THE IMPACT OF STUDENT'S COGNTIVE STYLE ON SPECIFIC ANTECEDENTS OF ENTREPRENERUIAL INTENTIONS

This study examines the role of three distinct cognitive styles as a determinant of specifically two entrepreneurial intent's antecedents: personal attitude (PA) and perceived behavioral control (PBC). The study found that individuals' cognitive preference for cognitive style influences their assessment of their PA towards setting up their own business in the future. Students with a balanced cognitive style had higher PA, compared to both analytical and intuitive cognitive styles. While a balanced cognitive style resulted in higher PBC compared to the intuitive and analytical cognitive style, mean differences were not significant. Contrary to popular belief, our findings suggest that a balanced cognitive style, rather than an intuitive cognitive style results in higher entrepreneurial intentions. Entrepreneurial education aimed at developing students' entrepreneurial intentions through a change in cognitions might want to consider the development of a balanced cognitive style rather than an intuitive cognitive style.

Introduction

There has been increased investment in education and economic policy to develop individuals' intention to start a business, that is, to develop entrepreneurial intent (Fayolle & Gailly 2009; Solomon, Duffy, & Tarabishy 2002). Intentions are the single best predictor of behavior (Ajzen, 1991). The most widely used approach used to study entrepreneurial intentions is based on the theory of planned behavior (Ajzen, 1991). The theory of planned behavior is a cognitive model that specifies two surface level cognitions to predict who will become an entrepreneur: personal attitude (PA) and perceived behavioral control (PBC). Less is known, however, on how to influence PA and PBC (Baron 2004; Krueger 2003). Accordingly, this study examines the impact of cognitive style on PA and PBC. Researchers have postulated that a focus on the role of cognitive style offers us an opportunity to build a richer and deeper understanding of how students assess their skills and abilities, which will improve our ability to develop students' entrepreneurial propensity (for example, Allinson & Hayes, 1996; Baron, 1998; Krueger, 2007; Mitchell et al, 2007). By examining student's cognitive style, this study moves beyond identifying student's attitudes and perceptions to explain *why* some individuals display more favorable attitudes and perceptions towards entrepreneurship.

Literature Review

Recent studies show that compared to analytical individuals, intuitive individuals tend to display lower self-efficacy in their EI because they are less confident in their ability to develop business plans, marshaling resources, implementing- many of the tasks required in the creating a venture (Barbosa et al., 2007; Kickul et al., 2009). The findings suggest that contrary to the prevalent view that individuals engage in entrepreneurship due to a dominant intuitive style, the analytical cognitive style plays an important role in one's decision to pursue entrepreneurship.

Despite their contention that human cognition reflects dual processing previous studies have predominantly operationalized cognitive style as a bipolar unidimensional construct, where individuals are either intuitive or analytical (Allinson & Hayes, 1996; Epstein et al., 1996). Accordingly, the studies overlook individuals who display both cognitive styles simultaneously.

This study conceptualizes cognitive style as a multi-dimensional construct, allowing us to focus on three cognitive styles: Analytical cognitive style refers to "judgment based on mental reasoning and a focus on detail" (Allinson & Hayes, 1996, p.122). Intuitive cognitive style refers to "immediate judgment based on feeling and the adoption of a global perspective" (Allinson & Hayes, 1996, p.122). Balanced cognitive style, defined as individuals' versatility (equally adept or equally prefer) to use both intuitive and analytical cognitive styles simultaneously.

Entrepreneurial Intentions

Azen's (1991) theory of planned behavior (TPB) is one of the most widely used models in psychological research to predict intentions (Fayolle et al., 2006). The TPB specifies two internal cognitive variables (motivational antecedents) that determine an individual's intent to become an entrepreneur: personal attitude and perceived behavior control (Ajzen, 19991). Intent and its motivational antecedents reflect cognitive scripts (Liñán and Chen, 2009).

Personal Attitude (PA), reflecting willingness scripts, refers to the degree to which an individual holds a positive or negative personal evaluation about being an entrepreneur (Liñán and Chen, 2009; Mitchell 2000). Perceived Behavioral Control (PBC), reflecting ability scripts, refers to the feasibility of performing the venture creation behaviors (similar to self-efficacy; Bandura, 1997). In line with previous research, (for example, Autio et al., 2001; Kreuger et al., 2000) we exclude subjective norms (SN) from our prediction of entrepreneurial intentions.

Hypothesis

Based on the expert information processing theory, the entrepreneurial expertise (EE) approach suggests that people "are more willing to make commitments within their domain of expertise" (Smith et al. 2009, p. 821). We assume that individuals preferring a certain cognitive style have experience in using the preferred style. Individuals with an intuitive style organize information in a holistic and synthetic manner- skills needed in the uncertain environment of entrepreneurship (Baron 2004; Brigham et al., 2007). Accordingly, students with experience (preference) in using intuition have a higher willingness to engage in the entrepreneurship compared to analytical students. Despite the uncertainty inherent in entrepreneurship, all activities of the venture creation process other than the opportunity identification stage have been associated with analytical skills (Barbosa et al., 2007; Kickul et al., 2009). Hence, the EE approach suggests analytical students will display more favorable evaluations of these later activities because they match their cognitive preferences. Taken together, we expect students with a balanced cognitive style to have more favorable attitudes towards entrepreneurship as they evaluate both the opportunity identification stage and later stages favorably.

Hypothesis 1: Individuals with a balanced cognitive style will have higher personal attitudes towards entrepreneurship compared to individuals with one dominant cognitive style.

As individuals evaluate the decision to become an entrepreneur, they think about the situation (entrepreneurship) and themselves (if they fit the situation) (Fisk and Taylor, 1984). It is acknowledged that different stages of the entrepreneurship process- searching for opportunities, planning for the venture, marshaling resources and implementation- require

different skills and abilities (Kickul et al., 2009). Therefore, it would make sense that different cognitive skills will be required at different stages. Previous research has shown that a dominant preference for one cognitive style can both inhibit and induce self-efficacy related to EI as individuals are likely to judge themselves good in certain areas only (Barbosa et al., 2007; Kickul et al., 2009). Students with a preference for both cognitive styles should see that they 'fit' more of the activities relevant to the entrepreneurial process. Hence, we expect students with a balanced cognitive style to display higher perceptions of their ability to pursue entrepreneurship.

Hypothesis 2: Individuals with a balanced cognitive style will have higher perceived behavioral control compared to individuals with one dominant cognitive style.

Methods

The sample consisted of 228 graduate students taking entrepreneurship courses at a large Mid-Atlantic university. Students were asked to participate as part of their course work. Participants were first asked to fill out a Hermann Brain Dominance Index (HBDI) questionnaire online, which was obtained from Hermann International's propriety software. Once students completed the online questionnaire, the propriety software produced results including each individual's raw scores on four thinking quadrants. The scores reveal preferences in four different thinking styles where "A" quadrant describes the analytical, logical factual thinking. "D" quadrant refers to intuitive, holistic, innovative thinking.

According to the HBDI instrument, individuals have a dominant preference, a secondary preference (a comfort without a strong preference), and a dislike or avoidance preference of using each cognitive style. Raw scores of 0-33 represent an avoidance preference, 34-66 indicate

a secondary preference. Values above 67 represent a dominant preference for using such cognitive style. To conceptualize *analytical cognitive style*, we grouped individuals who had values of 67 and above on the “A” quadrant but not on the “D” quadrant. Individuals with values of 67 and above on both the “A” and “D” quadrant were grouped together to represent *the balanced cognitive style*. Individuals with a score of 67 and above on the “D” quadrant, but not the “A” quadrant were grouped together to represent the *intuitive cognitive style*. Thus cognitive style was operationalized as a categorical variable whereby individuals were grouped according to their cognitive style preference (analytical=1, balanced=2, intuitive=3).

PA, PBC, SN, and EI were measured using Liñán and Chen’s (2009) Entrepreneurial Intentions Questionnaire (EIQ). The EIQ is a validated and reliable measure of EI and its antecedents. Respondents were asked to rate each item on a seven point Likert scale. PA was measured using four items, while PBC and EI had six items. All measures demonstrated good reliability. Cronbach’s alpha for PA, PBC, SN, and EI were 0.91, .88, .81 and 0.96 respectively.

We controlled for: Age, Gender, Ethnicity, Previous Employment/ owned a business.

Results

We tested the entrepreneurial intentions model. PBC and PA were both significantly and positively related to EI (β=.211, p<.01 and β=.734, p<.01 respectively).

A one-way between subjects ANOVA was conducted to compare the effect of balanced cognitive style, intuitive cognitive style, and analytical cognitive style conditions on PA and PBC. Results are displayed in Table 3. There was a significant effect of cognitive style on personal attitude for the three conditions (F [2, 201]= 4.623, p=0.011, η [illegible] 44 [illegible] Post hoc comparisons using the Tukey test indicated that mean score on PA for balanced cognitive style (M=22.01, SD=4.04) was significantly higher than the analytical cognitive style (M=19.78,

SD=4.81). However, the mean score on PA for the intuitive cognitive style (*M*=20.91, *SD*=4.34) did not significantly differ from the balanced cognitive style or the analytical cognitive style. Taken together, the results suggest that students with a balanced cognitive style display more favorable PA towards entrepreneurship. *Therefore, hypothesis 1 was supported.*

The one-way between subjects ANOVA revealed no significant differences (at significance level of 0.05) in mean PBC (F [2, 201]= .081, p=.081, η^2 = .025) between the three cognitive styles. *Therefore, hypothesis 2 was not supported.*

Discussion and Conclusion

Our results provided support for the role of cognitive style, as measured by HBDI, on personal attitude towards entrepreneurship. Students with a balanced cognitive style had the highest personal attitudes towards entrepreneurship compared to both the intuitive and analytical cognitive style. Although not significant, students with a balanced cognitive style also had the highest perceived behavioral control and entrepreneurial intentions. Contrary to prior beliefs that intuition encourages entrepreneurial intentions and analytics only inhibits, by conceptualizing cognitive style as uncorrelated dimensions students with a dominant intuitive cognitive style did not appear to have significantly higher personal attitude, perceived behavioral control or entrepreneurial intentions. Since starting a business involves both analytical and intuitive cognitive tasks, having a balanced cognitive style seemed to have a greater influence on attitudes towards entrepreneurship than an intuitive cognitive style.

From a theoretical perspective, researchers should focus more on the concept of balanced cognitive style. Future research might consider examining cognitive style before and after starting a business to identify if individuals display a shift towards a more balanced cognitive

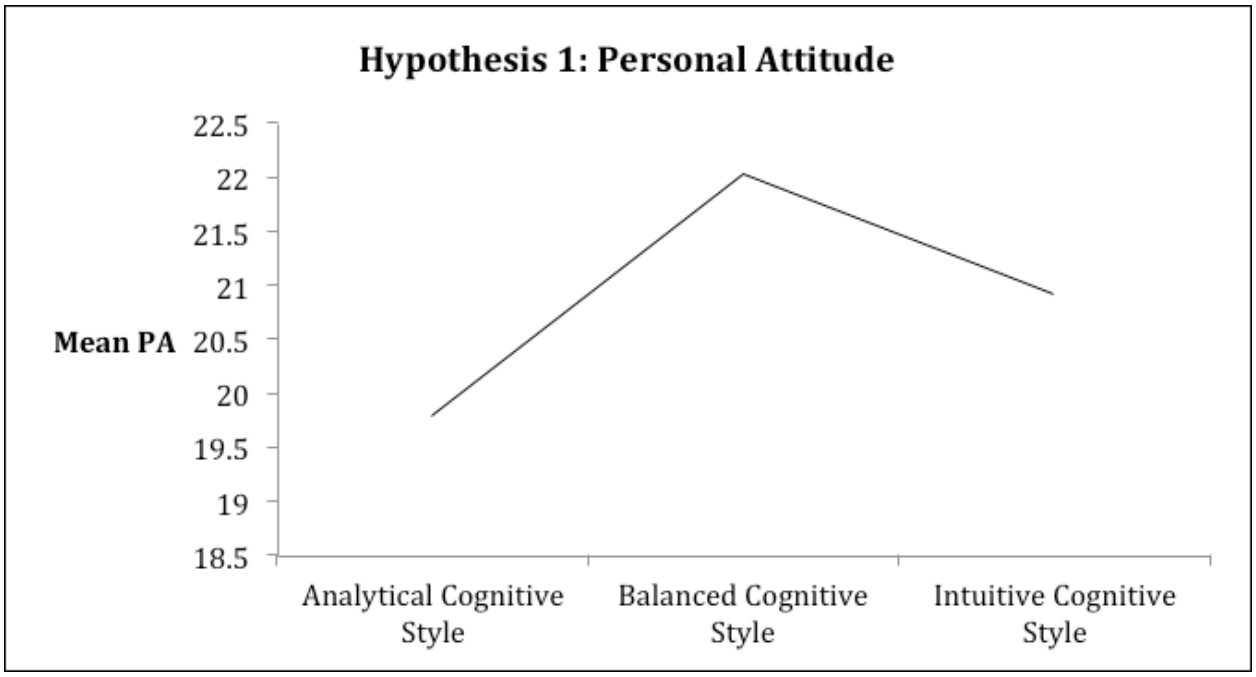
style. From a practical perspective, educators concerned with increasing entrepreneurial intentions might have been encouraged to focus predominantly on increasing intuitive cognitive styles. In contrast, our results suggest the need to understand student's cognitive styles to help develop student's balanced cognitive style to increase entrepreneurial propensity.

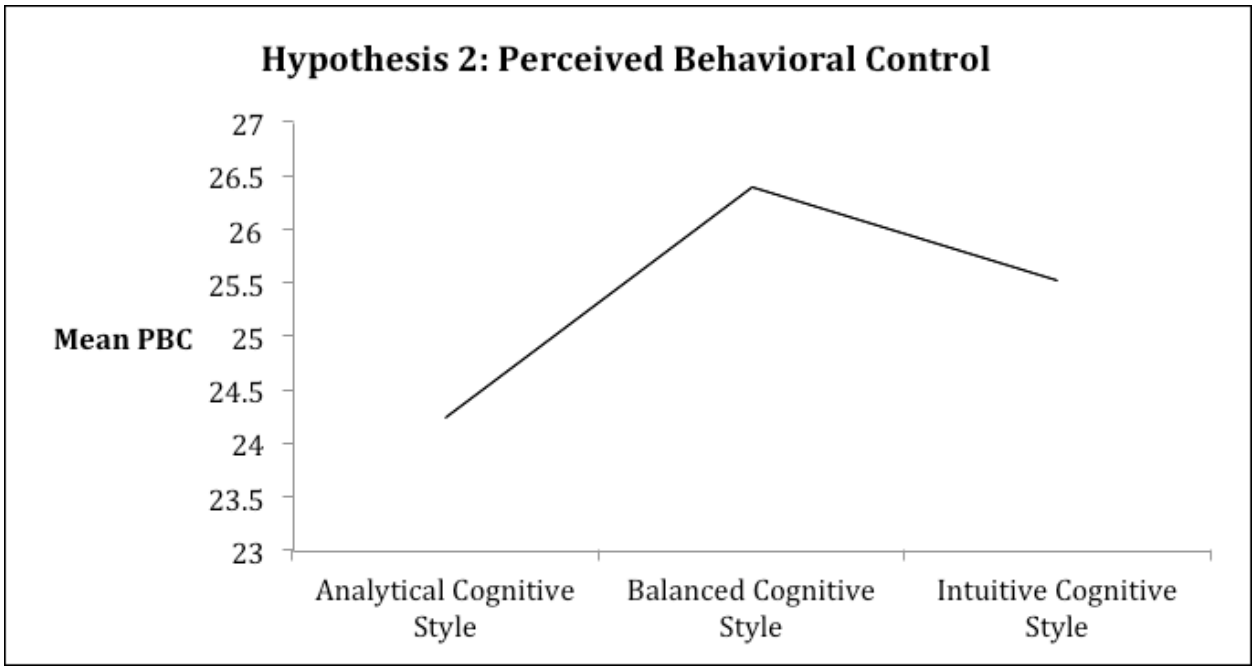
TABLE 1
Descriptive Results for ANOVA Testing Difference in Means Between Cognitive Styles on PA, PBC and EI

Personal Attitude (PA)				
	N	Mean	Std. Deviation	F for the between groups effect (2, 201)
Analytical Cognitive Style	89	19.78	4.81	4.623**
Balanced Cognitive Style	62	22.01	4.04	
Intuitive Cognitive Style	53	20.91	4.37	
Perceived Behavioral Control (PBC)				
	N	Mean	Std. Deviation	F for the between groups effect (2, 201)
Analytical Cognitive Style	89	24.24	6.03	2.546*
Balanced Cognitive Style	62	26.39	5.62	
Intuitive Cognitive Style	53	25.53	5.77	
Entrepreneurial Intent (EI)				
	N	Mean	Std. Deviation	F for the between groups effect (2, 201)
Analytical Cognitive Style	89	23.47	8.82	3.715**
Balanced Cognitive Style	62	27.10	7.73	
Intuitive Cognitive Style	53	26.00	8.50	

**significant at .05 level, significant at .1 level

Appendix 2: Anova Results





REFERENCES

Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50(2), 179–211.

Ajzen, I. (2001). Nature and operation of attitudes. Annual Review of Psychology, 52, 27–58.

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

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

Autio, E., Keeley, R.H., Klofsten, M., Parker, G.G.C., & Hay, M. (2001). Entrepreneurial intent among students in Scandinavia and in the USA. Enterprise and Innovation Management Studies, 2(2), 145–160.

Bandura, A. (1997). Self-efficacy: The exercise of control. New York: Freeman.

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 & Organizational Studies, 13(4), 86–104.

Baron, R. (2004). The cognitive perspective: A valuable tool for answering entrepreneurship's basic "why" questions. Journal of Business Venturing, 19, 221–239.

Blume, B. D., & Covin, J. G. (2011). Attributions to intuition in the venture founding process: Do entrepreneurs actually use intuition or just say that they do?. Journal of Business Venturing, 26(1), 137-151.

Busenitz, L.W. & Lau, C.M. (1996). A cross-cultural cognitive model of new venture creation. Entrepreneurship Theory and Practice, 20(4), 25–39.

Brigham, K.H., De Castro, J.O., & Shepherd, D.A. (2007). A person-organization fit model of ownermanagers' cognitive style and organizational demands. Entrepreneurship Theory and Practice, 31(1), 29–51.

Busenitz LW, Barney JB. 1997. Differences between entrepreneurs and managers in large organizations: biases and heuristics in strategic decision-making. J. Bus. Ventur. 12(1):9–30

Epstein, S., Pacini, R., Denes-Raj, V., Heier, H., 1996. Individual differences in intuitive-experiential and analytical rational thinking styles. Journal of Personality and Social Psychology 71 (2), 390–405.

Fayolle, A., and B. Gailly (2009). “Assessing the Impact of Entrepreneurship Education: A methodology and Three Experiments from French Engineering Schools,” in Handbook of University-Wide Entrepreneurship Education. Eds. G. P. West, E. J. Gatewood and K. G. Shaver. Northampton, MA: Edward Elgar, 203–214.

Fayolle, A., Gailly, B. and Lassas-Clerc, N. (2006), “Assessing the impact of entrepreneurship education programmes: a new methodology”, Journal of European Industrial Training, 30 (9), 701-20.

Ho, K. T. (1988). The dimensionality and occupational discriminating power of the Herrmann Brain Dominance Instrument. Unpublished Dissertation, BrighamYoung University, Provo,UT.

Hunt, H. K., & Robinson, P. B. (1996). A comparison of four scales predicting entrepreneurship. LETTER FROM THE EDITORS, 1(2), 56.

Kickul, J., L. K. Gundry, S. D. Barbosa and L. Whitcanack (2009). ‘Intuition versus analysis: testing differential models of cognitive style in entrepreneurial self-efficacy and new venture creation process’, Entrepreneurship Theory and Practice, 33, 439–453.

Koellinger P, Minniti M, Schade C. 2007. “I think I can, I think I can”: overconfidence and entrepreneurial behavior. J. Econ. Psychol. 28(4), 502–27

Kolvereid, L. (1996a). Organizational employment versus self-employment: Reasons for career intentions. Entrepreneurship Theory and Practice, 20(3), 23–31.

Kolvereid, L. (1996b). Prediction of employment status choice intentions. Entrepreneurship Theory and Practice, 21(1), 47–57.

Kozhevnikov, M., 2007. Cognitive styles in the context of modern psychology: toward an integrated framework of cognitive style. Psychological Bulletin 133 (3), 464–481.

Krueger, N.F., Jr. (2003). The cognitive psychology of entrepreneurship. In Z. Acs & D.B. Audrestsch (eds.), Handbook of entrepreneurial research. London: Kluwer Law International.

Krueger, N. F., & Kickul, J. (2006). So You Thought the Intentions Model Was Simple? Navigating the Complexities and Interactions of Cognitive Style, Culture, Gender, Social Norms, and Intensity on the Pathway to Entrepreneurship. Paper presented at the 2006 United States Association Small Business and Entrepreneurship Conference.

Krueger, N.F., 2007. What lies beneath? The experiential essence of entrepreneurial thinking. Entrepreneurship Theory and Practice 31 (1), 123–138.

Krueger, N.F., Reilly, M.D., & Carsrud, A.L. (2000). Competing models of entrepreneurial intentions. Journal of Business Venturing, 15(5–6), 411–432.

Krueger, N.F. & Carsrud, A.L. (1993). Entrepreneurial intentions: Applying the theory of

planned behaviour. Entrepreneurship and Regional Development, 5, 315–330.

Liñán, F. (2004). Intention-based models of entrepreneurship education. Piccola Impresa/Small Business, 2004(3), 11–35.

Liñán, F. (2007). “The Role of Entrepreneurship Education in the Entrepreneurial Process,” in Handbook of Research in Entrepreneurship Education. Ed. A. Fayolle. Cheltenham: Edward Elgar, 230–247.

Liñán, F., and Y. Chen (2009). “Development and Cross-Cultural Application of a Specific Instrument to Measure Entrepreneurial Intentions,” Entrepreneurship Theory and Practice 33(3), 593–617.

Mitchell, R.K. (1994). The composition, classification, and creation of new venture formation expertise. Unpublished doctoral dissertation, University of Utah.

Mitchell, R.K. (2005). Tuning up the global value creation engine: The road to excellence in international entrepreneurship education. In J.A. Katz & D. Shepherd (Eds.), Cognitive approaches to entrepreneurship research in advances, vol. 6, entrepreneurship, firm emergence and growth (pp. 185–248). Greenwich, CT: JAI Press.

Mitchell, J.R., Friga, P.N., Mitchell, R.K., 2005. Untangling the intuition mess: intuition as a construct in entrepreneurship research. Entrepreneurship Theory and Practice 29, 653–679.

Mitchell, R.K., Busenitz, L., Lant, T., McDougall, P.P., Morse, E.A., & Smith, B. (2002). Entrepreneurial cognition theory: Rethinking the people side of entrepreneurship research. Entrepreneurship Theory and Practice, 27(2), 93–104

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.

Mitchell, R.K., Smith, J.B., Morse, E.A., Seawright, K., Peredo, A.M., & McKenzie, B. (2002). Are entrepreneurial cognitions universal? Assessing entrepreneurial cognitions across cultures. Entrepreneurship Theory and Practice, 26(4), 9–32.

Mitchell, R.K., L.W. Busenitz, B. Bird, C.M. Gaglio, J.S. McMullen, and E.A. Morse. 2007. The central question in entrepreneurial cognition research 2007. Entrepreneurship Theory and Practice 31 (1), 1–27.

Mitchell, R. K., B. T. Mitchell, J. R. Mitchell (in press 2009). "Entrepreneurial Scripts and Entrepreneurial Expertise: The Information Processing Perspective." Submitted to The Handbook of Entrepreneurship: the Entrepreneurial Mind. New York: Springer Publishing Company.

Neisser, U. (1967). Cognitive Psychology. New York: Appleton-Century-Crafts.

Ornstein, R.E. (1977). The psychology of consciousness. New York: Harcourt Brace.

Sadler-Smith, E. & Badger, B. (1998). Cognitive style, learning, and innovation. Technology Analysis and Strategic Management, 10(2), 247–265.

Sarasvathy, S. (2004). Making it happen: Beyond theories of the firm to theories of firm design. Entrepreneurship Theory and Practice, 28(6), 519–531.

Segal G, Borgia D, Schoenfeld J (2005) The motivation to become an entrepreneur. Int J Entrep Behav Res 11(1), 42–57

Shane, S. & Vankataraman, S. (2000). The promise of entrepreneurship as a field of research. The Academy of Management Review, 25(1), 217–226.

Sheil, A. and Violanti, M. T. , 2008-05-22 "The Role of Brain Dominance in the Communication Feedback Process" Paper presented at the annual meeting of the International Communication Association, TBA, Montreal, Quebec, Canada Online

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), 815-844

Solomon, G. T., S. Duffy, and A. Tarabishy (2002). “The State of Entrepreneurship Education in the United States: A Nationwide Survey and Analysis,” International Journal Of entrepreneurship Education 1(1), 65–86.

Winslow, E. K., & Solomon, G. T. (1989). Further development of a descriptive profile of entrepreneurs. The Journal of Creative Behavior, 23(3), 149-161.