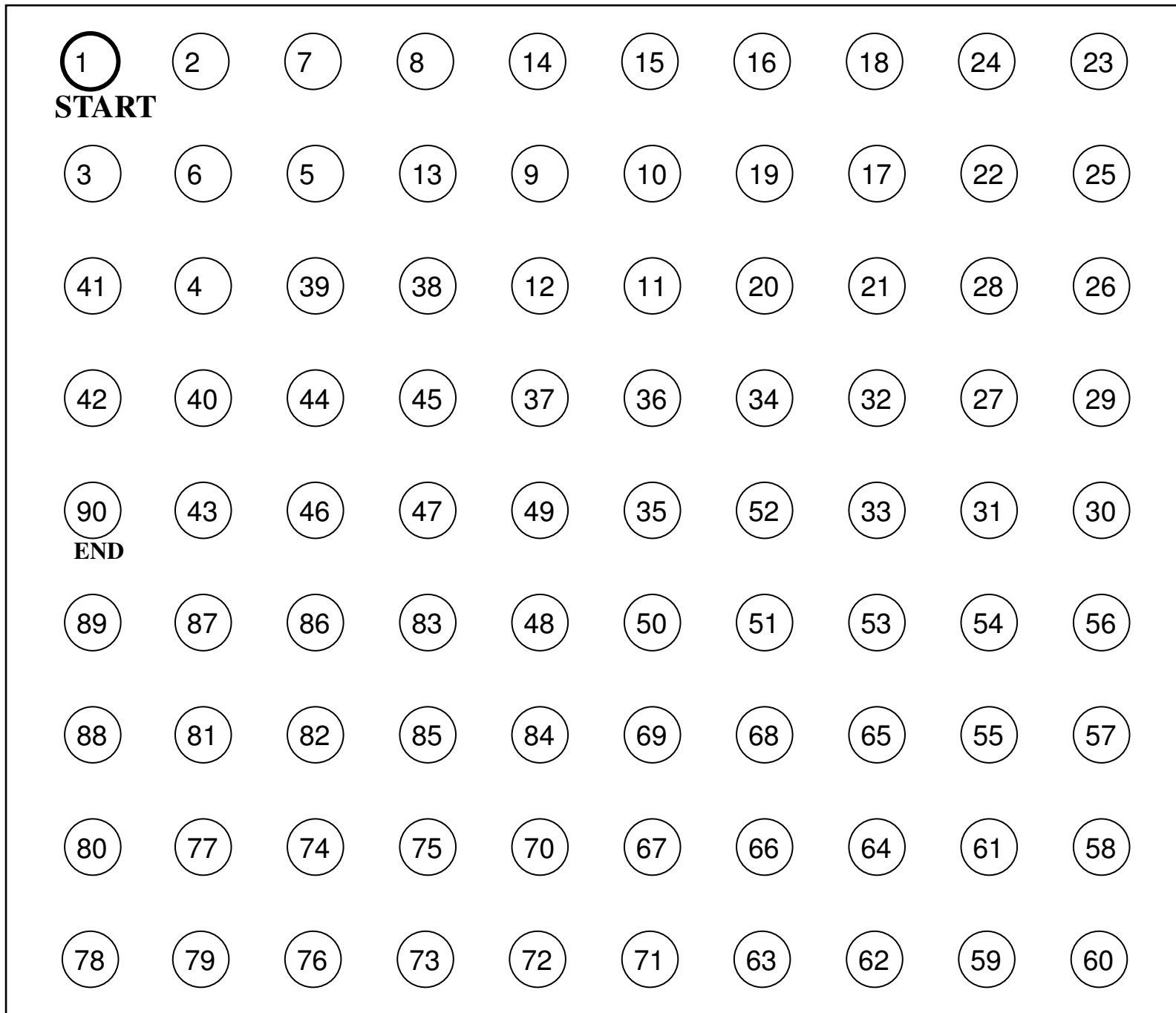
A

Subj. No.	
Int. No.	
Date	

B

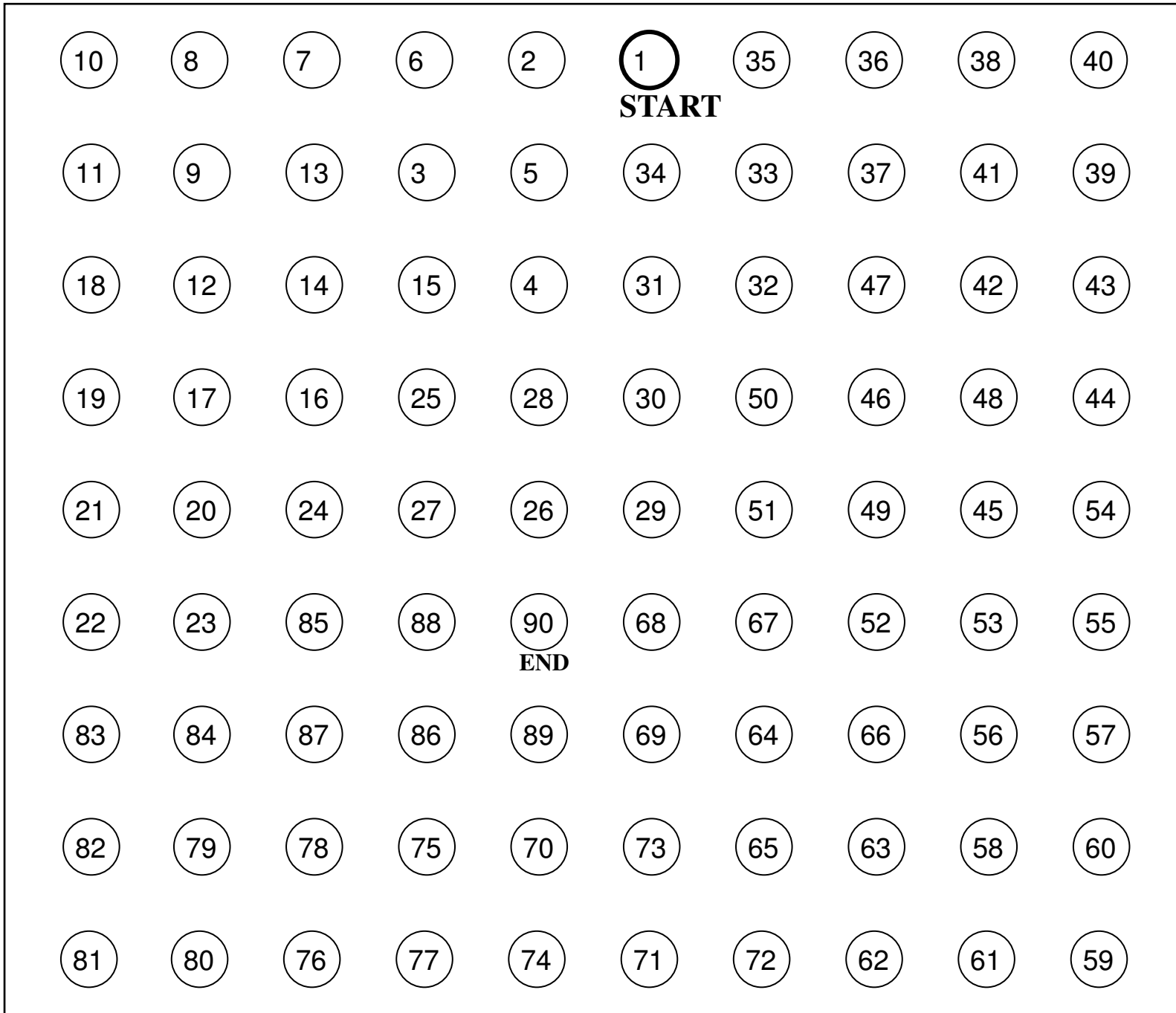


Subj. No.	
Int. No.	
Date	



C

Subj. No.	
Int. No.	
Date	



D

Subj. No.	
Int. No.	
Date	

Interview of Small Scale Entrepreneurs / Business Owners in Zimbabwe 2000

External Success Evaluation

subject number:

interviewer:

date:

1. How successful do you think is the person in question as a business owner in comparison with his/her competitors? (sucex1_r)

most successful business owner ()	belongs to the 10% most successful business owners ()	belongs to the upper 25% of successful business owners ()	belongs to the more successful half of business owners ()	belongs to the less successful half of business owners ()
---	---	---	---	---

2. How successful do you think is the person in question as a business owner in comparison with his/her competitors? (sucex2)

not at all successful () 1	not that successful () 2	medium successful () 3	somewhat successful () 4	very successful () 5
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note: Multiple answers are possible!


3. What is your relationship to the person/business owner in question?

- a) () I am a neighbour. (who1)
- b) () I am the manager of the business site / industrial hive. (who2)
- c) () I am the manager of the growth point. (who3)
- d) () I am a competitor. (who4)
- e) () I am an employee. (who5)
- f) () I am a family member. (who6)
- g) () I am a member of the same co-operative. (who7)
- h) () I work at the chamber of commerce. (who8)
- i) () We are both members of the chamber of commerce. (who9)
- j) () I am a friend. (who10)
- k) () other: _____.(who11)

4. How long do you know each other? Please give an approximation of months and years. (know)

Coding Scheme Interview Zimbabwe 2000/01

If you cannot code something for lack of information or because it is not necessary to code (e.g. because of branched question), use **X**.

 Use the extremes of scales, especially with innovativeness!

0. Interview Information

0.1 sno	subject number		interviewer no. & 001 - max.		
0.2 intno	interviewer no.		01 = Michael 17 = Valerie 02 = Steffi		
0.3 date	date of interview (d/m/y)		03 = Vicas 04 = Lynda		
0.4	total time of inter- view (minutes)		05 = Klaus 06 = Stephan		
0.5.1 rat1	rater 1		07 = Innocent 08 = Jens		
0.5.2 rat2	rater 2		09 = Pfungwa 10 = Elijah		
0.5.3 rat3	rater 3		11 = Edward 12 = Mufaro		
0.5.4 rat4	rater 4		13 = Lovemore 14 = Admire		
0.5.5	first or second (3 rd , 4 th) rating		15 = Richard 16 = Simone		
0.6 exist	the business does still exist	1 no	2 yes	3 unknown	
0.7 state	the participant	1 agreed to participate again	2 rejected to participate again	3 was not found	

1. General Business Information

1.0 name	are you Mr./Mrs. X	1 no	2 yes	
1.1 ownbus	owner of the busi- ness	1 no	2 yes	
1.1.1 othown	other business owners	1 no	2 yes (active)	3 yes (non- ac.)
1.1.2 same	same person as 1998/99	1 no	2 yes	if "yes", go to 1.2
1.1.3 samac	is the "same" per- son still active	1 no	2 yes	
1.1.4 takov	when was business taken over	day	month	year
1.1.5 takpay	how much did you pay for it?			

1.1.6 relat	are you a relative?	1 taken over	2 self- establ.				
1.1.7 relhow	how are you re- lated to the former owner?	1 mother /father	2 child	3 un- cle/aun t	4 wife/hu sband	5 brother /sister	6 cousin
1.1.7.1 relcor	belongs to core or extended family	1 core	2 ex- tended				
1.2 selfest	business self- established	1 taken over	2 self- establ.				
1.3 est	year of establish- ment						
1.4 noemp1	current number of employees (over all)						
1.4.1 noemp2	number of full- time employees						
1.4.2 noemp3	no. of employees from the extended family						
1.5.1 libus1	line of business manufacturing: textiles	1 no	2 yes				
1.5.2 libus2	line of business manufacturing: wood	1 no	2 yes				
1.5.3 libus3	line of business manufacturing: metal	1 no	2 yes				
1.5.4 libus4	line of business manufacturing: other	1 no	2 yes				
1.5.5 libus5	line of business construction	1 no	2 yes				
1.5.6 libus6	line of business trade: retail / trade	1 no	2 yes				
1.5.7 libus7	line of business trade: restaurants, bars, hotels, sha- beens	1 no	2 yes				
1.5.8 libus8	line of business services	1 no	2 yes				
1.5.9 libus9	line of business other	1 no	2 yes				
1.6.1 hours	number of work- ing hours/week						

1.6.2	number of work- ing months/year		
1.6.3	weekly opening hours		
1.7.1	member of cham- chacom ber of commerce	1 no	2 yes
1.7.2	member of coop- coop erative	1 no	2 yes
1.7.3	club/society/assoc. club to enhance busi- ness	1 no	2 yes
1.7.4	member of savings savcl / banking club	1 no	2 yes
1.8	written business buspla plan	1 no	2 yes
1.8.1	by plan covered platim time period	1 ≤ 1 year (op- erat.)	
		2 > 1 year (strate- gic)	

Attention! Members of savings & banking clubs are rated both, 1.7.3 and 1.7.4 (new category)

2. Human Capital

2.1	years of education											
2.1.1	highest degree of edudeg formal education	1 none	2 grade 7, stand. 6	3 ZJC	4 O- level	5 A- level	6 poly- tech.	7 bache- lor	8 mas- ter	9 Ph.D. / D.Sc.	10 other	
2.2	received voca- votra tional training	1 no	2 yes									
2.3	employment and ebost bus. owner at same time	1 no	2 yes, currently		3 yes, during the starting phase		4 yes, during any other phase					
2.4	age of subject											

3. Targets, Goals, and Strategies

3.0	goals: red cards or- redcar der	1	2	3	4	5	6	
3.0.1	most important goal goal1	1 show initiative	2 new market- ing strategy	3 improve produc- tion	4 better than com- petitors	5 expand- ing	6 more profit	7 other
3.0.2	second most impor- goal2 tant goal	1 show initiative	2 new market- ing strategy	3 improve produc- tion	4 better than com- petitors	5 expand- ing	6 more profit	7 other

A5 Measurement Instrument (Study 3)

3.0.3 goal3	third most important goal	1 show initiative	2 new marketing strategy	3 improve production	4 better than competitors	5 expanding	6 more profit	7 other
3.1 nogoal	no. of subgoals (goal 1&2)							
3.1.0 golmar	marketing and sales issues in the foreground (goal 1&2)	1 low	2	3	4	5 high		
3.1.1 spef1	goal specificity (goal1)	1 low	2	3	4	5 high	<u>high</u> : goal is a number or it is very clear when reached <u>high</u> : very difficult when lots of effort necessary to reach - given the situation s is in.	
3.1.2 diffr1	goal difficulty (goal1) rater estimate	1 low	2	3	4	5 high		
3.1.3.1 seff1	self-efficacy subgoal 1 (goal card 1)							
3.1.3.2 seff2	self-efficacy subgoal 2 (goal card 1)							
3.1.3.3 seff3	self-efficacy subgoal 3 (goal card 1)							
3.2.1 spef2	goal specificity (goal2)	1 low	2	3	4	5 high		
3.2.2 diffr2	goal difficulty (goal2) rater estimate	1 low	2	3	4	5 high		
3.2.3.1 seff4	self-efficacy subgoal 1 (goal card 2)							
3.2.3.2 seff5	self-efficacy subgoal 2 (goal card 2)							
3.2.3.3 seff6	self-efficacy subgoal 3 (goal card 2)							
3.3.1 detai1	detailedness of description (strategies goal1)	1 low	2	3	4	5 high		
3.3.2 reali1	realism (strategies goal1)	1 low	2	3	4	5 high	<u>low</u> : there is no chance to reach the goal this way, given the situation s is in.	
3.3.3 plan1	amount of planning (strategies goal1)	1 low	2	3	4	5 high		
3.3.4 proac1	proactiveness (strategies goal1)	1 low	2	3	4	5 high		
3.3.5 actpa1	action in the past (strategies goal1)	1 low	2	3	4	5 high		
3.3.6 compl1	complete planning (strategies goal1)	1 low	2	3	4	5 high	<u>high</u> : everything is planned out in detail, e.g. all necessary steps in-	

A5 Measurement Instrument (Study 3)

							cluding some substeps are described.
3.3.7 critp1	critical point planning (strategies goal1)	1 low	2	3	4	5 high	<u>high</u> : one important crucial point is described in detail, everything else is left vague; however high goal orientation - keeps goal in mind.
3.3.8 oppor1	opportunistic (strategies goal1)	1 low	2	3	4	5 high	<u>high</u> : does not plan in advance, but actively looks for business chances and exploits them; easily deviates from a goal.
3.3.9 react1	reactive (strategies goal1)	1 low	2	3	4	5 high	<u>high</u> : goes from one issue /problem to the other; does not produce changes, but waits for them to happen and reacts then, no goal orientation.
3.3.10 clear1	can't decide for 1 clear strategy (none 4/5)	1 no	2 yes				
3.3.11 sure1	sureness of rater about judgement of strategies (goal1)	1 low	2	3	4	5 high	
3.4.1 detai2	detailedness of description (strategies goal2)	1 low	2	3	4	5 high	
3.4.2 reali2	realism (strategies goal2)	1 low	2	3	4	5 high	<u>low</u> : there is no chance to reach the goal this way, given the situation s is in.
3.4.3 plan2	amount of planning (strategies goal2)	1 low	2	3	4	5 high	
3.4.4 proac2	proactiveness (strategies goal2)	1 low	2	3	4	5 high	
3.4.5 actpa2	action in the past (strategies goal2)	1 low	2	3	4	5 high	
3.4.6 compl2	complete planning (strategies goal2)	1 low	2	3	4	5 high	<u>high</u> : everything planned out in detail, e.g. all necessary steps incl. some substeps are described.
3.4.7 critp2	critical point planning (strategies goal2)	1 low	2	3	4	5 high	<u>high</u> : one important crucial point is described in detail, everything else is left vague; however high goal orientation - keeps goal in mind.

A5 Measurement Instrument (Study 3)

3.4.8 oppor2	opportunistic (strategies goal2)	1 low	2	3	4	5 high	<u>high</u> : does not plan in advance, but actively looks for business chances and exploits them; easily deviates from a goal.	
3.4.9 react2	reactive (strategies goal2)	1 low	2	3	4	5 high		<u>high</u> : goes from one issue /problem to the other; does not produce changes, but waits for them to happen and reacts then, no goal orientation.
3.4.10 clear1	can't decide for 1 clear strategy (none 4/5)	1 no	2 yes					
3.4.11 sure2	sureness of rater about judgement of strategies (goal2)	1 low	2	3	4	5 high		

4. Competition

4.1 noissu	number of issues competitors don't have		if "0", go to 4.2				
4.1.1 concom	concreteness of description	1 low	2	3	4	5 high	<u>high</u> : describes speciality in detail and gives many examples.
4.1.2 inocom	innovativeness	1 low	2	3	4	5 high	<u>high</u> : uses new ideas for this line of business and this environment. the more unusual the idea the more innovative.
4.2 gapor	gap / niche orientation (owner filled a gap)	1 low	2	3	4	5 high	<u>Gap</u> : Innovative/unusual product/service which many customers want but only few firm offer
4.3 nocomp	number of competitors						
4.4 compfri	competitors or more friends	1 definit. com- petitors	2	3	4	5 more friends	Interviewer judgement!
4.5 compag	competitive aggressiveness	1 live and let live	2	3	4	5 undo com- petitors	Interviewer judgement!

5. Innovativeness and Initiative

5.1 planch	plans change	1 no	2 yes	if "no", go to 5.2			
5.1.1 inocha	innovativeness of change	1 low	2	3	4	5 high	
5.1.2 realch	realism of change	1 low	2	3	4	5 high	
5.1.3 concino	concreteness of description (change)	1 low	2	3	4	5 high	
5.2 idea	had innovative idea	1 no	2 yes	if "no", go to 5.3			
5.2.1 concide	concreteness of description (idea)	1 low	2	3	4	5 high	
5.2.2 inoidea	innovativeness (idea)	1 low	2	3	4	5 high	
5.2.3 ideaelse	got idea from someone else	1 no	2 yes	if "no", go to 5.3			
5.2.4 else	this other person was	1 com- petitor	2 em- ployee	3 cus- tomer	4 family	5 friend	6 other
5.3 undsta	overcoming barriers: understood question	1 not at all	2	3	4	5 very well	
5.3.1 nobar1	number of different ideas: "out of money"						
5.3.1.1 actbar1	how much did S stay active / how much did he delegate "out of money"	1 not at all ac- tive	2	3	4	5 very active	
5.3.2 nobar2	number of different ideas: "broken machine"						
5.3.2.1 actbar2	how much did S stay active / how much did he delegate "ma- chine"	1 not at all ac- tive	2	3	4	5 very active	
5.3.3 nobar3	number of different ideas: "no supplies"						
5.3.3.1 actbar3	how much did S stay active / how much did he delegate "sup- plies"	1 not at all ac- tive	2	3	4	5 very active	

5.3.4 nobar4	number different ideas: "landlord"					
5.3.4.1 actbar4	how much did S stay active / how much did he delegate "landlord"	1 not at all active	2	3	4	5 very active

6. Leadership and Employees

6.1.1 conf1	confidence in leading					
6.1.2 conf2	confidence in negotiating (bus.)					
6.1.3 conf3	confidence in negotiating (cus.)					
6.1.4 conf4	confidence in financial overview					
6.1.5 conf5	confidence in own pricing					
6.1.6 conf6	confidence on communicating					
6.1.7 conf7	confidence in convincing					
6.2.1 noem98	number of employees 1998					
6.2.2 noem99	number of employees 1999					
6.2.3 noem00	number of employees 2000					
6.2.3 noem01	number of employees 2001					
6.3 famem	employed / employs family members	1 no	2 yes, in the past	3 yes, currently	if "no", go to 6.4	
6.3.1 corfam	employed family members belong(ed) to core family	1 no	2 yes, all of them	3 yes, some do	core family: child, brother, sister, cousin, mother, father, husband, wife, uncle, aunt	
6.3.2 worked	it worked	1 not at all	2	3	4	5 very well
6.4.1 kinsh1		1 wife		2 mother, etc.		

6.4.2 kinsh2		1 his choice	2 parents' choice
6.4.3 kinsh3			
6.4.4 kinsh4			
6.4.5 kinsh5			

7. Difficulties / Problems and Environment

7.1 dodiff	would do things differently	1 no	2 yes	if "no", got to 7.2		
7.1.1 concid	concreteness of ideas	1 low	2	3	4	5 high
7.1.2 learn	evidence of learning from experience	1 low	2	3	4	5 high
7.2.1 compl x	environment simplicity/complexity					
7.2.2.1 hosti	environment hostility					
7.2.2.2 friend	environment friendliness					
7.2.2.3 hostil1	environmental hostility 1					
7.2.2.4 hostil2	environmental hostility 2					
7.2.3.1 dy- nami	environment dynamic					
7.2.3.2 predic	environment predictability					
7.2.4 cntrl	environment controllability					
7.2.5 buscyc	business cycle					
7.3.1 concad	concreteness of description of advantage	1 low	2	3	4	5 high
7.3.2 answer	question answered to the point	1 not at all	2	3	4	5 abso- lutely
7.3.3 advant	estimate of how strong advantage is compared to competitors	1 very weak	2	3	4	5 very strong

7.4 busad	friend should(n't) invest in same bus.	1 should abso- lutely	2	3	4	5 should abso- lutely not
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8. Success

8.1.1 cus89	decrease / increase of customers 1998-1999	1 decrease	2 same	3 increase
8.1.1.1 cus89a	% decrease of cus- tomers 1998-1999			
8.1.1.2 cus89b	% increase of cus- tomers 1998-1999			
8.1.2 cus92	decrease / increase of customers 1999-2000	1 decrease	2 same	3 increase
8.1.2.1 cus92a	% decrease of cus- tomers 1999-2000			
8.1.2.2 cus92b	% increase of cus- tomers 1999-2000			
8.1.3 cus01	decrease / increase of customers 2000-2001	1 decrease	2 same	3 increase
8.1.3.1 cus01a	% decrease of cus- tomers 2000-2001			
8.1.3.2 cus01b	% increase of cus- tomers 2000-2001			
8.2.1 sal89	decrease / increase sold goods 1998- 1999	1 decrease	2 same	3 increase
8.2.1.1 sal89a	% decrease of sold goods 1998-1999			
8.2.1.2 sal89b	% increase of sold goods 1998-1999			
8.2.2 sal92	decrease / increase of sold goods 1999-2000	1 decrease	2 same	3 increase
8.2.2.1 sal92a	% decrease of sold goods 1999-2000			
8.2.2.2 sal92b	% increase of sold goods 1999-2000			
8.2.3 sal01	decrease / increase sold goods 1999- 2000	1 decrease	2 same	3 increase
8.2.3.1 sal01a	% decrease of sold goods 2000-2001			
8.2.3.2 sal01b	% increase of sold goods 2000-2001			
8.3.1 pro89	decrease / increase profit 2000-2001	1 decrease	2 same	3 increase

8.3.1.1 pro89	% decrease of profit 1998-1999				
8.3.1.2 pro89	% increase of profit 1998-1999				
8.3.2 pro92	decrease / increase profit 1999-2000	1 decrease	2 same	3 increase	
8.3.2.1 pro92a	% decrease of profit 1999-2000				
8.3.2.2 pro92b	% increase of profit 1999-2000				
8.3.3 pro01	decrease/increase profit 2000-2001	1 decrease	2 same	3 increase	
8.3.3.1 pro01a	% decrease of profit 2000-2001				
8.3.3.2 pro01b	% increase of profit 2000-2001				
8.4 indpro	increase / decrease profit (last 3 years)	1 decrease	2 same	3 increase	
8.4.1 decpro	% decrease profit (last 3 years)				
8.4.2 incpro	% increase profit (last 3 years)				
8.5 proout	% of profit taken out of business				
8.6 loapp	applied for loan	1 no	2 yes	if "no", got to 8.7	
8.6.0 loan	got a loan	1 no	2 yes	if "no", got o 8.7	
8.6.0.1 lopro	got a loan	1 no	2 yes	3	Attention! Rate twice new, categories added!
8.6.1 lobank	loan by bank	1 no	2 yes	it's still being processed	
8.6.2 lofam	loan by family	1 no	2 yes		
8.6.3 lofri	loan by friend	1 no	2 yes		
8.6.4 logov	loan by govern-ment	1 no	2 yes		
8.6.5 longo	loan by ngo	1 no	2 yes		
8.6.6 othlo	loan by other	1 no	2 yes		
8.6.7.1 much1	how much loan 1				
8.6.8.1 loyea1	what year loan 1				
8.6.7.2 much2	how much loan 2				

8.6.8.2 loyea2	what year loan 2					
8.6.7.3 much3	how much loan 3					
8.6.8.3 loyea3	what year loan 3					
8.7 dissuc	distribution of success (graphs sheet)					
8.8 sucoth	others say about success					
8.9 sucsel	how successful compared to competitors					
8.10 satwor	satisfied with work					
8.11 satinc	satisfied with current income					
8.12.1 grogo1	growth goal 1 (bus. owner A vs. B)					
8.12.2 moti1	motivation 1 (business owner A vs. B)					
8.12.3 grogo2	growth goal 2 (bus. owner A vs. B)					
8.12.4 moti2	motivation 2 (business owner A vs. B)					
8.13 kohle	asked someone for money last year 2000	1 no	2 yes			
8.14.1 payemp	could pay employees 2000	1 no pay	2 reduced	3 yes	4 delayed	
8.14.1.1 paynew	could pay employees 2000	1 no pay	2 reduced	3 delayed	4 normal	5 increase
8.14.2 payoft	how often did that happen					if "4 or 5", go to 8.15
8.14.3 pay67	more frequently in 2000	1 less	2 same	3 more		
8.15.1 supcos	pays more / less for supplies than last year	1 less	2 same	3 more		if "equal" or "less", got to 8.16
8.15.2 apricin	price increase according to supplies' costs	1 no	2 yes			

8.15.3 prilag	price increase lag					
8.16 buy	can you buy more / less for him/her self	1 less	2 same	3 more		
8.17 tenant	took on additional tenant 1997	1 no	2 yes			
8.18 elec	has electricity	1 no	2 yes			
8.19 phone	has a telephone line	1 no	2 yes			
8.20 indreg	is in an industry register	1 no	2 yes			
8.21.1 monav	no. of month: average sales					
8.21.2 salav	sales level: months of average sales					
8.21.3 monlo	no. of month: low sales					
8.21.4 sallo	sales level: months of low sales					
8.21.5 monhi	no. of month: high sales					
8.21.6 salhi	sales level: months of high sales					
8.22.1 lassal	sales during last week					
8.22.2 lasexp	expenses during last week					
8.22.3 laspro	profit last week					
8.22.4 lasav	was last week low, high, or average	1 low	2 average	3 high		
8.23 bucard	has business card	1 no	2 yes			
8.24.1 book	How do you do book-keeping	1 I have it in my head	2 I calculate it each month or at irregular intervals	3 I do professional book-keeping	4 My wife (or another fam. member) does the professional book-keeping	5 I have a professional book-keeper
Attention! Must be rated twice because new categories were added!						
8.24.1.1 book1	How do you do your book-keeping	1 I do it	2 A relative does it	3 An employee does it	4 An external book-keeper does it	5 Other

8.24.2 boexp	Estimate of ex- perience / quali- fication of the book-keeping person	1 low				5 high
8.25.1 land1	Land S operates from belongs to him/her	1 no	2 yes			
8.25.2 land2	Owens other land	1 no	2 yes			
8.26.1 equip1	Money spent on equipment					
8.26.2 equip2	Value today 1					
8.26.3 equip3	Value today 2					
8.27 wages	Payment to workers (monthly)					
8.28 supply	Payment for supplies (last month)					
8.29.1 accp1	Has personal bank account	1 no	2 yes			
8.29.2 accp2	Uses personal account for business	1 no	2 yes	3 sometimes		
8.29.3 accb	Has extra busi- ness bank ac- count	1 no	2 yes			

9. Vignettes

9.1.1 wldsel	would sell	1 no	2 yes			
9.1.2 autor	shows autonomy orientation	1 low	2	3	4	5 high
9.2.1 warn	would warn friend of registra- tion	1 not at all	2	3	4	5 defi- nitely
9.2.2.1 noneg	number of nega- tive statements					
9.2.2.2 nopos	number of posi- tive statements					
9.2.3.1 reg1	reason for not reg.:tax	1 no	2 yes			
9.2.3.2 reg2	reason for not reg.: fear of the un- known	1 no	2 yes			

9.2.3.3 reg3	reason for not reg.: too much hassle in the process of registration	1 no	2 yes				
9.2.3.4 reg4	reason for not reg.: doesn't have the skills to do it	1 no	2 yes				
9.2.3.5 reg5	reason for not reg.: psych. barriers (it's another world he can't even imagine being in)	1 no	2 yes				
9.2.3.6 reg6	reason for not reg.: other	1 no	2 yes				
9.2.3.7 reg7	not qualified / too small	1 no	2 yes				
9.2.3.8 reg8	wants to operate on low profile/from home	1 no	2 yes				
9.2.3.9 reg9	avoiding gov. interference/ monitoring	1 no	2 yes				
9.2.3.10 reg10	reg. process too expensive	1 no	2 yes				
9.2.3.11 reg11	to do illegal business	1 no	2 yes				
9.2.3.12 reg12	compulsory requirements (e.g. med aid & wages)	1 no	2 yes				
9.3.1 formal	formal / informal sector	1 registered	2 pays taxes	3 tax & reg.	4 doesn't know	5 no tax, not reg.	→if "not reg." go to 9.3.3.1 →if "reg." go to 9.3.2
9.3.2 became	when did S become formal		→now go to 9.4				
9.3.3.1 regre1	reason for not reg.:tax	1 no	2 yes				
9.3.3.2 regre2	reason for not reg.: fear of the unknown	1 no	2 yes				
9.3.3.3 regre3	reason for not reg.: too much hassle in the process of registration	1 no	2 yes				

9.3.3.4 regre4	reason for not reg.: doesn't have the skills to do it	1 no	2 yes
9.3.3.5 regre5	reason for not reg.: psych. Barriers (it's another world he can't even imagine being in)	1 no	2 yes
9.3.3.6 regre6	reason for not reg.: other	1 no	2 yes
9.3.3.7 regre7	not qualified / too small	1 no	2 yes
9.3.3.8 regre8	wants to operate on low pro- file/from home	1 no	2 yes
9.3.3.9 regre9	avoiding gov. inter- fer- ence/monitoring	1 no	2 yes
9.3.3.10 regre10	reg. process too expensive	1 no	2 yes
9.3.3.11 regre11	to do illegal business	1 no	2 yes
9.3.3.12 regre12	compulsory re- quire-ments (e.g. med aid & wages	1 no	2 yes
9.4.1 zvt1	IQ test item 1		seconds
9.4.2 zvt2	IQ test item 2		seconds
9.4.3 zvt3	IQ test item 3		seconds
9.4.4 zvt4	IQ test item 4		seconds

10. Modernism

10.1 ne5/R	understand way of thinking	1 no	2 yes
10.2 re12/R	be truly good without religion	1 no	2 yes
10.3 ac1	organisations		Count no. of organisations & omit the compulsory ones
10.4 as1	how much school- ing	years	

10.5 go2	problems facing your country?		Count no. of problems	
10.6 in7	In what country is Moscow?	1 wrong	2 right	
10.7 mm10/ R	Interests			
10.8 mm5/ R	Newspaper infor- mation			
10.9 ch3/R	New ways of do- ing things			
10.10 ci13/R	Qualification			
10.11 ef11/R	Important for fu- ture			
10.12 ef14/R	Earthquakes			
10.13a c6/R	Doing something about it			
10.14 fs3/R	Opinions	1 A	2 B	

11. Other Issues

11.1 adres	gave us own ad- dress	1 no	2 yes					
11.2 prov- ince	what province is your business in?	1 Harare	2 Matabele- land	3 Masho- naland East	4 Mosho- naland Cen- tral	5 other		
11.3 approv	asking a third person about busi- ness is ok.	1 no	2 yes					

A6 Manual of Scales (Study 3)

1. Self-Efficacy	A-123
2. Entrepreneurial Knowledge	A-124
3. Human Capital	A-126
4. Cognitive Ability	A-126
5. Financial Growth	A-127

1. Self-Efficacy

Scale: **Self-Efficacy**

Source: Krauss, S.I. (2003). *Psychological Success Factors of Small and Micro Business Owners in Southern Africa: A Longitudinal Approach*. Unpublished dissertation. University of Giessen, Department of Psychology.

	Scale
Alpha	.828
Mean	84.50
SD	11.63
N	279

Item	Label	Scale	ITC	ICC
conf1	How confident are you that you can lead people well?	0-100%	.526	
conf2	How confident are you that you can negotiate with fellow business men well?	0-100%	.632	
conf3	How confident are you that you can negotiate with customers well?	0-100%	.591	
conf4	How confident are you that you can keep an overview over your financial affairs well?	0-100%	.599	
conf5	How confident are you that you can do the pricing of your products well?	0-100%	.541	
conf6	How confident are you that you can communicate with other people well?	0-100%	.525	
conf7	How confident are you that you can convince customers to buy products well?	0-100%	.635	

2. Entrepreneurial Knowledge

Scale: **Entrepreneurial Knowledge**

Source: Adapted from Krauss, S.I. (2003). *Psychological Success Factors of Small and Micro Business Owners in Southern Africa: A Longitudinal Approach*. Unpublished dissertation. University of Giessen, Department of Psychology.

	Scale
Alpha	.453
Mean	.678
SD	.129
N	263

Item	Label	Scale	ITC	ICC
bqs1r	Profit is determined by: a) Business income minus expenses. (*) b) Business income minus wages. c) Business income minus advertising costs.	multiple choice	.223	
bqs2r	Market research is important for: a) Determining whether or not your products or services will sell. (*) b) Recruiting employees. c) Keeping within the law	multiple choice	.256	
bqs3r	National employment regulation must be observed by: a) All employees. (*) b) Only registered businesses. c) Only tax paying businesses.	multiple choice	.135	
bqs4r	Which is the best method of checking on business progress: a) Inspecting the business accounts. (*) b) Number of customers. c) Volume of sales.	multiple choice	.197	
bqs5r	Why is advertising important? a) The public learns about your product. (*) b) You can be proud of your business. c) It helps you get loans.	multiple choice	.303	
bqs6r	Business discounts given to your friends and family: a) Need to be recorded. (*) b) Do not need to be recorded.	multiple choice	.171	
bqs7r	Unregistered businesses: a) Are obliged to pay sales tax. (*) b) Are not obliged to pay sales tax.	multiple choice	.082	
bqs8r	Which of the following statements is true? a) Any business earning \$60,000 per annum is required to register for sales tax. (*) b) Informal businesses earning less than \$60,000 per annum need not required sales tax. c) Only formal businesses earning over \$60,000 per annum are required to register for sales tax.	multiple choice	.228	
bqs9r	When business is bad: a) All businesses may reduce wages to employees. b) No business may reduce wages to employees without the agreement of employees or applica-	multiple choice	.143	

	tion to the Labour Relations Board. (*) c) Only unreg. businesses may reduce wages.			
bqs10r	A business contract is binding: a) If both parties have agreed to clear terms. (*) b) Only if both parties have agreed to clear terms in writing.	multiple choice	-.157	
bqs11r	If you make an offer to sell a product or service and this offer is accepted by the other party: a) You are legally bound to provide the product or service as agreed. (*) b) You can change the terms if you feel it necessary.	multiple choice	.256	
bqs12r	Which of the following is a business expense? a) Donations to charity. b) Repairs to plumbing on the business premises. (*) c) Payment for tax advice. d) Paying for a party to which customers are invited.	multiple choice	.225	
bqs13r	A manufacturer must: a) Replace or repair goods proven to be faulty when purchased. (*) b) Does not need to compensate - it is the buyer's risk.	multiple choice	.123	
bqs14r	A sale is completed when: a) Agreement has been reached. (*) b) Only when money has changed hands.	multiple choice	-.013	
bqs15r	Collateral for a loan is required: a) To protect the interest of the lender. (*) b) To keep certain people from entering business.	multiple choice	.336	
bqs16r	If business is bad: a) A borrower may reschedule payment of the debt. b) A borrower may only reschedule payment of the debt with the agreement of the lender.	multiple choice	.011	
bqs17r	Informal, unregistered companies: a) Are not required to register for income tax purposes. b) Are required to register for income tax purposes. (*)	multiple choice	.095	
bqs18r	Employees in unregistered companies: a) Must have PAYE deducted if their earnings are above \$30,000 per annum. (*) b) Do not need to have PAYE deductions made by the employer.	multiple choice	.025	
bqs19r	Which of the following could be source of finance for business expansion? a) Loan from bank. (*) b) Government subsidy. c) The National Social Security Authority.	multiple choice	.141	
bqs20r	Which of the following is a business expense? a) Proprietor pays for a haircut. b) Proprietor buys lunch. c) Proprietor pays for an advertisement of the business. (*)	multiple choice	.105	

3. Human Capital

Scale: **Education**

Source: Krauss, S.I. (2003). *Psychological Success Factors of Small and Micro Business Owners in Southern Africa: A Longitudinal Approach*. Unpublished dissertation. University of Giessen, Department of Psychology.

	Scale
R	.629
Mean	-.041
SD	.870
N	278

Item	Label	Scale	ITC	ICC
edueas	Years of Education	factual		
edudegs	Highest Degree of Education	factual		

4. Cognitive Ability

Scale: **Cognitive Ability**

Source: Oswald, W. D., & Roth, E. (1987). *Der Zahlen-Verbindungs-Test (ZVT) - The Connecting numbers test*. Göttingen, Germany: Hogrefe. (Builds on the Trail Making Test used in the U.S. Army test of general mental ability.)

	Scale
Alpha	.961
Mean	113.670
SD	36.01
N	262

Item	Label	Scale	ITC	ICC
zvt1s	Connecting numbers test item 1	factual	.880	
zvt2s	Connecting numbers test item 2	factual	.909	
zvt3s	Connecting numbers test item 3	factual	.916	
zvt4s	Connecting numbers test item 4	factual	.907	

5. Financial Growth

Scale: **Financial Growth**

Source: Krauss, S.I. (2003). *Psychological Success Factors of Small and Micro Business Owners in Southern Africa: A Longitudinal Approach*. Unpublished dissertation. University of Giessen, Department of Psychology.

	Scale
Alpha	.879
Mean	15.937
SD	35.028
N	262

Item	Label	Scale	ITC	ICC
GroCUS	Growth Customer 2000 – 2003	factual	.733	
GroSAL	Growth Sales 2000 – 2003	factual	.839	
GroPRO	Growth Profit 2000 – 2003	factual	.769	

A7 German Summary

Wissenschaftler aus verschiedenen Disziplinen betonen die Bedeutung des Kleinunternehmersektors für wirtschaftliches Wachstum, die Schaffung von Arbeitsplätzen, Wohlstand, Innovation und die sozial-ökonomische Entwicklung der Gesellschaft (z.B. Autio, 2005; Birch, 1987; Kirzner, 1997; Frese, 2000). Ein besseres Verständnis der Erfolgsfaktoren in kleinen Unternehmen ist daher von großer Bedeutung.

Die vorliegende Dissertation basiert auf der Annahme, dass Wissen und Lernprozesse des Unternehmers entscheidend zum Erfolg in kleinen Unternehmen beitragen. Wissen und Lernen sind hilfreich für die Entdeckung und die Ausnutzung von Geschäftsmöglichkeiten (e.g. Shane, 2000; Shane & Venkataraman, 2000). Zusätzlich erfordert die sich stetig verändernde Arbeitswelt - mit neuen technologischen Entwicklungen und steigenden Erwartungen der Kunden - vom Unternehmer ein kontinuierliches Lernen zum Erwerb neuen Wissens und neuer Fertigkeiten (Howard, 1995; Thayer, 1997).

In drei unabhängige Studien befassten wir uns mit den Effekten von Human Kapital (Wissen/Fähigkeiten und Erfahrung/Schulbildung) und Lernen von Kleinunternehmern. Studie 1 ermittelte meta-analytisch über mehrer Studien den Gesamteffekt von Human Kapital auf Erfolg und identifizierte Moderatoren und Mediatoren des Erfolgzusammenhangs. Studie 2 fokuzierte den Prozeß des Lernens des Kleinunternehmers und die Aneignung aktuellen unternehmerischen Wissens. In Studie 3 untersuchten wir die Rolle unternehmerischen Wissens im Zusammenhang mit der Selbstwirksamkeit des Unternehmers.

Die erste Studie analysierte Human Kapital aus einer Perspektive des Lernens. Wir integrierten meta-analytisch Ergebnisse aus über zwei Jahrzehnten der Human Kapital-Forschung im Entrepreneurshipbereich. Bislang kam eine Reihe von Wissenschaftlern in narrativen Zusammenfassungen der Forschung zu Human Kapital zu dem Schluß, dass Human Kapital in positiver Beziehung zum Erfolg steht. Trotzdem gab es immer wieder widersprüchliche Befunde. Die Größe des Zusammenhangs zwischen Human Kapital und Erfolg, der beste Schätzwert für Human Kapital sowie die Prozesse zwischen Human Kapital Investitionen und Erfolg blieben bisher unbekannt.

Eine umfangreiche elektronische Literaturrecherche in gängigen psychologischen und betriebswirtschaftlichen Datenbanken, die Sichtung der Literaturverzeichnisse aufgefundener Arbeiten, manuelle Suchen in relevanten Zeitschriften sowie die Kontaktierung von Autoren

fürte zu 67 Studien mit brauchbaren statistischen Maßen zum Human Kapital - Erfolgswzusammenhang. Die Gesamtstichprobe der 67 Studien umfasste $n = 21.597$ Unternehmer. Für die statistische Analyse verwendeten wir die meta-analytischen Verfahren nach Hunter und Schmidt (1990) und Pfadanalysen nach Joereskog und Soerbom (1996). Für die Berechnung der Zusammenhänge korrigierten wir Stichprobenfehler und Unreliabilität von Prädiktor und Kriterium.

Der meta-analytischen Gesamtzusammenhang zwischen Human Kapital und Erfolg war positiv. Der Gesamteffekt war klein ($r_c = .10$) – insbesondere im Hinblick auf die Bedeutung, die Human Kapital in der Unternehmerforschung typischerweise beigemessen wird. Ein besonderer Schwerpunkt der ersten Studie lag auf der Analyse von Moderatorvariablen. Aus einer Perspektive des Lernens explizierten wir die Prozesse der Aneignung von Human Kapital mit Erfahrung/Schulbildung als *Möglichkeiten* zum Erwerb von Wissen/Fähigkeiten sowie der Anwendung von Wissen/Fähigkeiten im unternehmerischen Kontext. Im Gegensatz zu Wissen/Fähigkeiten sind Erfahrungen/Schulbildung lediglich Näherungsvariablen für Human Kapital. Wie erwartet zeigten sich höhere Erfolgswzusammenhänge für Wissen/Fähigkeiten im Vergleich zu Erfahrung/Schulbildung. Human Kapital kann im unternehmerischen Kontext besser angewandt werden je mehr es den aktuellen unternehmerischen Aufgaben angepasst ist. In Übereinstimmung mit dieser Vorstellung ergaben Moderatoranalysen höhere Zusammenhänge für Human Kapital bezogen auf unternehmerische Aufgaben verglichen mit Human Kapital mit niedrigem Bezug zu unternehmerischen Aufgaben. Eine Reihe weiterer Variablen moderierte den Zusammenhang zwischen Human Kapital und Erfolg. Der Zusammenhang zwischen Human Kapital und Erfolg war höher in Entwicklungsländern im Vergleich zu entwickelten Ländern, in jungen Unternehmen verglichen mit älteren Unternehmen und wenn der unternehmerische Erfolg über die Größe des Unternehmens gemessen wurde (im Vergleich zu Profit und Wachstum). Human Kapital als Wissen/Fähigkeiten ($r_c = .17$) und Human Kapital in jungen Unternehmen ($r_c = .19$) ergaben die höchsten Erfolgswzusammenhänge

In Moderatoranalysen verglichen wir zudem die Validität verschiedener theoretischer Ansätze zu unternehmerischem Erfolg: Schulbildung, Intelligenz, ressourcen-basierter Ansatz. Intelligenz und Variablen des ressourcen-basierten Ansatzes zeigten höhere Erfolgswzusammenhänge als Schulbildung.

Im letzten wichtigen Beitrag betrachteten wir die Effekte von Human Kapital auf Erfolg als Prozeß. Wir stützten uns auf die Unterscheidung zwischen Erfahrung/Schulbildung

und Wissen/Fähigkeiten. Unter Berücksichtigung des gefundenen Einflusses von Intelligenz entwickelten wir ein Mediationsmodell zum Einfluß von Human Kapital auf Erfolg: Von Erfahrung/Schulbildung und Intelligenz über Wissen zum Erfolg. Die Befunde waren in Einklang mit dem theoretischen Model. Es zeigten sich indirekte Effekte von Erfahrung/Schulbildung auf Erfolg, die von Wissen/Fähigkeiten mediiert wurden. Neben einem direkten Effekt zeigte sich auch ein indirekter Effekt der Intelligenz, der partiell von Wissen/Fähigkeiten mediiert wurde.

Die Befunde sind bedeutsam für Geldgeber, politische Entscheidungsträger, Pädagogen, und die Unternehmer selbst. Entrepreneurshipforschern bietet die Arbeit Hinweise für eine besse Auswahl und Operationalisierung von Human Kapital-Variablen in zukünftigen Studien.

In Studie 2 betrachteten wir einen wichtigen Aspekt von Human Kapital: Den Prozeß des Lernens. Die Studie überträgt erstmalig das Konzept von „deliberate practice“ (zielgerichtetes Lernen) auf den Entrepreneurshipbereich. Deliberate Practice umfaßt regelmäßige Aktivitäten mit dem Ziel der Verbesserung individueller Kompetenzen (Ericsson, Krampe, & Tesch-Römer, 1993). Deliberate Practice-Aktivitäten zeigten sich als gute Prädiktoren von Expertise und Performanz in Domänen der Musik, des Sports und kürzlich in ausgewählten Domänen der Arbeit (Sonntag & Kleine, 2000). Die Notwendigkeit der kontinuierlichen Anpassung des Unternehmers an Weiterentwicklungen im Bereich der Technik, neue Arbeitsabläufe und steigende Kundenerwartungen (vgl. Sonntag, Niessen, & Ohly, 2004) sowie die Bedeutung des Lernens in unternehmerischen Prozessen der Wahrnehmung und Beurteilung von Geschäftsmöglichkeiten (z.B. Shane & Venkataraman, 2000) legen nahe, dass Deliberate Practice auch im Entrepreneurshipbereich ein wichtiger Erfolgsfaktor ist. Zu Deliberate Practice Aktivitäten im Entrepreneurshipbereich zählen unter anderem das Lesen von Fachliteratur, mentales Simulieren und die aktive Suche nach Rückmeldung für die eigene Leistung. Unser zugrundeliegendes theoretisches Model des Lernens unterscheidet zwischen Intelligenz und Schulbildung als Voraussetzungen für Lernen, Deliberate Practice als Lernaktivitäten, und aktuellem Wissen und Erfolg als Folgen des Lernens.

Die Stichprobe umfaßte 90 südafrikanische Unternehmer. Das Hauptmeßinstrument bestand aus strukturierten situationalen Interviews und Fragebögen. Die Aktivitäten der Unternehmer wurden als Deliberate Practice gewertet und zu einem Deliberate Practice Index zusammengefaßt, wenn sie mit dem Ziel der Verbesserung der eigenen Kompetenzen

ausgeführt wurden und über die reine Erfüllung von Arbeitsaufgaben hinausgingen. Die Messung von Wissen umfaßte Tests aktuellen deklarativen unternehmerischen Wissens, prozeduralen Marketingwissens und einen Test unternehmensbezogener Wissensstrukturen. Erfolg wurde operationalisiert als Umsatz-, Kunden und Profitwachstum der letzten drei Jahre.

Ergebnisse aus Strukturgleichungsmodellen stützten das theoretische Lernmodell. Es zeigte sich ein direkter Effekt von Deliberate Practice auf unternehmerisches Wissen sowie ein indirekter Effekt auf Erfolg über unternehmerisches Wissen. Intelligenz und Schulbildung zeigten sich als Antezedenzen von Deliberate Practice.

Die Arbeit verdeutlicht die Bedeutung kontinuierlichen Lernens im Entrepreneurshipbereich. Erstmals konnten indirekte Effekte von Deliberate Practice auf Erfolg über die Aneignung aktuellen Wissens nachgewiesen werden. Die Ergebnisse sind praktisch relevant: Das Konzept von Deliberate Practice umfaßt individuell zugeschnittene Lernaktivitäten, die ohne große Kosten trainierbar sind.

In Studie 3 untersuchten wir die Rolle unternehmerischen Wissens und wahrgenommener Selbstwirksamkeit für späteren Erfolg. Selbstwirksamkeit bezieht sich auf die individuelle Überzeugung, mit eigenem Wissen und eigenen Fähigkeiten Aufgaben erfolgreich zu bewältigen (Bandura, 1997). Eine hohe Selbstwirksamkeit ist wichtig für Ausdauer und Einsatz bei der Ausführung von Aufgaben (Bandura & Locke, 2003). Dies gilt besonders für herausfordernde Aufgaben und in riskiobehafteten, unsicheren Situationen. Meta-analytisch konnten positive Effekte der Selbstwirksamkeit auf Performanz von Angestellten (Stajkovic & Luthans, 1998) und kürzlich auch auf Erfolg im Entrepreneurshipbereich nachgewiesen werden (Rauch & Frese, 2006). Unklar bleibt, inwiefern diese Effekte auf objektive Unterschiede im Leistungsvermögen des Individuums, bestimmte Aufgaben erfolgreich auszuführen, zurückzuführen sind (vgl. Gist, 1987). Bei Diskrepanzen zwischen tatsächlichem Wissen und der Selbstwirksamkeit könnten Anstrengung und Ausdauer auch fehlgeleitet werden und somit die Zusammenhänge zwischen Selbstwirksamkeit und Erfolg sinken. Neue Studien zeigen sogar negative Effekte für künstliche, nicht auf tatsächlichen Leistungen basierende Selbstwirksamkeit (Vancouver, Thompson, Tischner, & Putka, 2002). Wir erwarten einen Interaktionseffekt zwischen Selbstwirksamkeit und unternehmerischem Wissen: Je höher unternehmerisches Wissen, desto größer der Zusammenhang zwischen Selbstwirksamkeit und Erfolg.

Die Studie wurde in Zimbabwe durchgeführt und umfaßte 280 einheimische Unternehmer. Meßinstrumente waren Fragebögen und ein strukturiertes Interview. Unternehmerisches Wissen wurde über einen Multiple-Choice-Test operationalisiert. Selbstwirksamkeit wurde als spezifische Überzeugungen, unternehmerische Aufgaben erfolgreich auszuführen, gemessen. Erfolg wurde operationalisiert als finanzieller Wachstum und als Mitarbeiterwachstum der letzten drei Jahre.

Strukturgleichungsmodelle ergaben positive Effekte von unternehmerischem Wissen auf finanzielles Wachstum und Mitarbeiterwachstum. Die Effekte von Selbstwirksamkeit auf finanziellen Wachstum waren marginal. Es gab keinen Effekte auf das Mitarbeiterwachstum. Die Daten bestätigten für beide Erfolgsindikatoren die Annahme eines Interaktionseffektes zwischen Selbstwirksamkeit und unternehmerischem Wissen. Die Beziehung zwischen Selbstwirksamkeit und Erfolg war höher für Unternehmer mit hohem unternehmerischem Wissen.

Wir interpretieren die Befunde als nachteilige Auswirkungen eines übermäßigen Selbstvertrauens in das eigene Leistungsvermögen (*overconfidence*). Ein solches *übermäßiges* Selbstvertrauen resultiert aus der Diskrepanz zwischen tatsächlichem Wissen und dem Glauben an das eigene Leistungsvermögen. Die Befunde liefern einen Beitrag zum besseren Verständnis potentiall negativer Effekte der Selbstwirksamkeit auf die Leistung.

Die Dissertation liefert einen Beitrag zur Entwicklung evidenzbasierten Unternehmertums (vgl. Frese, Schmidt, Bausch, Rauch, & Kabst, 2005; Rauch & Frese, 2006). Auf der Basis meta-analytische Befunde können Manuale mit Handlungsanweise für Unternehmer und politische Entscheidungsträger entwickelt werden. Die Arbeit zeigt die Relevanz eines individuumzentrierten psychologischen Ansatzes in der Entrepreneurshipforschung. Mit dem Konzept von *Deliberate Practice* wurde ein neues individuumsbasiertes Konstrukt auf den Bereich Entrepreneurship angewandt, das theoretisch und praktisch brauchbar ist.

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Erklärung

Ich erkläre: Ich habe die vorgelegte Dissertation selbständig und nur mit den Hilfen angefertigt, die ich in der Dissertation angegeben habe. Alle Textstellen, die wörtlich oder sinngemäß aus veröffentlichten oder nicht veröffentlichten Schriften entnommen sind, und alle Angaben, die auf mündlichen Auskünften beruhen, sind als solche kenntlich gemacht.

Bad Homburg, den 4. Juli, 2006

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