

# Intuition Versus Analysis? Testing Differential Models of Cognitive Style on Entrepreneurial Self-Efficacy and the New Venture Creation Process

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This research revealed the significant role of two distinct cognitive styles as a determinant of perceived entrepreneurial self-efficacy regarding the different stages of the new venture process. The study found that individuals' cognitive preference for analysis or intuition influences their perception and assessment of their entrepreneurial self-efficacy in their intentions to create a new venture. Individuals with the intuitive cognitive style were more confident in their ability to identify and recognize opportunities, without much confidence in their capacity of assessment, evaluation, planning, and marshalling of resources. Conversely, individuals with the analytic cognitive style were more confident in their abilities to assess, evaluate, plan, and marshal resources, but felt less confident in their abilities to search for and recognize new opportunities.

## Introduction

Within the last three decades, research has indicated that intentions are a reliable—and for many the most effective—predictor of actual behavior (Ajzen, 1991; Ajzen & Fishbein, 1980; Krueger & Carsrud, 1993; Shaver & Scott, 1991). Intentions are heavily influenced by individuals' perceptions of their own abilities regarding skill sets (i.e., self-efficacy, Bird, 1988; Krueger, Reilly, & Carsrud, 2000). Over the years,

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entrepreneurship scholars have focused on the decision to pursue an entrepreneurial career, demonstrating the connection between entrepreneurial self-efficacy and career intention. However, little has been done to examine the role of cognitive style in the development of entrepreneurial self-efficacy within the context of the new venture creation process.

Cognitive style is widely recognized as an important determinant of individual behavior in the psychology literature (Sadler-Smith & Badger, 1998) and has been conceptualized as “a high-order heuristic that individuals employ when they approach, frame, and solve problems” (Brigham, De Castro, & Shepherd, 2007, p. 31). As individuals approach the possibility of becoming entrepreneurs and think about the different skills required to create a new venture, their cognitive styles may indeed foster some self-perceptions and inhibit others, enhancing different types of self-efficacy.

New venture creation is typically conceptualized in terms of broad stages (e.g., Timmons, 2005) such as searching for opportunities, planning for the new venture, marshalling resources, and implementation. These stages can be nonlinear and iterative, being perceived by aspiring entrepreneurs through the lens of different cognitive styles. Little is known about the ways in which cognitive styles facilitate or inhibit an individual’s ability or entrepreneurial self-efficacy when confronting the challenges associated with the different stages of the venture creation process.

Thus, our goal in the present study is to assess the role of cognitive style in the relationship between entrepreneurial self-efficacy and intentions to be an entrepreneur, taking into account the diverse set of activities that must be carried out during the new venture creation process. This study adds to the literature on entrepreneurial intentions in two fundamental ways:

1. Each stage of the new venture process has unique demands that call on specific cognitive skills or abilities; this research further investigates the ways in which the cognitive styles of individuals influence their perceived entrepreneurial self-efficacy regarding particular stages in the new venture creation process.
2. Based on our findings, recommendations are offered for further research and to inform practice with regard to the effective creation of new business ventures.

## **Cognitive Style and Entrepreneurial Cognition**

Cognitive style refers to an individual’s preferred and habitual approach to organizing, representing, and processing information (Streufert & Nogami, 1989). According to Brigham et al. (2007, p. 31), research has shown that: (1) Cognitive style is a pervasive dimension that can be assessed using psychometric techniques; (2) it is stable over time; (3) it is bipolar; and (4) it describes different rather than better thinking processes.

Entrepreneurial cognitions are defined as “... the knowledge structures that people use to make assessments, judgments, or decisions involving opportunity evaluation, venture creation, and growth” (Mitchell et al., 2002, p. 97). These cognitions are formed through an individual’s perception and interpretation of information, which, in the context of entrepreneurship, refer to any information (about the marketplace, the technology, social, political, regulatory, and economic changes, etc.) that ultimately enable the discovery and exploitation of new business opportunities (Shane & Vankataraman, 2000). Researchers have postulated that cognition has the potential to make a significant contribution to the study of entrepreneurship (e.g., Allinson & Hayes, 1996; Allinson, Chell, & Hayes, 2000; Baron, 1998; Busenitz & Barney, 1997; Mitchell et al.).

An individual's cognitive style may influence the preference for different types of learning, knowledge gathering, information processing, and decision making, many of the critical behaviors with which an entrepreneur is confronted on a daily basis. In addition, it can lead individuals to direct their attention to specific areas of knowledge and certain tasks, and reduce the extent to which they focus on other, similarly important, knowledge and tasks.

Cognitive style is generally thought of as a phenomenon with multiple dimensions, including decision making, learning, personality, and awareness (Leonard, Beauvais, & Scholl, 2005). One dimension, *awareness*—of people, ideas, objects, and incidents—is considered to be especially important (Allinson & Hayes, 1996; Leonard, Scholl, & Kowalski, 1999). This dimension can be conceptualized as a continuum ranging from intuitive to analytic, and has been frequently used to represent the whole construct of cognitive style (see, e.g., Brigham et al., 2007, who also used the label “decision-making style”).

Early on, Ornstein (1977) referred to two modes of awareness that reflect the analytic and intuitive sides of an individual. Intuitive individuals are likely to discover opportunities by observing cues or signals through unfamiliar and unorganized information that is processed in a synthetic and holistic manner (Olson, 1985). This can help individuals identify an opportunity and motivate them to take action, as evidenced by the work of Miner (1997) who found intuition to be an important thinking mode of expert idea generators. Therefore, the *intuitive* cognitive style may be useful in the searching stage (i.e., opportunity identification) of the new venture creation process.

Olson (1985) also described the analytic process, when individuals rely on linear, sequential processing of information that enables them to evaluate and plan for the new venture. Individuals with the *analytic* cognitive style may display competency in judging and evaluating information, and selecting actions to implement—skills that are needed in later stages of the new venture creation process (Olson).

Empirical studies have demonstrated that cognitive style influences individual choice, is closely connected to workplace behaviors, and can facilitate the understanding of strategic decisions in organizations (Hough & ogilvie, 2005; Sadler-Smith, 1998). Moreover, cognitive style has proved to be a useful indicator to assess person-organization fit of owner-managers in small high-technology firms, helping to predict satisfaction, intentions to exit, and actual turnover of the entrepreneurs that owned and managed such firms (Brigham et al., 2007).

## **Perceptions of Entrepreneurial Self-Efficacy and Entrepreneurial Intentions**

Entrepreneurial self-efficacy may play an important role in uncovering the essential skill set needed throughout the various stages of the new venture development process. In many cases, perceptions of self-efficacy are even more important than actual skills as a determinant of behavior (Krueger & Dickson, 1994). The construct of self-efficacy has been widely applied in psychology as an individual difference variable. Self-efficacy relates to one's choice of activities, one's effort and persistence to perform these activities, and one's thought processes and emotional reactions when confronted with obstacles (Bandura, 1997; Lent, Brown, & Hackett, 1994). Self-efficacy is defined by Bandura as people's judgments of their capabilities to organize and execute courses of actions required to attain designated types of performance. Self-efficacy is concerned not with the skills one has, but with one's judgments of what one can do with whatever skills one possesses.

An extensive amount of research has been conducted to explicitly investigate the relationship of entrepreneurial self-efficacy and entrepreneurial intentions. The dominant model of intentions was and remains Ajzen's Theory of Planned Behavior (Ajzen, 1991; Krueger & Carsrud, 1993; Krueger et al., 2000). There is sufficient robust research to assert the relationship between self-efficacy and intentionality: Individuals with higher entrepreneurial self-efficacy tend to have higher entrepreneurial intentions (Chen, Greene, & Crick, 1998; De Noble, Jung, & Ehrlich, 1999; Jung, Ehrlick, De Noble, & Baik, 2001; Krueger et al.; Scott & Twomey, 1988). Researchers have suggested that educators and policy makers may boost students' entrepreneurial intentions by (1) enhancing students' confidence to succeed in an entrepreneurial career and (2) enhancing students' perceptions and expectations of strong positive outcomes resulting from an entrepreneurial career (Segal, Borgia, & Schoenfeld, 2002). Of course, enhancing students' confidence and perceptions does not assure that they will succeed—it only increases the likelihood that they will consider and try an entrepreneurial career. In essence, those with higher self-efficacy are more likely to believe they also have an actionable idea, even though they may not. Research has also shown that an increase in perceived self-efficacy leads to an increase in risk taking, by affecting perceptions of opportunities and threats (Krueger & Dickson, 1994).

In addition, perceived self-efficacy determines the slate of alternatives and options for consideration along a spectrum of opportunities and decisions. For instance, Markman, Balkin, and Baron (2002) found evidence that, in high-technology industries, inventors with higher self-efficacy choose to exploit their inventions by launching new businesses, whereas inventors with lower self-efficacy prefer to work for established companies.

## **The Influence of Cognitive Style on Different Types of Self-Efficacy Required Along the Entrepreneurial Process**

Entrepreneurial self-efficacy is typically discussed in terms of the entire new venture creation process. Since it is acknowledged that the stages in this process require different skills and abilities, it makes sense to consider whether individuals with intuitive or analytic styles would be effective in performing the required tasks within all the stages or just within some of them. There is reason to expect that no one cognitive style embraces all the entrepreneurial self-efficacy needed for new venture creation. Individuals are likely to judge themselves good in some areas, and may look to team members, e.g., to compensate for their perceived weaknesses (in doing so, they may strengthen their beliefs in the collective efficacy of their teams, consequently strengthening their entrepreneurial intentions as well, as suggested by Shepherd & Krueger, 2002).

As individuals process information, they develop a sense of how capable they are to engage in a course of action in the stages of new venture creation. For instance, when individuals use the intuitive cognitive style, their self-efficacy perceptions are influenced as they sift through the "ambiguous, unordered bits and pieces of information" (Olson, 1985, p. 28) they gather and form into an interesting and novel entrepreneurial idea. Such thinking influences their perceived competences regarding their abilities of invention and idea generation (Miner, 1997; Olson).

Similarly, the analytic cognitive style induces individuals to analyze with precision and rigor. Refining, improving, and adapting the entrepreneurial idea into a business opportunity (i.e., marshalling the resources, planning for new venture launch, etc.) positively influences individuals' self-perceptions of their abilities to execute those tasks.

Utilizing the framework of cognitive style described above, we propose that there will be discernible differences between the intuitive and analytic cognitive style groups as they navigate the new venture creation process. Bygrave and Hofer (1991) define the

entrepreneurial process as involving all the functions, activities, and actions associated with the perceiving of opportunities and the creation of organizations to pursue them. To extend the research on self-efficacy's influence on entrepreneurship intentions, we utilized the Cox, Mueller, and Moss (2002) scale to assess individuals' abilities to perform many of the instrumental functions within each stage of the new venture creation process. This framework consists of 10 distinct tasks within four stages: (1) the searching stage, (2) the planning stage, (3) the marshalling stage, and (4) the implementing stage (see Appendix A for the list of items comprising each stage).

The influence of the intuitive cognitive style on the self-efficacy–entrepreneurial intention relationship grows out of the processing of information in a synthetic, holistic manner that was discussed earlier. The results of this creative process generate intuitions, gut feelings, and hunches that mobilize individuals to pursue the ideas discovered. Bird (1988) argued that intuitive, holistic, and contextual thinking frames entrepreneurs' intentions and actions by inspiring vision, an expanded view of untapped resources, and a feeling of the potential of the enterprise. Olson (1985) introduced the notion that different approaches to information processing are more effective at different stages of the entrepreneurial life cycle: For example, when an entrepreneur is immersed in opportunity identification (e.g., attempting to develop a new product, service, or technology application), the entrepreneur's thinking tends to be predominantly intuitive. Creative thinking skills that rely on intuition are very useful at this stage, since searching for opportunities includes the adaptation of ideas across disciplines, solving unstructured problems, and finding unexpected solutions. Therefore, hypothesis 1 is proposed:

**Hypothesis 1:** There will be a stronger positive relationship between perceived entrepreneurial self-efficacy regarding the searching stage of the new venture process (i.e., conception and identification of new venture opportunities) and entrepreneurial intentions, for individuals with the *intuitive* cognitive style than for those with the *analytic* cognitive style.

As the entrepreneur shifts to evaluation of market opportunities, and the planning and implementation of the new venture, the entrepreneur's information processing is predominantly analytic (Olson, 1985). Linear, analytic thinking is a strength within these stages of the venture creation process, since the ability to refine and evaluate, coordinate and organize, and execute plans are skills necessary to the effective launch of a new venture. For instance, Shane and Delmar (2004) demonstrated that "completing business plans before undertaking marketing activities reduces the hazard of termination of new ventures" (p. 782). These authors argue that the benefits of planning before action exceed the opportunity cost on the entrepreneur's time. As proposed by Bird (1988, p. 443), "a person's rational, analytic, and cause-and-effect-oriented processes structure intention and action. These psychological processes underlie formal business plans, opportunity analysis, resource acquisition, goal setting, and most observable goal-directed behavior." The analytic cognitive style is likely to influence the self-efficacy–intention connection in that individuals who are focused on analyzing and planning for the launch of the venture find that the results of their linear approach (e.g., finding unexpected flaws in the original idea and remedying them) strengthen their perceived viability of the business opportunity (Olson). Thus, we propose:

**Hypothesis 2:** There will be a stronger positive relationship between perceived entrepreneurial self-efficacy regarding the planning stage of the new venture process (i.e., preparing a business plan) and entrepreneurial intentions for individuals with the *analytical* cognitive style than for those with the *intuitive* style.

Similar to the planning stage, the marshalling of resources stage also requires a good deal of analysis. In particular, the activities of raising money to start a business, convincing banks and investors to invest in the business, and convincing others to work for the new venture, all require the realization of other analytical activities such as the elaboration of business plans, financial forecasts, cash-flows, definition of capital needs, definition of a more formal organizational structure with specific roles for employees, etc. For instance, MacMillan and Narasimha (1987) compared characteristics of funded and unfunded business plans evaluated by venture capitalists. The authors concluded that—at least in their sample—funded plans generally present more conservative financial forecasts and more balanced plan structures than unfunded plans. They suggest that, in order to get funded, entrepreneurs should include in their business plans formal comparisons between their financial projections and typical numbers for the industry being entered, a detailed description for large entries in their income statement, and a balanced structure that does not over- or under-report any of the initial functions of marketing, finance, production, and management. Without going further into the details of the seeking financing process, we hope that this brief description suffices to say that the marshalling of resources requires a good deal of analytical planning. Analytic individuals will probably feel more confident than intuitive individuals in their ability to carry out such activities.

**Hypothesis 3:** There will be a stronger positive relationship between perceived entrepreneurial self-efficacy regarding the marshalling of resources stage of the new venture process (i.e., seeking financing, attracting investors, persuading others to collaborate) and entrepreneurial intentions, for individuals with the *analytical* cognitive style than for those with the *intuitive* style.

Finally, we suggest that analytic individuals will also feel more confident than intuitive individuals in their ability to carry out the managerial activities included in the implementation stage of a new venture. This may happen because although intuitive thinking facilitates the recognition of opportunities, the proliferation of ideas, and a vision that may inspire the entrepreneur's efforts (Allinson et al., 2000; Bird, 1988; Olson, 1985), the implementation of ideas and the exploitation of opportunities require sequential processing and a focus on “the needed resources, where they can be obtained, and how they should be organized and controlled” (Olson, p. 29). Analytical-sequential thinking is important, because the order in which firm-organizing activities are undertaken affects the evolution of new ventures (Shane & Delmar, 2004). Analytic individuals may feel more confident in their capacity to anticipate and plan the implementation of such activities—which will be reflected in higher levels of perceived self-efficacy concerning the implementation stage of the venture creation process.

Another reason why analytic individuals may exhibit higher self-efficacy beliefs than intuitive respondents concerning the implementation stage is that they tend to experience higher satisfaction than intuitive respondents when working in more structured environments (Brigham et al., 2007). Although the initial stages of an organization's development are usually characterized by a very low structured work environment, as the venture grows a more formal structure tends to appear as a result of the acquisition of resources, the definition of boundaries that separate the new organization from its environment, and the formalization of exchanges across the organizational boundary and across the borders of subsystems within the organization (Katz & Gartner, 1988). Consequently, if both analytic and intuitive individuals imagine that managing and growing a new business require more structured work environments, analytic individuals may simply feel more comfortable doing it than intuitive individuals, and will exhibit higher self-efficacy beliefs on these activities.

**Hypothesis 4:** There will be a stronger positive relationship between perceived entrepreneurial self-efficacy regarding the implementation stage of the new venture process (i.e., launching, managing, and growing the new venture) and entrepreneurial intentions for individuals with the *analytical* cognitive style than for those with the *intuitive* style.

## Method

### Overview

Participants were 138 students enrolled in a part-time MBA program at a large, midwestern university. Of the 138 participants, 53% were male and 47% were female, with an average age of 26.20. Their average business experience was 6.42 years with 9% having experience of starting a business. For purposes of subsequent analyses, we omitted those responses from students who had previous experience of starting a business, since the study's focus is on the individuals who are currently at the stage of assessing their own cognitive style and perceiving their self-efficacy in achieving many of the critical skills and abilities associated with entrepreneurial intentions. This approach avoids retrospective data collection techniques (entrepreneurial sample) in which it may be difficult for the entrepreneurs to identify their cognitive style and self-efficacy *post hoc* the creation of a new venture.

All students were involved in entrepreneurship courses at the university, coming from sections that focused on new venture initiation and management (Entrepreneurship and New Venture Management course) as well as sections that focused on the growth and management of the venture (Growth Strategies for the Emerging Enterprise course). Since students were enrolled in entrepreneurship courses, and based on the assumption that they had a desire to learn about new venture creation/management, we thought they would be appropriate to include within our subsequent analyses and testing of our hypotheses.

### Cognitive Style Index

Cognitive style was assessed on the basis of the analytic–intuitive dimensions. Participants completed the Cognitive Style Index (CSI; Allinson & Hayes, 1996), a 38-item measure that has a true/false response mode (true coded as “1” and false coded as “0”). While previous research has supported the unifactorial structure of the CSI (e.g., Brigham et al., 2007; Sadler-Smith, Spicer, & Tsang, 2000), a study that reassessed the CSI by Hodgkinson and Sadler-Smith (2003) found that a two-factor model with correlated factors demonstrated an improved approximation of answers on the CSI. Hodgkinson and Sadler-Smith recommended a new and revised scoring procedure in which both the intuitive and analytic scales be treated as separate scales. In light of this recent research, we performed our own principal factors extraction with oblique rotation on the items in the scale. Two factors were extracted, the first being the intuitive factor and the second, the analytic factor. Cronbach’s alpha for the intuitive and analytic scales were .89 and .79, respectively. Mean composite scores on these two scales were then calculated.

To determine their overall cognitive style and which style was preferred, we grouped respondents into one of the two styles based on their highest mean composite score on the two scales. That is, if an individual’s mean composite score was higher on the intuitive scale than on the analytic scale, the individual was labeled (coded) as having a preferred/dominant intuitive style. If the mean composite score was higher on the analytic scale, the

**Table 1****Goodness of Fit Statistics for Entrepreneurial Self-Efficacy**

Model	$\chi^2$	df	<i>p</i>	GFI	NNFI	CFI	RMR
Model 1: 4 factors (1st order)	115.18	29	>.001	.88	.92	.95	.046
Model 2: 1 factor	806.97	35	>.001	.51	.43	.56	.150
Model 3: 1st-order factors + 2nd-order factor	174.45	24	>.001	.80	.64	.81	.100

*Note:* Internal reliability for searching stage was .77, planning stage was .79, marshalling stage was .88, and implementing stage was .75.

df, degree of freedom; GFI, goodness of fit; NNFI, non-normed fit index (Tucker-Lewis); CFI, comparative fit index; RMR, root mean square residual.

respondent's style would be coded as preferred/dominant analytic. While a practical problem could have emerged if an individual presented the same mean composite score on both scales, which could characterize an absence of a preferred/dominant cognitive style, we found that no individual in our sample exhibited such similar scores. Overall, our line of reasoning of coding and analyzing in terms of a preferred/dominant cognitive style is consistent with a broad literature on cognitive style (i.e., individuals tend to have a preferred and habitual approach to organizing, representing, and processing information, e.g., Allinson & Hayes, 1996; Brigham et al., 2007; Streufert & Nogami, 1989).

### **Entrepreneurial Self-Efficacy**

The Cox et al. (2002) scale was used to measure the participants' perceptions of their ability to perform many of the instrumental functions within each stage of the entrepreneurial life cycle (see Appendix A). For each statement, they rated their level of confidence on a 7-point Likert scale (1 = "not confident"; 7 = "completely confident").

Lisrel VIII (Joreskog & Sorbom, 1993) was utilized to analyze the 10 self-efficacy items (see Table 1). The chi-square difference test shows that the four-factor model (Model 1) is a significantly better fit than the single-factor model (Model 2);  $\chi^2_{\text{diff}} = 691.79$ ,  $p < .001$ . The third model examined was a higher order with four-order factors. It can be seen that compared with a first-order four-factor model (Model 1), the higher-order model (Model 3) is a poorer fit (CFI [comparative fit index] = .81 and non-normed fit index [Tucker-Lewis] [NNFI] = .64). Thus, based on these three model analyses, we chose to utilize Model 1 and the four factors in subsequent analyses of the role of cognitive style on entrepreneurial self-efficacy and entrepreneurial intention.

### **Entrepreneurial Intentions**

Two items from Crant (1996) were used to measure entrepreneurial intentions: "I will probably own my own business one day," and "It is likely that I will personally own a small business in the relatively near future." Moreover, two additional items specifically designed for this study were also used: "Being 'my own boss' is an important goal of mine," and "I often think of having my own business." Responses to these items were

indicated on a 7-point Likert scale (1 = “strongly disagree”; 7 = “strongly agree”). Cronbach’s alpha was .78.

## Results

### Structural Equation Model Results for the Intuitive and Analytic Groups

Following an approach recommended by Joreskog and Sorbom (1993) and Jaccard and Wan (1996), a two-step structural model comparison analysis was conducted to test each of our four hypotheses. As mentioned earlier, individuals were grouped based on their preferred/dominant cognitive style. In the first step of our analysis, a “multiple group” solution is calculated in which Lisrel derives estimates for both the intuitive and analytical groups separately. A measure of goodness of fit for these two groups together is also estimated (i.e., pooling of the fit measures from both groups to test how our data for both the analytic and intuitive groups compares with an overall model of entrepreneurial intentions).

This overall model had a  $\chi^2$  of .23 with 1 degree of freedom (goodness of fit [GFI] = .97; CFI = .98; NFI = .98). In the second step, we reestimated the model by imposing equality constraints on the solution. Equality constraints essentially determine if such constraints would adversely affect the overall fit of the model. If the path coefficients are equal, then these constraints should not adversely influence the fit of the first model. Specifically, we imposed constraints on the paths between perceived entrepreneurial self-efficacy on all stages of the new venture creation process and entrepreneurial intentions. The results of this constrained model were then compared with the unconstrained model that was conducted in step one. This model had a  $\chi^2$  of 51.59 with 5 degrees of freedom (GFI = .84; CFI = .83; NFI = .83). The chi-square difference between the structural model without equality constraints and the structural model with equality constraints was significant ( $\chi^2 = 51.26$ , df = 4,  $p < .001$ ). Thus, from the overall analyses, the relationships examined differ across the intuitive and analytic groups.

### Significance of Individual Paths

The model comparisons discussed above were conducted to test the aggregate, and not the individual relationships as proposed in our hypotheses. While our model analyses revealed that there are discernible differences between the two groups regarding the relationships between their perceived self-efficacy along the stages of the new venture creation process and their entrepreneurial intentions, we needed to investigate which relationships were stronger regarding each particular stage of the creation process.

Based on both our “multiple model” group analyses and the individual relationships within the venture creation process for both of our groups, we found support for each of our four hypotheses. More specifically, we found support for hypothesis 1 in that the positive relationship between perceived entrepreneurial self-efficacy regarding the identification of opportunities and intentions was stronger for the intuitive style group than that for the analytic style group (Lisrel estimates = +.52,  $p < .05$  for intuitive individuals; -.33,  $p < .05$  for analytic individuals).

For hypothesis 2, results revealed that the positive relationship between entrepreneurial self-efficacy regarding the planning of activities and intentions was stronger for the analytic style group than that for the intuitive style group (Lisrel estimates = +.20,  $p < .05$  for analytic respondents; -.43,  $p < .05$  for intuitive respondents). For hypothesis 3, we found that the positive relationship between entrepreneurial self-efficacy regarding the

marshalling of resources and intentions was stronger for the analytic style group than that for the intuitive style group (Lisrel estimates = +.35,  $p < .05$  for the analytic group; -.17, not significant for intuitive group). Finally, for hypothesis 4, our results revealed that the positive relationship between entrepreneurial self-efficacy regarding the implementation of activities and resources and intentions was stronger for the analytic style group than that for the intuitive style group (Lisrel estimates = +.30,  $p < .05$  for the analytic group; +.14, not significant for the intuitive group).

## Discussion

The present research reveals the influence of cognitive style on perceived entrepreneurial self-efficacy, and demonstrates that styles can predict how individuals will differ in their perceived self-efficacy regarding different stages of the new venture creation process. This research presents the first attempt to test models of cognitive style, entrepreneurial self-efficacy, and intention to launch within the framework of the venture creation process. Our findings reveal that individuals with different cognitive styles do not see themselves as possessing equal self-efficacy in all the tasks required for new venture creation, and thus may have not only different motivations to undertake a new venture, but may also be more effective in different phases/activities of the venture process.

Our results demonstrate that students' cognitive style matters greatly in directing their attention to specific stages of the new venture creation process that fit most closely with their preferred style, and away from other stages that rely on the thinking style that is less preferred. For example, individuals who prefer the intuitive style of information processing reported higher self-efficacy beliefs regarding the tasks included in the searching stage (i.e., discovery of new opportunities), which were associated with their intentions. The problem that may emerge if those individuals decide to launch new ventures, is that they may overlook necessary stages of the venture process that do not rely on their preferred cognitive style.

Similarly, individuals with the analytic preferred mode of thinking reported greater entrepreneurial self-efficacy for the planning, marshalling of resources, and implementation stages of the venture creation process. Our results suggest that their entrepreneurial intentions are, at least in part, motivated by their self-efficacy beliefs regarding their capacity to carry out those activities of planning the new business, convincing others to invest in it, and managing its growth. However, they do not have so much confidence in their capacity for divergent thinking to identify and create a new idea or opportunity—which may ultimately inhibit them from acting upon their own entrepreneurial ideas.

Our study adds to the literature on entrepreneurial intentions and cognition by uncovering the divergent effects of cognitive style on specific types of perceived self-efficacy within a framework of the new venture creation process. Although the framework we adopted (from Cox et al., 2002) presents only four broad stages of the new venture creation process and, as any framework, is subject to questioning, we believe that the activities included in it and for which we measured participants' perceived self-efficacy may be generalized for most cases of new venture creation. In this sense, what is really of interest here are the perceptions individuals with different cognitive styles have about their own ability in carrying out those activities. As we have shown, such perceptions may foster or inhibit their intention to become an entrepreneur.

From a practical standpoint, the question that emerges is: Given the different aptitudes and preferences of intuitive and analytic individuals throughout the venture creation process, what can be done in order to help aspiring entrepreneurs in their entrepreneurial

endeavors? Based on this study, one possible response may be the suggestion to support would-be and nascent entrepreneurs in understanding their own cognitive styles, allowing them to recognize what particular stages of the entrepreneurial process their modes of thinking may prefer and preclude. This may influence them to seek assistance from others (e.g., partners, consultants, etc.) who can help them complete the steps within the venture creation stage(s) that rely on the cognitive style least preferred by the entrepreneur.

Over 20 years ago, Olson (1985) suggested that two different modes of thinking were necessary to the successful completing of the entrepreneurial process. His framework presented only two phases, suggesting that intuitive thinking was crucial to the development of "invention abilities," while analytic thinking was essential to the development of "innovation abilities." Since then research on entrepreneurship has considerably advanced, but the interplay between these two modes of thinking and the abilities required through the venture creation process still needs further investigation. Our study provides evidence that perceptions of self-efficacy vary according to cognitive style and the types of abilities required, affecting intentionality in different ways. Further research should focus on behavior, in order to assess the effectiveness of each mode of thinking in the different phases/activities of the entrepreneurial process. If this type of research produces significant results, venture capitalists and other business support agencies may well consider screening nascent entrepreneurs and their potential partners for their cognitive style, as an indicator that may help them to advise and manage the venture creation process.

## **Limitations and Further Suggestions for Future Research**

Our study, similar to other studies on cognition and intentionality, has a number of limitations. Although implications can be inferred, it is clear that we assessed students' perceptions, and not entrepreneurs' behaviors. Using a sample of students is justified, in this case, because we focus on factors that may affect the intentionality of potential entrepreneurs toward entrepreneurial behavior. Although there is a great deal of previous research establishing the reasonable linkage between intentions and later behavior (Ajzen, 1991; Zhao, Seibert, & Hills, 2005), we acknowledge that intentionality does not automatically imply behavior.

Moreover, our results relating cognitive style and self-efficacy concern only *perceptions* of self-efficacy, not actual abilities. That is, the fact that analytic individuals in our sample exhibited, e.g., a stronger positive relationship between perceived entrepreneurial self-efficacy regarding the implementation stage of the new venture process and entrepreneurial intentions than that for intuitive individuals, *does not mean* that analytic individuals are actually better prepared than intuitive individuals to implement new ventures. This interpretation would be wrong and does not correspond to our findings. Further research should examine the relationship between cognitive style and actual behavior throughout the different phases of the entrepreneurial process, in order to assess effectiveness. Other influencing factors that have been related to self-efficacy and actual behavior including having an entrepreneurial family background as well as disciplinary background and industry/job experience should also be considered. The absence of a comparative sample of nascent entrepreneurs, along with additional individual and demographic background, are further limitations of this study. The use of a comparative sample of entrepreneurs could help to rule out, for instance, potential perceptual biases generated by the fact that our respondents have taken classes in analytical techniques applied to business creation.

Additionally, our data in this research are self-reported. While self-report data are the typical mechanism for assessing and understanding certain individual differences, such as self-efficacy, and it can be argued that an accurate assessment of constructs such as cognitive style and intentions must occur from the individual, it is important to acknowledge that the data in this study all came from a common source. This may result in common method variance and multicollinearity, problems that we minimized by using structural equation modeling (Pedhazur & Schmelkin, 1991). Finally, the causal relationships linking perceptions of self-efficacy and intentionality can only be inferred, at most, and remain to be clearly demonstrated by future research.

## Conclusion

All of these findings indicate and provide additional evidence about the role of cognitive style and its influence on the connections among perceived self-efficacy, entrepreneurial intentions, and the new venture creation process. This gives us a better understanding of how individuals learn and process information, specifically those paths leading to entrepreneurial intent. On the one hand, our results indicate that intuitive individuals' intentions toward entrepreneurship are better explained by their self-efficacy beliefs regarding the opportunity identification stage of the new venture creation process. On the other hand, it seems that analytic individuals' intentions toward entrepreneurship rely more strongly on their self-efficacy beliefs concerning the planning, marshalling of resources, and implementation stages of the new venture creation process. Thus, while analytic and intuitive individuals may present similar levels of entrepreneurial intentionality, they may arrive there by different cognitive paths. Our findings reinforce the view that deep cognitive structures are at play in how entrepreneurial intentions evolve. As our awareness of these structures becomes richer and more detailed, so does our ability to diagnose shortfalls in entrepreneurial activity and to remedy them.

## Appendix A

### Entrepreneurial Self-Efficacy Scale

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For each task, participants rated their level of confidence on a 7-point Likert scale (1 = "not confident"; 7 = "completely confident").

Searching stage

Task 1: Conceive a unique idea for a business

Task 2: Identify market opportunities for a new business

Planning stage

Task 3: Plan a new business

Task 4: Write a formal business plan

Marshalling stage

Task 5: Raise money to start a business

Task 6: Convince others to invest in your business

Task 7: Convince a bank to lend you money to start a business

Task 8: Convince others to work for you in your new business

Implementing stage

Task 9: Manage a small business

Task 10: Grow a successful business

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