

## **Business Owners' Action Planning and Its Relationship to Business Success in Three African Countries**

Michael Frese  
University of Giessen

Stefanie I. Krauss

Nina Keith

Susanne Escher

Rafal Grabarkiewicz

Siv Tonje Luneng,

Constanze Heers

Jens Unger

Christian Friedrich

### **Abstract**

A model of business success is developed with motivational resources (locus of control, self-efficacy, achievement motivation, and self-reported personal initiative) and cognitive resources (cognitive ability and human capital) as independent variables, business owners' elaborate and proactive planning as a mediator and business size and growth as dependent variables. Three studies with a total of 408 African micro- and small-scale business owners were conducted in South Africa, Zimbabwe, and Namibia. Structural equation analyses partially support our hypotheses on the importance of psychological planning by the business owners. Elaborate and proactive planning was substantially related to business size and to an external evaluation of business success, and was a (partial) mediator for the relationship between cognitive resources and business success. The model carries important implications for selection, training, and coaching of business owners.

Published in: Journal of Applied Psychology

Link: <http://www.apa.org/journals/apl/>

**Business Owners' Action Planning and Its Relationship to Business Success in Three African Countries**

Michael Frese, Stefanie I. Krauss, Nina Keith, Susanne Escher, Rafal Grabarkiewicz, Siv Tonje Luneng,  
Constanze Heers, Jens Unger, and Christian Friedrich

Dept. of Work and Organizational Psychology and Interdisciplinary Research Unit on Entrepreneurship  
and Management: Evidence Based Best Practice, Justus-Liebig-University

Otto-Behaghel-Str. 10F, 35394 Giessen, Germany

FAX: ++49 - (0)641 – 9926 229

e-mail: [michael.frese@psychol.uni-giessen.de](mailto:michael.frese@psychol.uni-giessen.de)

**Journal of Applied Psychology, in press**

*Acknowledgments:* We gratefully acknowledge the funding of this research through the Deutsche Forschungsgemeinschaft (German Research Foundation, project no.: FR 638/13-1, title "Psychological success factors of small and micro businesses: The role of goals and strategies"). We would also like to thank Simone Rief, who helped by collecting data in Harare. Thanks are also due to Pino Audia and Bob Baum for critiques of earlier drafts, and to Nico Bödeker who performed statistical analyses for a prior version of this article. We also thank the two anonymous reviewers who have very much helped to improve the manuscript. A prior publication on entrepreneurial orientation was done using parts of the Zimbabwe sample and the South African data (Krauss, Frese, Friedrich & Unger, 2005). The current analysis constitutes the only analysis of action planning done with these data.

## **Business Owners' Action Planning and Its Relationship to Business Success in Three African Countries**

### **ABSTRACT**

A model of business success is developed with motivational resources (locus of control, self-efficacy, achievement motivation, and self-reported personal initiative) and cognitive resources (cognitive ability and human capital) as independent variables, business owners' elaborate and proactive planning as a mediator and business size and growth as dependent variables. Three studies with a total of 408 African micro- and small-scale business owners were conducted in South Africa, Zimbabwe, and Namibia. Structural equation analyses partially support our hypotheses on the importance of psychological planning by the business owners. Elaborate and proactive planning was substantially related to business size and to an external evaluation of business success, and was a (partial) mediator for the relationship between cognitive resources and business success. The model carries important implications for selection, training, and coaching of business owners.

## **Business Owners' Action Planning and Its Relationship to Business Success in Three African Countries**

Scholars agree that performance models must take goal-directed actions as their starting point (e.g., Campbell, McCloy, Oppler, & Sager, 1993). Actions are determined by goals, plans, and feedback. Our study concentrates on business owners' action planning because the functionality of planning is controversial in entrepreneurship research and there is relatively little psychological research on planning. "A plan ... can control the order in which a sequence of operations is to be performed." (Miller, Galanter, & Pribram, 1960, p. 16; Wood & Locke, 1990).

Three lines of theory converge on the proposition that one requirement for effective goal-directed action is the development of well-developed plans. *Goal setting theory* (Locke & Latham, 1990) argued that plans are of particular importance in complex task environments (Wood, Mento, & Locke, 1987), that new tasks lead to deliberate planning (E. A. Locke & Latham, 2002), that comprehensive planning is necessary (Smith, Locke, & Barry, 1990), and that process characteristics of plans need to be considered (Wood & Locke, 1990). *Cognitive theory* has long held that planning is necessary to translate thoughts and intentions into action (at least since Miller, Galanter, & Pribram's 1960 book). The mechanisms of planning have been studied in the sense of "if-then" statements (Anderson, 1983; Card, Moran, & Newell, 1983), plans are not static but developed (refined) while acting, including bottom-up opportunistic processes that depend on perceived opportunities (Anderson, 1983; Hayes-Roth & Hayes-Roth, 1979) and with plans to be adapted at critical junctures (Mumford, Schultz, & Osburn, 2002). Finally, *action theory* has argued that plans are critical for transferring an intention into action (Gollwitzer, 1999), that amount of planning per se is not important, but that the quality of the plans counts (Sonnentag, 1998); quality plans include a long range perspective of planning, a range of important details, and back-up plans (particularly in unpredictable environments) (Frese & Zapf, 1994), and they are also based on a better mental model of a given situation (Hacker, 1992, Sonnentag, 1998).

In spite of this theoretical agreement, planning has not been studied sufficiently. The most comprehensive review of the planning literature states: “Although planning represents a crucial aspect of performance in many complex, real-world tasks, psychology has not, historically, invested much effort in studies of planning.” (Mumford, Schultz, & Van Doorn, 2001). Our study seeks to contribute to the literature on planning in the following ways:

1) We want to contribute to the controversy in entrepreneurship research on whether planning is useful. Scholars have been critical of conscious planning, arguing that entrepreneurs base their decisions on intuition (Allinson, Chell, & Hayes, 2000), that too much planning does not pay off (Bhide, 1994), and that planning makes people rigid, while the conditions for entrepreneurs are uncertain and require a high degree of improvising (Baker, Miner, & Easley, 2003). From this perspective planning is a distraction from time-constrained intuitive actions. Our study is *not* on formal planning in the sense of business plans or strategic plans formulated by special departments that are often based on calculations and usually take a long time to develop (often external consultants are involved as well). In contrast, we study plans in small businesses that are often merely in the owner’s head and usually not the result of a formal decision process. It is not a blueprint that a firm is supposed to act on but a list of issues that need to be thought about as owners pursue goals. The costs of such plans are minimal.

We would like to argue that these types of plans may enhance flexibility when dealing with unexpected events. Because planning helps business owners to think about several issues and several approaches, they may easily adjust their plans if something goes wrong, and contingencies can be added beforehand. Planning is based on mental simulations (Hacker, 1992) and forethought (Bandura, 2001) that can be used in a flexible way. Smith, Locke, and Barry (1990) have suggested differentiating between content and process of planning. While there is at least one study that has examined the function of the content of planning for entrepreneurial success (Baum, Locke, & Smith, 2001), to our knowledge there is no study outside our research group that has investigated process characteristics of these plans. We

studied two interrelated process characteristics of plans, the levels of elaborateness and of proactivity.

2) We shall report a field study on planning. Most studies on planning have used experimental approaches or simulated environments (Wood & Locke, 1990). Detailed field studies are necessary to convince the skeptics who worry about the external validity of simulations and experimental approaches. Specifically, there are very few field studies on planning which link the quality of planning to performance. Methodologically, we use detailed interviews to study process characteristics of action plans and code the qualitative material to perform quantitative analyses. To our knowledge, no such study has been done outside our research group.

3) This article focuses on elaborate and proactive planning as process characteristics. We develop a theoretical framework in which planning is a mediator between motivational and cognitive resources on the one hand and indicators of success on the other hand. We test a full model of entrepreneurial performance, using planning parameters as mediators in a model with cognitive and motivational resources – a model that has not been tested up to this point (cf. Figure 1a). We report three studies carried out in three southern African countries. Our studies provide a rare opportunity to examine relationships of psychological variables with entrepreneurial success in an understudied, but important, environment. The focal point of our theoretical model is elaborate and proactive planning (cf. Figure 1a), which we turn to next.

## **Planning**

Plans are mental simulations of actions (Probehandlung) used to develop forethought and to control future actions. Action plans provide steps to achieve a goal (Miller et al., 1960). Action plans can be routinized or automatic (System 2) or conscious and effortful (System 1). Most cognitive theories differentiate between a routine system that is fast, parallel, and effortless and a second one that is conscious, slow, serial, effortful, but flexible and adaptive (Frese & Zapf, 1994; Kahneman, 2003). In this paper, we concentrate on System 1 planning - the conscious and effortful process that is adaptive when

planning for new actions in difficult environments (Frese & Zapf, 1994; Kahneman, 2003; Locke & Latham, 1990). We are interested in conscious plans because they refer to new and important situations.

These plans refer to important goals reachable by business owners within a few months or a year, and can be for example, buying a new, expensive machine, building a roof over an open-air repair shop, or introducing a new marketing approach. These plans require a certain degree of situational analysis and decisions on how to proceed to achieve a goal (Hacker, 1992; Mumford et al., 2001). These conscious plans are dynamic and change with the development of opportunities (Gollwitzer, 1999; Mumford et al., 2001). Plans are supposed to bring about future states of the situation by mentally simulating future actions. A high degree of planning involves two issues – the degree of detailing the plan and the degree to which the mental simulations are oriented to bring about long term future states (i.e., the degree of proactiveness) (Frese & Zapf, 1994).

The degree of detail may vary from an elaborate, detailed, and specific plan to one that is very general and does not specify steps. One aspect of elaborate planning is to think about contingencies or have a plan B if the first plan does not work out. Another aspect is the large inventory of potential signals (Hacker, 1992). Signals tell the actor whether it is useful to implement a plan, and they also indicate future difficulties and opportunities (e.g., the owner anticipates potential errors which allow the owner to prepare for them). Elaborate planning does *not* mean, however, that *all* important parameters are planned out in detail; rather the most important parameters of a problem space are, at least briefly, considered with a view to enhance potential actions.

The scope of the proactiveness dimension of planning reaches from passive to proactive (Hacker, 1992). Passive is derived from the Latin word *patior* (= to suffer, endure, permit) and means “accepting or allowing what happens or what others do, without active response or resistance” (Compact Oxford English Dictionary, internet version). A passive plan does not attempt to change the environment and

actions are primarily affected by the environment. In contrast, proactive planning<sup>1</sup> implies that owners determine their environment to a certain extent by anticipating future demands and opportunities and preparing for them at present and acting on the environment to bring about future events (Bandura, 2001, uses very aptly the terms “forethought” and “self-regulation” to describe this phenomenon). Moreover, a proactive plan also implies that future feedback is developed – owners think of feedback needed and they develop indicators for feedback (e.g., whether customers are satisfied with the products and/or services). This helps to adjust plans when needed (Mumford et al., 2001).

The dimensions of proactiveness and detail are interrelated. A high level of anticipation is functional for increasing both the detailedness and the proactiveness of planning. Owners who are more proactive are more focused on the long term and consider more potential issues and signals; therefore, they tend to develop more elaborate plans. Conversely, owners who develop more detailed plans, tend to think of more long term issues and are, thus, more proactive.

Elaborate and proactive planning is functional for high performance for the following reasons (some of them tested in experimental settings): First, plans function as a bridge between thought and actions (Miller et al, 1960). Planning increases the likelihood that people get started by translating their goals into actions and by mobilizing extra effort (Gollwitzer, 1996).

Second, elaborate and proactive planning helps to keep people on track by reducing erratic actions and increasing persistence when problems arise (Diefendorff & Lord, 2004; van der Linden, Sonnentag, Frese, & van Dyck, 2001). Planning assists in not forgetting goals (Locke & Latham, 1990) and in reducing premature triggering of an action (Kuhl & Kazen, 1999); it motivates people to deal with problems and prepares them for having a ready-made answer if something goes wrong (Mumford et al., 2001). Planning allocates resources, (e.g., time allocation to tasks) and leads to a clearer focus on priorities (Tripoli, 1998); this reduces load because a person does not have to do a lot of ad-hoc planning

---

<sup>1</sup> Note that proactive is not the same as active – pro- in Greek means “before” (Comprehensive Oxford Dictionary), thus proactive means to be active before the action is needed.



(actions run, therefore, smoothly). Owners who use elaborate and proactive planning can cope with the inherent insecurities of being a business owner by making good use of scarce resources.

Third, elaborate and proactive planning facilitates readiness for action when opportunities arise (Gollwitzer, 1999). The proactive component of planning implies that the owner is concerned with and prepares for future opportunities and threats now. Detailed planning allows the owner to develop cues on future opportunities and to build up a good inventory of danger signals; these cues function as signals to act. This also implies that owners can adapt their plans accordingly as soon as opportunities change. As opportunity detection and exploitation has become an important issue in entrepreneurship research (Shane & Venkataraman, 2000), the concept of elaborate and proactive planning needs to be developed to study entrepreneurship.

Fourth, elaborate and proactive planning increases knowledge on the action environment by augmenting the number of relevant issues that owners think about (including a plan B). This includes knowledge on important environmental signals and feedback, which helps to interpret the situation adequately, and prepares the owners for unexpected problems or opportunities; thus, elaborate and proactive planning makes it possible to receive more and better feedback than when using a passive approach (Ashford & Tsui, 1991). Planning allows people to explore new action ideas, testing hypotheses on environmental conditions (Wood & Locke, 1990), and to quickly withdraw if things do not work out. All of this improves the mental model of the situation and of one's action possibilities, as well as knowledge of boundary and contingency conditions. Problem solving is enhanced because it is based on a better knowledge of the situation.

Fifth, all of the functions of elaborate and proactive planning discussed above lead to structuring of the situation and influencing environmental conditions. Structuring the situation may, for example, imply a better access to customers, improved conditions for getting supplies, faster uptake of innovations, or more efficient or enhanced quality of production or services.

In contrast, short term and passive plans will be called reactive; owners react to environmental signals that tell them what needs to be done at this point. For a reactive approach, a simple stimulus-response model is adequate. These stimuli may be physical cues, such as receiving a bill or a machine break down, or they may lie in the social environment, for example, competitors may change their product range. Owners with a reactive approach are driven by the immediate situational demands and they are often dependent on others; the latter may mean that they copy their competitors' products, follow a consultant's advice word for word, or wait for others (e.g., customers, distributors) to tell them what to do next. The reactive approach does not attempt to change environmental conditions. Of course, in reality there are very few cases of a purely reactive approach or of a purely planning approach – these two approaches are just the endpoints of a dimension. Empirically, the more strongly owners use reactive approaches, the lower is their business success (Frese, Brantjes, & Hoorn, 2002).

*Hypothesis 1:* Elaborate and proactive planning is positively related to business success.

### **Resources as Antecedents of Elaborate and Proactive Planning**

A number of theories agree (e.g., action theory, Frese & Zapf, 1994, resource allocation theory, Kanfer & Ackerman, 1989, goal setting theory, Baum & Locke, 2004, and cognitive theories, Mumford et al., 2001) that resources are needed to develop elaborate and proactive plans. We differentiate between cognitive (refer to cognitive ability and knowledge) and motivational resources (the latter refer to energy and motivation, in particular, self-efficacy, internal locus of control, achievement motivation, and self-reported personal initiative). These resources are related to success via proactive and elaborate plans as mediators.

*Cognitive resources:* Cognitive ability and school knowledge help to deal with new and complex tasks for which we have little biological preparation (Kanazawa, 2004) and lead to better performance.

*Cognitive ability* is related to success and to elaborate and proactive planning. Cognitive ability implies a good working memory (Kyllonen & Christal, 1990), it assists in the acquisition of knowledge and skills,

and speeds up decision making (Ackerman & Humphreys, 1990; Hunter, 1986). Elaborate and proactive conscious planning is complex because many ideas have to be kept in mind, and complex tasks increase the need for cognitive resources, such as working memory (Kanfer & Ackerman, 1989). Given high task complexity, higher cognitive resources contribute to more effective planning, including thinking about many relevant issues and about the relationships between these issues. The opposite of elaborate and proactive planning – the reactive approach – does not require holding many concepts in working memory because the relevant action cues are taken directly from the environment. The same arguments as for cognitive ability also apply for *human capital* (skills and knowledge). High skills and knowledge make it possible to recognize relevant issues; this increases the chances to develop long term plans and to deal with a high number of relevant signals and feedbacks. A high degree of skills also provides more ready-made routinized responses (Frese & Zapf, 1994; Kahneman, 1973) which frees up working memory to develop elaborate and proactive plans.

Studies on employees provide evidence for a relationship between cognitive ability and performance (Schmidt & Hunter, 1998); therefore, it is surprising that there are only a few studies on the effects of cognitive ability on business owners' success (exception, van Praag & Cramer, 2001). On the other hand, there is ample evidence in the entrepreneurship literature that *human capital* (skills and knowledge) is related to higher performance (e.g., Baum et al., 2001; van Praag & Cramer, 2001). Thus, cognitive resources help to develop elaborate and proactive plans which in turn lead to success.

*Hypothesis 2a:* Cognitive resources are related to elaborate and proactive planning and to success.

*Hypothesis 2b:* Elaborate and proactive planning mediates the relationship between cognitive resources and success.

*Motivational Resources:* Motivational resources (energy and direction) refer to feasibility and desirability. Elaborate and proactive planning requires motivational resources. Studies on entrepreneurial success have shown the following motivational concepts (Kanfer & Heggstad, 1997) to be related to

entrepreneurial success: internal locus of control, self-efficacy, achievement motivation, and personal initiative (Rauch & Frese, 2000, cf. also Baum et al., 2001 for similar concepts). The first two refer to outcome and competency expectancies; accordingly, they make it feasible to develop plans and to implement them actively. *Internal locus of control* (Rotter, 1972) implies that people think of themselves to be masters of their own fate and that they are able to achieve desired outcomes. An internal locus of control should lead to more elaborate and proactive planning because it makes sense to be proactive and to plan one's actions, if one is the master of one's fate (Skinner, 1997). An internal locus of control also leads to higher entrepreneurial performance because owners are required to be self-motivated and not to wait for others to tell them what one should do. *Self-efficacy* refers to the belief that one is able to competently perform actions (Bandura, 1997). The feeling of competence makes it more useful to develop elaborate and proactive plans (or lack of competence leads to less elaborate and proactive planning, because one does not have control over one's own actions). Self-efficacy has been shown to contribute to performance in various domains (Stajkovic & Luthans, 1998).

The latter two motivational constructs – achievement motivation and self-reported personal initiative – relate to the desire to develop proactive plans not suggested by others and to change the environment. *Achievement motivation* implies that people want to have an impact and that they do not give up easily (McClelland & Winter, 1971) and, therefore, develop proactive plans. *Personal initiative* is to be self-starting, to anticipate and prepare for future opportunities and threats, and to overcome barriers (cf. Frese, Fay, Hilburger, Leng, & Tag, 1997). Therefore, personal initiative makes proactive and elaborate planning desirable; moreover, self-reported initiative is related to entrepreneurial success (Crant, 1995).

*Hypothesis 3a:* Motivational resources are related to elaborate and proactive planning and to success.

Elaborate and proactive planning mediates the relationship between motivational resources and

success. Elaborate and proactive planning is important for success because complex activities with a high degree of anticipation of events need to be planned well. Motivational resources have an impact on how people develop plans. We mentally simulate a situation only if we think that it makes sense (desirability) and if we believe that we can actually achieve the goals that give rise to the plans of actions (feasibility). As far as we know, there is no study on planning characteristics as mediators; however, a study on planning content (called in this case “strategy”) has shown planning content to be a mediator between motivational variables and success (Baum et al., 2001).

*Hypothesis 3b:* Elaborate and proactive planning is a mediator of the relationship between motivational resources and success.

### **MICRO- AND SMALL-SCALE ENTERPRISES IN AFRICA**

It is important for practice to know more about the success factors of African business owners. One of the best ways to reduce poverty and to increase economic development and growth is to strengthen the small business sector (Birch, 1987). Micro- and small-scale businesses are important because they create employment (Mead & Liedholm, 1998). About 17 to 27 % of the working population in five African countries is involved in small-scale enterprises outside agriculture (Mead & Liedholm, 1998) – this percentage is twice as high as those employed by large companies or the public sector.

The three countries sampled showed some similarities in their economic context. They were all transformational countries that had recently opened up to private ownership (by blacks) and capitalism; they had stopped harassing informal businesses, and did not have a welfare system (the latter required some people to become business owners, if they did not want to suffer economically); all three countries had high unemployment rates (above 30%), had a high percentage of young people who did not find a job as employee in the formal system, their real gross national product growth rates were small or even negative: Namibia had a real growth rate of 3.5% in 2000, the year our study took place in this country;

South Africa had 2.1% real growth in 1999; Zimbabwe already showed first signs of trouble with a negative growth rate of 4.9% in 2000 (the time period for our study included 2000 and 2001); Zimbabwe later on slid into a deep economic depression, the dissolution of civil institutions, and the active suppression of small business owners *after* our study had been completed.

## METHODS

### Samples

Between 1998 and 2001, we sampled business owners in South Africa, Zimbabwe, and Namibia who had founded and managed their firms, had at least one employee, and had been in business for more than one year (to exclude people who just bridged a period of unemployment and to get adequate reports on their experiences and success). Small-scale firms in southern Africa are usually clustered in certain areas (often called industrial hives) frequently located near high density housing areas. Most of these firms are not registered, do not appear in any formal listing, and often do not have a telephone. Therefore, we used a combination of two procedures: One was a “random” walk procedure in the industrial areas to ask for participation. A random walk procedure was necessary because there were no maps of these industrial areas in which businesses existed and we, therefore, went to these areas and chose one route on which we asked every business to participate if they met the prerequisites. Businesses typically found in such areas include scrap metal merchants, auto repair shops, carpenters, bottle stores, grocery stalls, tailors, welders, and soap manufacturers. A second approach was used to include up-market and formal businesses in our sample (e.g., commodity brokers, travel and advertising agencies, and telecommunication firms): We consulted business directories and made appointments. We attempted to sample the listed businesses at random. However, addresses were often incomplete or not up-to-date and, therefore, we also used a snowball procedure in which we asked business owners to tell us about other business owners who might participate in the study.

The *South African* sample for *Study I* was drawn in Cape Town ( $N = 126$ , with  $n = 36$  Xhosa,  $n =$

2 Zulu,  $n = 17$  of other African origin, and  $n = 71$  so-called Coloureds (the term 'Coloured' is still used as a self-descriptive term for people of mixed African and white background although this term is becoming “politically incorrect”). Participants were given a pen with the 'University of Giessen' logo as a sign of gratitude. The refusal rate in South Africa was 44 %. The sample of *Study II* in *Zimbabwe* ( $N = 280$ ) was drawn from Harare and Bulawayo and included the two major ethnic groups Shona and Ndebele (refusal rate was 30%). Participants received the equivalent of 5 US Dollars. *Study III* in *Namibia* was carried out in Windhoek ( $N = 87$  business owners, 31 % Black, 37 % White, and 32 % “Coloured” or of other African origin). This was the only study that included white nationals of the country. The participants' refusal rate was 25%. In this study we also included some of the participants of an earlier study (Frese et al., 2002) (however, there were not enough participants to warrant an analysis of the longitudinal data).

### **Interview Procedures**

All three studies utilized structured interviews. Confidentiality was repeatedly assured throughout the interviews. Where appropriate, interviewers employed standardized prompts to clarify participants' answers. Interview responses were written down as verbatim as possible and subsequently typed (transcripts of tape recordings could not be produced because the noise level was too high at most business sites; where appropriate, we recorded interviews to ensure the quality of interviews and notes). Interviews were carried out by the authors, German graduate students, and in Zimbabwe also by local interviewers. Interviewers were thoroughly trained in a 2-10 day course (depending on their knowledge) on interview techniques, coding, and note taking. They role-played the interview situation, and then an experienced interviewer accompanied the new interviewers during their first actual interviews.

Two raters coded each interview (one rater was usually the interviewer). Ratings were done on the basis of typed protocols and an elaborate coding scheme. Close supervision and consultative meetings minimized coding biases throughout the studies. Directly after the interview, interviewers filled out a questionnaire (the interviewer evaluation form) that captured the interviewers' impressions of the

participants. The use of the interviewer evaluation form was also explicitly trained beforehand.

### **Operationalization of Variables**

We employed the same research design for each of the three southern African countries and only slightly varied the operationalization of the variables (there were slight differences in the number of items per scale across the countries and in the way we operationalized cognitive ability and self-efficacy). Table 1 presents the number of items, the number of valid participants (as a consequence of missing data), Cronbach's alphas of the scales, inter-rater reliabilities, range, mean, and standard deviation of the variables, separately for the three countries (S=South Africa, Z=Zimbabwe, and N=Namibia; a list of items and the interview procedure is available upon request from the authors). As inter-rater reliabilities of items, we used intraclass coefficients for Likert (ICC [1,2]) items and combined the scores (divided by number of raters). Missing data were estimated by the overall scale mean for up to a third of the missing items (only for scales with more than 2 items). We minimized the number of items in each scale to keep the interview and questionnaire length manageable: This led to somewhat lower alphas. All of the scales except one (achievement motive in Zimbabwe) had alphas above a cut-off point of .60 suggested by Nunnally (1978) for scales utilized within a new field.

***Measurement of Elaborate and Proactive Planning.*** “Plans as retrospective descriptive concepts of actions can easily be confused with plans as causal psychological mechanisms of the generation of actions.” (Wiesner & Hacker, 1994, p. 652). People sometimes develop plans of actions retrospectively; we, therefore, had to make sure that we developed adequate measures. A qualitative approach based on an in-depth structured interview with a number of safeguards (prompts and queries) was used to produce adequate measures of owners’ planning. Our measure of elaborate and proactive planning is a modified and improved version of a measure on planning and proactivity that has shown adequate construct validity (Frese, van Gelderen, & Ombach, 2000); the prior version of our planning variables proved longitudinally to predict entrepreneurial success in the Netherlands (van Gelderen et al., 2000).



Actions are goal oriented behaviors. Therefore, we first stimulated the goal structures of the participants. To understand the goals of the participants, stimulus material on common business goal areas were written on cards (these had been previously pilot tested) and participants were asked to rank order the cards (New marketing strategy, Expanding, Make more profit, Perform better than competitors, Improve the way to produce a product, Show initiative). We asked participants to first describe the two most important goal areas. We then asked them to identify the goals in these two goal areas that they pursued (e.g., buying a machine to expand production, make more profit or more income, more machinery or computerize production, improve procedures, please customers) – these goals were more or less loosely related to the stimulus material presented on the cards. Usually the goals mentioned by the owners were important growth goals and, timewise, it would take between several months or even a year to reach them. To determine their planning characteristics, we asked the participants to describe how they would want to go about achieving their goals. As prompts we asked, for example, What do you mean by ...? Can you give me an example? What have you done so far to reach ...? Do you want to go about this differently in the future and how? A general prompt was to repeat what the participant had just said. Care was taken to avoid words like "plan" or "active" to not influence participants' answers. This part of the interview took up to 40 minutes to complete.

The two aspects elaborate plan and proactive plan were rated separately by two independent raters who used a coding scheme with 5-point Likert scales. The following components indicated that participants used an *elaborate plan*: detail of plan, number of substeps identified, taking steps towards implementing certain substeps, past actions in similar areas. We did not assume that all of these components needed to be present to rate a plan as elaborate. For example, we rated a plan as highly elaborate (5) if it included at least three substeps and if first actions or preparations towards accomplishing at least one of the substeps had already been done. We rated a plan as medium elaborate (3) if it included a plan for one issue or substep in more detail (e.g., the financing of an extension of firm),

and had done the first actions or preparations towards accomplishing it. Finally, a plan was considered low in elaborateness, (1) if there was no mention of a plan or only an abstract plan was revealed that did not include concrete substeps or no concrete action had been done to accomplish any of its substeps. The following components were used to rate the *proactiveness of a plan*: produces changes (e.g., several owners pooling together to buy supplies to get them cheaper), is not a copy of others in the relevant environment (e.g., there was one owner who utilized Western fashion journals to get ideas on what tourists would want to buy), includes unusual ideas for buying supplies, production, or marketing (e.g., inspecting the quality of shoes of security firm employees and approaching those firms who had employees with worn-out shoes), contains thoughts about future problems and opportunities (e.g., opportunities in the area of second hand clothing), prepares for these problems and opportunities now (e.g., back-up plan in case something goes wrong), and, thus, is *not* waiting to see what happens (e.g., what others are doing). When the thoughts of the participants included two of these components (change, unusual ideas, preparing for future problems and opportunities now) we rated this as a high degree of proactiveness of a plan (=5). Waiting for things to come, copying what others did (“many owners had done that, so I thought I should do that too”), or not expecting future problems or opportunities and not preparing for them contributed to low ratings in proactive planning (=1).

The questions and the coding of the plan characteristics were done for the two most important goal areas so that the scale elaborate planning and proactive planning consisted of four items (elaborate planning and proactive planning with regard to two different goals - the two resultant elaborate and proactive planning indexes correlated significantly and highly with each other  $r=.82/.69/.63$ , indicating that the same construct was measured, cf. also the factor scores in Figures 1 and 2). Inter-rater reliabilities and alphas were adequate (cf. Table 1).

***Cognitive Resources.*** Our participants needed a long time to complete psychological tests because they were not used to such tests, and English was often their second language. Therefore, we used short

language-free cognitive ability tests; since short forms are often less valid than longer forms, we employed different tests in the different countries. The Wechsler digit span items “forward” and “backward” (Tewes, 1991) (South Africa) correlate well with general intelligence (Jensen, 1985) and are proxy measures for working memory (Hacker, Priemuth, Breitenstein, & Wachter, 2002). The Connecting Numbers Test (a variation of the Trail Making Test used by the U.S. Army) (Zimbabwe) is a short measure of cognitive performance speed, which was shown to correlate well ( $r = .69$ ) with established IQ measures (Oswald & Roth, 1978, p. 20). We measured the time needed to finish the four tasks of this test (and reverse scored the scale). In Namibia we used a short form of the Raven Advanced Progressive Matrices test as a power test (Arthur & Day, 1994). The alpha of this test was .67 (the last item was excluded because it was too difficult for the respondents). Arthur and Day (1994) reported an alpha of .65 and a test-retest correlation of .75. *Human capital* was assessed by two items: years of education and highest level of formal education (cf. Bruederl, Preisendoerfer, & Ziegler, 1992).

***Motivational Resources.*** The motivational resources scales were shortened after using them in a prior study. *Internal-external control* was measured by two of the three factors isolated by Levenson (1974). *Self-efficacy* was measured in South Africa and Namibia with a scale of medium generality (Schwarzer, Baessler, Kwiatek, & Schroeder 1997) and with a specific scale of self-efficacy beliefs in Zimbabwe (developed along the lines suggested by Bandura, 1997, with items referring to important action areas of owners). *Need for achievement* was operationalized as a shortened version of Hermans’ (1970) scale. *Self-reported initiative* is a well-validated scale taken from Frese et al. (1997).

***Success Measures.*** Business success is difficult to measure in micro- and small-scale business research in general (Sapienza, Smith, & Gannon, 1988), and even more so in developing countries – bookkeeping is scarce and secrecy towards the tax office is high (McPherson, 1998). Therefore, we employed four different measures of growth and size from different sources – we took care to base our measures on variables that could be reported relatively objectively. *Growth* included 9 items on

percentage increase and decrease of profit, customers, and sales business growth from 1997 to 2001 (per year) in Zimbabwe. In South Africa and Namibia we only asked for last year's increase or decrease on these dimensions. *Size* was measured by inquiring about the equipment value and number of employees and by an interviewer evaluation. *Equipment value* can be estimated by owners and they did not mind reporting it. Another variable that owners are able to report relatively objectively is *number of employees*. *Interviewer evaluation* was based on the interviewers' impression of business success (response were given on a 5-point Likert scale). This measure is regarded as a good summary measure (Frese, 2000) because the observations of the interviewers of the 'shop' were incorporated as well. For example, if owners said they were exceptionally successful and had a lot of work, but the interviewer saw most of the employees idly playing cards, this information influenced the interviewer evaluation of success. Also, features like the degree of professionalism and the condition of the equipment affected this measure. Thus, the interviewer evaluation is not fully based on participants' reports and this reduces common method variance. In South Africa, we were fortunate to get a useful *expert evaluation* of success from a third person (the hive manager) who was otherwise not involved in the interviews: Many firms are based in so-called "hives" (often a group of "garages") which are usually administered by the hive manager who knows the firms quite well. Thus, we have one measure that clearly overcomes common method variance (note, however, that common method variance is lower in interviews, because interviewers are trained to question and probe owners' answers and coders do not take each statement at face value). Additionally, *control variables* (single items) on firm age (year of firm establishment) and industry (dummy coded) were ascertained. We also controlled whether a business operated in the formal or the informal sector.

### **Statistical Treatment**

The mediator hypotheses were tested using structural equation modeling (SEM). The advantage of SEM for testing mediator hypotheses is that all conditions establishing mediation can be tested simultaneously and do not have to be tested in separate regression analyses (Baron & Kenny, 1986). Also,

the indirect effect from the predictor via the mediator on the criterion, which corresponds to the product of the two paths, can be tested for statistical significance (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). To account for the different control variables assessed in the three samples (e.g., different lines of industries in the three countries) and to specify identical models for all countries, we used partial correlations as input for SEM analyses (controlling for line of industry, formal/informal operation, and business age). Listwise deletion of missing data was used because pairwise deletion can seriously distort parameter estimates in SEM. The resulting sample sizes were 215 for Zimbabwe, 123 for South Africa, and 70 for Namibia.

To account for the three-country structure of the data, we specified multi-sample models (Jöreskog & Sörbom, 1996), with each country (i.e., South Africa, Zimbabwe, and Namibia) constituting one sample. In multi-sample models, the parameters are estimated simultaneously across multiple samples, and the overall model fit across samples can be evaluated. In addition, various parameter restrictions can be introduced to test for parameter invariance across samples (Hayduk, 1987). If the model with restricted parameters does not have a significantly deteriorated model fit compared to the model without these restricted parameters, the respective parameters can be considered to be invariant (i.e., the same) across samples. In our models, we tested for invariance of structural coefficients (path coefficients among latent variables) across the three samples because these were the theoretically relevant parameters which we expected not to differ between the three countries. We did not impose invariance restrictions in the measurement models (relations among manifest indicators and latent variables, i.e., factor loadings and error variances) because measures differed across the three countries and, therefore, the parameters cannot be expected to be invariant across the samples. More specifically, using the  $\chi^2$ -difference procedure, we tested whether the fit of the model with parameter restrictions (i.e., where structural coefficients were set to be equal across countries) significantly deteriorated compared to the fit of the model without these restrictions.

In the models for South Africa and Namibia, impossible parameter estimates - negative error variances - occurred (Namibia: for self-efficacy; South Africa: for interviewer evaluation). We consequently fixed these parameters to zero. Such impossible parameter estimates can occur in smaller samples (Anderson & Gerbing, 1984; Bollen, 1989) – they occurred only in the two small samples of Namibia and South Africa (but not in the larger Zimbabwean sample). In addition, the negative variances did not significantly differ from zero (all  $t$ -values  $< 1.23$ ), and the model fits did not deteriorate when fixing the parameter to zero (all  $\chi^2$ -differences  $< 2.32$ ,  $df < 2$ ). We therefore attributed these impossible values to sampling fluctuations (Bollen, 1989).

## RESULTS

Table 2 presents the intercorrelations of the variables. The success variables – except growth – were highly intercorrelated which underscores their validity; the correlations also suggest that they fall into two broad categories of success – growth and size. In order to model size adequately, we had to allow correlations between number of employees and equipment value. These two observed variables are related because they both refer to similar objective phenomena (the amount invested in human and equipment capital). Other latent variables developed were motivational resources, cognitive resources, and elaborate and proactive planning (cf. Figures 1 and 2).

Table 2 also shows that elaborate and proactive planning was significantly related to the success variables (exception: growth in South Africa) and to many motivational and all cognitive resources. However, there was some variability in the size of the correlations, particularly among those involving motivational resources. The motivational resource variables showed a number of significant, albeit often small, correlations with the success variables. The strongest of these small correlations appeared for external locus of control (average  $r$  across countries and the four success variables:  $-.16$ ), for achievement motivation (average  $r = .11$ ), and for self-efficacy (average  $r = .11$ ). The cognitive resources human capital and cognitive ability correlated with the success variables (average  $r$  of  $.28$  and  $.19$  respectively).

The control variables showed a few small yet significant correlations with the psychological constructs and success. However, they were not uniform across countries – in a few cases, there was one significant negative and one significant positive correlation for the same variables across the three studies that is, manufacturing. Thus, it means something different to be involved in manufacturing in the different countries. Our analysis strategy to control for these variables within each country separately is, therefore, warranted. Whether or not a business was registered and operated in the formal versus in the informal sector was clearly related to success, to elaborate and proactive planning, and to cognitive ability and human capital. Therefore, this was also included as a control variable (control variables were included as country-specific controls in the partial correlations that were used as starting matrices for SEM analyses).

The hypotheses were tested using SEM. All four models presented in Figures 1 and 2 show that, for Hypothesis 1, the relationship between elaborate and proactive planning and success was supported for the business success factors size and expert evaluation, but not for growth (elaborate and proactive planning is significantly related to growth only in Model 1b). According to Hypotheses 2a and 2b, the construct cognitive resources acts as a mediator and is related to elaborate and proactive planning and to success. Such a model (1c), in which structural coefficients were restricted to be equal across countries, had an acceptable fit ( $\chi^2 (df= 62) = 89.76$ , RMSEA = .057, CFI = .97). The fit did not deteriorate compared to the model without restrictions ( $\Delta\chi^2 (\Delta df= 16) = 25.43$ ,  $p > .05$ ), indicating that the effects were the same across countries. The indirect effect of cognitive resources via elaborate and proactive planning on size was significant ( $t = 4.86$ ,  $p < .01$ ), but the indirect effect on growth was not ( $t = 1.47$ , n.s.).

In Hypotheses 3 a and 3 b we argued that elaborate and proactive planning functions as mediator for the relationship between motivational resources and success. Model 1b (Figure 1b), in which structural coefficients were restricted to be equal across countries, tested these hypotheses and had an acceptable fit ( $\chi^2 (df= 135) = 166.19$ , RMSEA = .041, CFI = .97). The fit did not deteriorate compared to

the model without restrictions ( $\Delta\chi^2 (\Delta df = 16) = 24.63, p > .05$ ), indicating that the effects were the same across countries. Both indirect effects of motivational resources via elaborate and proactive planning on size ( $t = 4.62, p < .05$ ) and on growth ( $t = 2.21, p < .05$ ) were significant.

Figure 2a combines motivational and cognitive resources into one model. This model, with structural coefficients restricted to be equal across groups, yielded an acceptable fit ( $\chi^2 (df = 192) = 266.12, RMSEA = .053, CFI = .95$ ). The fit did not deteriorate compared to the model without restrictions ( $\Delta\chi^2 (\Delta df = 22) = 26.10, p > .05$ ), indicating that the effects were the same across countries. Introducing both sets of independent variables into one model reduced the impact of motivational resources, whereas the effects of cognitive resources remained stable. Motivational resources showed nonsignificant paths with elaborate and proactive planning and with the two success variables (all  $ts < 1.40$ ); however, the indirect effects of motivational resources ( $t = 2.13, p < .05$ ) on size remained significant as well as the effect of cognitive resources on size ( $t = 3.54, p < .01$ ).

We also did a separate SEM analysis with the expert evaluation of the South African firms by hive managers; this is a particularly useful dependent variable because the expert evaluation extracts the information from a third person who knows the firms well but did not participate in the interview (cf. Figure 2b). The model had an acceptable fit ( $\chi^2 = 39.88 (df = 30, N = 117), p < .05, RMSEA = .053, CFI = .97$ ). In this model, the effects of Model 2a were replicated (Figure 2a); in addition, Model 2b also showed a full mediator role of elaborate and proactive planning for the relationship between cognitive resources and expert evaluation – the direct path from cognitive resources to expert evaluation was nonsignificant ( $t = 1.29, n.s.$ ) but the indirect effect was significant ( $t = 1.95, p < .05, one-tailed$ ).

## DISCUSSION

With a unique focus on the planning process characteristics in a field study setting, the current study seeks to contribute to the literature a theoretical framework that systematically employs the concept of elaborate and proactive planning as an important mediator between motivational and cognitive



resources and performance (i.e., success of small business owners). To our knowledge, there is yet no study that examines these process characteristics of business owners' planning.

Our hypotheses were partly supported. Elaborate and proactive planning was related to size and expert evaluation as can be seen in the significant relations with two of the three success measures (Hypothesis 1) – the relationship with growth also reached significance at least in Model 1b that included motivational resources. There were indirect effects of motivational resources on size as long as only motivational resources were included (Hypotheses 3a and 3b; Model 1b), although the significance of the effect of motivational resources disappeared once cognitive resources were included into the models (cf. Figure 2a and 2b) (Hypotheses 2a and b). Cognitive resources were significantly related to size and expert evaluation, and elaborate and proactive planning partially mediated the relationship between cognitive resources and size (cf. Figure 1c) and fully mediated this relationship when utilizing expert evaluation as a success measure (only used in South Africa, cf. Figure 2b); however, there was no mediator effect for growth (cf. Figure 1c) (Hypotheses 3a and b). Although each one of the psychological variables was only weakly related to success, overall the psychological variables of this study explain overall a sizeable part of the variance - 71% of the variance of size and 38% of the variance of the expert evaluation of success – thus, these variables seem to be of some practical importance for success of business owners. This article can be considered a part of a larger group of articles that point to the importance of psychological variables for studying entrepreneurship (Baron, 2002).

The following results need more detailed interpretation: First, there were surprisingly high relationships between motivational and cognitive resources (the relationships in the LISREL Model 2a were significant in South Africa and Zimbabwe). This was partially responsible for the fact that motivational resources were not significantly related to elaborate and proactive planning once cognitive resources were included into the models. One interpretation is that cognitive resources may influence motivational resources to a certain extent – one feels more in control of the situation and finds

achievement situations more appealing, when cognitive resources are high. An alternative interpretation is that motivational factors contribute to better human capital. Thus, cognitive resources overshadowed the effects of motivational resources; when cognitive resources were included in the model, the relationships of motivational resources were reduced to insignificance (cf. Figures 2a and 2b) although the motivational resources were significant, when they were alone in the model (cf. Figure 1b). We recommend future studies to retain motivational resources in their models because there were significant indirect effects of motivational resources (although the direct paths of motivational resources did not remain significant when cognitive resources were included). Moreover, future studies should include more specific motivational resources (such as growth goals) because these types of resources have been shown to be important predictors of venture growth (Baum et al., 2001).

Second, there were different results for growth and size. Size was well predicted by the variables in our models (e.g.,  $R^2 = .71$  in Model 2a) in contrast to growth (e.g.,  $R^2 = .05$  in this model); there was also no significant relationship between elaborate and proactive planning and growth in most models (the path was significant only in Model 1b). We suggest that size is a reasonable indicator for long term success. Size is the result of past growth over time (at the same time, we controlled for firm age). Thus, long range factors may have a stronger effect on size than on growth, which can be affected by yearly fluctuations. Our operationalization of growth was also a bit more subjective than for size – we asked for estimates of yearly percentage increase/decrease of variables – size included exact numbers as indicators (e.g., number of employees and equipment value) plus another source, namely, interviewer evaluation. Future research may want to develop specific dynamic measures of growth applicable in a setting with small business in developing and developed countries and relate them to specific predictors.

Third, cognitive ability and level of education were, in their own right, moderate to good predictors of success (at least of size). Taking into consideration the fact that we used short measures of cognitive ability and that the causal effect is likely to go from cognitive ability to success because of the

high stability of cognitive ability (Lubinski & Dawis, 1992), these relationships suggest that the findings of cognitive ability as a predictor of job performance in employees (Schmidt & Hunter, 1998) can be generalized to business owners. Cognitive ability is likely the cause of elaborate and proactive planning; there may be reciprocal relationships between human capital and elaborate and proactive planning.

Fourth, elaborate and proactive planning was sometimes a partial (the overall model in Figure 1c) and sometimes a full mediator (the model on expert evaluation, cf. Figure 2b) for the relationship between cognitive resources and success. It is understandable that elaborate and proactive planning does not completely mediate the effects of cognitive resources on success: High processing capacity makes it possible for people to develop plans on the spot. Thus, in some situations, quick thinking may help to provide good and successful plans of actions developed right on the spot without having to rely on previously developed elaborate and proactive plans. Thus, it is possible that there is a direct path from cognitive resources to success. The fact that there was a mediation effect of planning speaks for the theories that argued for planning to be an important part of performance – the theories of goal setting (Locke & Latham, 1990) as well as agentic theory (Bandura, 2001), cognitive theories of planning (Mumford et al., 2001), and action theory (Frese & Zapf, 1994).

### ***Limitations and Strengths***

The most important limitation of our three studies is their cross-sectional design. Consequently, we cannot draw any conclusions about the causality of elaborate and proactive planning and success. There may be a reciprocal effect of planning and success with higher growth and size leading to more necessities of planning, and failure and stress may lead owners to become more reactive (van Gelderen et al., 2000).

Our studies were not designed to test the differential validity of measuring goal setting and planning. Since we used goal cards as stimulus material, we influenced the type of goals participants

mentioned to a certain extent. Future studies should also look at spontaneously developed goals by the participants to examine the add-on effects of elaborate and proactive planning on success.

A further limitation may lie in our measurement of the dependent variables. We do not have any "hard" data on cash flow, profit rate, or similar measures. It is difficult to get hard data from small-scale business owners even in a Western environment and much more so in an African context – many of the business owners in our sample did not practice any type of bookkeeping. Moreover, those who kept books may have obfuscated profit data for tax purposes and other reasons. However, it is sometimes overlooked that even cash flow data (at least from small- to medium-sized firms) are really “self-disclosures” of owners and not "objective" in the sense that the owner has no influence on these data or on their reporting (cf. Sapienza, Smith, & Gannon, 1988). One way we dealt with this problem was to obtain measures from different sources (owners, interviewers, and hive managers). The best dependent variable in our studies is the hive managers’ expert rating in South Africa (cf. Model 2b in Figure 2), because their evaluation was truly independent from our data collection that involved the owners. The paths were very similar using this dependent variable to the paths of the other models. Interestingly, hive managers’ expert evaluations were highly correlated with the success evaluations completed by the interviewers and done independently of the hive managers ( $r=.78$ , cf. Table 2); a finding which strengthens the validity of our results (as interviewer evaluations were included into our dependent variable size).

A strength of our approach was the use of structured interviews. While even well-done interviews rely on information provided by study participants, the answers are not taken at face value and critical probing helps to keep the constructs clean. The combination of qualitative interviews and its quantitative coding can overcome many problems of questionnaire research, such as unclear representation of constructs in participants, erratic answers to questionnaire items, and problems of interpreting what the answers really mean. Structured interviews are useful, not only because they showed excellent validity in meta-analytic research (Schmidt & Hunter, 1998), but also because they gave us a possibility to probe

owners' answers and to understand well what they meant. The cultural context in Africa adds difficulties to using surveys because the culture is characterized by an interdependent self; that is, Africans tend to create harmony and they desire to "fit in", they tend to use indirect speech, and hesitate to say "no" to questions (Markus & Kitayama, 1991). Owners sometimes reported plans, but when we probed further, we found that there had been no actions based on these plans and that they were probably developed on the spot during the interview. In such cases, we did not count this answer as an example of elaborate and proactive planning. Another problem is differential anchor points which appear in questionnaire research: What is great success for one owner may be near failure for another one, and the same plan may be interpreted differently by different owners. Yet this is not a problem for interviewers and coders, who use the same standards for all participants. Thus, for both our theoretical questions and the cultural context of Africa, we are convinced that interviews and subsequent rating of answers are the method of choice to understand how owners regulate their actions.

Another issue is generalization of the results. We do not assume that our results necessarily generalize to larger firms (except possibly to internal entrepreneurs in larger firms). Owners' actions are probably more important for smaller firms. Our results may also not generalize to one-person enterprises that do not have employees. All of our participants had at least one employee. Technically, our studies are also not based on random samples. We do, however, believe that our results might generalize to non-African countries because a Dutch study using a prior version of the interview version of psychological action planning showed a relationship with success as well (van Gelderen et al., 2000). Finally, we think that the multiple study approach used in this article is a solid approach because it shows the degree to which the results are common to different samples improving the replicability of results in future studies.

### **THEORETICAL AND PRACTICAL IMPLICATIONS**

One contribution of our study was to examine a mediator between cognitive resources and entrepreneurial performance. The traditional interpretation has been that cognitive ability leads to better

knowledge which in turn leads to higher performance (Hunter, 1986). To our knowledge, action plans have not been hypothesized and empirically examined within this research tradition. Our results suggest that it is valuable to study elaborate and proactive action plans in more detail. Since cognitive ability is largely resistant to intervention, elaborate and proactive planning can be taught, the function of this mediator has important practical implications.

The results speak for the importance of elaborate and proactive planning for business owners. Coaches, bankers, and advisers should not tell small business people to just rely on their intuition or to just improvise but rather to develop elaborate and proactive plans. However, three caveats are in order: First, people may develop “bad” plans - plans that are not adjusted to the relevant parameters of success. A “bad” plan may be due to low cognitive ability that reduces the chances to include the relevant parameters into the plans (in this case, there might be an interaction between cognitive ability and the usefulness of plans) or the plan may be “bad” because there is not enough feedback in the situation that allows people to correct their plans (some industries may provide more feedback). A second caveat relates to a possible curvilinear relationship between planning and success. While this was not the case in our study – there was no evidence for a curvilinear relationship between elaborate and proactive planning and success – such a curvilinear relationship may appear under certain conditions: Owners may sometimes over-plan, for instance, when they want to plan every little detail, spend a very long time on planning and refrain from acting, and if they stick to a plan in spite of contradictory feedback. Another issue relates to recent research on small business owners to do better if they experimented (Benner & Tushman, 2003; Peters, 1987), improvised (Baker et al., 2003) or effectuated (Sarasvathy, 2001). In principle, both relationships may exist: Elaborate and proactive planning can impede improvisation/experimentation (e.g., because owners would stick to their plans instead of experimenting). If this were the case, then the results of our study would tend to speak against improvisation and experimentation (and for planning). However, an alternative hypothesis is that planning and experimentation can actually complement each

other, for example, because planning may lead to a better understanding of the environment and one effects on it (Sarasvathy, 2001). Elaborate and proactive planning may improve the mental model to include more relevant parameters of how the action should proceed and how the environment might react – the number of relevant signals and potential feedbacks may increase as a result of planning (Hacker, 1992), and planning may help to interpret feedback adequately. Under these conditions, planning may actually improve the use of experimenting and improvising, for example, owners may be able to recognize more effectively, whether they are “on track” in their “experiments”. Future research may want to explicitly examine the question whether planning and improvisation/experimentation are opposites or whether they might actually complement each other. A third caveat relates to the issue of phases. The differentiation between the phases of opportunity detection, evaluation, or opportunity exploitation (Shane & Venkataraman, 2000) may lead to a new set of scientific questions: In which phase is elaborate and proactive planning most important? Similarly, phases of organizational growth should be affected differentially by elaborate and proactive planning (Katz & Kahn, 1978) – at this moment, our results are not fine grained enough to allow answers to these questions that need to be studied in future research.

Our results suggest a number of practical implications. Poverty reduction often works via support for local small business in developing countries. Since resources are scarce, banks, micro-credit organizations, non-governmental organizations, companies that work with small business, and franchise companies have to make choices regarding the firms they will support. We have consulted with, for example, large construction companies that work continuously with a set of smaller companies. Such firms often develop own departments that manage the long term relationships with a set of smaller firms. For all of them, selection, training, and coaching vis-à-vis small business needs to be done effectively; the model developed here may help in endeavors of this nature.

Our results suggest that cognitive ability and human capital may be used in the selection of owners. Our primary theoretical reasoning for introducing elaborate and proactive planning was, however,

to better understand the processes that connect individual difference variables of cognitive and motivational resources to business success. Elaborate and proactive planning has been shown to be a (partial) mediator; at the same time it can be coached and trained. Owners can be trained to plan for long term opportunities and threats, and to develop elaborate plans and back-up plans. The evaluation of such a training concept demonstrated that participants increased their business success after such a training (Frese et al., 2007).



## REFERENCES

- Ackerman, P.L., & Humphreys, L.G. (1990). Individual differences theory in industrial and organizational psychology. In M.D. Dunnette, & L.M. Hough (Eds.), *Handbook of industrial and organizational psychology* (Vol.1, 2nd ed. , pp. 223-282). Palo Alto: Consulting Psychologists Press.
- Allinson, C., Chell, E., & Hayes, J. (2000). Intuition and entrepreneurial behavior. *European Journal of Work and Organizational Psychology, 9*, 31-43.
- Anderson, J. R. (1983). *The architecture of cognition*. Cambridge/Mass: Harvard University.
- Anderson, J. C., & Gerbing, D. W. (1984). The effect of sampling error on convergence, improper solutions, and goodness-of-fit indices for maximum likelihood confirmatory factor analysis. *Psychometrika, 49*, 155-173.
- 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.
- Ashford, S. J., & Tsui, A. S. (1991). Self-regulation for managerial effectiveness: The role of active feedback seeking. *Academy of Management Journal, 34*, 251-280.
- Baker, T., Miner, A., & Eesley, D. (2003). Improvising firms: Bricolage, account giving, and improvisational competency in the founding process. *Research Policy, 32*, 255-276.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Baron, R. A. (2002). OB and entrepreneurship: The reciprocal benefits of closer conceptual links. *Research in Organizational Behavior, 24*, 225-269.
- Baron, R. A. (2004). The cognitive perspective: A valuable tool for answering entrepreneurship's basic "why" questions. *Journal of Business Venturing, 19*, 221-240.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182.

- Baum, J. R., Frese, M., & Baron, R. A. (Eds.). (2007). *The Psychology of Entrepreneurship*: Lawrence Erlbaum Publishers.
- Baum, J. R., & Locke, E. A. (2004). The relation of entrepreneurial traits, skill, and motivation to subsequent venture growth. *Journal of Applied Psychology, 89*, 587-598.
- Baum, J. R., Locke, E. A. & Kirkpatrick, S.A. (1998). A longitudinal study of vision and vision communication to venture growth in entrepreneurial firms. *Journal of Applied Psychology, 83*, 43-54.
- Baum, J. R., Locke, E. A., & Smith, K. G. (2001). A multi-dimensional model of venture growth. *Academy of Management Journal, 44*, 292-303.
- Benner, M. J., & Tushman, M. L. (2003). Exploitation, exploration, and process management: The productivity dilemma revisited. *Academy of Management Review, 28*, 238-256.
- Bhide, A. (1994). How entrepreneurs craft strategies that work. *Harvard Business Review, 72*(2), 150 – 159.
- Birch, D.L. (1987). *Job creation in America*. New York: Free Press.
- Bollen, K. A. (1989). *Structural equations with latent variables*. New York: Wiley.
- Bruederl, J., Preisendoerfer, P., & Ziegler R. (1992). Survival chances of newly founded business organizations. *American Sociological Review, 57*, 222-242
- Campbell, J.P., McCloy, R.A., Oppler, S., & Sager, C.E. (1993). A theory of performance. In N. Schmitt & W. C. Borman (Eds.), *Personnel selection in organizations* (pp. 35-79). San Francisco: Jossey-Bass.
- Card, S. K., Moran, T. P., & Newell, A. (1983). *The psychology of human-computer interaction*. Hillsdale, N.J.: Erlbaum.
- Carter, N. M., Gartner, W. B., & Reynolds, P. D. (1996). Exploring start up even sequences. *Journal of Business Venturing, 11*, 151-166.
- Crant, J.M. (1995). The proactive personality scale and objective job performance among real

estate agents. *Journal of Applied Psychology*, 80, 532-537.

Dess, G. G., Lumpkin, G. T., & Taylor, M. L. (2005). *Strategic management*. Boston: McGraw-Hill.

Diefendorff, J. M., & R. G. Lord, R.G. (2004). The volitional and strategic effects of planning on task performance and goal commitment. *Human Performance*, 16, 365-387.

Earley, P.C. & Perry, B.C. (1987). Work plan availability and performance: An assessment of task strategy priming on subsequent task completion. *Organizational Behavior and Human Decision Processes*, 39, 279-302.

Foxcraft, M-L., Wood, E., Kew, J., Herrington, M., & Segla, N. (2002). *South African Executive Report; Global Entrepreneurship Monitor, 2002*. Capetown, South Africa: University of Capetown.

Frese, M. (2000). For the specialist: Methodological issues. In M. Frese (Ed.), *Success and failure of microbusiness owners in Africa: A new psychological approach* (pp. 149-159). Westport, CT: Greenwood Publications.

Frese, M., Brantjes, A., & Hoorn, R. (2002). Psychological success factors of small scale businesses in Namibia: The roles of strategy process, entrepreneurial orientation and the environment. *Journal of Developmental Entrepreneurship*, 7, 259-282.

Frese, M., Fay, D., Hilburger, T., Leng, K., & Tag, A. (1997). The concept of personal initiative: Operationlization, reliability, and validity in two German samples. *Journal of Occupational and Organizational Psychology*, 70, 139-161.

Frese, M., Glaub, M., Gramberg, K., Hass, L., Friedrich, C., & Solomon, G. (2007). *Training business owners in personal initiative: Two studies in South Africa and Germany*. Giessen: Univ of Giessen, technical report.

Frese, M., van Gelderen, M., & Ombach, M. (2000). How to plan as a small scale business owner: psychological process characteristics of action strategies and success. *Journal of Small Business*

*Management*, 38(2), 1-18.

Frese, M., & Zapf, D. (1994). Action as the core of work psychology: A German approach. In H.C. Triandis, M.D. Dunnette, & L.M. Hough (Eds.), *Handbook of industrial and organizational psychology* (Vol.4, 2nd ed., pp. 271-340). Palo Alto: Consulting Psychologists Press.

Gollwitzer, P. M. (1996). The volitional benefits of planning. In P.M. Gollwitzer & J.A. Bargh (Eds.), *The psychology of action* (pp. 287-312). New York: The Guilford Press.

Gollwitzer, P. M. (1999). Implementation intentions: Strong effects of simple plans. *American Psychologist*, 54, 493-503.

Hacker, W. (1992). *Expertenkönnen. Erkennen und Vermitteln*. Göttingen: Hogrefe.

Hacker, W., Priemuth, K., Breitenstein, F., & Wachter, B. (2002). *Working memory and thinking - conditions of their relationships*. Dept. of Psychology: Dresden.

Hayduk, L. A. (1987). *Structural equation modeling with LISREL: Essentials and advances*. Baltimore, MD: The Johns Hopkins University Press.

Hayes-Roth, B., & Hayes-Roth, F. (1979). A cognitive model of planning. *Cognitive Science*, 3, 275-310.

Hermans, H.J.M. (1970). A questionnaire of achievement motivation. *Journal of Applied Psychology*, 54, 353-363

Hunter, J. E. (1986). Cognitive ability, cognitive aptitudes, job knowledge, and job performance. *Journal of Vocational Behaviour*, 29, 340-362.

Jensen, A. R. (1985). The nature of the black-white difference on various psychometric tests: Spearman's hypothesis. *The Behavioral and Brain Sciences*, 8, 193-263.

Kahneman, D. (1973). *Attention and effort*. Englewood Cliffs, NJ: Prentice Hall.

Kahneman, D. (2003). A perspective on judgment and choice: Mapping bounded rationality. *American Psychologist*, 58, 697-720.

- Kanazawa, S. (2004). General intelligence as a domain-specific adaptation. *Psychological Review*, *111*, 512-523.
- Kanfer, R., & Ackerman, P. L. (1989). Motivation and cognitive abilities: An integrative/aptitude-treatment interaction approach to skill acquisition. *Journal of Applied Psychology*, *74*, 657-690.
- Kanfer, R., & Heggestad, E. D. (1997). Motivational traits and skills: A person-centered approach to work motivation. *Research in Organizational Behavior*, *19*, 1-56.
- Katz, D., & Kahn, R. L. (1978). *Social psychology of organizations* (2nd ed.). New York: Wiley.
- Klein, K. J., & Kozlowski, S. W. J. (Eds.). (2000). *Multilevel theory, research, and methods in organizations*. San Francisco, Calif.: Jossey-Bass.
- Krauss, S. I., Frese, M., Friedrich, C., & Unger, J. (2005). Entrepreneurial orientation and success: A psychological model of success in Southern African small scale business owners. *European Journal of Work and Organizational Psychology*, *14*, 315-344.
- Kuhl, J. & Kazen, M. (1999). Volitional facilitation of difficult intentions: Joint activation of intention memory and positive affect removes Stroop interference. *Journal of Experimental Psychology: General*, *128*, 382-399.
- Kyllonen, C., & Christal, R. E. (1990). Reasoning ability is (little more than) working-memory capacity?! *Intelligence*, *14*, 389-433.
- Levenson, H. (1974). Activism and powerful others: Distinctions within the concept of internal-external control. *Journal of Personality Assessment*, *38*, 377-383.
- Locke, E. A., & Latham, G.P. (1990). *A theory of goal setting and task performance*. Englewood Cliffs, NJ: Prentice-Hall.
- Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation. *American Psychologist*, *57*, 705-717.
- Lubinski, D., & Dawis, R.V. (1992). Aptitudes, skills and proficiency. In M.D. Dunnette & L.M.

Hough (Eds.), *Handbook of industrial and organizational psychology* (Vol.2, 2nd ed., pp. 1-60). Palo Alto: Consulting Psychologists Press.

MacKinnon, D. P., Lockwood, C., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods*, 7, 83-104.

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion and motivation. *Psychological Review*, 98, 224-253.

McClelland, D.C., & Winter, D. G. (1971). *Motivating economic achievement*. New York: Free Press.

McPherson, M.A. (1998). *Zimbabwe: A third nationwide survey of micro and small enterprises*. Washington: U.S. Agency for International Development.

Mead, D.C., & Liedholm, C. (1998). The dynamics of micro and small enterprises in developing countries. *World Development*, 26, 51-74.

Miller, C.C., & Cardinal, L.B. (1994). Strategic planning and firm performance: A synthesis of more than two decades of research. *Academy of Management Journal*, 37, 1649-1665.

Miller, G.A., Galanter, E., & Pribram, K.H. (1960). *Plans and the structure of behavior*. London: Holt.

Mumford, M. D., Schultz, R. A., & Osburn, H. K. (2002). Planning in organizations: Performance as a multi-level phenomenon. *Research in Multi-Level Issues*, 1, 3-65.

Mumford, M. D., Schultz, R. A., & Van Doorn, J. R. (2001). Performance in planning: Processes, requirements, and errors. *Review of General Psychology*, 5, 213-240.

Neace, M. B. (1999). Entrepreneurs in emerging economies: Creating trust, social capital, and civil society. *Annals of the American Academy of Political and Social Science*, 565, 148-161.

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill.

Olson, P.D., & Bokor, D.W. (1995). Strategy process-content interaction: Effects on growth performance in small, start-up firms. *Journal of Small Business Management*, 33, 34-44.

Oswald, W. D., & Roth, E. (1978). *Der Zahlen-Verbindungs-Test (ZVT)*. Goettingen, Germany: Hogrefe.

Compact Oxford English Dictionary, [http://www.askoxford.com/concise\\_oed/reactive?view=uk](http://www.askoxford.com/concise_oed/reactive?view=uk).

Paul, S. M. (1986). The Advanced Raven's Progressive Matrices: Normative data for an American university population and an examination of the relationship with Spearman's g. *Journal of Experimental Education*, 54, 95-100.

Pedersen, P. O., Sverrisson, A., & Van Dijk, M.P. (Eds.). (1994). *Flexible specialization*. London: Intermediate Technology Publications.

Peters, T. (1987). *Thriving on chaos*. New York: Harper & Row.

Reynolds, P. D., Bygrave, W. D., Autio, E., et al. (2003). *Global Entrepreneurship Monitor 2003 Executive Report*. London: London Business School.

Rauch, A., & Frese, M. (2000). Psychological approaches to entrepreneurial success: A general model and an overview of findings. *International Review of Industrial and Organizational Psychology*, 15, 101-142.

Rotter, J. B. (1972). Generalized expectancies for internal versus external control of reinforcement. In J. B. Rotter, J. E. Chance, & E. J. Phares (Eds.), *Applications of a social learning theory of personality* (pp. 260-294). New York: Holt.

Sapienza, H.J., Smith, K.G., & Gannon, M.J. (1988). Using subjective evaluations of organizational performance in small business research. *American Journal of Small Business*, 45-53.

Sarasvathy, S. D. (2001). Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review*, 26, 243-263.

Schmidt, F. L. & Hunter, J.E. (1998). The validity and utility of selection methods in personnel

psychology: Practical and theoretical implications of 85 years of research findings. *Psychological Bulletin*, 124, 262-274.

Schwarzer, R., Baessler, J., Kwiatek, P., & Schroeder, K. (1997). The assessment of optimistic self-beliefs: Comparison of the German, Spanish, and Chinese version of the General Self-efficacy Scale. *Applied Psychology: An International Review*, 46, 69-88.

Schwenk, C. R., & Shrader, C. B. (1993). Effects of formal strategic planning on financial performance in small firms: A meta- analysis. *Entrepreneurship Theory and Practice*, 48-53.

Shane, S., & Delmar, F. (2004). Planning for the market: business planning before marketing and the continuation of organizing efforts. *Journal of Business Venturing*, 19, 767-785.

Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25, 217-226.

Skinner, E. A. (1997). Planning and perceived control. In S. L. Friedman & E. K. Scholnick (Eds.), *The developmental psychology of planning: Why, how, and when do we plan?* (pp. 263-284). Mahwah, N.J.: Lawrence Erlbaum.

Smith, K. G., Locke, E. A., & Barry, D. (1990). Goal setting, planning, and organizational performance: An experimental simulation. *Organizational Behavior and Human Decision Making Processes*, 46, 118-134.

Sonnentag, S. (1998). Expertise in professional software design: A process study. *Journal of Applied Psychology*, 83, 703-715.

Sonnentag, S. (2000). Expertise at work: Experience and excellent performance. *International Review of Industrial and Organizational Psychology*, 15, 223-264.

Stajkovic, A.D., & Luthans, F. (1998). Self-efficacy and work-related performance: A meta-analysis. *Psychological Bulletin*, 124, 240-261.

Tewes, U. (1991). *HAWIE-R: Hamburg-Wechsler Intelligenztest für Erwachsene: Handbuch und*



*Testanweisung*. Stuttgart, Germany: Huber.

Tripoli, A. M. (1998). Planning and allocating: Strategies for managing priorities in complex jobs. *European Journal of Work and Organizational Psychology, 7*, 455-475.

Van der Linden, D., Sonnentag, S., Frese, M., & van Dyck, C. (2001). Exploration strategies, performance, and error consequences when learning a complex computer task. *Behaviour and Information Technology, 20*, 189-198.

Van Gelderen, M., Frese, M., & Thurik, R. (2000). Strategies, uncertainty and performance of small business startups. *Small Business Economics, 15*, 165-181.

Van Praag, C., & Cramer, J. (2001). The roots of entrepreneurship and labour demand: Individual ability and low risk aversion. *Economica, 68*, 45-62.

Viswesvaran, C., & Ones, D. S. (1995). Theory testing: Combining psychometric meta-analysis and structural equations modeling. *Personnel Psychology, 48*(4), 865-885.

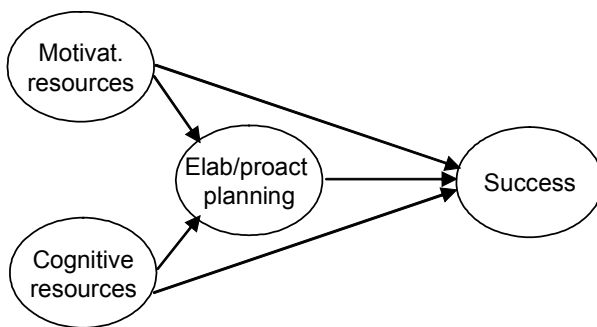
Wally, S. & Baum, J.R. (1994). Personal and structural determinants of the pace of strategic decision making. *Academy of Management Journal, 37*, 932-956.

Wechsler, D. (1997). *WAIS - III administration and scoring manual (3rd ed.)*. San Antonio, TX: The Psychological Corporation.

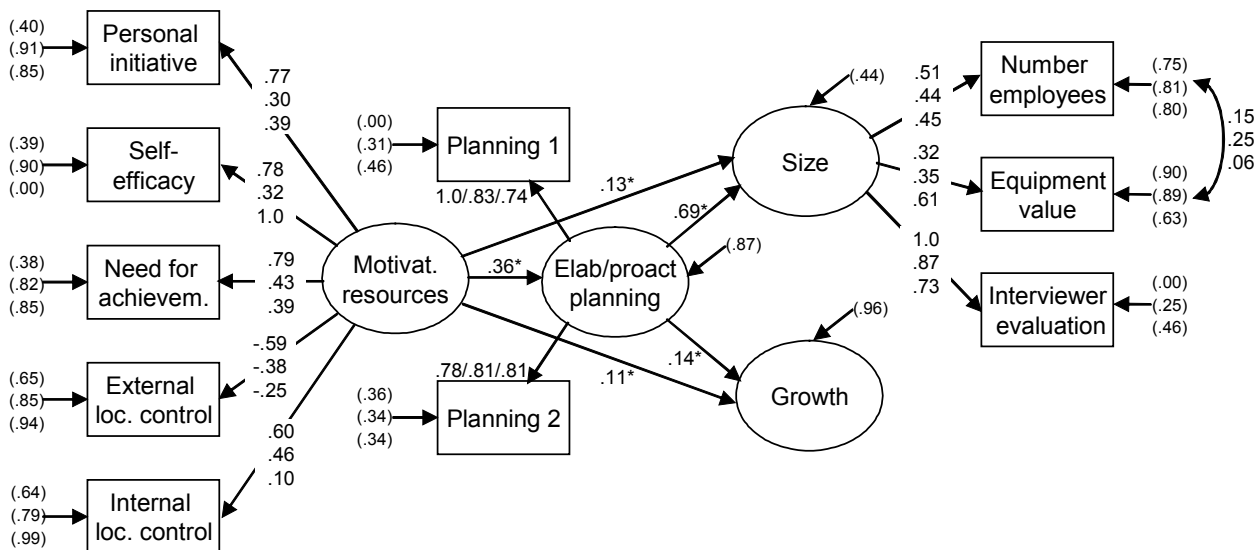
Wiesner, B., & Hacker, W. (1994). Mentale Handlungsvorbereitung: Studie zu Leistungsfluss und personalen Bedingungen. *Zeitschrift Experimentelle und Angewandte Psychologie, 41*, 649-677.

Wood, R.E., Mento, A.J., & Locke, E.A. (1987). Task complexity as a moderator of goal effects: A meta-analysis. *Journal of Applied Psychology, 72*, 416-425.

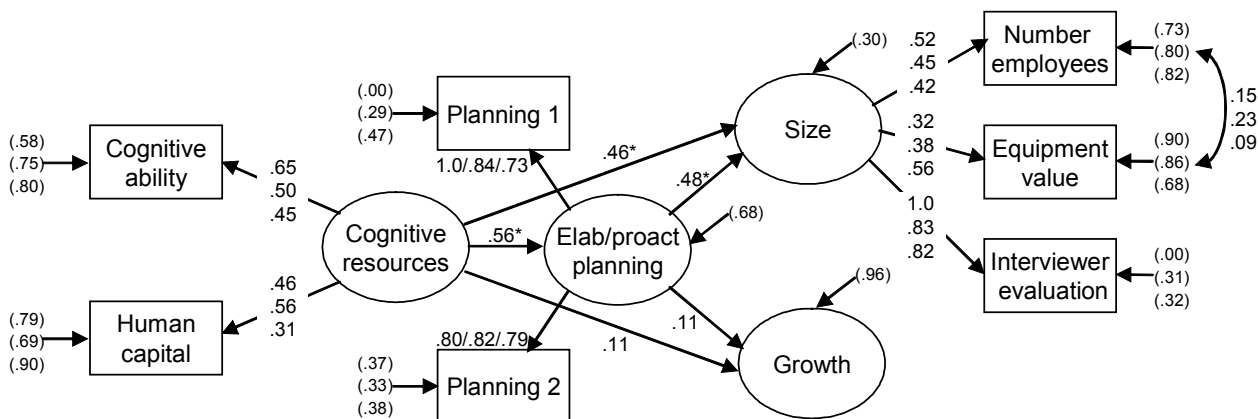
Wood, R.E. & Locke, E.A. (1990). Goal setting and strategy effects on complex tasks. *Research in Organizational Behavior, 12*, 73-109.



(a) Theoretical mediational model for resources, strategies, and entrepreneurial success

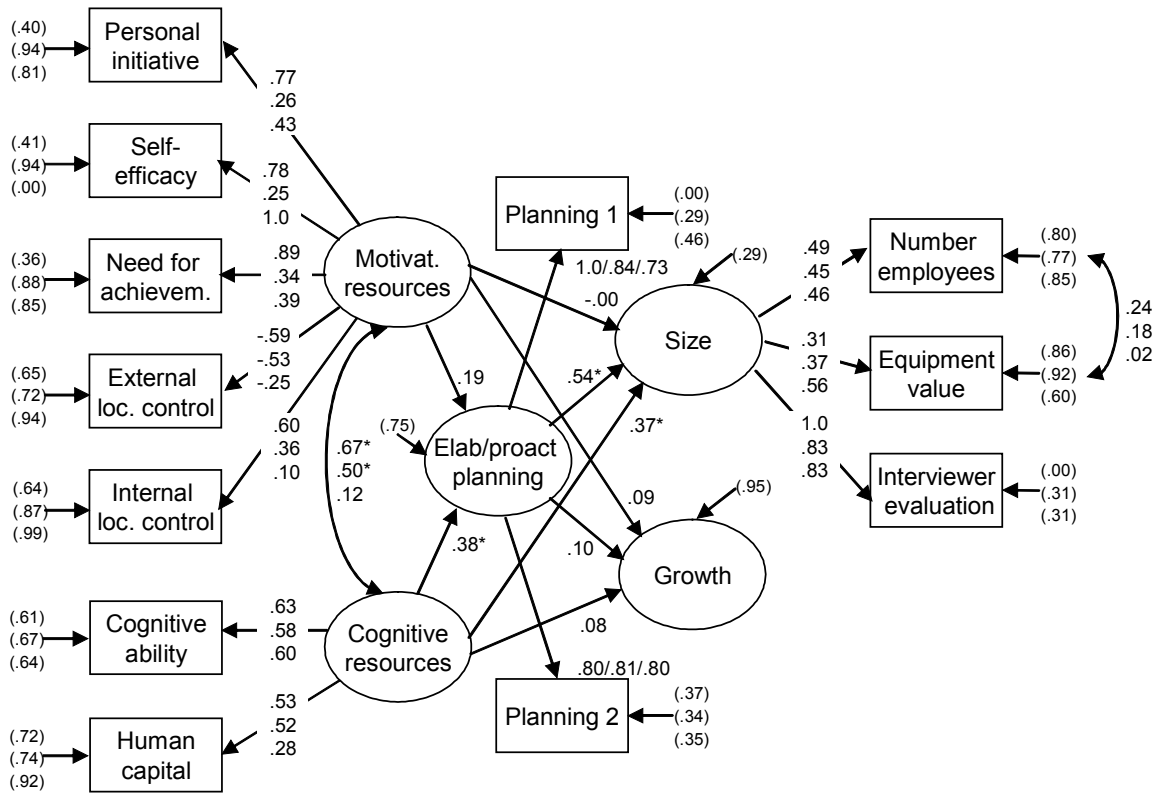


(b) Model for motivational resources; Model fit:  $\chi^2(135, N_1=215, N_2=123, N_3=70)=166.19, p<.05$ ; RMSEA=.041, CFI=.97; numbers in measurement models refer to samples from South Africa, Zimbabwe, and Namibia, respectively.

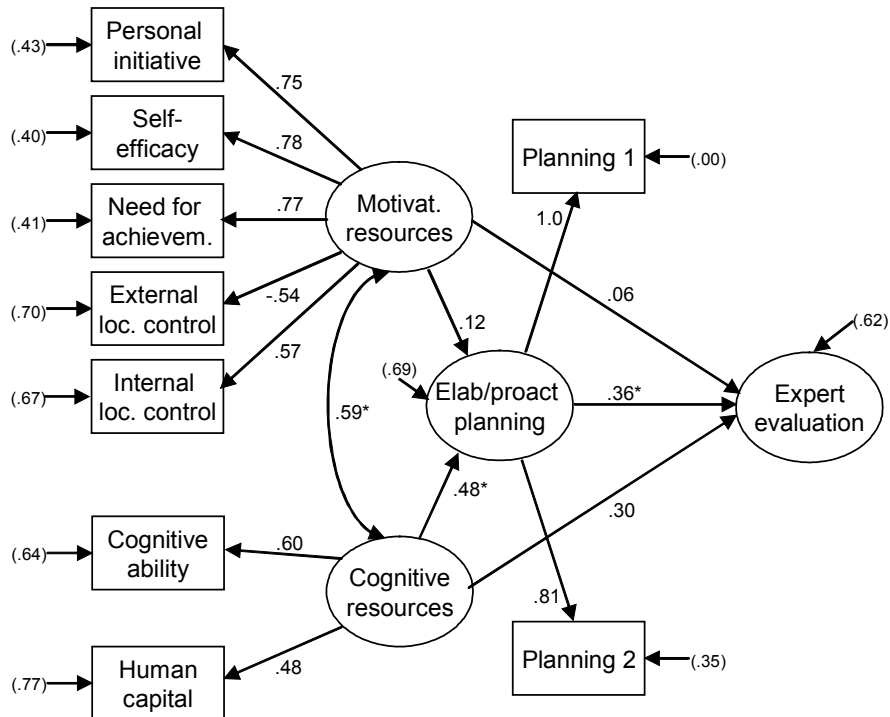


(c) Model for cognitive resources; Model fit:  $\chi^2(62, N_1=215, N_2=123, N_3=70)=89.76, p<.05$ ; RMSEA=.058, CFI=.97; numbers in measurement models refer to samples from South Africa, Zimbabwe, and Namibia, respectively.

Theoretical model (a) and standardized path coefficients and variances (in brackets) of Lisrel models for motivational resources (b) and cognitive resources (c). Indicators of latent variables with only one indicator are not shown. Elab/proact planning = elaborate and proactive planning.  
 \*  $p < .05$  for structural coefficients.



(a) Complete model; Model fit:  $\chi^2(192, N_1=215, N_2=123, N_3=70)=266.12, p < .01$ ; RMSEA=.054, CFI=.95; numbers in measurement models refer to samples from South Africa, Zimbabwe, and Namibia, respectively.



(b) Model for South Africa with expert evaluation;  $\chi^2(30, N=117)=39.88, p=.11$ ; RMSEA=.053, CFI=.97

Table 1: Characteristics of the Main Scales, Indices, and Variables (S= South Africa/Z=Zimbabwe/N=Namibia)

Variable (source)	k items	n (S/Z/N)	Alpha (S/Z/N)	Interrater reliability (S/Z/N)	Range	M (S/Z/N)	SD (S/Z/N)
<b>Mediator Planning:</b>							
Elaborate and proactive planning (S/Z/N)	4	125/280/78	.93/.85/.87	.92-.96/.68-.76/.88-.92 <sup>a</sup>	1-5/1-4.75/1.25-5	2.57/2.52/2.92	1.11/.80/.87
<b>Cognitive Resources:</b>							
Human capital (S/Z/N)	2	126/278/86	.77/.75/.56	—	— <sup>b</sup>	— <sup>b</sup>	— <sup>b</sup>
Years of education (S/Z/N)	1	126/280/87	—	—	0-15/2-24/6-17	10.22/11.15/10.86	2.44/2.38/2.02
Highest level of formal education (S/Z/N)	1	126/278/86	—	—	1-10/1-10/1-10	4.16/4.38/6.08	1.75/1.91/2.80
<b>Cognitive ability:</b>							
Digit span test forward and backward (S/-/-)	2/-/-	125/-/-	.69/-/-	—	1-11	6.51	1.90
Connecting Numbers Test (-/Z/-)	-/4/-	-/260/-	-.96/-	—	55-316	113.67	36.01
Raven Matrices (-/-/N)	-/-/12	-/-/82	-/-/.67	—	0-12	3.74	2.46
<b>Motivational Resources:</b>							
Internal locus of control (S/Z/N)	5/3/5	124/272/80	.77/.69/.61	—	1-6/1-6/1-6	4.84/4.97/5.05	1.01/.95/0.82
External locus of control (S/Z/N)	7/7/7	124/271/80	.84/.76/.71	—	1-6/1-6/1-6	2.90/2.77/3.00	1.30/1.18/1.04
Self-efficacy (S/-/N) (Schwarzer et al., 1997)	10/-/10	123/-/80	.88/-/.79	—	1-4/-/1-4	3.24/-/3.29	0.58/-/0.45
Self-efficacy (-/Z/-) (Bandura, 1997)	-/13/-	-/269/-	-.84/-	—	0-100	80.55	11.64
Achievement motivation (S/Z/N)	6/4/3	123/279/80	.79/54/.64	—	1-5/1-5/1-5	4.11/4.35/4.37	0.65/0.58s/0.56
Self reported initiative (S/Z/N)	7/6/6	123/263/80	.88/.86/.78	—	1-5/1-5/1-5	3.76/4.07/4.00	0.82/0.88/0.67
<b>Success:</b>							
Growth (S/Z/N)	3/9/4	125/260/87	.80/.81/.86	—	— <sup>b</sup>	— <sup>b</sup>	— <sup>b</sup>
Number of employees (S/Z/N)	1	126/279/87	—	—	1-50/1-73/1-41	5.20/4.70/7.60	7.81/9.21/7.20
Interviewer evaluation (S/Z/N)	1	126/280/87	—	.73 <sup>c</sup>	1-5/1-5/1-5	2.86/2.49/2.84	1.25/.97/1.34
Equipment value (converted into Million US \$)	1	125/275/86	—	—	0-0.27/0-1.1/0-0.96M	0.015/0.023/0.065	0.036/0.097/0.096
Expert evaluation (S/-/-)	2/-/-	120/-/-	.93/-/-	—	1-5/-/-	3.00/-/-	1.42/-/-
<b>Controls:</b>							
Year of firm establishment (firm age) (S/Z/N)	1	126/280/87	—	—	1951-1998/ 1953-2000/1977-1999	1993/1994/1991	6.05/5.87/5.93
Industry: Manufacturing (S/Z/N)	dummy	126/278/87	—	—	1—2	—	—
Industry: Construction (S/Z/-)	dummy	126/278/-	—	—	1—2	—	—
Industry: Trade (retail) (S/Z/N)	dummy	126/280/87	—	—	1—2	—	—
Industry: Service (S/Z/N)	dummy	126/279/87	—	—	1—2	—	—
Industry: Other (S/Z/N)	dummy	126/279/87	—	—	1—2	—	—
Formal (S/Z/N) (formal firms, % of total)	1	125/278/87	—	—	1—2	38/37/79%	—

<sup>a</sup> ICC between two raters; <sup>b</sup> based on z-standardized items, therefore Range, M and SD are not meaningful; <sup>c</sup> N was smaller, and for this calculation we collapsed across countries because both interviewers needed to be present in the interview to give their personal interpretation of the success (N=74); \*  $p < .05$ , \*\*  $p < .01$

Table 2: Intercorrelations (South Africa, first correlation/ Zimbabwe, second correlation/ Namibia, third correlation)

	1	2	3	4	5	6	7	8	9	10	11	12	13
<i>Success</i>													
1. Growth													
2. Expert Evaluation	13/-/-												
3. Number of Employees	-02/19*/23*	42*/-/-											
4. Interviewer Evaluation	15/30*/38*	78*/-/-	53*/47*/49*										
5. Equipment Value	-02/01/05	34*/-/-	36*/48*/62*	33*/44*/46*									
<i>Mediator Planning</i>													
6. Elaborate & proactive planning	12/24*/31*	58*/-/-	42*/.37*/26*	80*/61*/46*	32*/25*/28*								
<i>Motivational Resources</i>													
7. External locus of control	-25*/-12/-07	-49*/-/-	-23*/-07/-22	-49*/-13*/-29*	-13/02/-25*	-40*/-08/-43*							
8. Internal locus of control	12/00/12	16/-/-	08/09/-01	26*/09/-20	11/-03/-17	30*/04/-09	-39*/-19*/04						
9. Self-efficacy	16/15*/12	35*/-/-	17/-03/00	36*/15*/07	19*/02/06	31*/14*/18	-48*/-09/-20	60*/18*/12					
10. Achievement motivation	31*/-02/13	46*/-/-	18/05/06	43*/10/08	14/-02/02	43*/09*/-07	-53*/-08/09	47*/21*/12	66*/15*/36*				
11. Self reported initiative	26*/-06/09	41*/-/-	24*/-19*/-09	47*/02/08	25**/-02/-02	42*/02/19	-50*/-19*/-21	51*/02/11	65*/05/38*	66*/19*/21			
<i>Cognitive Resources</i>													
12. Cognitive ability (IQ)	19*/12/10	46*/-/-	32*/07/14	54*/24*/49*	10/01/19	49*/16*/24*	-43*/-27*/-30*	25*/-07/-17	31*/08/02	44*/13/-24*	36*/14*/-02		
13. Human capital	22*/12/15	42*/-/-	20*/36*/14	45*/44*/42*	11/40*/20	37*/41*/42*	-30*/-19*/-27*	29*/-05/-27*	25*/-10/09	46*/00/-11	41*/06/-06	41*/29*/30*	
<i>Controls</i>													
14. Year of firm establishment	14/13/31*	02/-/-	-05/-05/-06	15/02/19	-14/-12/-04	11/08/31*	-12/-06/-13	09/-10/10	07/03/13	07/02/06	13/16*/14	15/36*/12	31*/16*/30*
15. Industry: Manufacturing	19*/-06/-04	26*/-/-	20*/-10/11	26*/-23*/-13	15/-10/02	20/-07/-15	-22*/08/16	07/08/15	15/-04/00	22*/02/-08	21*/-17*/07	19*/-14*/-02	17/-11/-16
16. Industry: Construction	-01/-07/-	13/-/-	12/09/-	01/01/-	-16/-03/-	04/03/-	-13/09/-	10/00/-	09/-13/-	03/-10/-	04/-17*/-	07/-06/-	06/-04/-
17. Industry: Trade (retail)	-14/-07/24*	-03/-/-	-15/-10/27*	-02/07/33*	10/01/22*	-07/-01/28*	15/-04/-08	-23*/-11/-17	-29*/-04/-07	-25*/-01/-01	-30*/12/02	-12/02/-02	03/-02/29*
18. Industry: Service	-11/08/13	-18*/-/-	-06/22*/-09	-12/19*/02	01/24*/-05	-08/08*/20	-02/-03/-08	16/-01/07	15/04/03	00/00/17	11/-02/-04	00/-10/-02	-08/07/03
19. Industry: Other	-03/-05/01	-11/-/-	-06/01/-02	-05/-06/26*	-05/11/-05	-09/06/22	00/00/-09	-08/08/04	-09/15*/07	-08/-03/03	01/07/18	-06/03/26*	-32*/-01/02
20. Formal	04/05/42*	37*/-/-	25*/35*/29*	26*/49*/53*	21*/33*/16	22*/38*/49*	-28*/09/-33	11/06/-05	14/-01/-05	23*/-07/01	17/-12/03	21*/-09/25*	29*/43*/44*

	14	15	16	17	18	19
15. Industry: Manufacturing	-09/-15*/-36*					
16. Industry: Construction	-06/01/-	-10/02/-				
17. Industry: Trade (retail)	18*/-02/25*	-45*/-44*/-23*	-05/-13/-			
18. Industry: Service	-01/-11/20	-40*/-29*/-68*	-06/-13/-	-30*/-14*/-13		
19. Industry: Other	-10/06/08	-11/-17*/-04	-02/-05/-	-10/-06/00	-02/-06/-04	
20. Formal	-18*/-13/31*	22*/-09/-18	07/04/-	-16/01/30*	07/19*/11	-23*/-01/10

Note: Decimal points were removed to save space; \*p < 05; N (South Africa) = 117 to 126; N (Zimbabwe) = 215; N (Namibia) = 73 to 87