COGNITIVE STYLE DIFFERENCES OF NOVICE SERIAL AND PORTFOLIO ENTREPRENEURS: A TWO-SAMPLE TEST

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COGNITIVE STYLE DIFFERENCES OF NOVICE SERIAL AND PORTFOLIO ENTREPRENEURS: A TWO-SAMPLE TEST

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ABSTRACT

Based on research and conceptualizations of cognition, we propose a model that provides a process explanation for habitual entrepreneurship. The model includes three paths that illustrate how distinct push and pull factors may influence an owner-manager to engage in habitual entrepreneurship. We propose that a more intuitive (less rational) cognitive style operates as a direct pull factor and influences other pull and push factors through the greater tendencies to (1) be attracted to entrepreneurial contexts, (2) recognize new opportunities, and (3) experience negative psychosocial outcomes in formal organizations. Empirical tests provide support for our basic premise that an intuitive cognitive style is associated with entrepreneurial behavior in general and habitual entrepreneurship.

INTRODUCTION

In the extant entrepreneurship literature, entrepreneurs have largely been treated as a homogeneous group. However, a growing literature recognizes that entrepreneurs are in fact heterogeneous with respect to their cognitions (Busenitz and Barney, 1997; Mitchell et al., 2002; 2007) and what differences in cognitive processing lead to different entrepreneurial behaviors and outcomes (Baron, 1998, 2004; Mitchell et al., 2002; 2007). The importance of cognition in the field of entrepreneurship was emphasized by a recent special issue of Entrepreneurship Theory and Practice dedicated to entrepreneurial cognition in which Mitchell et al. (2007) argue that entrepreneurial behavior is influenced by cognitions and that those cognitions may not follow the normative/rational model. These cognitions are “knowledge structures used to make assessments, judgments, or decisions involving opportunity evaluation, venture creation, and growth,” and are fundamental to understanding entrepreneurial behavior (Mitchell et al., 2002, p. 97).

With respect to behavior, researchers (MacMillan, 1986; Westhead and Wright, 1998) have differentiated between entrepreneurs with no previous entrepreneurial experience (novice entrepreneurs) and those who have pursued entrepreneurship prior to their current venture (habitual entrepreneurs). Researchers studying novice, habitual, and portfolio entrepreneurship suggest that these different types of entrepreneurs may think and process information differently, which may help explain the motivations underlying habitual behavior (Ucbasaran et al., 2003). A specific call has been made for more research in this area (Westhead et al., 2005a). Gaining a better understanding of habitual entrepreneurs may offer insights into the broader entrepreneurial process (MacMillan, 1986; Starr and Bygrave, 1991) and have important implications for practitioners, economic growth, and public policy decisions (Westhead et al., 2003). In this paper, we propose a model (see Figure I) that outlines how an individual owner-manager’s cognitive style may lead to habitual entrepreneurship through multiple paths.

This paper proceeds as follows. First, we briefly review the literature on habitual
entrepreneurship. Then, we describe our conceptual model, which is based on the entrepreneurial cognition approach, and illustrate the relationships between cognitive style and push and pull forces that would likely be associated with habitual ownership. Next, we develop a series of hypotheses relating to the relationship between cognitive style and both entrepreneurship and specifically habitual ownership behaviors and test these using a two-sample design. Finally, we present results, and discuss the implications of our findings.

**HABITUAL ENTREPRENEURSHIP**

The classification of entrepreneur ownership type used in this paper is consistent with those developed by Westhead and Wright (1998), and by Westhead et al. (2003). Novice entrepreneurs are individuals with no prior minority or majority business ownership experience. Habitual entrepreneurs are individuals with prior minority or majority business ownership experience. Serial and portfolio are subsets as habitual entrepreneurs. Serial entrepreneurs have ownership, one at a time, of a series of businesses. Portfolio entrepreneurs have simultaneous ownership in two or more businesses.

Habitual entrepreneurs make up a substantial portion of the entrepreneur population. Westhead and Wright (1998) reviewed studies in the U. K. indicating that the proportion of habitual entrepreneurs within varied samples ranged from 11.5 to 45.5 percent. In the U. S., the incidence of habitual entrepreneurship across samples has ranged from 51 percent to as high as 63 percent (Ucbasaran et al., 2003). Carter and Ram (2003) reported that portfolio entrepreneurship rates vary by industry, gender, ethnicity, and geographic region with rates of portfolio entrepreneurship in these different segments ranging from 12 percent to 38 percent. Despite the variance in rates, habitual entrepreneurs are an important subset of entrepreneurs who make a sizeable contribution to societal wealth creation (Scott and Rosa, 1996).

Carter and Ram (2003) argue that the extant literature has given little attention to the factors and processes underlying habitual entrepreneurship. Researchers have begun to recognize that individual cognitions and decision-making may play a role in habitual entrepreneurship. Ucbasaran et al. (2003) espoused the potential benefits of a cognitive perspective and issued a call for future studies that measure and compare cognitive styles across novice, serial, and portfolio entrepreneurs. Westhead et al. (2005a) reported significant differences between the three types of entrepreneurs regarding information search and opportunity recognition behaviors. Westhead et al. (2005a, 2005b) concluded that these different types of entrepreneurs possess different cognitive mindsets and that future research should examine these differences.

Entrepreneurs are not homogeneous and may behave differently due, in part, to their distinctive approaches towards gathering and processing information, and making decisions based on that information. We argue that these cognitive differences may be a critical factor in understanding why some entrepreneurs will remain novice entrepreneurs while others will become serial and portfolio entrepreneurs over time. In the next section, we describe the key components of our process model illustrating the relationships between individual cognitions and habitual entrepreneurial behavior.

**COGNITION AND HABITUAL ENTREPRENEURSHIP: A CONCEPTUAL MODEL**

Based on theory and empirical research, the model in Figure I presents three distinct paths for how an entrepreneur’s cognitive style might directly and indirectly influence different types of entrepreneurship behavior. Path 1 shows that an intuitive cognitive style will be directly related
with pursuing entrepreneurship as a general “pull” factor. Path 2 shows that an intuitive style will lead to greater opportunity recognition. The recognition of an attractive opportunity acts to “pull” individuals towards entrepreneurship, either through an initial business (novice) or subsequent (serial) or concurrent (portfolio) ownership. Path 3 shows that an intuitive style may interact with the levels of formal structure in an owner’s firm (cognitive misfit) and adversely influence individual attitudes and intentions. These negative psychosocial outcomes may act to “push” individuals out of their current firms to varying degrees. This is an integral and important step in moving from a novice entrepreneur to a habitual entrepreneur. The main components of the model and theoretical foundations are presented and developed in the rest of this section.

**Push and Pull Factors**

Several researchers have attempted to model the relationship between supply and demand factors that can serve to either “push” and/or “pull” an individual towards exiting a current organization and starting a new venture (Shapero and Sokol, 1982; Vesper, 1983). In particular, Vesper introduces the notion of entrepreneurship “as a path for pursuit of occupational happiness” (1983, p. 40). Vesper defines personal pushes as “negative aspects of present employment which cause individuals to look for something else, either another job or a start-up” (1983, p. 39). For example, unemployment and discontent with work are possible push variables. Conversely, pull factors can draw an individual toward new venture formation. For example, individuals may be pulled by the lure of independence, the chance to pursue an idea, an attractive market opportunity, offers of financial support, and performance rewards (Vesper, 1983). These personal pushes and pulls are described as “impelling forces” (Vesper, 1983, p. 38), which play an important role in an individual’s decision of whether to leave an organization and start a new venture. The core element of our model is the linking of cognitive style, both directly and through other relevant push and pull factors, to the likelihood of engaging in novice, serial, and portfolio entrepreneurship.

**Cognitive Style**

Cognitive style refers to an individual’s preferred and consistent approach to gathering, processing, and evaluating information (Riding and Rayner, 1998). It affects how people scan the environment for information, interpret this information, and integrate the interpreted information into the theories, models, and schemas that drive their decision-making and behaviors (Hayes and Allinson, 1998). Sadler-Smith and Badger (1998) note that two models and measures from within this family satisfy the criteria for a “style” and are suitable for use in organizational settings. These are the Kirton Adaption-Innovation Inventory (KAI) (Kirton, 1976) and the Cognitive Style Index (CSI) (Allinson and Hayes, 1996).

In 1996, Allinson and Hayes presented the initial theoretical development and validation study for the Cognitive Style Index. The CSI attempts to measure the superordinate intuition-analysis dimension of cognitive style. The CSI measure places individuals on a continuum anchored at one end by a more holistic and heuristic-based logic labeled intuitive. The other end of the continuum is anchored by more analytic and rational-based logic labeled analytic (Allinson and Hayes, 1996).

**Path 1: Intuitive Cognitive Style as a General Pull Factor**

The first path in our model suggests that individuals possessing an intuitive cognitive style will be pulled towards entrepreneurial contexts (see Figure I). Allinson and Hayes (1996) proposed that individuals would have a strong preference for different work contexts based on the match
between their cognitive style and the information processing demands of the context. In organizational settings, analytic individuals will subscribe to the bureaucratic norm and prefer work settings that are oriented towards careful routines, are governed by logic, and are clearly structured and organized. In contrast, intuitive individuals will prefer freedom from rules and regulations, and a work setting that is activity oriented, flexible, and unstructured. Intuitive approaches to information processing are more compatible with entrepreneurial activity than rational approaches (Allinson et al., 2000).

Busenitz and Barney (1997) state that more cautious, methodical, and analyzing decision-makers will be attracted to large organizations, while less rational thinkers and those more susceptible to the use of certain biases and heuristics will prefer an entrepreneurial context. Heuristics are simplifying strategies or mental short cuts that individuals may use when making decisions (Tversky and Kahneman, 1974), and entrepreneurs are more prone to use heuristics in their decision-making than managers (Baron, 1998; Busenitz and Barney, 1997). While the use of heuristics is often associated with non-rational processing and sub-optimal outcomes, employing a heuristic-based logic may be more prevalent and advantageous among entrepreneurs who tend to operate in more time sensitive, uncertain and complex contexts (Bird, 1988; Busenitz and Barney, 1997). Baron (2004) asserts that entrepreneurs possess a more heuristic-based logic and that this plays a role in their decisions to engage in entrepreneurship in the first place.

An intuitive cognitive style, representing a high order heuristic-based logic, is more compatible with an entrepreneurial context. Individuals vary on the intuitive – analytic dimension, and we theorize that more intuitive owners will experience a stronger pull towards an entrepreneurial context than their more analytic counterparts. Over time, this will be manifested as different ownership patterns. Owners who remain with one firm (novice) will be more analytic than owners who are habitual (serial or portfolio). The direct link between cognitive style and entrepreneurial behavior is indicated by the letter “A” in the model (see Figure I).

Path 2: Intuitive Cognitive Style and Opportunity Recognition as a Pull Factor

The second path in the model suggests that an intuitive cognitive style increases opportunity recognition. Recent research provides support for developing theoretical links between cognition, and opportunity identification and “entrepreneurial alertness” (Kirzner, 1973). Mitchell et al. (2007, p. 7) assert that certain individuals are particularly adept at recognizing opportunities and that this may be due to distinct mental processes. Entrepreneurial alertness has been conceptualized as running on a continuum and that a more heuristic-based cognitive approach may be associated with the more alert end of the continuum (Gaglio and Katz, 2001). Thus, more heuristic-based thinking may lead to greater alertness and opportunity recognition and, therefore, it may be a pull factor (Vesper, 1983) to pursue entrepreneurial opportunities.

Ucbasaran et al. (2003) presented a series of propositions relating entrepreneurial cognition (high levels of heuristic-based thinking) to alertness and opportunity identification. They propose that habitual entrepreneurs (with a more entrepreneurial cognition) will be more alert to entrepreneurial opportunities, and recognize more and better opportunities than novice entrepreneurs. These relationships are illustrated in path 2 of our model. Recent empirical evidence supports the specific link between habitual entrepreneurship and opportunity recognition indicated by the letter “C” in path 2. Westhead et al. (2005a) reported that novice, serial, and portfolio entrepreneurs do differ significantly with respect to opportunity identification and that novice entrepreneurs identified significantly fewer opportunities than habitual entrepreneurs. Recent work by Corbett (2005; 2007) provides empirical evidence that there is a significant
relationship between an owner-manager’s more intuitive cognitive style (using the CSI measure) and an increase in opportunities identified. Thus, there is existing empirical support for both links “B and C” in path 2 of the model (see Figure I).

Path 3: Cognitive Misfit as a Push Factor

The third path in our model explicates the relationship between owners’ cognitive styles and the structural aspects of their firms (see Figure I). An intuitive cognitive style is incongruent with higher levels of firm structure. This produces negative attitudes and intentions to exit the firm, possibly serving as a precursor in moving from novice to habitual entrepreneurship. This perspective is consistent with Vesper (1983), who argues that an individual’s negative reactions and discontent with his or her current organizational setting can serve as a strong supply or push factor towards new venture creation.

Brigham et al. (2007) operationalized cognitive misfit as the interaction of an owner-manager’s cognitive style (CSI) and the corresponding levels of formal structure in their firm. In our model, we employ the same approach; the component parts of the construct of cognitive misfit are indicated by the letters “D and E” in the model. We theorize that in more structured firms, intuitive owner-managers will experience more negative psychosocial outcomes than their more analytic counterparts. This relationship is noted by the letter “F” within path 3 of the model. Brigham et al. (2007) reported that, while controlling for a number of factors, the interaction of individual style and the levels of structure at the firm level was a significant predictor of the owner-manager’s expressed attitude of dissatisfaction and intentions to exit. Furthermore, dissatisfaction and intentions to exit were shown to be significant predictors of actual exit over a five year period. This link from attitudes and intentions to actual behavior is noted by the letter “G” in the model. Either exiting or partially disengaging from a firm to become an owner/manager of another firm concurrently would be a prerequisite for becoming a habitual entrepreneur. Thus, there is existing empirical evidence for the link between an intuitive cognitive style, operating through construct of cognitive misfit, to influence individual attitudes, intentions, and actions relevant to habitual entrepreneurial behavior. This supports the relationships indicated by the letters “D, E, and F” within path 3 of the model.

HYPOTHESES

The purpose of this study is to test the general overall association between cognitive style and entrepreneurial behaviors. Surprisingly, there is little empirical evidence supporting the general relationship between an individual’s cognitive style and entrepreneurial and habitual behaviors. In the development of hypotheses, we briefly review several studies that have either used the Kirton Adaption-Innovation Measure or Cognitive Style Index (Allinson and Hayes, 1996) to measure decision-making style. Sadler-Smith and Badger (1998) assert that the respective poles for both the CSI (Analytic – Intuitive) and the KAI (Adaptive – Innovative) share a number of features and that the analyst (CSI) and adaptor (KAI) styles could, for convenience, be grouped together and labeled "analytic," and the intuitive (CSI) and innovative (KAI) styles may be grouped together and labeled as "holistic." While acknowledging that these are different measures, for the sake of generating hypotheses, we will follow Sadler-Smith and Badger (1998) and treat the respective poles of each measure as similar.

If individuals do have preferences for different work environments based on either a dominant analytic or intuitive orientation, then we would expect to find these individuals in occupations that match their dominant style. Research using both the CSI and KAI measures supports this
connection (Allinson and Hayes, 1996; Sadler-Smith et al., 2000) with individuals in more structured professions having significantly more analytic cognitive styles. Examples of these adaptive/analytic groups include bankers, accountants, and those involved mostly in maintenance or production areas (Chan, 1996; Holland, 1987). Conversely, groups that operate in relatively less structured organizational environments possess styles that are significantly more innovative/intuitive. Examples of these intuitive/innovative groups include marketing, personnel, planning, and research and development (Chan, 1996; Holland, 1987).

Work contexts differ in terms of the information-processing demands placed on individuals (Hayes and Allinson, 1998). On average, the context faced by entrepreneurs tends to be more complex and uncertain than that faced by managers in large organizations (Baron, 1998; Busenitz and Barney, 1997; Hambrick and Crozier, 1985). Based on the conceptual model and the previous discussion, we hypothesize that individuals with an intuitive decision-making style will prefer an entrepreneurial context and will engage in some form of entrepreneurship.

**H1**: Founding owner-managers will possess more intuitive cognitive styles (as measured by the CSI) than the general population.

Smith and Miner (1983) proposed that entrepreneurs are more innovative than their managerial counterparts in large U.S. corporations. Buttner and Gryskiewicz (1993) found that entrepreneurs possessed significantly more innovative (using the KAI measure) decision-making styles than managers in large organizations. Allinson et al. (2000) reported that the mean CSI score for Scottish entrepreneurs (high growth owner-managers) was significantly more intuitive than the mean CSI score from previous samples of managers in general. Therefore, we hypothesize that entrepreneurs may possess more intuitive cognitive styles than mainstream managers.

**H2**: Founding owner-managers will possess more intuitive cognitive styles (as measured by the CSI) than managers in large organizations.

Ucbasaran et al. (2003) argued that entrepreneurs can be differentiated based on their greater predilection for heuristic-based thinking and that this can be labeled as entrepreneurial cognition. Ucbasaran et al. (2003) also indicated that the CSI could be a useful measure for differentiating levels of entrepreneurial cognition between novice, serial, and portfolio entrepreneurs. Consistent with Ucbasaran et al. (2003), we theorize that individuals would be more inclined toward novice, serial, or entrepreneurial behavior based on levels of intuitive cognitions.

We are aware of only three studies that have used holistic/analytic measures of decision-making style in an attempt to differentiate between novice and habitual entrepreneurs. Buttner and Gryskiewicz (1993) reported that habitual entrepreneurs (serial and portfolio) were significantly more innovative than novice entrepreneurs using the KAI measure. However, using a sample of 117 entrepreneurs, Young et al. (2002) reported no significant differences between novice, serial, and portfolio entrepreneurs with respect to scores on the CSI. Brigham and De Castro (2003) and Brigham et al. (2007) reported significant correlations between a more intuitive style (CSI) and a greater number of prior businesses owned and/or founded, but did not specifically examine differences between novice, serial, and portfolio entrepreneurs. Despite somewhat mixed results, consistent with the rationale presented above, we hypothesize that different entrepreneurial ownership patterns may be associated with cognitive decision-making styles.

**H3a**: Habitual entrepreneurs will possess more intuitive cognitive styles (as measured by the CSI) than novice entrepreneurs.
**H3b:** Serial entrepreneurs will possess more intuitive cognitive styles (as measured by the CSI) than novice entrepreneurs.

**H3c:** Portfolio entrepreneurs will possess more intuitive cognitive styles (as measured by the CSI) than novice entrepreneurs.

**H3d:** Portfolio entrepreneurs will possess more intuitive cognitive styles (as measured by the CSI) than serial entrepreneurs.

As shown in our conceptual model, cognitive style may influence entrepreneurial ownership behaviors through one or more paths. If a more intuitive cognitive style is related to habitual ownership as we have theorized, then it should be a valid predictor of habitual entrepreneurship. Thus we propose the following hypothesis:

**H4:** Cognitive style will be a significant predictor of group membership for habitual entrepreneurs.

**METHODS**

**Samples**

To test our hypotheses, we employ a two-sample design. This allows us to test our hypothesized relationships across two samples of founding owner managers of SMEs. The two samples are described below.

**High Technology Firms.** The first sampling frame consisted of an existing database comprised of companies listed in the 2000 Rocky Mountain High Technology Directory. Companies were included if they develop and/or manufacture proprietary products that incorporate state of the art technology or demonstrate significant technical expertise. Subsidiaries and not-for-profit companies were excluded from the sampling frame.

From the total number of 1791 companies listed in the directory, 1294 were retained for inclusion in the study. A total of 267 usable questionnaires were returned constituting an effective response rate of 22.1%. For the present study, a smaller sub-sample of the original data set was used. This set included only those respondents who were founders of the surveyed firm, were members of the top management team, currently had ownership, were involved in the day-to-day operations of the firm, and whose firms were privately held and had less than 250 full-time employees. This left 182 founding owner-managers in the current sub-sample for which the hypotheses in this study were tested.

**Family Firms.** The original completed database consisted of 393 identified family businesses. In 2002, a follow up study on these firms that had completed the original survey was conducted. 211 new questionnaires were received. To make comparisons to the high technology group described above, it was necessary to further refine our sample. Again, the final subset included only those respondents who were founders of the surveyed firm, were members of the top management team, currently had ownership, were involved in the day-to-day operations of the firm, and whose firms were privately held and had less than 250 full-time employees. This left 109 founding owner-managers in the current family firm sub-sample for which the hypotheses in this study were tested.
Variables and Measures

**Cognitive Style.** The Cognitive Style Index (Allinson and Hayes, 1996) consists of 38 items and produces a possible range of scores from 0 to 76. The closer the individual’s total CSI score to the maximum of 76, the more analytical the respondent. The nearer the total CSI score to 0, the more intuitive the respondent. Previous research (Allinson and Hayes, 1996; Sadler-Smith et al. 2000) has demonstrated that the CSI displays good temporal stability and both construct and concurrent validity. For the high tech sample, \( \alpha = .88 \). For the family firm sample, \( \alpha = .87 \).

**Novice and Habitual (Serial & Portfolio) Ownership.** Based on responses to several items, individuals were classified according to the definitions of entrepreneurial types presented earlier.

**Satisfaction** was measured using a five item scale developed by Quinn and Staines (1979). For both samples \( \alpha = .88 \). **Firm performance** was measured by a single item where the respondent was asked to rate the current profit performance of his or her firm versus the competition. Finally, we coded for the *owner’s age* and *gender* using single questions.

Data Analysis

SPSS software was used to conduct the statistical analyses in this study. ANOVA tests were used to compare group means for normally distributed continuous variables such as the CSI. Simple t-tests were employed for comparing CSI group scores of the entrepreneurs in our sample to other established group CSI scores. T tests were used to test hypotheses 1 and 2 by using theorized and established mean CSI scores of the general population and managers. ANOVA and discriminant analysis were conducted to test hypotheses 3 and 4.

RESULTS

Based on the classification by ownership type, for the high technology sample 73 (40%) of the respondents were novice entrepreneurs, and 109 (60 %) were habitual entrepreneurs. Within the set of habitual entrepreneurs, 51 (28 % overall; 47 % of habitual) were serial entrepreneurs, and 58 (32 % overall; 53 % of habitual) were portfolio entrepreneurs.

The mean score on the CSI for our high technology sample was 34.6. Scores ranged from 6 to 69, and the standard deviation was 13. Simple t-tests revealed that owner-managers scored significantly more intuitive on the Cognitive Style Index than the theoretical population mean (Allinson and Hayes, 1996) of 38.5 (t (182) = -2.90, p <.01) and than managers in general (using a score of 37.5 reported by Allinson et al. (2000) for a sample of 257 managers (t (439) = -3.94, p <.001). These results support Hypotheses 1 and 2.

Based on the classification by ownership type, for the family firm sample 48 (44 %) of the respondents were novice entrepreneurs, and 61 (56 %) were habitual entrepreneurs. Within the set of habitual entrepreneurs, 32 (29 % overall; 52 % of habitual) were serial entrepreneurs, and 29 (27 % overall; 48 % of habitual) were portfolio entrepreneurs.

The mean score on the CSI for the family firm sample was 39.01. Scores ranged from 9 to 70, and the standard deviation was 12. Simple t-tests revealed that owner-managers did not score significantly different on the Cognitive Style Index than the theoretical population mean (Allinson and Hayes, 1996) of 38.5 (t (109) = .42, p >.05) and than managers in general (using a score of 37.5 reported by Allinson et al. (2000) for a sample of 257 managers (t (316) = 1.19, p >.05).
Thus, hypotheses 1 and 2 were not supported in the family firm sample.

The results of an ANOVA test for cognitive style scores by novice, serial, and portfolio entrepreneurs in both samples are presented in Table I. A test of homogeneity of variances was not significant, indicating that this assumption was not violated in either sample. For the high technology sample, the overall test (F Statistic) for different mean scores was significant \( p = .005 \). Novice entrepreneurs had a group mean score of 38.1, which is close to the theoretical population mean score (38.5) and past reported scores of general managers (37.5). Portfolio entrepreneurs were significantly more intuitive than novice entrepreneurs \( p < .001 \) and were the most intuitive group on the CSI measure with a mean score of 30.5. Habitual entrepreneurs (serial and portfolio combined) were significantly more intuitive than novice entrepreneurs \( p < .01 \). As a result of these analyses, hypotheses \( H3a \) and \( H3c \) are supported. \( H3b \) was not supported. Also, while portfolio entrepreneurs were more intuitive than serial entrepreneurs, this difference was not statistically significant, and \( H3d \) is not supported. A more rigorous test for differences may require a larger subject population or a more mature group of entrepreneurs who have had sufficient time to fully develop entrepreneurial opportunities and exhibit different ownership behaviors.

For the family firm sample, the overall test (F Statistic) for different mean scores was significant \( p = .011 \). Novice entrepreneurs had a group mean score of 43.3, which is higher than the theoretical population mean score (38.5) and past reported scores of general managers (37.5). Serial entrepreneurs were the most intuitive group on the CSI measure with a mean score of 34.5, and were significantly more intuitive than novice entrepreneurs \( p < .01 \). Portfolio entrepreneurs were significantly more intuitive than novice entrepreneurs \( p < .05 \) and habitual entrepreneurs (serial and portfolio) were significantly more intuitive than novice entrepreneurs \( p < .05 \). As a result of these analyses, hypotheses \( H3a, H3b, \) and \( H3c \) are supported. \( H3d \) is not supported.

The final test conducted was a discriminant analysis to predict whether the respondents would be correctly classified as novice or habitual entrepreneurs. Along with cognitive style, the respondents age, gender, perceived firm performance, and level of job satisfaction were entered as predictor variables. These additional variables were chosen based on indications from previous research that they might be associated with habitual entrepreneurship and that the same measure was available for both samples. While other variables could have been included, the goal of this test was not to maximize the predictive ability of the function. Rather, it was to test the predictive ability of cognitive style while including other relevant variables.

The previous results show prima facie evidence for differences in cognitive style between entrepreneurs and other groups and within group differences between different types of entrepreneurs. A subsequent discriminant analysis, focused on testing the predictive ability of cognitive style and other variables in predicting group membership between novice and habitual entrepreneurs was performed on both samples with habitual entrepreneurship as the DV and cognitive style, gender, age, performance and satisfaction as predictor variables. The discriminant analysis model is not presented in tabular form due to space limitations.

For the high technology sample, a total of 177 cases were analyzed. Univariate ANOVAs revealed that the novice and habitual entrepreneurs differed significantly on the cognitive style, gender, satisfaction, and performance predictor variables. Respondent age was not significant. A single discriminant function using prior probabilities was calculated. The value of this function was significantly different for novice and habitual entrepreneurs (chi square = 18.65, df = 5, \( p < .01 \)). The correlations between predictor variables and the discriminant function suggest that cognitive style and gender were the best predictors of habitual entrepreneurship. Cognitive style was
negatively correlated with the discriminant function value, suggesting that more intuitive founding owner-managers were more likely to be habitual entrepreneurs. Gender was positively correlated, suggesting that female founding owner-managers were less likely to be habitual entrepreneurs than their male counterparts. Additionally, respondents with higher levels of individual job satisfaction and greater perceived firm performance were more likely to be habitual entrepreneurs. Overall, the discriminant function successfully predicted outcome for 67.2% of cases, with accurate predictions being made for 38% of novice entrepreneurs and 86.8% of habitual entrepreneurs.

For the family firm sample, a total of 106 cases were analyzed. Univariate ANOVAs revealed that the novice and habitual entrepreneurs differed significantly on cognitive style and gender. Respondent age, satisfaction, and performance were not significant predictor variables. A single discriminant function using prior probabilities was calculated. The value of this function was significantly different for novice and habitual entrepreneurs (chi square = 25.79, df = 5, p < .001). The correlations between predictor variables and the discriminant function suggest that cognitive style and gender were again the best predictors of habitual entrepreneurship. Cognitive style was positively correlated with the discriminant function value (which was in the opposite direction of the function for the high tech sample), suggesting that more intuitive founding owner-managers were more likely to be habitual entrepreneurs. Gender was negatively correlated, suggesting that female founding owner-managers were less likely to be habitual entrepreneurs than their male counterparts. Overall, the discriminant function successfully predicted outcome for 69.8% of cases, with accurate predictions being made for 59.6% of novice entrepreneurs and 78% of habitual entrepreneurs. Cognitive style was a strong and significant predictor of habitual entrepreneurship in both samples.

DISCUSSION

In this paper, we extend the recent work on the cognition of entrepreneurs to investigate novice, serial, and portfolio ownership behavior. The empirical tests show that, on average, the founding owner-managers in our high technology sample were significantly more intuitive (as measured by the CSI) than the general population and managers. However, there was no significant difference for the family firm sample. In addition, within our two samples of owner-managers, habitual entrepreneurs (both serial and portfolio) were significantly more intuitive than novice entrepreneurs. Cognitive style was a significant predictor of habitual entrepreneurship in the discriminant function for both samples and the overall function demonstrated strong predictive ability. These results offer general support for the fundamental relationship between cognitive style and habitual ownership behavior and our basic premise that cognitive style may be an important construct for discriminating between entrepreneurs and non-entrepreneurs, and between different types of entrepreneurs.

While the full testing of the model was not possible using the secondary data available for this study, future research employing more sophisticated statistical analyses and longitudinal designs should examine the amount of variance accounted for through different paths and the degree to which the paths act in combination. If cognitive style influences habitual behavior through a variety of factors as we have argued and modeled, then the aggregate effect of an intuitive cognitive style might be quite large. Furthermore, when identifying differences between novice, serial, and portfolio entrepreneurs, researchers are dealing with potentially “nested” groups. Individuals classified as novice entrepreneurs may eventually become serial and/or portfolio entrepreneurs. More complete ownership histories across an entrepreneur’s entire career would offer advantages. The existence of potentially nested groups and the time-dependent nature of
classifications could explain the wide ranges of reported incidences of habitual entrepreneurship across different studies. Nesting effects might also limit one’s ability to detect differences among groups, such as the non-significant findings on CSI scores between novice, serial, and portfolio entrepreneurs reported by Young et al. (2002). Finally, we acknowledge that the decision to either fully exit before becoming involved with another firm versus maintaining concurrent ownership is likely very complex and influenced by a number of individual, firm, and environmental-level factors beyond what was examined in this paper.

Managing a new venture through the stages of start-up to a professionally managed business is generally problematic for entrepreneurs (Hambrick and Crozier, 1985), and it is rare to find an individual who possesses all the attributes necessary to successfully lead a business to maturity (Stevenson and Jarillo, 1990). Founders often have little interest and reduced capacities for managerial routines associated with the latter stages of business development (Willard et al., 1992). The value of founders may diminish as the business matures and the founders are often replaced by professional managers as firm size increases (Boeker and Karichalil, 2002). Starr and Bygrave (1991) argue that prior business ownership of the owner/founder might be a liability. Carter and Ram (2003) report that no prior studies have been robust in directly linking habitual ownership with increased firm performance. Habitual entrepreneurs may possess a dominant logic (Prahalad and Bettis, 1986) that was successful and reinforced with a prior venture, but is not beneficial in a new context (Baron, 2006; Wright et al., 1998). As reported in this study, habitual entrepreneurs possess a more intuitive cognitive style than novice entrepreneurs. Highly intuitive entrepreneurs who cognitively function at an abstract level may overlook important organizational realities and may not adequately “mind the store.”

CONCLUSION

Macmillan (1986) stated that to really understand entrepreneurship, we should study habitual entrepreneurs. More recently, there have been several calls for studies comparing habitual entrepreneurs using cognitive measures and, specifically, measures of cognitive style (Ucbasaran et al., 2003; Westhead et al., 2005b). In this study, we found both significant between and within group differences for entrepreneurs with respect to cognitive style. In addition, we presented a conceptual model extending theory relating to how an intuitive cognitive style may operate as a general pull factor and, likely in combination, influence other pull and push forces that are directly related to habitual business ownership. This study makes an important contribution by extending the cognitive perspective to the process of habitual ownership behavior.

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Figure I: Model of Cognitive Style, Push and Pull Factors, and Habitual Entrepreneurship

Firm (Formal Structure Levels) → Cognitive Misfit (Push Factor) → Psychosocial Outcomes and Intentions → Path 1

Intuitive Cognitive Style (Pull Factor) → Opportunity Recognition (Pull Factor) → Path 2

Path 3: Habitual Entrepreneurship (Serial & Portfolio)

- Novice
- Habitual (Serial & Portfolio)
Table 1: Cognitive Style by Ownership Type (High Tech Sample, n=182)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Novice (n = 73)</th>
<th>Serial (n = 51)</th>
<th>Portfolio (n = 58)</th>
<th>ANOVA F Statistic</th>
<th>Sig. Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Style (CSI)</td>
<td>5.46</td>
<td></td>
<td></td>
<td></td>
<td>.005</td>
</tr>
<tr>
<td>Mean</td>
<td>38.1</td>
<td>34.3</td>
<td>30.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
*a* Statistically significant difference between novice and habitual owners at least at the .01 level;
*b* Statistically significant difference between novice and portfolio owners at least at the .001 level;

Table 2: Cognitive Style by Ownership Type (Family Firm Sample, n=109)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Novice (n = 48)</th>
<th>Serial (n = 32)</th>
<th>Portfolio (n = 29)</th>
<th>ANOVA F Statistic</th>
<th>Sig. Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Style (CSI)</td>
<td>4.73</td>
<td></td>
<td></td>
<td></td>
<td>.011</td>
</tr>
<tr>
<td>Mean</td>
<td>43.3</td>
<td>34.5</td>
<td>37.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
*a* Statistically significant difference between novice and habitual owners at least at the .05 level;
*b* Statistically significant difference between novice and serial owners at least at the .01 level;
*c* Statistically significant difference between novice and portfolio owners at least at the .05 level.