

The entrepreneur from a cognitive approach

José C. Sánchez, Tania Carballo and Andrea Gutiérrez
Universidad de Salamanca

The cognitive approach to entrepreneurship is a response to the limitations of the trait approach. Its aim is to explain entrepreneurial behavior through cognitions. The main body of research has studied cognitive elements such as scripts, self-efficacy, cognitive styles and heuristics. Understanding entrepreneurial cognition represents a potential and productive field of research that, to date, has received little attention. In this article, we review and highlight the most important contributions of Cognitive Psychology to the field of entrepreneurship; we point out some of the limitations and suggest new avenues of enquiry.

El emprendedor desde una orientación cognitiva. El enfoque cognitivo del estudio del emprendedor surge como respuesta a las limitaciones de la orientación de los rasgos. Su objetivo es explicar la conducta emprendedora a través de las cogniciones. Entender el pensamiento emprendedor representa un campo de estudio fértil aún no muy explotado. Las principales investigaciones destacan el papel de los scripts, la autoeficacia, los estilos de pensamiento y los heurísticos en la acción de crear una empresa. En este artículo se revisan y se señalan las contribuciones más relevantes de la Psicología cognitiva al campo del emprendimiento, se señalan algunas de las limitaciones y se apuntan nuevas líneas de investigación.

The cognitive approach to the study of entrepreneurs emerged as a new option to the trait orientation because although the latter has produced important results, many of these have been clearly contradictory, generating the displacement of researchers to other personal aspects of the individual (Baron & Markman, 1999; Boucknooghe, Van den Broeck, Cools, & Vanderheyden, 2005; Vecchio, 2003).

The cognitive approach is characterized by the study of certain types of cognitions that, among other aspects, could help to explain entrepreneurial behavior, success in business, the definition of entrepreneurs, and to distinguish them from other individuals. Researchers using this approach believe that cognitive aspects are the elements that distinguish entrepreneurs from non-entrepreneurs. These cognitive aspects range from their beliefs to their values, cognitive styles and mental processes.

Entrepreneurship is considered a relatively new field of study and the first in depth studies focused on psychological traits. By contrast, little attention has been devoted to research using the cognitive approach. Nevertheless, some of these studies have afforded valuable results that clarify the importance of certain cognitive aspects; for example, beliefs about self-efficacy and the use of the intentions model in the study of entrepreneurial behavior. Also in this approach it can be shown that some of the mistakes committed in the trait orientation approach also seem to recur in this cognitive orientation.

The aim of this paper is to review the contributions of the cognitive approach to the field of entrepreneurship, and to identify some limitations and new lines of research in this area.

The article will adopt the following scheme: First, we describe the characteristics of the cognitive approach; we discuss the main cognitive aspects of entrepreneurs that have been studied and the most relevant discoveries in the field. Finally, we offer some conclusions and suggest new research lines for the future.

The cognitive approach

The cognitive approach uses the cognitive aspects of entrepreneurs to study and even to explain their behavior, which is related to the identification of opportunities for the creation of businesses and business growth. In fact the term «cognitive style» is used to characterize certain ways of processing information related to entrepreneurial behavior. Two main lines can be differentiated within the cognitive literature: the study of cognitive structures and the study of cognitive processes. Some studies have attempted to identify the knowledge structures that entrepreneurs use to make assessments, judgments or decisions, in evaluating opportunities, and in the creation and growth of businesses (Boucknooghe et al., 2005; Busenitz & Barney, 1997; Gaglio & Katz, 2001; Mitchell, Smith, Seawright, & Morse, 2000; Sánchez, 2009). Other types of research are based on the idea that whatever the individual thinks, says or does is influenced by the cognitive processes through which individuals acquire, use and process information (Baron & Markman, 1999; Krueger & Evans, 2004; Neisser, 1967). This perspective suggests that entrepreneurs think and process information differently from non-entrepreneurs and such differences may help to distinguish people who create or aim to establish businesses (entrepreneurs) from people who do not create

and will not create companies (non-entrepreneurs). Thus, some authors have coined the term «cognitive style» to characterize certain ways of processing information related to entrepreneurial behavior (Baron, 2004; Boucknooghe et al., 2005; Van den Broeck, Vanderheyden, & Cools, 2003).

Cognitive psychology is not only an aid to understanding individuals and their behavior, considering their mental processes when they interact with other people, but also addresses the environment in which these mental processes and interactions take place (Mitchell, Busenitz, Lant, McDougall, Morse, & Smith, 2002). The Theory of Social Cognition introduces the idea of knowledge structure; i.e. the mental models (cognitions) that are used to achieve personal effectiveness in certain situations. Thus, since entrepreneurship is defined as relating to individuals or teams that create products/services for other people, Cognitive Psychology is increasingly useful to help establish the phenomena associated with entrepreneurship.

In this sense, experts insist on the possibility of explaining a large part of entrepreneurial behavior and its origin from both cognitive structural and process variables (e.g., Busenitz & Lau, 1996; Sánchez, 2010a,b). Cognitive structures represent and contain knowledge, while cognitive processes relate to the manner in which that knowledge is received and used. In sum, the field of entrepreneurial cognition includes all aspects of cognition that can potentially play an important role in certain aspects of the entrepreneurial process. Thus, we shall address the main cognitive aspects reflected in the literature that shed light on the study of entrepreneurship.

Self-efficacy

Originally defined by Bandura (1994, p. 72) as «one's beliefs in their abilities to perform a certain level of performance or desired outcomes that influence situations that affect their lives,» self-efficacy has become an important variable considered in the cognitive study of entrepreneurial behavior. Shane, Locke and Collins (2003) emphasize self-efficacy as a robust predictor of individual outcome in a given activity and its validity to explain why people with equal skills may act differently.

Like Chen, Greene, & Crick (1998), by entrepreneurial self-efficacy we understand the self belief in one's ability to adopt the role and conduct the tasks of an entrepreneur successfully. Thus, research on self-efficacy in entrepreneurial behavior has been characterized by making distinctions between entrepreneurs and non entrepreneurs (Chen et al., 1998; Markman, Baron, & Balkin, 2005; Sánchez, 2009). In a given situation, entrepreneurs perceive more opportunities than those who have low levels of entrepreneurial self-efficacy, who perceive the same situation to have more costs and greater risks (Lucas & Cooper, 2005; Vecchio, 2003). People who have a higher level of self-efficacy also feel more competent to overcome perceived obstacles and they anticipate more positive results (Vecchio, 2003) and persist in the effective search and organization of activities in the midst of uncertainty (Trevelyan, 2009).

Entrepreneurial self-efficacy enables us to differentiate entrepreneurs from managers and it also correlates with the intention of owning a business, pointing to the notion that the individual who believes or feels him or herself most capable of undertaking a business concern is more prone to implementing such behavior than one who does not feel able to do so (Chen et

al., 1998). Self-efficacy can also be used to identify the reasons why some individuals avoid becoming entrepreneurs, since some people avoid entrepreneurial activities not because of their lack of ability but because they believe that they do not have such ability. Moreover, it can be used to identify areas of weakness or strength for developing the entrepreneurial potential of individuals or communities and to improve the performance of existing entrepreneurs (Chen et al., 1998).

Further, entrepreneurial self-efficacy studies provide data that help to understand why some businesses do not grow, on the grounds that some entrepreneurs have insufficient self-efficacy to cope with specific tasks (Vecchio, 2003).

All these contributions have lent considerable impetus to clarifying the cognitive study of entrepreneurs. Accordingly, it is crucial to focus on possible factors that might influence the development of self-efficacy. For example, Oliveira, Garrido and Sánchez (2005), seeking to identify the impact of the social environment on the self-efficacy beliefs of entrepreneurs, reported that those who had a favorable micro-social environment (support from family and friends) had higher levels of self-efficacy than those who had an unfavorable micro-social environment. Similarly, Kickul and Krueger (2005) argued that individuals assess their entrepreneurial skills in reference to perceived resources, opportunities, and obstacles in the environment; thus, the environment exerts an impact on entrepreneurial self-efficacy.

Scripts

The area of scripts has expanded considerably and has provided fruitful results in the field of entrepreneurship, mainly thanks to Ron Mitchell and colleagues. Like Fiske and Taylor (1991), we define a script (schema) as a cognitive structure of beliefs and standards concerning a given domain of stimulus, which provides the individual with a reference point from which to represent his or her environment and provides guidelines for action and decision making. This cognitive structure represents the organized knowledge that a person has about a particular concept and contains information about the attributes of this concept and about the relationships between such attributes (Busenitz & Lau, 1996).

Within the context of entrepreneurship, scripts are considered to refer to the knowledge structures that entrepreneurs use to make assessments, judgments or decisions regarding the assessment of opportunities, enterprise creation and business growth.

In other words, research on entrepreneurial scripts refers to the study of how entrepreneurs use simplified mental models to link previously unconnected information that will help them to identify or invent new products or services and the necessary resources to start up and cultivate a business (Mitchell et al., 2002). Thus, scripts in the field of entrepreneurship are knowledge structures that individuals have concerning the actions themselves to be undertaken (Busenitz & Lau, 1996).

The main contribution of these studies suggests that expert entrepreneurs think differently from novices. The way in which entrepreneurial experts become experts is reflected in the development of an expert script. Experts have knowledge structures or scripts about a particular domain that allow them to perform better in their environment than non-experts, who neither have nor use structured knowledge (Mitchell et al., 2000; Westhead, Deniz, & Wright, 2009).

This contribution extends to the intercultural level. Several cross-cultural studies have shown that knowledge structures differentiate between entrepreneurs and non-entrepreneurs in different countries (Mitchell et al., 2002; Smith, Mitchell, & Mitchell, 2009). The explanation is that entrepreneurs have shared experiences about the conceptualization, early development and growth of new businesses, leading them to develop similar and more refined mental models than non-experts might have, given their reduced experience in the domain (Mitchell et al., 2002; Smith et al., 2009).

Moreover, script studies provide clues to understanding the functioning of entrepreneurs in a group. Scripts are manifested not only individually, but are also manifested in a team. Although teams do not have cognitions alone, the prospects of the team about what is an appropriate action (schema) are significantly greater than the collection of individual perspectives, and the collective cognition of the entrepreneurial team is what drives many strategic business decisions (West, 2007).

Cognitive styles

Cognitive style is defined as the way people perceive environmental stimuli, and how they organize and use information from their environment to guide their actions. In their study, Boucknooghe et al., (2005) raised the following questions: What is the cognitive style of entrepreneurs? Is the way they perceive, organize and use environmental information different from the way non-entrepreneurs do? The results of that investigation confirmed the notion that entrepreneurs differ in their cognitive styles. Successful entrepreneurs enjoy discovering opportunities, being innovators and taking risks, as do inventors. Individuals who use a *knowing style* (analytical and conceptual) look for facts and data. They want to know exactly how things are, and they tend to retain many facts and details. They are task-oriented and accurate, and they thrive on complex problems if they can find a clear and rational solution. The creative style is characterized by holistic and conceptual thinking. Individuals who use this style tend to be creative and enjoy experimentation. They tend to see opportunities and challenges. They do not like rules and procedures, and take pleasure in uncertainty and freedom. They are ambitious and achievement-oriented. Successful entrepreneurs show more originality than others and are able to produce solutions that run against established knowledge. Creative thinking also facilitates the recognition of business opportunities (Bridge, O'Neil, & Cromie, 2003). The integration of both analytic (knowing) and intuitive (creative) processing styles is required to process information (Hodgkinson & Sparrow, 2002) and minimizes the dangers of cognitive biases identified by researchers into behavioral decisions (e.g., Mintzberg, 1994; Sinclair, Ashkanasy, Chattopadhyay, & Boyle, 2002).

In addition, other research has shown that entrepreneurs collect, process and evaluate information in a more intuitive manner than managers, middle managers and initiates. Senior managers have cognitive styles similar to those of entrepreneurs (Allison, Puce, & McCarthy, 2000). Recently, Lindblom, Olkkonen and Mitronen (2008) have found differences in the cognitive style of the different types of entrepreneurs. Those authors investigated the cognitive style of retail entrepreneurs with respect to marketing decisions. The results revealed that the cognitive style of retail entrepreneurs is more consistent with the style of employees than with that of other entrepreneurs.

Decision making: Heuristics and errors

Research on heuristics has afforded important results in our understanding of the cognitive functioning of human beings in general and of entrepreneurs in particular. Heuristics are simplifying strategies that individuals use to manage information and reduce uncertainty in decision making (Tversky & Kahneman, 1973).

Research has shown that entrepreneurs with a logic based on heuristics are able to make sense of complex and ambiguous situations more quickly and take more orthodox approaches in making decisions (Mittchel, Busenitz, Bird, Gaglio, McMullen, Morse, & Smith, 2007). However, other studies (Baron & Markman, 1999) have shown that the use of certain cognitive heuristics leads to biases and errors, as discussed below.

Counterfactual thinking. This is understood as an afterthought in decision-making in which the procedures followed to perform the task are discussed, and various alternatives that could have been followed are considered (Wadeson, 2006). These are the thoughts that occur due to adverse outcomes or wrong expectations (Markman et al., 2005). Counterfactual thinking has positive and negative effects on the entrepreneur. On the one hand, it can lead to regret and can reduce perceived self-efficacy if one decides the choice was not the best one. On the other hand, counterfactual thinking can lead to the formation of alternative strategies for the future, so the best strategies can be learned from experience.

In the field of entrepreneurship, research that has analyzed counterfactual thinking reveals that entrepreneurs are less likely to engage in counterfactual thinking, they regret missed opportunities less and bear past mistakes more easily, both their own and those of others (Baron, 1998, 2000).

Another important contribution was a study by Gaglio and Katz (2001), who hypothesize that people on entrepreneurial alert are involved in counterfactual thinking, unraveling the causal sequences. Therefore, they are more likely to increase the complexity of their mental patterns, changing in response to novel events. A further discussion of the role of counterfactual thinking and its importance in entrepreneurship can be found in Gaglio's work (2004).

The planning fallacy. The planning fallacy is a cognitive aspect related to errors in planning, that is, the tendency to believe that one can achieve more in a given period of time than one is really is capable of. The planning fallacy is the result of people failing to break down multifaceted mental tasks into their different components (Krueger & Evans, 2004). Thus, when people are asked to break down the tasks to be performed, the planning fallacy becomes reduced. Most people, including entrepreneurs, tend to overestimate how much they can accomplish in a given period of time and may underestimate the amount of resources needed to complete certain projects (Baron & Markman, 1999). These authors defended the idea that entrepreneurs tend to be more susceptible to the planning fallacy than other people, because they operate in a dynamic and uncertain environment, under the severe pressure of time and large amounts of information. However, the results have shown the opposite, i.e. that entrepreneurs are less prone to the planning fallacy (Baron & Markman, 1999).

Overconfidence. Over-confidence refers to the tendency of thinking one knows more than what one really knows (Baron & Markman, 1999). That is, our failure to know the limits of our own knowledge. Over-confidence occurs when decision makers'

assessments are overly optimistic. In sum, overconfident people are characterized by poor meta-cognition.

According to Russo and Schoemaker (1992), overconfidence may be the result of the availability heuristic, the anchoring and adjustment heuristic, confirmatory bias, and hindsight bias. The confirmation bias is a tendency to gather evidence for and assign more weight to information that confirms one's belief, and to stop seeking or to ignore dissonant information.

Hindsight bias is a tendency to see past events as more predictable than they actually were, such as the familiar saying: «I knew it». It is important to realize that to collect less information when a person is feeling very safe is not really a heuristic, but something rational. However, if the confidence level is not justified, then it will fail in the collection of information.

Over optimism. This is the tendency to believe that things will work out. Overoptimism has three main forms (Taylor & Brown, 1988): positive self-evaluation, optimism about plans and future events and over-optimism due to the illusion of control bias.

Cooper, Woo and Dunkelberg (1988) found that 81% of entrepreneurs interviewed believed that their chances of success would be at least 70% and 33% claimed that they were destined for success. However, reality showed that only 25% of new businesses survive for more than five years. Such positive statements partly reflect a need for self justification. The authors suggest that entrepreneurs can start a psychological phenomenon called post-decisional reinforcing, in which decision makers tend to exaggerate the attractiveness of an option once it has been chosen. They also advance the possibility that employers may have a natural tendency to talk positively about their efforts as an incentive to encourage others, such as financiers, employees and customers into believing they will be successful. If employers are more optimistic when they decide to start a business, then this has additional implications in comparison to a situation in which one is only over-optimistic after the initial decision.

According to Vecchio (2003), there are studies that have identified highly secure entrepreneurs and managers of small businesses. He cites the discovery of Cooper, Woo and Dunkelberg (1988) that entrepreneurs express a high level of confidence in success. Also, Parker (2006) argues that certain findings in the psychology literature suggest that entrepreneurs are particularly over-optimistic. It is this optimism that tends to be greater when individuals have emotional commitment to the results of their work.

Bernardo and Welch (2001) found that by providing positive information externally to their social group, over-confident entrepreneurs are more preferred by their environment. If these externalities are significant enough, then social welfare will be increased through having some over-confident people in the population, even though such people are not behaving in an optimal way as regards their own welfare. This has important implications and applications for the workplace, and suggests that the inclusion of over-confident workers in the company will have beneficial effects on work climate, self-efficacy, performance, etc.

In conclusion, the relationship between different heuristics is established: overconfidence, as defined above, leads to incorrect estimates of the risks that an entrepreneur has to face, but the estimates could go in two directions: either being too pessimistic or too favorable, depending on whether the estimate is positively or negatively biased. However, it is quite possible that people who are optimistic enough to start a business show a tendency towards the overconfidence bias in the direction of underestimating the

risk they face. Similarly, the belief in the law of small quantities can lead to over-confidence if the small sample used is biased in a positive direction. The anchor could lead to overoptimism about the creation and progress of a company, in cases where the expectations based on indications of the progress made so far are too optimistic.

Conclusions

The first conclusion is based on a review of the studies addressing the cognitive aspects of entrepreneurship in that this trend has emerged as a response to the failures and limitations of research that has focused on traits. In addition to this first conclusion, we found that: 1) Its main emphasis is on the cognitive processes and structures of individuals (beliefs, information processing, cognitive styles, etc.) to explain entrepreneurial behavior and entrepreneurs themselves. 2) According to this orientation, entrepreneurial behavior is influenced by mental processes, i.e. the mechanisms through which an individual acquires, processes, and uses information. People think and process information differently. These differences are used by cognitive researchers to identify or characterize entrepreneurs. 3) The authors of the cognitive approach attribute to cognitive structures an important role in behavior, even though there are those who argue that individuals exist within a configuration of forces where cognition and motivation are two major forces, along with people and the situation. Studies regarding entrepreneur's scripts have important implications for entrepreneurial education, as it has been shown that entrepreneurial training can measurably change individuals' scripts. 4) For scholars of this approach, entrepreneurial behavior is characterized by the search for and identification of opportunities for creating and/or developing a business. Even when cognitive arguments are used to explain entrepreneurs, behavioral parameters are often invoked to define entrepreneurs because they consider entrepreneurs as opportunity hunters, founders and / or business owners/managers. 5) Entrepreneurs use mental models to identify and invent new products and services and to obtain the necessary resources for business creation or development. 6) Considering the results of the research studies mentioned in this article, entrepreneurs are business creators that are characterized by the following cognitive aspects: they have a creative and knowing cognitive style, use intuition to make decisions, develop expert scripts, are self-efficient in the perception and development of opportunities, create an innovative environment, cope with unexpected challenges, develop investor relations, define business goals, develop human resources, and are prone to innovation and risk taking. They have more intense counterfactual thoughts related to business. They are more alert to opportunities and less prone to planning failures and to the use of heuristics. 7) Within the cognitive perspective, self-efficacy beliefs and intentions proved to be the most important predictor of entrepreneurial behavior, specifically those self-efficacy beliefs related to the ability to face unexpected challenges. However, it is clear that not all the potential of self-efficacy entrepreneurial beliefs has been fully explored in this field, representing a great opportunity for future research.

Limitations / Future research

As we have seen throughout this study, it is undeniable that the cognitive approach provides important results in the

study of entrepreneurs. Entrepreneurs have been attributed a different capacity for processing information, and the concept of entrepreneurial cognition has been created as a distinct feature that defines entrepreneurs. However, it seems to fall into the same mistake as the trait orientation, that is, it does not consider variables external to the individual when seeking to explain entrepreneurial behavior or even the entrepreneur, whereas some studies are already introducing contextual variables.

Nevertheless, the attempts made to date to understand the role of cognition in the entrepreneurial process have generally focused on the study of a very small number of certain cognitive variables and specific phases of the entrepreneurial process. This is why we have no coherent, integrated models that provide a conclusive view on the importance of an individual's cognitive infrastructure

and its evolution throughout the entrepreneurial sequence. Another criticism is that research studies indirectly restrict the concept of an entrepreneur, because they are focused on studying the cognitive abilities of business creators, leaving aside other types of entrepreneurs. The cognitive orientation is a relatively new field in the study of entrepreneurship, and therefore it is possible that it still has much to contribute in this area, but it is also clear that researchers need to broaden their focus a little more.

Acknowledgements

This article is part of a special section of *Psicothema* financed by project n° SA042A08 from Education Council of *Junta de Castilla y León*.

References

- Allison T., Puce A., & McCarthy, G. (2000). Social perception from visual cues: Role of the STS region. *Trends in Cognitive Science*, 4, 267-278.
- Bandura, A. (1994). Self-efficacy. In V.S. Ramachaudran (Ed.), *Encyclopedia of human behavior* (Vol. 4, pp. 71-81). New York: Academic Press (Reprinted in H. Friedman (Ed.), *Encyclopedia of mental health*. San Diego: Academic Press, 1998).
- Baron, R.A. (1998). Cognitive mechanisms in entrepreneurship: Why, and when, entrepreneurs think differently than other persons. *Journal of Business Venturing*, 13, 275-294.
- Baron, R.A. (2000). Counterfactual thinking and venture formation: The potential effects of thinking about «what might have been». *Journal of Business Venturing*, 15(1), 79-91.
- Baron, R.A. (2004). The cognitive perspective: A valuable tool for analysing entrepreneurship's basic «Why» Questions'. *Journal of Business Venturing*, 19(2), 221-239.
- Baron, R.A., & Markman, G.D. (1999). Cognitive mechanisms: Potential differences between entrepreneurs and non-entrepreneurs. In P.D. Reynolds, W.D. Bygrave, et al. (Eds.), *Frontiers of entrepreneurship research*. Wellesley, MA: Babson College.
- Bernardo, A.E., & Welch, I. (2001). On the evolution of overconfidence and entrepreneurs. *Journal of Economics & Management Strategy*, 10(3), 301-330.
- Bouckenoghe, D., Van den Broeck, H., Cools, E., & Vanderheyden, K. (2005). *In search for the heffalump: An exploration of the cognitive style profiles among entrepreneurs*. Vlerick Leuven Gent Management School Working Paper Series -4, Vlerick Leuven Gent Management School.
- Busenitz, L.W., & Barney, J.B. (1997). Differences between entrepreneurs and managers in large organizations: Biases and heuristics in strategic decision making. *Journal of Business Venturing*, 12(1), 9-30.
- Busenitz, L.W., & Lau, C.M. (1996). A cross-cultural cognitive model of new venture creation. *Entrepreneurship Theory and Practice*, 20(4), 25-39.
- Bridge, S., O'Neil, K., & Cromie, S. (2003). *Understanding enterprise, entrepreneurship and small business* (2nd ed.). Palgrave/Macmillan.
- Chen, G.C., Greene, P.G., & Crick, A. (1998). Does entrepreneurial self-efficacy distinguish entrepreneurs from managers? *Journal of Business Venturing*, 13, 295-317.
- Cooper A.C., Woo, C.Y., & Dunkelberg, W.C. (1988). Entrepreneurs' perceived chances for success. *Journal of Business Venturing*, 3(1), 97-108.
- Fiske, S.T., & Taylor, S.E. (1991). *Social cognition*. (2nd ed.). New York: McGraw Hill.
- Gaglio, C.M. (2004). The role of mental simulations and counterfactual thinking in the opportunity identification process. *Entrepreneurship Theory and Practice*, 28(6), 533-552.
- Gaglio, C.M., & Katz, J.A. (2001). The psychological basis of opportunity identification: Entrepreneurial alertness. *Small Business Economics*, 16(2), 95-111.
- Haynie, J.M., Shepherd, D., Mosakowski, E., & Earley, P.C. (2010). A situated metacognitive model of the entrepreneurial mindset. *Journal of Business Venturing*, 25(2), 217. New York: March 2010.
- Hodgkinson, G.P., & Sparrow, P. (2002). *The competent organization: A psychological analysis of the strategic management process*. Buckingham: Open University Press.
- Kickul, J., & Krueger, N.F. (2005). *Toward a new model of intentions: The complexity of gender, cognitive style, culture, social norms and intensity on the pathway to entrepreneurship*. Centre for Gender in Organizations (Simmons School of Management), Working Paper no. 20.
- Krueger, J., & Evans, M. (2004). If you don't want to be late, enumerate: Unpacking reduces the planning fallacy. *Journal of Experimental Social Psychology*, 40, 586-598.
- Lindblom, A., Olkkonen, R., & Mitronen, L. (2008). Cognitive styles of contractually integrated retail entrepreneurs: A survey study. *International Journal of Retail & Distribution Management*, 36(6), 518. Bradford.
- Lucas, W.A., & Cooper, S.Y. (2005). *Measuring entrepreneurial self-efficacy*. A paper prepared for the EDGE Conference 11-13th July, Singapore.
- Markman, G.D., Baron, R.A., & Balkin, D.B. (2005). Are perseverance and self-efficacy costless? Assessing entrepreneurs' regretful thinking. *Journal of Organizational Behavior*, 26(1), 1-19.
- Mintzberg, H. (1994). *The rise and fall of strategic planning*. New York: Prentice Hall.
- Mitchell, R.K., Busenitz, L., Lant, T., McDougall, P.P., Morse, E.A., & Smith, B. (2002). Toward a theory of entrepreneurial cognition: Rethinking the people side of entrepreneurship research. *Entrepreneurship Theory & Practice*, 27, 93-104.
- Mitchell, R.K., Busenitz, L.W., Bird, B., Marie Gaglio, C., McMullen, J.S., Morse, E.A., & Smith, J.B. (2007). The Central Question in Entrepreneurial Cognition Research. *Entrepreneurship Theory & Practice*, 31(1), 1-27.
- Mitchell, R.K., Smith, B., Seawright, K.W., & Morse, E.A. (2000). Cross-cultural cognitions and the venture creation decision. *Academy of Management Journal*, 43(5), 974-993.
- Neck, R., Haber, G., & McKibbin, W.J. (1999). Macroeconomic policy design in the European Monetary Union: A numerical game approach. *Empirica*, 26, 319-333.
- Neisser, U. (1967). *Cognitive psychology*. Englewood Cliffs, NJ: Prentice-Hall.
- Oliveira, M.F., Garrido, E., & Sánchez, J.C. (2005). El impacto del entorno social en las ciencias de autoeficacia de los emprendedores: un estudio pragmático. In *Psicología Social y Problemas Sociales* (Vol. 4, pp. 407-418). ISBN 84-9742-453-0.
- Russo, J.E., & Schoemaker, P.J.H. (1992). Managing overconfidence. *Sloan Management Review*, Winter, 7-18.
- Sánchez, J.C. (2010a). University training for entrepreneurial competencies: Its impact on intention of venture creation. *International Entrepreneurship and Management Journal*, April, 1-16.

- Sánchez, J.C. (2010b). Evaluation of entrepreneurial personality: Factorial validity of entrepreneurial orientation questionnaire (COE). *Revista Latinoamericana de Psicología*, 42(1), 32-52.
- Sánchez, J.C. (2009). Social learning and entrepreneurial intentions: A comparative study between Mexico, Spain and Portugal. *Revista Latinoamericana de Psicología*, 41(1), 107-117.
- Shane, S., Locke, E. A., & Collins, C.J. (2003). Entrepreneurial motivation. *Human Resource Management Review*, 13(2), 257-279.
- Sinclair, M., Ashkanasy, N.M., Chattopadhyay, P., & Boyle, M.V. (2002). Determinants of intuitive decision-making in management: The moderating role of affect. In N.M. Ashkanasy, W. Zerbe & C.E.J. Härtel (Eds.), *Managing emotions in the work place* (pp. 143-163). Armonk, NY: M. E. Sharpe.
- Smith, J.B., Mitchell, J.R., & Mitchell, R.K. (2009). Entrepreneurial scripts and the new transaction commitment mindset: Extending the expert information processing theory approach to entrepreneurial cognition research. *Entrepreneurship Theory & Practice*, 33(4), 815.
- Taylor, S.E., & Brown, J.D. (1988). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin*, 103, 193-210.
- Trevelyan, R. (2009). Entrepreneurial attitudes and action in new venture development. *International Journal of Entrepreneurship and Innovation*, 10(1), 21.
- Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive Psychology*, 5, 207-232.
- Vecchio, R.P. (2003). Entrepreneurship and leadership: Common trends and common threads. *Human Resource Management Review*, 13, 303-327.
- VandenBroeck, H., Vanderheyden, K., & Cools, E. (2003). The field of cognitive styles: From a theoretical review to the construction of the cognitive style inventory. *Vlerick Leuven Gent Management School Working Paper Series* 2003-26. Vlerick Leuven Gent Management School.
- Wadson, N. (2006). Cognitive aspects of entrepreneurship: Decision-making and attitudes to risk. In Casson et al. (Eds.), *Oxford Handbook of Entrepreneurship* (pp. 91-113). Oxford University Press.
- West, G.P. (2007). Collective cognition: When entrepreneurial teams, not individuals, make decisions. *Entrepreneurship Theory & Practice*, 31(1), 77-101.
- Westhead, P., Ucbasaran, D., & Wright, M. (2009). Information search and opportunity identification: The importance of prior business ownership experience. *International Small Business Journal*, 27(6), 659-680.