FACULTEIT ECONOMIE
EN BEDRIJFSKUNDE

TWEEKERKENSTRAAT 2
B-9000 GENT
Tel. : 32 - (0)9 – 264.34.61
Fax. : 32 - (0)9 – 264.35.92

WORKING PAPER

Determinants of entrepreneurs' growth intentions. A cognitive style perspective[1]

Mirjam Knockaert[2]

Maw Der Foo[3]

Truls Erikson[4]

May 2011

2011/720

[1]

[2] University of Gent, Faculty of Economics and Business Administration, Tweekerkenstraat 2, 9000 Gent, Belgium, And University of Oslo, Norway, E-mail: Mirjam.knockaert@ugent.be
[3] Maw Der Foo, University of Colorado at Boulder, 419 UCB, Boulder, Colorado, 80303, USA, Email: foom@colorado.edu And University of Gent, Belgium
[4] Truls Erikson, University of Oslo, Centre for Entrepreneurship, Gaustadalléen 21 | N-0318 Oslo | Norway, E-mail: truls.erikson@sfe.uio.no

D/2011/7012/25

ABSTRACT

Despite the vital role high growth firms play in the economy, our understanding of drivers of growth intentions remains limited. We investigate the relation between cognitive styles and an individual's growth intentions using a sample of 251 researchers at the University of Oslo. Our study indicates that cognitive style, defined as the characteristic way in which an individual processes and evaluates information, solves problems, and makes decisions is a crucial predictor of growth intentions. We find that a planning cognitive style promotes while a knowing cognitive style curbs growth intentions. Further, working experience positively moderates the relationship between a knowing style and growth intentions, with the curbing effects of a knowing cognitive style diminishing as people gain working experience. We discuss implications for academia and practitioners, including entrepreneurs and stakeholders in new ventures.

1. INTRODUCTION

Cognition is an important theoretical perspective for understanding and explaining human behavior and action (Wofford and Goodwin, 1990) and has been widely applied in industrial and organizational psychology. There has also been an interest in the role of cognition for entrepreneurship (Baron, 2004; Corbett, 2007; Dutta and Thornhill, 2008; Keh et al., 2002; Krueger et al., 2000; Mitchell et al., 2000; Simon et al., 2000) because entrepreneurial action is emergent, arising out of the entrepreneur's underlying cognitive processes (Mitchell et al., 2002).

Within entrepreneurial cognition research, the cognitive style perspective—defined as a stable characteristic way in which individuals process and evaluate information, solve problems, and make decisions (Hayes and Allinson, 1994; Goldstein & Blackman, 1978)–has been identified as promising in explaining entrepreneurial behaviors (Carland et al., 2002; Mitchell et al., 2000). For example, Allinson et al. (2000) and Buttner and Gryskiewicz (1993) used cognitive styles to distinguish between entrepreneurs and non-entrepreneurs. Dimov (2007) and Hmieleski and Corbett (2006) applied cognitive styles to understand why some people discover and exploit particular entrepreneurial opportunities, while others do not. Several mechanisms have been proposed to explain cognitive style influences on entrepreneurial behaviors, including entrepreneurial drive (Armstrong and Hird, 2009) and risk preferences (Barbosa et al., 2007). This is because cognitive style has a direct influence on an individual's approach towards information and how he or she makes decisions (Dutta and Thornhill, 2008). Although much of the literature has found cognitive styles to explain differences in entrepreneurial intentions and progress through the entrepreneurial life cycle, in this study, we highlight the role of cognitive styles to understand growth intentions. This is important since growth intentions are seen as an important predictor for growth and may be a catalyst for job creation and economic prosperity.

Intention is a good predictor of planned behavior (Bagozzi et al., 1989) especially if the phenomenon is rare, obscure, or involves unpredictable time lags, which is typically the case in entrepreneurship (MacMillan and Katz, 1992). Given the role of entrepreneurial intentions in predicting entrepreneurial behavior, many researchers (e.g. Lee et al., 2011; Lüthje and Franke, 2003;

Souitaris et al., 2007; Thompson, 2009) have studied determinants of entrepreneurial intentions. Yet within entrepreneurial intentions, some entrepreneurs are content with a venture that merely survives while other entrepreneurs favor high growth ventures (Gundry and Welsch, 2001). Hence, it is not only essential to study entrepreneurial intentions, but to also distinguish between the nascent entrepreneurs who have low growth intentions and preferences and those who intend to start ventures with potentially larger impact upon the economy (Cassar, 2007). Providing an understanding of what distinguishes people with low from high growth intentions may be helpful in identifying and supporting those entrepreneurs who may create ventures with a high economic impact.

Following Dutta and Thornhill (2008), we define growth intentions as the entrepreneur's goals and aspirations for growth. Entrepreneurs' growth ambitions are important for future welfare and employment. Research in the United Kingdom for instance found that 4% of all start-ups represent 50% of job creation by start-ups (Storey, 1994). Further, Kuratko and Hodgetts (1998) emphasized the role of new and smaller firms to the US economy and, in particular, of job-creating, fast-growing 'gazelle' businesses versus 'life style' businesses. Growth creation is not trivial and requires large investments, investments which will not be made if the intention to grow is absent at the time of start-up (Autio, 2005). Many ventures fail to achieve substantial growth, simply because the entrepreneur did not intend to have the venture achieve substantial size and growth (Cliff, 1998; Davidsson, 1989; Kolvereid, 1992). Wiklund and Shepherd (2003) and Delmar and Wiklund (2008) also found growth expectations to predict post-founding growth. Barringer et al. (2005) used content analysis to determine growth orientation for firms and found that it delineated rapid-sales growth firms from other firms. Therefore, it is important to study growth intentions as they are antecedents of growth oriented behavior.

Researchers studying entrepreneurs' growth ambitions have identified some individual-level and environmental characteristics affecting the entrepreneurs' growth ambitions. Individual-level characteristics include race (Edelman et al., 2010), age (Cassar, 2006), gender (Cliff, 1998), household income and education (Cassar, 2006), significance the entrepreneur attaches to financial success (Cassar, 2007), and the entrepreneur's strategic intentions (Gundry and Welsch, 2001). Tominc and Rebernik (2007) further identified cultural support in the environment as a promoter for an

entrepreneur's growth ambitions. Despite the contributions of these studies, they neglected a potentially important driver of growth intentions, namely cognitive styles. The entrepreneur's cognitive style may influence how he or she engages with the venture's task environment (Dutta and Thornhill, 2008). Studies using traditional cognitive style models have identified discerning characteristics of different types of styles, including a proclivity for planning versus improvisation, rules-versus intuition-focus, conformity seeking versus divergence, and a preference for incremental versus quantum goals (Dutta and Thornhill, 2008). Following these differences between cognitive styles, we build a theoretical framework linking different cognitive styles to growth intentions and explain how cognitive style influences the entrepreneur's growth intentions.

Our study fits the cognitive and behavioral streams of research about entrepreneurs and as such provides an understanding of the relationship between cognitive styles and growth intentions. In so doing, we provide a new perspective in our theoretical understanding of the processes underlying the emergence of differences between high-growth oriented and low-growth oriented entrepreneurs. Moreover, the study provides a comprehensive assessment of the effects of cognitive styles on growth intentions. Even though cognitive styles have been used to asses differences between entrepreneurs and non-entrepreneurs, our understanding of the impact of cognitive styles on many other elements of the nascent entrepreneurial process remains limited. Finally, this study applies a relatively new but comprehensive framework of cognitive styles. To date, many researchers have used unidimensional bipolar classifications of cognitive styles, excluding the possibility that people could score high on different cognitive dimensions. Following the critique on the use of these bipolar classifications (Sadler-Smith, 2009), we build upon a cognitive style framework developed by Cools and Van den Broeck (2007) in which they introduced three cognitive style dimensions. In the next section, we present our theoretical framework, linking different cognitive styles to growth intentions. Following that, we describe the study methodology using a sample of researchers in a University in Olso. Next, we present our results, and provide conclusions, discussion and directions for further research.

2. THEORETICAL FRAMEWORK

2.1. Cognitive styles

Cognitive styles are stable attributes, preferences, or habitual strategies determining how individuals perceive, remember, think, solve problems, and relate to others (Messick, 1976; Witkin et al., 1977). Cognitive style is generally thought of as a phenomenon with multiple dimensions, including decision making, learning, personality, and awareness (Kickul et al., 2009). In the field of industrial and organizational psychology, cognitive style is considered a fundamental factor determining both individual and organizational behavior. It is seen as a critical variable in personnel selection, internal communication, career guidance, counseling conflict management and education (Kozhevnikov, 2007). Most theorists further claim cognitive styles to be stable, pervasive, consistent across different areas of cognitive functioning and stable over time (Sadler-Smith, 1998).

Although the study of cognitive styles is hardly new, the literature has been inconclusive on the definition of styles (Sadler-Smith and Badger, 1998), and a large number of style dimensions have been used. A review of cognitive styles is beyond the scope of this paper (we refer to Kozhevnikov (2007) for an overview of the cognitive style literature). Two frequently used classifications in the context of business and management research are the ones identified by Kirton (2003) and Allinson and Hayes (1996). Kirton (2003) identifies an adaptive and innovative style, whereas Allinson and Hayes (1996) distinguish between analysis and intuition. Analytical/Adaptive thinkers prefer structured, ordered and rather impersonal work environments. People with an intuitive/innovative style favor unstructured, changing, highly involving, innovative, flexible, dynamic, relatively personalized environments, in which they can work autonomously. We follow the classification made by Cools et al. (2009), identifying a knowing style, planning style and creating style, and use their Cognitive Style Indicator (CoSI; Cools and Van den Broeck, 2007) in our study. The CoSI was developed as a reaction to the use of bipolar unidimensional cognitive style models, excluding the possibility people can simultaneously show strong or weak preferences for both poles of a dimension (Hodgkinson et al., 2009; Sadler-Smith, 2004; Taylor, 1989). We use the CoSI model as research using different samples has found strong support for the construct and predictive validity for this model (Cools et al., 2009)

and given the critique of using bipolar unidimensional cognitive style models, such as the ones developed by Kirton (2003) and Allinson and Hayes (1996). Further, the CoSI dimensions are relevant for entrepreneurship research and are, for instance, fairly parallel to the dimensions that underlie successful intelligence, including analytical, creative and practical intelligence (Sternberg, 1997; 2004). In the framework of successful intelligence, creative intelligence is used to come up with new ideas, analytical intelligence to evaluate these ideas and the practical intelligence to find out in which way to sell these ideas (Sternberg, 2004).

In the Cools and Van den Broeck classification, people with a knowing style prefer a rational and impersonal way of information processing and have strong analytical skills. They search for accuracy and like to make informed decisions on the basis of a thorough analysis of facts and figures and logical arguments. People with a planning style have a need for structure and like to organize and control in a highly structured environment relying on preparation and planning. Those with a creating style like uncertainty and freedom, search for renewal and see problems as opportunities and challenges. Whereas their definition of "creating style" relates highly to the intuitive and innovative style defined by other researchers, the knowing and planning style definition originates from criticism on the definition of the analytical style, which is uniting two different perspectives, namely planning and knowing.

2.2. The relation between cognitive styles and growth intentions

Creating cognitive style

People with a creating style like uncertainty and freedom, search for renewal and see problems as opportunities and challenges and have high risk preferences (Barbosa et al., 2007). As such, it is not surprising for Kickul et al. (2009) to find that a creating (or intuitive) cognitive style may be particularly useful in the opportunity identification phase of the new venture creation process. Further, Armstrong and Hird (2009) found entrepreneurs who are more intuitive or score higher on the creating style dimension to have higher entrepreneurial drive. Miner (1997) found intuition to be an important thinking mode of expert idea generators. Thus a creating cognitive style may be helpful in the early stages of the venture creation process, and may lead to a higher likelihood of venture creation

(Allinson et al., 2000; Buttner and Gryskiewicz, 1993). Individuals with this style prefer to leave options open, and may much easier see business creation as a potential future career. While a creating cognitive style has been found to positively affect entrepreneurial intentions, we argue that people scoring high on the creating cognitive style will also be more inclined to start high growth ventures.

People scoring high on the creating cognitive style dimension are attracted by high-risk proposals and see problems as opportunities and challenges. It has been widely acknowledged that entrepreneurial growth is a process fraught with difficulties and challenges. For instance, the process of growth requires access to resources, including access to financing, skilled labor, technology and information (Petrakis, 1997). According to Shelton (2010), firm growth is impeded by expansion barriers, which represent resource positions that firms of a given size possess which other firms must obtain at a cost. As such, smaller firms have to overcome resource deficiencies, or expansion barriers, if they are to grow. Finally, small firm growth is neither linear nor described well by biological paradigms, which requires entrepreneurs to act as problem solvers (Orsen et al., 2000). Given this high risk and uncertainty characterizing the growth process, it seems natural for people scoring high on the creating cognitive style to have a positive attitude towards growth-oriented ventures. Given that they favor situations characterized by high risk and uncertainty they will be highly attracted by the challenges underlying the creation of growth-oriented ventures. Therefore, we offer the following hypothesis:

H1: Entrepreneurs scoring high on the creating cognitive style dimension will exhibit high growth intentions

Planning cognitive style

The act of planning pertains to the development of a sequence of behaviors used to translate an individual's resources into actions aimed at achieving particular goals (Shank and Abelson, 1977). Planning allows identifying possible positive and negative scenarios (Hoc, 1988), and bestows a number of benefits, such as increased focus, lower susceptibility to distraction, higher persistence, and readiness to act (Gollwitzer, 1996). Planning is particularly important in complex and uncertain tasks

(Campbell, 1988), in highly uncertain environments (Liao and Gartner, 2006) such as those faced by nascent entrepreneurs (Dimov, 2010). People with a planning style need structure, like to organize and control, and prefer a well-structured working environment. They like to prepare to reach their objectives, and adhere to the motto: “first plan, then act”. People with a planning style prefer a structured approach when making decisions. Further, planners tend to be demanding to themselves and to the people surrounding them (Cools and Van den Broeck, 2007). Therefore, people who score high on the planning cognitive style may be attracted by the demanding nature of the venture growth process and the challenges to be overcome. These challenges include, amongst other the task of attracting resources into the new venture as the lack of both reputation and track record creates a heightened perception of risk by potential resource providers (Brush et al., 2001). Further, establishing a growth-oriented venture requires significant structuring effort (Covin and Slevin, 1988; Gundry and Welsch, 2001), which planners like to do. As such, people scoring high on the planning cognitive style may be attracted by both the demanding nature and the need for a structured approach typifying a growth oriented venture. Therefore, we offer the following hypothesis:

H2: Entrepreneurs scoring high on the planning cognitive style dimension will exhibit high growth intentions

Knowing cognitive style

People with a knowing style look for data and tend to retain many facts and details. They like complex problems and try to find rational and logical solutions. People with a knowing style prefer to take their time to make decisions, sometimes postponing them to collect more information while a lack of data or relevant information can be a source of doubt for knowing people in the decision-making process. As such, they do not like tasks that are undefined, ambiguous, lack supporting facts and figures, and insufficiently challenging from an intellectual perspective. These people may find it difficult to come up with creative solutions and out-of-the box thinking. In their jobs, they prefer to engage in intellectually challenging tasks with a clearly defined goal. It is unlikely for people who score high on the knowing cognitive style dimension to exhibit entrepreneurial intentions (Cools and

Van den Broeck, 2007). This is because the entrepreneurial process is a process fraught with difficulties, unforeseeable hazards and high levels of uncertainty (Aldrich, 1979; Nelson and Winter, 1982), and often characterized by decisions that cannot be fully supported by data or facts and figures. In case they do have entrepreneurial intentions, it is likely the businesses they build will be oriented towards fulfilling their intellectual hunger (for instance through the establishment of a research-based consulting firm), and unlikely to have the achievement of high growth as an objective. Further, the uncertainty related to growth may have them feel uncomfortable. Indeed, in another context, Nutt (1990) found that managers with a preference for thinking were most reluctant to take risks when making strategic decisions; moreover, growth adds complexity to an organization, and this complexity is sometimes difficult to manage (Covin and Slevin, 1997). Indeed, failure of high growth firms is often due to the inability of managers to cope with the demands this complexity entails (Mishina et al., 2004). Given the complexity and uncertainty surrounding aiming for and achieving growth, it is unlikely there can be a full understanding of the actions needed to achieve growth or the underlying logic of growth. As such, as people who score high on the knowing style may be uneasy with the uncertainty and the lack of facts and figures allowing them to predict the growth process, they may simply not foster growth ambitions. Therefore, we offer the following hypothesis:

H3a: Entrepreneurs scoring high on the knowing cognitive style dimension will exhibit low growth intentions

In summary, we expect both creating and planning cognitive styles to positively affect growth intentions, whereas we expect a knowing cognitive style to negatively affect growth intentions. In what follows, we argue under which conditions the negative impact of this knowing style may be mitigated. More specifically, we argue how working experience could positively affect the relation between this knowing style and growth intentions. Earlier, we suggested that people scoring high on the knowing style prefer to avoid the risk and uncertainty relating to starting a high growth business. However, as people gain experience, this is likely to affect their risk perceptions (Dimov and Shepherd, 2005) and change their attitude towards high growth businesses. We build upon the

knowledge corridor thesis (Shane, 2000) and propose that the relationship between people with a predominantly knowing style and growth intentions is moderated by the experience people build in their working environment.

The logic underlying the knowledge corridor thesis is that exposure to certain ideas and practices determines the entrepreneurial process (Cliff et al., 2006). According to this thesis, working experience influences the entrepreneur's ability to comprehend, extrapolate, interpret and apply new information in ways those lacking experience cannot replicate (Shane, 2000). Cliff et al. (2006) further contended that there exist different knowledge corridors; the corridor in the core of an organizational field, one in the periphery and another in other industries. The first corridor was found to lead to the creation of less innovative ventures whereas the other two were catalysts for innovative entrepreneurship. Experiences in the organization's core provide an enhanced appreciation of the risks, in the form of social disapproval and withdrawal of support, associated with the failure to meet social expectations (Cliff et al., 2006). The alternative knowledge corridors allow combining existing stocks of information in different ways. People with a knowing style are therefore likely to collect information in their core domain, decreasing the likelihood they will foster the ambition to start up innovative and growth-oriented ventures. However, as they gain working experience they are more likely to learn from experiences from peripheral organizations and move through the other knowledge corridors.

This is also the case in our study, where researchers are more likely to move through the other knowledge corridors as they gain working experience. Researchers are increasingly pressured to engage in industry-science relations and to commercialize at least part of their research results through licensing and/or new ventures (Wright et al., 2007). Consequently, it is likely that people who have worked for a longer time at the university, will have engaged in one or different modes of industry-science relationships. For people who score high on a knowing cognitive style, these modes of interaction provide information and insights into how businesses develop and function. Their inclination towards a knowing style further helps them to look for data and relevant information which may not be readily available in the environment, but may become available as they build experience in interaction with the business community. As a result, working experience may decrease risk

perceptions related to starting new ventures, because there is less perceived risk in familiar domains than in unfamiliar ones (Sitkin and Pablo, 1992). Therefore, working experience may positively affect the earlier presumed relationship between a knowing cognitive style and growth intentions. We offer the following hypothesis:

H3b: Working experience positively moderates the relationship between a high score on a knowing cognitive style and growth intentions such that working experience will alleviate the negative impact of a knowing cognitive style on growth intentions

3. DATA COLLECTION AND METHODOLOGY

3.1. Data collection and sample

Our research draws upon a sample of 251 doctoral and post-doctoral researchers at the Faculty of Mathematics and Natural Sciences at Oslo University, Norway. Within the entrepreneurship and innovation literatures, there has been a substantial interest in the entrepreneurial intentions of people engaged in technological activities (e.g. Lee et al., 2011). This is caused by the fact that, despite the pressures faced by universities to commercialize at least parts of their research results through licensing or spin-off creation, many research results do not get commercialized. Further, commercialization of research results do not always result in high growth ventures, and many authors have observed that the majority of academic spin-offs remain small or grow slowly (Mustar et al., 2008). As such, it is important to study factors influencing growth intentions of researchers.

Data were collected in February 2010, using an online questionnaire. The data collection phase was preceded by a pilot phase in the period November 2009-January 2010, during which respondents were also requested to provide comments on the questionnaire itself, allowing refining of the instrument. The survey population consisted of 690 doctoral and post-doctoral researchers in the Faculty of Mathematics and Natural Sciences. They received a request to fill out the online questionnaire through email, sent by the central administration, and signed by the research team and the vice-dean. The first mailing resulted in a response of 170 researchers, and was followed by a

second email request for filling out the questionnaire one week later, resulting in 112 additional responses. From the total of 282 responses, 31 were eliminated due to missing data, resulting in 251 full questionnaires, or a response rate of 36%. *T* tests found no significant differences between early and late respondents in age, type of research scientist (postdoc vs. doctoral researcher), and time employed at the university.

To limit common methods bias (CMB), we pretested the survey on researchers (Tourangeau et al., 2000). As a robustness test we carried out a Harman One-Factor test (Podsakoff et al., 2003). CMB is assumed to exist if (1) a single factor emerges from unrotated factor solutions; or (2) a first factor explains the majority of the variance in the variables (Podsakoff and Organ, 1986). Analysis on our data produced five components, explaining 72% of the variance with the first component explaining 25% of the variance. Second, we used confirmatory factor analysis (CFA) controlling for a single unmeasured latent method construct and as such followed the ULMC (Unmeasured Latent Method Construct) technique as outlined by Richardson et al. (2009) and Facteau et al. (1995). Specifically, we used CFA to analyze four alternative measurement models. Model 1 was a null measurement model (i.e., no factors underlie the data). Model 2 posited that a single method factor explained the data. Model 3 was the measurement model used in this study in which the constructs of interest ('traits') were positioned to underlie the data. Model 4 posited that the data could be accounted for by the traits in Model 3 plus a single uncorrelated method factor. The results of the different models are presented in Table 1 below.

<<<Insert Table 1 about here>>>

The first important comparison for assessing CMB involves models 1 and 2. Model 2 provides a significantly better fit to the data than Model 1 (chisquare=1408; df=25; $p<.01$), but fits the data very poorly. The second comparison involves models 3 and 4 (measurement model). Model 3 provides a good fit for the data. Model 4 (chisquare=184; df=25; $p<.01$), however, fits the data better than model 3. However, while statistically significant, the gain in fit achieved by this model is relatively small. Subsequently, we partitioned the variation accounted for by model 4 into trait and method

components. Specifically, for each item, the square of the trait factor loading and of the method factor loading indicate the amount of variance due to the trait and the method factors, respectively. The amount of variance due to the trait model was 60%, compared to 16% for the method factor. It is generally accepted that the common method variance present in the data is not sufficient to bias results if the proportion of variance attributed to method is smaller than 25% (Choi and Chen, 2007; Williams et al., 1989), which is the case for our data. Consequently, there is limited evidence to suggest the results will be affected by common method bias. Further, it is unlikely for reverse causality to occur as cognitive styles remain stable over time.

3.2. Models and measures

We employed a Heckman two-step selection model to model the importance of cognitive styles for growth intentions. It is necessary to use this two step model as respondents who did have any intention to start up a business could not properly respond to questions on growth intentions for this business (and therefore were not asked these questions). Therefore, all respondents without intention to start up a business would get a score of zero on growth intentions, which may cause selection bias (Greene, 2000). The Heckman two-step selection procedure is based on computing the inverse Mills-ratio from the first equation, or the selection model, and using it as an additional regressor in the second step (Heckman, 1976). In this study, the selection model involves modeling the prevalence of entrepreneurial intention, whereas the regression model involves estimating growth intentions with the coefficients adjusted to the first step.

The selection model took the following form:

Entrepreneurial intention= F (gender, age, subjective norm, entrepreneurial self-efficacy, working experience, creating cognitive style, planning cognitive style, knowing cognitive style)

The measures used for the selection model are elaborated on below.

Entrepreneurial intention. We used the scale developed by Linan and Chen (2009), measuring entrepreneurial intention using 6 items on a 7-Likert scale (ranging from 1 “disagree to a large extent”

to 7 “agree to a large extent”). The items were: “I am ready to do anything to be an entrepreneur”, “My professional goal is to become an entrepreneur”, “I will make every effort to start and run my own firm”, “I am determined to create a firm in the future”, “I have very seriously thought about starting a firm”, “I have the firm intention to start a firm some day”. The scale was reliable with a Cronbach Alpha of .94. Since entrepreneurial intention was used as a filter variable in the selection model, we had to dichotomize the variable for it to be used as a conditional variable in the questionnaire. As such, only respondents indicating some entrepreneurial intention (score on entrepreneurial intention 4 or above) received further questions on growth intentions. The majority of respondents, 189 respondents (or 75%) scored below 4, whereas 63 (or 25%) scored 4 or above. Only the latter received the questions on growth intentions.

Gender. Following Zhao et al. (2005), who found gender to affect entrepreneurial intentions, we controlled for gender, using a dummy variable (1 for men, 0 for women). For our sample of researchers, 37.3% were female and 63.7% were men.

Age. We controlled for age, because of the impact age has on career decisions (Lee et al., 2011). The average age of the respondents was 32.3 years.

Subjective norm. Kolvereid (1996) found that social context influences the propensity to become an entrepreneur. We used Kolvereid’s measure, asking respondents to indicate on a 7-Likert scale the extent to which they agreed with the following statements: “I believe that my closest family think that I should pursue a career as an entrepreneur”, “I believe that my closest friends think that I should pursue a career as an entrepreneur”, “I believe that people who are important to me think that I should pursue a career as an entrepreneur”. Likert scales ranged from 1 (not) to 7 (should). Cronbach Alpha of the measure was .94. The average score for subjective norm was 2.32.

Entrepreneurial self-efficacy. As previous research has identified a positive relationship between entrepreneurial self-efficacy and entrepreneurial intentions (e.g. Zhao et al., 2005), we controlled for

this type of self-efficacy using the measure developed by Zhao et al. (2005). We asked respondents how confident they were in successfully "identifying new business opportunities", "creating new products", "thinking creatively" and "commercializing an idea or new development". Likert scales ranging from 1 (no confidence) to 7 (complete confidence) were used. Cronbach Alpha of the measure was .84, the average score was 3.84.

Cognitive styles. The CoSI, developed by Cools et al. (2009) was used. Cronbach Alpha's were .72 for the knowing style, .79 for the planning style and .77 for the creating style. We refer to Appendix 1 for a description of the instrument. Even though the focus of this research is on understanding the relation between cognitive styles and growth intentions, we deemed it necessary to include cognitive styles in the selection model. Indeed, Busenitz and Barney (1997) and Stewart et al. (1998) suggest that a cognitive perspective may allow differentiating entrepreneurs from non-entrepreneurs. Further, scholars have used cognitive styles to distinguish entrepreneurs from non-entrepreneurs (Allinson et al., 2000; Buttner and Gryskiewicz, 1993). The average score for the knowing style was 4.13, for the planning style 3.65 and for the creating style 3.98.

Working experience. We controlled for working experience as factors relating to the environment and working conditions affect perception on the ability to implement entrepreneurial behaviors (Fini et al., 2011). On average, the respondents had worked for 3.19 years at the university.

The regression model took the following form:

Growth intentions = F (creating cognitive style, planning cognitive style, knowing cognitive style, controls) with controls including age, gender and working experience.

We control for age as growth preferences vary with age (Cassar, 2006) and gender given that venture size and growth differs between male and female entrepreneurs, with women generally being involved in lower growth and smaller scaled ventures (Cassar, 2006). We elaborate on the dependent variable in the regression model below.

Growth intentions. Following Stewart et al. (1998) and Stewart and Roth (2001), we asked the respondents to indicate on a 7-Likert scale (1-disagree to a large extent to 7- agree to a large extent) whether or not they agreed with the following statements: "I would like my company to have a size I can manage myself or with a few key employees", and "I would like my company to become as large as possible". Our measure is identical to the one used in the PSED (Panel Study of Entrepreneurial Dynamics) (Cassar, 2007). Cronbach Alpha of the scale was .73. The average score was 3.35.

4. RESULTS

Table 2 provides the descriptive statistics of the variables used in both the selection and regression models.

<<<Insert Table 2 about here>>>

Table 3 offers the results of both the selection and regression models. The selection model informs on the prevalence of entrepreneurial intention. The regression model informs our main research question and studies the link between cognitive styles and growth intention. Correlations between variables were all below .60, while the variance inflation factors were below 3.0 (maximum value of 1.6) indicating that multicollinearity was not an issue (Hair et al., 2010).

We first ran the analysis including the control variables only (Model 1), followed by the full model (Model 2) and the model including the interaction effect (Model 3). Model 1 did not significantly explain growth intentions. The model improved significantly when we included cognitive styles as potential determinants of growth intentions (Model 2).

We first comment on the results of the selection model. The results on gender, subjective norm and entrepreneurial self-efficacy confirm previous findings, with men (Beta=.52; $p<.05$), subjective norm (Beta=.44, $p<.0001$), and entrepreneurial self-efficacy (Beta=.36, $p<.001$) relating positively to entrepreneurial intentions. We find that a knowing style negatively predicts entrepreneurial intentions

(Beta=-.43, p<.05). A planning style also negatively predicts these intentions but this result is not statistically significant. We find a nonsignificant positive result for the creating style. These findings are consistent with research employing the same cognitive style indicator, where no significant differences were found between entrepreneurs and non-entrepreneurs for the creating style, but with non-entrepreneurs having significantly higher scores on the knowing and planning styles (Cools, 2008).

<<<Insert Table 3 about here>>>

Model 2 informs on our research question: Do cognitive styles affect growth intentions? Although we find positive results on the impact of a creating cognitive style, this result is not significant; therefore **hypothesis 1 is not supported**. The results **support hypothesis 2**, indicating that people with a planning style exhibit higher growth intentions (Beta=.91, p<.001). Finally, we find **support** for **hypothesis 3a** that people with a knowing style will have lower growth intentions (Beta=-.60, p<.05). Model 3 further explored the extent to which interaction effects occur between a knowing style and working experience. We centered both variables by subtracting their respective mean values and used these centered variables to calculate the interaction term. This is standard practice in multiple regression to avoid potential multicollinearity problems (Kutner et al., 2005). Model 3 **supports hypothesis 3b** and indicates a positive interaction effect between a knowing style and working experience. Figure 1 illustrates the interaction effect of the time people worked at the university on the association between a knowing style and growth intentions. It indicates that when researchers have worked for a limited time at university (mean – 1 S.D.) there is a negative association between the extent to which people score high on the knowing style and growth intentions. When researchers have worked for a long time at the university (mean + 1 S.D.) there is a positive association between scoring high on the knowing style and growth intentions.

<<<Insert Figure 1 about here>>>

The analysis further revealed that for people who score the maximum on the knowing style (score of 5), the negative impact of this score on growth intentions only gets mitigated after nine years of working experience at the university.

5. DISCUSSION

This paper extends our knowledge on drivers of growth intentions, by highlighting the importance of cognitive styles for growth intentions. First, considering entrepreneurial intentions, our research indicates that people with mainly a knowing style are less likely to start new ventures. Second, we found that people with a predominantly knowing style also exhibited lower growth intentions in case they were considering starting a new venture. High knowing style people like to make decisions based upon facts, information and details, and may find it difficult to cope with the uncertainty related to entrepreneurial ventures in general and growth-oriented ventures specifically. Interestingly, our research also suggest that, while people gain experience and move through different knowledge corridors, people scoring high on the knowing style may become inclined to start growth oriented ventures. Notably, a higher score on the planning cognitive style dimension resulted in a higher level of growth intentions. This indicates that people who tend to prepare and plan to reach their objectives may be more confident on reaching these objectives, and therefore are more likely to target higher objectives. Further, these people tend to be fast decision makers and are demanding to themselves, which may lead them to target higher ambitions. Finally, the results did not support the expected positive effect of a creating cognitive style on growth intentions. This may be caused by the fact that other factors related to a creating cognitive style may affect growth intentions. For example, while aiming for growth may seem attractive to high creating style people, the motivation to pursue high growth may be mitigated by the continuous search for new opportunities. Even after founding the business, people with this cognitive style may continue to look for new opportunities and prefer to keep their options open. They may also dislike the venture structuring activities required after founding. These arguments are consistent with Buttner and Gryskiewicz (1993) findings that innovative entrepreneurs are less likely to continue their business as time passes, and are more likely

to sell or spin off their business, as they dislike the administrative and bureaucratic responsibilities critical to long-term survival. Studying employees, Cools et al. (2009) found that people who score higher on the creating style are more likely to exhibit job search behavior and intentions to leave. They reasoned that people with a creating style prefer "to leave options open, like to restructure situations, have a proactive personality and can tolerate ambiguity" (pp. 189). Therefore, even though people scoring high on the creating style may foster high risk and high growth ambitions, they may also be attracted by new venture ideas.

5.1.Theoretical implications

First, this study advances our theoretical understanding of the processes that underlie the emergence of differences between high-growth oriented and low-growth oriented entrepreneurs. Even though only a small proportion of firms, namely those achieving high growth, have been found to substantially contribute to the economy, our understanding of the drivers of growth intentions has so far remained relatively limited. This is remarkable given the impact of growth-oriented entrepreneurs on economic welfare and job creation. We show that cognitive styles offer an important theoretical framework to study these differences.

Second, the study provides a comprehensive assessment of the effects of cognitive styles on growth intentions since not all types of cognitive styles lead to growth intentions. By further demonstrating that an individual's experience moderates the relationship between a knowing style and growth intentions, it indicates the importance of integrating different theoretical perspectives when studying the nascent entrepreneurial process. While entrepreneurship research traditionally falls into three schools of thought, namely the neoclassical equilibrium theories, psychological theories, and Austrian theories (Shane, 2000), this study highlights the benefits of uniting different perspectives. Although the importance of psychological traits, including cognitive styles would have been advocated by the psychological theories, our findings illustrate that combining these psychological traits with experience, typically grounded in Austrian theories provides additional insights into the entrepreneurial process.

Third, this study applies a comprehensive framework of cognitive styles as such overcoming disadvantages of the commonly used unidimensional bipolar classifications of cognitive styles. Our research has implications for the cognitive style literature by providing support for the benefit of multidimensional models; these models may provide more fine grained insights than bipolar unidimensional models. Our findings indicating that a planning and knowing cognitive style have conflicting effects on growth intentions emphasize the usefulness of integrating the underlying dimensions of what has been previously united under an analytical or adaptive cognitive style (Allinson and Hayes, 1996; Kirton, 2003).

Fourth, our study sheds new light on the discussion on the benefits and disadvantages of planning (we refer to Dimov (2010) for an overview), by underscoring that a planning cognitive style may not differentiate potential entrepreneurs from people with low entrepreneurial intentions. We do however demonstrate that people who score high on a planning style--and therefore like to plan before they act, and like to work in structured environments--are more likely to favour high-growth ventures, in the case they decide to be an entrepreneur.

5.2. Limitations and directions for further research

Despite the contribution of this paper to the fields of cognition and entrepreneurship, this paper has a number of limitations which may lead to future research avenues. A first limitation lies in the cross-sectional nature of our research design. Even though there is much evidence indicating intentions to be a robust predictor for future behavior (Ajzen, 1991), future research could adopt a longitudinal approach to discover which participants start their own business, and which entrepreneurs achieve the growth they were aiming for, and the extent to which growth intentions are shaped over time. It could indicate whether people with a mainly planning cognitive style also start up ventures with high growth prospects that eventually realize high growth. A study by Cassar (2010) for instance found that people who use plans and financial projections may be overly optimistic in their forecasts. Even though Cassar's research is not on cognitive styles, it provides some implications of the use of planning in the early venture development phase. Further research could indicate to which extent a

planning cognitive style mainly leads to optimism in forecasting or eventually leads to ventures obtaining higher growth.

Second, while cognitive styles remain stable over time, cognitive strategies may affect human behavior. As such, future research could examine the extent to which the interaction between cognitive styles and strategies affect the transition from entrepreneurial intentions to entrepreneurial behavior.

Third, we find interaction effects at the individual level, with working experience moderating the relationship between cognitive styles and growth intentions. Even though we tested for interaction effects between environmental and individual level factors, our choice to collect a dataset in one faculty of one university may have prevented us from finding multi-level effects. Further research studying nascent academics could investigate the extent to which faculty- and university-related factors such as the presence of a technology transfer office, publishing versus commercialization focus of faculties and universities, and incentive systems affect growth intentions of individuals.

5.3.Practical implications

For stakeholders in new ventures, who may be affected by entrepreneurs' growth intentions (Dutta and Thornhill, 2008), including employees, venture capitalists, customers and suppliers, it may be relevant to understand whether the entrepreneur is more likely to build a lifestyle business or to build a high growth business. Venture capitalists, for instance, have incentives to grandstand (Gompers, 1996), i.e. to take actions signaling their ability to potential investors. As such, they are interested in investing in growth companies which can be brought public in an IPO or generate income through trade sales. As a consequence, an assessment of cognitive styles may complement the assessment of the human capital of the entrepreneur during the due diligence process, which is currently limited to assessing the entrepreneur's or entrepreneurial team's track record and management skills (Shepherd and Zacharakis, 1998; Tyebjee and Bruno, 1984), and the functional heterogeneity of the entrepreneur and the entrepreneurial team (Keeley and Roure, 1989). It may further inform parties involved in early venture team composition, including venture capitalists and technology transfer officers (in case of spin-off companies), who could try to match teams' cognitive styles to their (growth) objectives for the venture. Finally, it may inform parties involved in education

such as public policy on education and training of current and potential entrepreneurs. Even though cognitive styles are supposed to be stable and consistent across different areas of cognitive functioning (Sadler-Smith, 1998), people may develop cognitive strategies, which are tactics used to deal with specific situations and tasks (Hayes and Allinson, 1994). These cognitive strategies may change, in contrast with cognitive styles, which are relatively stable features of an individual (Riding and Cheema, 1991). Whereas cognitive styles may not be easily modified through training or experience, cognitive strategies are adaptable (Hayes and Allinson, 1994).

6. ACKNOWLEDGEMENTS

The authors would like to thank Eva Cools and Herman Van den Broeck for their comments on the study and paper and Godfrey Sendege for assistance in data collection. The authors would further like to thank Marilyn Uy, Hendrik Slabbinck, Bart Clarysse and Veroniek Collewaert for comments on an earlier version of this paper.

7. REFERENCES

Ajzen, I., 1991. The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50, 179-211.

Aldrich, H., 1979. Organizations and Environments, Prentice Hall, Englewood Cliffs, NJ.

Allinson, C., Hayes, J., 1996. The cognitive styles index: A measure of intuition-analysis for organizational research. Journal of Management Studies, 33, 119-135.

Allinson, C., Chell, E., Hayes, J., 2000. Intuition and entrepreneurial behavior. European Journal of Work and Organizational Psychology, 9, 31-43.

Armstrong, S., Hird, A., 2009. Cognitive style and entrepreneurial drive of new and mature business owner-managers. Journal of Business and Psychology, 24, 419-430.

Bagozzi, R., Baumgartner , H., Yi , Y. , 1989. An investigation into the role of intentions as mediators of the attitude-behavior relationship. Journal of Economic Psychology, 10, 35-62.

Barbosa, S., Gerhardt, M., Kickul, J., 2007. The role of cognitive style and risk preference on entrepreneurial self-efficacy and entrepreneurial intentions. Journal of Leadership and Organisational Studies, 13, 86-104.

Baron, R., 2004. Opportunity recognition: insights from a cognitive perspective, in: Butler, J. (Ed.), Research in Entrepreneurship and Management: Opportunity Identification and Entrepreneurial Behavior. Information Age Publishing, Greenwich, 4, pp. 47-74.

Barringer, B., Jones, F., Neubaum, D., 2005. A quantitative content analysis of the characteristics of rapid-growth firms and their founders. Journal of Business Venturing, 20, 663-687.

Brush, C., Greene, P., Hart, M., 2001. From initial idea to unique advantage: the entrepreneurial challenge of constructing a resource base. Academy of Management Executive, 15, 64-81.

Buttner, E., Gryskiewicz , N. ,1993. Entrepreneurs' problem-solving styles: an empirical study using the Kirton adaption/innovation theory. Journal of Small Business Management, 31, 22-31.

Campbell, D., 1988. Task complexity: a review and analysis. Academy of Management Reviews, 13, 40-52.

Carland J., Carland J., Ensley M., 2002. Hunting the Heffalump: the theoretical basis and dimensionality of the Carland entrepreneurial index. Academy of Entrepreneurship Journal, 7, 51-84.

Cassar, G., 2006. Entrepreneur opportunity costs and intended venture growth. Journal of Business Venturing, 21, 610-632.

Cassar, G., 2007. Money, money, money? A longitudinal investigation of entrepreneur career reasons, growth preferences and achieved growth. Entrepreneurship & Regional Development, 19, 89-107.

Cassar, G., 2010. Are individuals entering self-employment overly optimistic? An empirical test of plans and projections on nascent entrepreneur expectations. Strategic Management Journal, 31, 822-840.

Choi J., Chen, C. , 2007. The relationships of distributive justice and compensation system fairness to employee attitudes in international joint ventures. Journal of Organizational Behaviour, 28, 687-703.

Cliff, J., 1998. Does one size fit all? Exploring the relationship between attitudes towards growth, gender and business size. Journal of Business Venturing, 13, 523-542.

Cliff, J., Devereaux, J., Greenwood, R. (2006). New to the game and questioning the rules: the experiences and beliefs of founders who start imitative versus innovative firms. Journal of Business Venturing, 21, 633-663.

Cools, E., Van den Broeck, H. , 2007. Development and validation of the Cognitive Style Indicator. The Journal of Psychology, 141, 359-387.

Cools, E., 2008. The Hunt for the Heffalump Continues: Who is the Flemish Entrepreneur?, in: Landström, H., Smallbone, D., Crijns, H., Laveren, E. (eds.), RENT 2006 Anthology, Entrepreneurship, Sustainable Growth and Performance: Frontiers in European Entrepreneurship Research. Edward Elgar Publishing , Cheltenham, UK, pp. 29-53.

Cools , E., Van den Broeck ,H., Bouckenooghe, D., 2009. Cognitive styles and person-environment fit: investigating the consequences of cognitive (mis)fit. European Journal of Work and Organizational Psychology, 18, 167-198.

Corbett, A. , 2007. Learning asymmetries and the discovery of entrepreneurial opportunities. Journal of Business Venturing, 22, 97-118.

Covin, J., Slevin, D.,1997. High growth transitions: theoretical perspectives and suggested directions, in: Sexton, D.L, Smilor, R.W. (eds), Entrepreneurship 2000. Upstart, Chicago, IL, 99-126.

Covin, J., Slevin, D., 1988. The influence of organization structure on the utility of an entrepreneurial top management style. Journal of Management Studies, 25, 217-234.

Davidsson, P., 1989. Entrepreneurship and after? A study of growth willingness in small firms. Journal of Business Venturing, 4, 211-226.

Delmar ,F., Wiklund ,J., 2008. The effect of small business managers' growth motivation on firm growth: a longitudinal study. Entrepreneurship Theory and Practice, 32, 437-457.

Dimov, D.P., Shepherd, D.A., 2005. Human capital theory and venture capital firms: exploring "home runs" and "strike outs". Journal of Business Venturing, 20, 1-21.

Dimov, D., 2007. From opportunity insight to opportunity intention: the importance of person-situation learning match. Entrepreneurship Theory and Practice, 31, 561-583.

Dimov, D., 2010. Nascent entrepreneurs and venture emergence: opportunity confidence, human capital, and early planning. Journal of Management Studies, 47, 1123-1153.

Dutta D., Thornhill S., 2008. The evolution of growth intentions: toward a cognition-based model. Journal of Business Venturing, 23, 307-332.

Edelman, L., Brush, C., Manolova, T., Greene, P. ,2010. Start-up motivations and growth intentions of minority nascent entrepreneurs. Journal of Small Business Management, 48, 174-196.

Facteau, J., Dobbins, G., Russell, J., Ladd, R., Kudisch, J., 1995. The influence of general perceptions of the training environment on pretraining motivation and perceived training transfer. Journal of Management, 21, 1-25.

Fini, R., Grimali, R., Marzocchi, G-L., Sobrero, M., 2011. The determinants of corporate entrepreneurial intention within small and newly established firms. Forthcoming in Entrepreneurship Theory and Practice.

Goldstein, K., Blackman, S., 1978. Cognitive Style: Five Approaches and Relevant Research, Wiley, New York.

Gollwitzer, P., 1996. The Volitional Benefits of Planning, in: Gollwitzer, P., Bargh, J. (eds), The psychology of action: linking cognition and motivation to behavior. Guilford, New York, pp 287-312.

Gompers, P.A., 1996. Grandstanding in the venture capital industry. Journal of Financial Economics, 42, 133-156.

Greene, W. H. , 2000. Econometric Analysis, Prentice-Hall , New Jersey.

Gundry, L., Welsch, H., 2001. The ambitious entrepreneur: high growth strategies of womenowned enterprises. Journal of Business Venturing, 16, 453-470.

Hair, J., Black, W., Babin, B., R. Anderson, 2010. Multivariate Data Analysis. A Global Perspective, Prentice Hall, New York.

Hayes, J., Allinson, C., 1994. Cognitive style and its relevance for management practice. British Journal of Management, 5, 53-71.

Heckman, J., 1976. The common structure of statistical models of truncation, sample selection and limited dependent variables and a simple estimator for such models. Annals of Economic and Social Measurement, 5, 475-492.

Hmieleski, K., Corbett, A., 2006. Proclivity for improvisation as a predictor of entrepreneurial intentions. Journal of Small Business Management, 44, 45-63.

Hoc, J.-M., 1988. Cognitive Psychology of Planning, Academic Press, London.

Hodgkinson, G., Sadler-Smith, E., Sinclair, M., Ashkanasy, N., 2009. More than meets the eye? Intuition and analysis revisited. Personality and Individual Differences, 47, 342-346.

Keeley, R.H., Roure, J.B., 1989. Determinants of new venture success before 1982 and after a preliminary look at two eras. Frontiers of Entrepreneurship Research, 274-287.

Keh, H.T., Foo, M.D., Lim, B.C.,2002. Opportunity evaluation under risky conditions: the cognitive processes of entrepreneurs. Entrepreneurship Theory and Practice, 27, 125-148.

Kickul, J., Gundry, L., Barbosa, S., Withcanack, L.,2009. Intuition versus analysis? Testing differential models of cognitive style on entrepreneurial self-efficacy and the new venture process. Entrepreneurship Theory and Practice, 439-453.

Kirton, M., 2003. Adaption-Innovation in the Context of Diversity and Change, Routledge, London.

Kolvereid, L., 1992. Growth aspirations among Norwegian entrepreneurs. Journal of Business Venturing, 7, 209-222.

Kolvereid, L., 1996. Prediction of employment status choice intentions. Entrepreneurship Theory & Practice, 21, 47-57

Kozhevnikov, M., 2007. Cognitive styles in the context of modern psychology: toward an integrated framework of cognitive style. Psychological Bulletin, 133, 464-481.

Krueger, N., Reilly, M., Carsrud ,A.,2000. Competing models of entrepreneurial intentions. Journal of Business Venturing, 15, 411-432.

Kuratko, D., Hodgetts, R.,1998. Entrepreneurship: A Contemporary Approach, Dryden Press and Harcourt Brace College Publishers, Fort Worth, TX.

Kutner, M.H., Nachtsheim, C.J., Neter, J., & Li, W.,2005. Applied Linear Statistical Models, 5th International ed. McGraw-Hill, Boston.

Lee, L., Wong, P.K., Foo, M.D., Leung, A, 2011. Entrepreneurial intentions: The influence of organizational and individual factors. Journal of Business Venturing, 26, 124-136.

Liao, J., Gartner, W., 2006. The effects of pre-venture plan timing and perceived environmental uncertainty on the persistence of emerging firms. Small Business Economics, 27, 23-40.

Linan, F., Chen, Y., 2009. Development and cross-cultural application of a specific instrument to measure entrepreneurial intentions. Entrepreneurship Theory and Practice, 33, 593-617.

Lüthje, C., Franke, N., 2003. The 'making' of an entrepreneur: testing a model of entrepreneurial intent among engineering students at MIT. R&D management, 33, 135-148.

MacMillan, I., Katz, J., 1992. Idiosyncratic milieus of entrepreneurship research: the need for comprehensive theories. Journal of Business Venturing, 7, 1-8.

Messick, S. ,1976. Personality consistencies in cognition and creativity, in: Messick, S. (ed.), Individuality in Learning, Jossey-Bass, San Francisco, pp. 4-23.

Miner, J., 1997. Participating in profound change. Academy of Management Journal, 40, 1420-1428.

Mishina, Y., Pollock, T., Porac, J., 2004. Are more resources always better for growth? Resource stickiness in market and product expansion. Strategic Management Journal, 25, 1179-1197.

Mitchell, R., Smith, B., Seawright, K, Morse, E., 2000. Cross-cultural cognitions and the venture creation decision. Academy of Management Journal, 43, 974-993.

Mitchell, R., Busenitz, L., Lant, T., McDougall, P., Morse, E., Smith, J., 2002. Toward a theory of entrepreneurial cognition: rethinking the people side of entrepreneurship research. Entrepreneurship Theory and Practice, 27, 93-104.

Mustar, P., Wright, M., Clarysse, B., 2008. University spin-off firms: lessons from ten years of experience in Europe. Science and Public Policy, 35, 67-80.

Nelson, R., Winter, S., 1982. An Evolutionary Theory of Economic Change, Harvard University Press, Cambridge, MA.

Nutt, P.C., 1990. Strategic decisions made by top executives and middle managers with data and process dominant styles. Journal of Management Studies, 27, 173-194.

Orsen, B., Hogarth-Scott, S., Riding, A. ,2000. Performance, firm size, and management problem solving. Journal of Small Business Management, 38, 42-58.

Petrakis, P. ,1997. Entrepreneurship and growth: creative and equilibrating events. Small Business Economics, 9, 383-402.

Podsakoff, P., Organ, D., 1986. Self-reports in organizational Research: Problems and Prospects. Journal of Management, 12, 531-545.

Podsakoff, P.M., MacKenzie, S. B., Lee, J. Y. , Podsakoff, N. P., 2003. Common method biases in behavioral research: a critical review of the literature and recommended remedies. Journal of Applied Psychology, 88, 879-903.

Richardson H., Simmering, M., Sturman, M., 2009. A tale of three perspectives. Examining Post Hoc Statistical Techniques for Detection and Correction of Common Method Variance. Organizational Research Methods, 12, 762-800.

Riding, R., Cheema, I., 1991. Cognitive styles: an overview and integration. Educational Psychology, 11, 193-215.

Sadler-Smith, E., Badger, B., 1998. Cognitive style, learning and innovation. Technology Analysis and Strategic Management, 10, 247-265.

Sadler-Smith, E., 1998. Cognitive style: some human resource implications for managers. International Journal of Human Resource Management, 9, 185-202.

Sadler-Smith, E., 2004. Cognitive style and the management of small and medium-sized enterprises. Organization Studies, 25, 155-181.

Sadler-Smith, E., 2009. A Duplex Model of Cognitive Style, in: Zhang, L.F. , Sternberg, R.J. (eds.), Perspectives on the Nature of Individual Preferences, Springer, New York, pp. 3-28.

Shane, S., 2000. Prior knowledge and the discovery of entrepreneurial opportunities. Organization Science, 11, 448-469.

Shank, R., Abelson, R., 1977. Scripts, Plans, Goals and Understanding, Erlbaum, Hillsdale, NJ.

Shelton, L., 2010. Fighting an uphill battle: expansion barriers, intra-industry social stratification, and minority firm growth. Entrepreneurship Theory and Practice, 34, 379-398.

Shepherd, D.A., Zacharakis, A., 1998. Conjoint analysis: a new methodological approach for researching the decision policies of venture capitalists. Venture Capital, 1, 197 – 217.

Simon, M., Houghton, S., Aquino, K., 2000. Cognitive biases, risk perception, and venture formation-implications of interfirm (mis)perceptions for strategic decisions. Journal of Business Venturing, 15, 113-134.

Sitkin, S.B., Pablo, A.L., 1992. Reconceptualizing the determinants of risk behavior. Academy of Management Review, 17 , 9-38.

Souitaris, V., Zerbinati, S., Al-Laham, A., 2007. Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources. Journal of Business Venturing, 22, 566-592.

Sternberg, R., 1997. Successful Intelligence, Plume, New York.

Sternberg, R., 2004. Successful intelligence as a basis for entrepreneurship. Journal of Business Venturing, 19, 189-201.

Stewart, W., Roth, P., 2001. Risk propensity between entrepreneurs and managers: a meta-analytic review. Journal of Applied Psychology, 86, 145-153.

Stewart, W., Watson, J., Carland, J., Carland, J., 1998. A proclivity for entrepreneurship: a comparison of entrepreneurs, small business owners, and corporate managers. Journal of Business Venturing, 14, 189-214.

Storey, D., 1994. Understanding the Small Business Sector, Routledge, London.

Taylor, W.G.K., 1989. The Kirton Adaption-Innovation Inventory: should the subscales be orthogonal?, Personality and Individual Differences, 9, 921-929.

Thompson, E., 2009. Individual entrepreneurial intent: construct clarification and development of an internationally reliable metric. Entrepreneurship Theory and Practice, 33, 669-694.

Tominc, P., Rebernik, M., 2007. Growth aspirations and cultural support for entrepreneurship: a comparison of post-socialist countries. Small Business Economics, 28, 239-255.

Tourangeau, R., Rips, L.J., Rasinski, K., 2000. The Psychology of Survey Response, Cambridge University Press, Cambridge, UK.

Tyebjee, T.T., Bruno, A.V., 1984. A model of VC investment activity. Management Science, 30: 1051-1066.

Wiklund, J., Shepherd, D., 2003. Aspiring for, and achieving growth: the moderating role of resources and opportunities. Journal of Management Studies, 40, 1919-1941.

Williams, L., Cote, J., Buckley, M., 1989. Lack of method variance in self-reported affect and perceptions at work: reality or artifact? Journal of Applied Psychology, 74, 462-468.

Witkin, H.A., Moore, C.A., Goodenough, D.R., Cox, P.W., 1977. Fielddependent and field-independent cognitive styles and their educational implications. Review of Educational Research, 47, 1-64.

Wofford J., Goodwin, V., 1990. Effects of feedback on cognitive processing and choice of decision style. Journal of Applied Psychology, 75, 603-612.

Wright, M., Clarysse, B., Mustar, P., Lockett, A., 2007. Academic Entrepreneurship in Europe, Edward Elgar, Cheltenham.

Zhao, H., Hills, G.E., Seibert, S.E., 2005. The mediating role of self-efficacy in the development of entrepreneurial intentions. Journal of Applied Psychology, 90, 1265-1272.

Table 1: Results of ULMC procedure

Model	Chi-Square	df	GFI	RMSEA	NFI
1	**4200***	**300**			
2	**2792***	**275**	**.49**	**.21**	**.52**
3	**562***	**265**	**.83**	**.072**	**.83**
4	**378***	**240**	**.88**	**.051**	**.90**

*P<.001; GFI=goodness of fit index, NFI= normed-fit index, RMSEA = Root Mean Square Error of Approximation

Table 2: Descriptive statistics

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1.Knowing style	1	.30*	.42*	-.11	.10	.17	.09	-.09
2.Planning style		1	.14*	.02	-.08	.14*	-.08	.34*
3.Creating style			1	.15*	.03	.40*	-.03	.13
4.Subjective norm				1	-.06	.45*	-.08	.12
5.Age					1	-.01	.50*	.17
6.Entrepreneurial self-efficacy						1	-.06	.31
7. Working experience							1	.03
8. Growth intentions								1
Mean	4.13	3.65	3.98	2.32	32.29	3.84	3.19	3.35
Standard Deviation	.57	.67	.57	1.44	5.79	1.30	2.79	1.63

Pearson correlations, * correlations are significant at $p<0.05$, n=251 (except for correlations with growth intentions, where n=63)

Table 3: Results of the Heckman two-step selection model for growth intentions

Regression model (step 2)

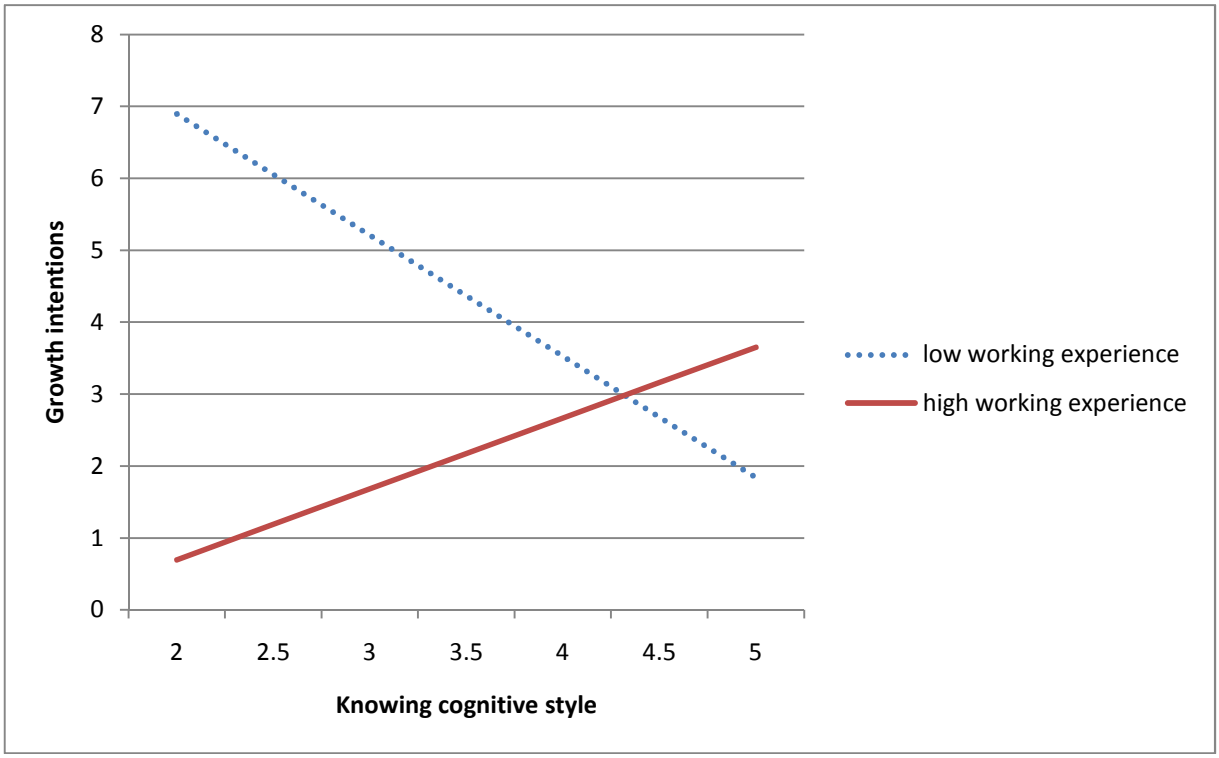
	Model 1		**Model 2**		**Model 3**	
Growth intentions (dependent)	Standardized Beta	Standard Error	Standardized Beta	Standard Error	Standardized Beta	Standard Error
Independents						
Creating style			.58	.45	.51	.43
Planning style			.91***	.31	.89***	.29
Knowing style			-.60**	.31	-.35	.32
Controls						
Age	.05	.05	.03	.04	.06	.04
Gender	.67	.56	.73	.53	.89*	.51
Working experience	.01	.09	.04	.08	-.09	.09
Interaction term						
Knowing style x working experience					.47***	.18
Constant	1.59	1.56	-1.40	2.11	-2.53	2.07
Number of observations	251		251		251	
Number of censored observations	188		188		188	
Number of uncensored observations	63		63		63	
Inverse Mill's ratio	-.53	.40	-.42	.37	-.59*	.36
Wald Chisquare for full model fit	3.11		16.10**		24.25***	

Selection model (step 1)- dependent variable: Entrepreneurial Intention

Entrepreneurial intention (dummy)	Standardized Beta	Standard Error
Gender	.51**	.24
Subjective norm	.44****	.08
Age	-.01	.02
Entrepreneurial self-efficacy	.37***	.11
Creating style	.20	.23
Planning style	.05	.16
Knowing style	-.44**	.21
Working experience	.05	.04
Constant	-2.70**	1.16

Significance levels: *p<.10, **p<.05, ***p<.001;****, p<.0001

Figure 1: Interaction effect of working experience on the relation between a knowing cognitive style and growth intentions



Plots starting at score= 2 for a knowing cognitive style (equals minimum value for this style)

Appendix 1: Description of the CoSI[**] (cognitive style indicator)- Cools and Van den Broeck (2007)

Knowing style
K1. I want to have a full understanding of all problems
K2. I like to analyze problems
K3. I make detailed analyses
K4. I study each problem until I understand the underlying logic

Planning style
P1. Developing a clear plan is very important to me
P2. I always want to know what should be done when
P3. I like detailed action plans
P4. I prefer clear structures to do my job
P5. I prefer well-prepared meetings with a clear agenda and strict time management
P6. I make definite engagements, and I follow up meticulously
P7. A good task is a well-prepared task

Creating style
C1. I like to contribute to innovative solutions
C2. I prefer to look for creative solutions
C3. I am motivated by ongoing innovation
C4. I like much variety in my life
C5. New ideas attract me more than existing solutions
C6. I like to extend boundaries
C7. I try to avoid routine

[**] Each item receiving a score between 1 (disagree entirely) and 5 (agree entirely)