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Opportunity Recognition as the Detection of Meaningful Patterns: Evidence from Comparisons of Novice and Experienced Entrepreneurs

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It is suggested that the recognition of new business opportunities often involves pattern recognition—the cognitive process through which individuals identify meaningful patterns in complex arrays of events or trends. Basic research on pattern recognition indicates that cognitive frameworks acquired through experience (e.g., prototypes) play a central role in this process. Such frameworks provide individuals with a basis for noticing connections between seemingly independent events or trends (e.g., advances in technology, shifts in markets, changes in government policies, etc.), and for detecting meaningful patterns in these connections. We propose that ideas for new products or services often emerge from the perception of such patterns. New business opportunities are identified when entrepreneurs, using relevant cognitive frameworks, "connect the dots" between seemingly unrelated events or trends and then detect patterns in these connections suggestive of new products or services. To obtain evidence on these proposals, we compared the "business opportunity" prototypes of novice (first-time) and repeat (experienced) entrepreneurs—their cognitive representations of the essential nature of opportunities. As predicted, the prototypes of experienced entrepreneurs were more clearly defined, richer in content, and more concerned with factors and conditions related to actually starting and running a new venture (e.g., generation of positive cash flow) than the prototypes of novice entrepreneurs. These findings offer support for the view that pattern recognition is a key component of opportunity recognition.

Key words: entrepreneurship; opportunity recognition; cognition and entrepreneurship
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When written in Chinese, the word crisis *is composed of two characters. One represents danger and the other represents opportunity.*
—John F. Kennedy (1959)

The field of entrepreneurship generally concurs with Kennedy's words, recognizing both the risks of starting new ventures and the potential opportunities that doing so provides. In fact, entrepreneurship researchers have focused considerable attention on investigating the nature of opportunity recognition—the process through which ideas for potentially profitable new business ventures are identified by specific persons (e.g., Kirzner 1979, Shane 2003). Research on opportunity recognition has added greatly to our understanding of this aspect of the entrepreneurial process and, taken as a whole, provides clear evidence for the role of several key factors in its occurrence. For example, many studies point to the importance of engaging in an active search for opportunities. Indeed, there is considerable empirical support for Shane's (2003) suggestion that access to and attainment of appropriate information plays a crucial function in opportunity recognition (e.g., Gaglio and Katz 2001, Hills and Shrader 1998, Kaish and Gilad 1991).

Similarly, additional studies have reported evidence indicating that alertness, defined by Kaish and Gilad (1991, p. 48) as "a unique preparedness to recognize opportunities when they exist…" also influences opportunity recognition. As noted by Shane (2003), alertness rests, at least in part, on cognitive capacities of individuals—capacities such as high intelligence and creativity (e.g., Vesalainen and Pihkala 1999). These capacities help specific persons identify new solutions to market and customer needs in existing information, and to imagine new products and services that do not currently exist (Hills et al. 2002). As such, they play a key role in the identification of new business opportunities.[1]

[1] It should be noted that alertness is distinct, at least to a degree, from the related concepts of "mindfulness" or "heedfulness" (e.g., Weick 1996). These terms refer to general tendencies to process incoming information in systematic and effortful ways, while alertness refers primarily to receptivity to opportunities—noticing them when they exist.

Many other factors have also been found to influence opportunity recognition, including prior knowledge of a field or industry (e.g., Shane 2001, McKelvie and Wicklund 2004), specific search strategies, potential entrepreneurs' social networks (e.g., Ozgen and Baron 2006, Singh et al. 1999), and a wide range of cognitive factors, including attributions and intentions (e.g., Krueger 2003). While this prior research has added greatly to our knowledge of opportunity recognition, it does not, in general, address one fundamental question: What is the basic nature of this process? In other words, how does opportunity recognition actually occur in the minds of specific persons? If it is assumed that the recognition of new business opportunities does indeed involve cognitive events and processes experienced by individuals, then one possible strategy for addressing this question involves applying the theories and methods of cognitive science to this task.

One topic long investigated by cognitive science that may be closely related to the identification of new business opportunities, and to the cognitive events and processes that lead to such identification, is *pattern recognition*—the process through which individuals identify meaningful patterns in complex arrays of events or trends (e.g., Matlin 2005). Applying pattern recognition to the identification of business opportunities, it seems possible that specific persons recognize opportunities for new ventures because they perceive connections between apparently independent events (e.g., advances in technology, changes in markets, shifts in government policies, to mention a few possibilities), and then detect meaningful patterns in these connections—patterns that point to new business opportunities.

Another aspect of theories of pattern recognition with important implications for understanding opportunity recognition is the suggestion that cognitive frameworks, developed through individuals' unique life experiences, play a crucial role in pattern recognition. Theories of pattern recognition suggest that these cognitive frameworks serve as templates (patterns or guides), assisting specific persons to recognize connections between apparently independent events and trends and to detect meaningful patterns in these connections. This aspect of pattern recognition theories suggests an intriguing explanation for the fact that particular business opportunities are recognized by specific persons but not by others. Briefly, the persons who recognize specific opportunities may do so because they possess relevant cognitive frameworks that help them accomplish this task—frameworks that enable them to perceive the emergent patterns that underlie many new business opportunities. Perhaps a concrete example of how this process operates will be helpful.

Consider Chester Carlson, the individual credited with developing the modern copy machine. Why was he able to recognize the opportunity suggested by a combination of technological advances, changes in business practices, and changes in the field of education (e.g., a huge growth in the number of college and graduate students), while many others failed to perceive this opportunity—or at least—failed to perceive an appropriate means of pursuing it? One possibility involves the fact that Carlson held both law and technical degrees; and as a result he possessed well-developed cognitive frameworks (e.g., prototypes) for interpreting information relating both to the needs of potential customers (e.g., the need for clear copies of legal documents) and several of the technical processes that might be used to meet this need. Further, once he decided to try to solve this problem, he restricted his efforts (i.e., his active search) to technologies and processes he understood well (e.g., Fiet et al. 2004). By focusing on processes for which he already had well-developed cognitive frameworks, he enhanced his own ability to perceive the emergent pattern that then suggested to him an effective way of making dry, permanent copies. In short, Carlson, possessed the cognitive frameworks necessary for perceiving connections between seemingly independent events and trends (advances in several aspects of technology, changes in the needs of many businesses, etc.) and for detecting an emergent pattern in these connections—a pattern suggestive of the opportunity he then pursued.

The present research was designed to gather evidence on these suggestions and on the potential role of pattern recognition in identifying new business opportunities. It sought to do so by comparing the cognitive frameworks of two groups of entrepreneurs: novice (first-time) entrepreneurs and experienced entrepreneurs (persons who have started several new ventures). Because all individuals have unique life experiences, their cognitive frameworks vary tremendously, reflecting the diversity of such experience. For instance, individuals trained in a specific field or who work for many years in a particular industry will develop cognitive frameworks (e.g., prototypes) reflecting such experience. Moreover, their cognitive frameworks will be very different in content from those developed by persons trained in other fields or who work in other industries.[2] To consider this basic fact, we focused on one cognitive framework that is, presumably, possessed by all entrepreneurs: prototypes for business opportunity.

[2] As noted by one of the anonymous reviewers of this paper, such development reflects the effects of learning, and it seems quite likely that differences in learning style or approach may influence the form and nature of these prototypes.

As will be explained in more detail below, the present research focused on prototypes because they play a key role in pattern recognition. However, other cognitive frameworks (e.g., schemas, tacit knowledge, and procedural knowledge) may also be relevant and should be examined in subsequent research (e.g., Gobet and Simon 1998, Sternberg 2004).

Below, we describe the specific hypotheses concerning such prototypes that we investigated. Before presenting these hypotheses, however, we first briefly describe the nature of prototypes and the specific cognitive model on which the current research is based—a major theory of pattern recognition (e.g., Matlin 2005).[3]

Prototype Theory: A Cognitive Model of Pattern Recognition

While several different theories of pattern recognition exist, one that is supported by a large body of evidence (e.g., Hahn and Chatter 1997) and that appears to offer important insights into the nature of opportunity recognition, is known as *prototype theory* (e.g., Whittlesea 1997). This theory suggests that through experience, individuals acquire prototypes, cognitive frameworks representing the most typical member of a category—the instance of that category best capturing its essential meaning or nature. Prototype models of pattern recognition further suggest that as individuals encounter new events or objects, their existing prototypes play an important role in the perception of these events or objects and in the detection of connections between them. In essence, prototypes serve as templates, assisting the persons who possess them to notice links between diverse events or trends and to perceive recognizable, meaningful patterns in these connections. In part, this process involves comparison of new events or objects with existing prototypes. If the match is close, these events or objects are recognized as fitting within the prototype. If, instead, the match is not close, the events or objects are not perceived as fitting within this cognitive framework. For instance, consider the prototype for "car," one cognitive framework most persons possess. This framework is broad enough so that everything from a huge limousine or SUV to a small sports car can be recognized as a "car," while other objects used for transportation not matching this prototype well (e.g., motorcycles, scooters, bicycles) are excluded.

Applying prototype models to opportunity recognition, we suggest that entrepreneurs engage in an analogous process with respect to identifying new business opportunities. Specifically, they compare ideas for new products, services, means of production, or markets with their existing prototype for "business opportunity" (Shane 2003). The closer the match, the more likely they are to conclude that they have identified a potential business opportunity (cf., Craig and Lindsay 2001). Recall that in a sense, prototypes represent the essential meaning of a given cognitive framework or category; thus, to the extent new products or services match an individual's prototype for business opportunity, they are perceived as fitting within this category and thus as offering the potential basis for a new venture. What attributes would the prototype for business opportunity include? At present, no direct empirical evidence exists on this issue; indeed, identifying these attributes is one purpose of this study. However, drawing on extant definitions of opportunity (e.g., Herron and Sapienza 1992, Shane 2003), such features as newness and potential profitability might be central. It should be emphasized again, however, that the specific content of the business opportunity prototype is an empirical question—one that is addressed in this research.

Theories of pattern recognition further suggest that the cognitive frameworks (i.e., prototypes) playing a role in this process change in several respects with increasing experience (e.g., Knowlton 1997, Nosofsky and Palmeri 1998). Among these changes, however, are three that have received considerable emphasis—shifts in clarity, richness of content, and degree of focus on key attributes of the content domain. We reasoned that changes in these respects would be visible in the business opportunity prototypes of novice and experienced entrepreneurs. In other words, reflecting differences in their experience as entrepreneurs, the "business opportunity" prototypes of the two groups would differ in several respects. We further reasoned that to the extent such differences were found to exist, this would provide evidence for the role of pattern recognition in the identification of new business opportunities.

With respect to clarity, previous research on prototypes (e.g., Matlin 2005) indicates that these cognitive frameworks become more clearly defined with increasing experience. One index of such clarity is the degree to which the prototypes of different individuals converge on the same set of basic dimensions—in other words, the extent to which the prototypes possessed by different persons agree on basic attributes.

[3] The question of whether opportunities exist in the external world or are created by human minds is one that has been debated in the field of entrepreneurship for several years (e.g., Krueger 2003). The position taken here is that there is, in fact, no essential contradiction between these views. Opportunities, as a potential, come into existence as a result of changes in knowledge, technology, markets, and a wide range of political and social conditions; however, they remain merely a potential until they emerge in specific human minds as the result of active cognitive processes.

For example, when automobiles were a new product, different individuals might well have included different attributes in their prototypes for this new method of transportation. As experience with automobiles increased, however, these prototypes would be expected to show increasing agreement on basic attributes (e.g., all automobiles are self-propelled, have a system for steering, a separate system for stopping, etc.). Agreement with respect to basic dimensions is generally interpreted as one indicant of increased prototype clarity (e.g., Knowlton 1997). On the basis of this previous research, we formulated the following hypothesis:

Hypothesis 1. *The business opportunity prototypes of experienced entrepreneurs will be more clearly defined than the opportunity prototypes of novice* (*first-time*) *entrepreneurs*; *that is*, *experienced entrepreneurs will show greater agreement on the basic dimensions of this prototype*.

Turning to richness of content, basic research on prototypes indicates that this, too, increases with growing experience. One measure of such richness is the number of different dimensions included in the prototype; this increases with growing experience in the prototype domain. Considering the prototype for automobiles once again, the number of attributes or dimensions included in this prototype would be expected to be relatively small initially—when automobiles were a new means of transportation—but then to increase as individuals gained experience with them. For instance, such attributes as "has doors," "possesses a windshield," or "includes a control for changing gears," might be added to the basic dimensions described above. On the basis of this reasoning, we propose the following hypothesis:

Hypothesis 2. *The business opportunity prototypes of experienced entrepreneurs will be richer in content than the opportunity prototypes of novice entrepreneurs* (*i.e.*, *they will include more discrete dimensions*).[4]

Finally, additional research findings (Matlin 2005) indicate that as individuals acquire experience in a given domain, their prototypes become increasingly focused on key attributes of that domain—attributes related to the primary function or process of the item or domain. With respect to prototypes for business opportunities, this suggests that such prototypes would become increasingly focused on attributes of opportunities related to actually starting and running a new venture (e.g., meeting customer needs, capacity to generate cash flow, manageable risk, etc.) and less focused on other attributes less central to starting or running a new business (e.g., newness, uniqueness, or generates feelings of excitement). This reasoning suggested the following hypothesis:

Hypothesis 3. *The business opportunity prototypes of experienced entrepreneurs will be more concerned than those of novice entrepreneurs with factors or conditions related to actually starting and running a new venture*; *in contrast*, *the opportunity prototypes of novice entrepreneurs will more strongly emphasize attributes less directly related to business processes* (*e.g.*, *the novelty or uniqueness of new products or services*).

With respect to Hypothesis 3, it should be noted that several previous studies indicate that focusing on the "novelty" or "uniqueness" of opportunities may be detrimental to the success of new ventures because focusing on these issues can divert entrepreneurs' attention from factors relating to the feasibility of successfully developing specific opportunities, and in fact, away from the question of whether the perceived opportunities offer the potential for financial gains or are, instead, mainly illusory ("false alarms" in the language of signal detection theory; Archdivili et al. 2003, Baron 2004a).

Method

To assess and compare the opportunity prototypes of experienced and novice entrepreneurs, we asked carefully matched groups of experienced and novice (first-time) entrepreneurs to respond to two open-ended questions: "Describe the idea on which your new venture was based," and "Why did you feel this was a good idea—one worth pursuing?" Replies to these items were then content analyzed (see below), and the results of these analyses provided the primary data for determining the content of the opportunity prototypes of novice and experienced entrepreneurs, and for comparing these prototypes.

In addition, to obtain further information on the cognitive frameworks employed by entrepreneurs to identify new business opportunities, we also asked participants in the study to describe ideas for new products or services they had considered but ultimately rejected ("Describe an idea for a new product, service, etc., that you considered but then ultimately rejected") and to indicate why they had rejected such ideas ("Please indicate why you rejected this idea"). While these data were considered subsidiary to the data concerning identified opportunities, they were analyzed in the same manner and are described below.

[4] As noted by one reviewer, it is possible that the relationship between the number of dimensions in prototypes and experience might be curvilinear in nature, with the number of dimensions rising at first but then decreasing after individuals become truly expert in a given domain. However, recent research in cognitive science on the topic of exceptional performance (e.g., Ericcson 2006) suggests that this function might well be linear until extremely high levels of expertise are attained.

Sample of Entrepreneurs

We obtained samples of both experienced and first-time entrepreneurs through the assistance of entrepreneurial networking organizations in three major southeastern U.S. cities. The executive directors of these organizations sent our questionnaire to the members of the networking organization (via e-mail in PDF format) along with an accompanying cover letter. Because most entrepreneurs have been involved in only one new venture (Wright et al. 1997), we made special efforts to obtain a sizeable sample of experienced entrepreneurs. Such persons, identified from membership data provided by the entrepreneurial networking organizations, were sent a second and third e-mail requesting their participation in the study. Through these procedures, we obtained the cooperation of 88 experienced entrepreneurs and 106 novice entrepreneurs. A total of 521 entrepreneurs were invited to participate in the study for an effective response rate of 39%.

In an effort to assess the possible impact of response bias, we contacted 50 randomly selected nonrespondents directly on the telephone and requested input. Thirty-two of them complied with the request. Comparison of respondents and nonrespondents indicated that they did not differ with respect to any of the variables of interest in the present study.

Experienced Entrepreneurs. Eighty-two percent of the experienced entrepreneurs were male, while 18% were female; their average age was 39 years. The age range was 22 to 54 years old and had a standard deviation of 4.2 years. Ninety percent were founders, and 86% held at least 10% of the equity in their respective companies. Experienced (repeat) entrepreneurs had started an average of 2.6 companies. Virtually all (98%) considered themselves entrepreneurs. With respect to education, 14% held only high school diplomas, 10% held associates degrees, 40% had received bachelors degrees, 21% had masters degrees, and 3% held doctoral degrees. The firms these entrepreneurs headed were drawn from 37 different industries, ranging from light manufacturing to retail and also included companies whose business activities focused on information technology and on biotechnology. These firms averaged 4.8 years of age with a range of 2.6 years to 8.9 years with a standard deviation of 1.9 years.

Novice Entrepreneurs. Seventy-four percent of the novice (first-time) entrepreneurs were male and 26% were female; their average age was 31 years. The age range of the novice entrepreneurs was 21 to 44 years with a standard deviation of 5.6 years. Ninety-five percent were founders, and over 90% held at least 10% of the equity in their respective companies. All of them considered themselves entrepreneurs. With respect to education, 11% held only high school diplomas, 7% held associates degrees, 54% had received bachelors degrees, 33% had masters degrees, and 6% held doctoral degrees. The firms headed by these entrepreneurs were drawn from 42 different industries, including light manufacturing, retail, and both biotechnology and information technology companies. These firms averaged 4.2 years of age with a range of 1.2 years to 5.3 years with a standard deviation of 1.5 years.

Comparison of the Two Samples. In an effort to examine potential differences between the novice and experienced entrepreneurs aside from their experience in starting new ventures, we compared them with respect to age, founding industry, race, and sex. We conducted a t-test for age, and appropriate chi-square tests of the categorical variables of founding industry, based on NAICS (North American Industrial Classification System codes), race, and gender. All tests were nonsignificant at the 0.05 level except for respondent age. The experienced entrepreneurs were significantly older than the novice entrepreneurs (39 versus 31 years; $t = 2.91$, $p < 0.01$). Because differences were observed for age, we included this variable in subsequent analyses (see below).

Data Reduction and Derivation of Prototypes

Because the data generated by our open-ended questions were both voluminous and complex, we employed methods of data reduction similar to those used in basic research on the nature of prototypes and pattern recognition to determine the content of entrepreneurs' opportunity prototypes (e.g., Chi et al. 1994, Matlin 2005, Ward et al. 1997). These procedures involved the following steps:

Step 1. Entrepreneurs' replies to the two questions concerning their current company ("Describe the idea on which your venture was based" and "Why did you feel it was a good idea—one worth pursuing?") were first analyzed by Ethnograph 5.0, a program specifically designed for purposes of content analysis. Ethnograph 5.0 reports frequencies of words and word phrases, and these frequencies are then used to identify patterns in the responses provided by participants.

Step 2. Results provided by the Ethnograph 5.0 program were then discussed in detail by a panel of three graduate students trained in methods of content analysis and use of the Delphi technique for group decisions. Panel members, who were unaware of the entrepreneurs' identities and did not know whether they were novice or experienced entrepreneurs, then met and attempted to identify distinct ideas or attributes present in the entrepreneurs' responses.

Step 3. Following these initial efforts to identify key attributes or indicators in entrepreneurs' responses,

Table 1 Means, Standard Deviations, and Correlations of Study Variables

Dimensions of prototypes	Mean	SD	1	2	3	4	5	6	7	8	9
1. Solves customer problems	5.46	1.94									
2. Positive net cash flow	6.12	1.56	0.11								
3. Manageable risk	4.42	1.82	0.14**	0.17**							
4. Superior product	6.21	1.18	0.38*	0.09	0.13						
5. Change industry	4.91	2.17	0.27*	0.18**	−0.17**	0.25*					
6. Overall financial model	5.63	2.41	0.08	0.41*	0.24**	0.11	−0.24				
7. Advice from experts	3.84	1.82	0.05	0.12	0.07	0.05	0.06	0.18**			
8. Unique product	5.11	1.47	0.29*	0.07	−0.24*	0.34*	0.28*	0.09	0.08		
9. Big potential market	4.27	1.28	0.22**	0.11	−0.31*	0.13	0.31*	0.19**	0.22*	0.38*	
10. Intuition	5.69	1.73	0.19**	0.08	0.05	0.09	0.12	0.24*	0.34*	0.26*	0.25*

Note. $N = 194$.
† = Net cash flow, $^{**}p < 0.05$; $^{*}p < 0.01$.

panel members met with the researchers to discuss their preliminary results. After these discussions (which served to clarify and refine the initial data), the panel met again and discussed each attribute until unanimous agreement was reached about its presence and meaning. These procedures yielded 47 distinct attributes included by entrepreneurs in their descriptions of the ideas for their new ventures and in their explanations as to why they viewed these as good ideas. Examples of these attributes include uniqueness of the idea, extent to which it is based on innovative technology, length of the sales cycle, the ease with which sales can be developed, and financial characteristics of the situation.

Step 4. In an additional step, panel members reported the number of times each entrepreneur mentioned a particular attribute during the interview (interviews lasted, on average, two hours). This procedure was used to enhance the psychometric properties of the final dependent measure over and above what would be obtained with a simple binary count (e.g., "mentioned" or "did not mention" a particular dimension). The panelists then met once again and discussed the counts for each entrepreneur on each dimension. The final data generated by these procedures, therefore, were frequencies—the number of times each entrepreneur mentioned each dimension during the interview—based on consensus among the panel members.[5]

These procedures (Ethnograph 5.0 in conjunction with deliberations by panel members) yielded a score for each participating entrepreneur on each of 47 indicators mentioned in their answers to the two open-ended questions ("What was the idea for your business?" and "Why did you think it was worth pursuing?"). These were the primary data employed in further analyses. (As noted earlier, data for the questions relating to rejected ideas were analyzed in the same manner.)

[5] In addition, panel members rated, on 10-point scales, the extent to which entrepreneurs mentioned each dimension. Analyses indicated that these ratings yielded results statistically equivalent to those obtained from the frequency data. Therefore, as suggested by two reviewers, we employed the frequency data, because such data are less subject to potential sources of bias than ratings.

Results

Means, standard deviations, and correlations for study variables are presented in Table 1. The variables shown are derived from analyses described in the following section (factor analyses), and reflect the key dimensions of entrepreneurs' opportunity prototypes as identified in this research. (Further details concerning the nature of these variables is presented below.)

Identifying the Content of Entrepreneurs' Prototypes for "Business Opportunities": Factor Analysis of Panel Rating Data

To determine the actual content of entrepreneurs' prototypes for "business opportunity," the 47 attributes identified through the procedures described earlier were first divided, by the panel of graduate students, into two groups. One group of attributes related to the nature of the ideas entrepreneurs had identified and were developing, while the second group related to the reasons why they viewed these as good ideas, worth developing. The 47 attribute dimensions were divided into these two groups to consider the possibility that as a result of their growing experience in starting new ventures, entrepreneurs might well alter their criteria for deciding whether a given idea represents a bona fide opportunity (i.e., is, or is not, worth pursuing). Thus, this dimension is distinct from the basic nature of the ideas themselves; to reflect this fact, we analyzed data pertaining to the two questions separately.

Twenty-three attributes were rated by the judges as pertaining primarily to the nature of the entrepreneurs' ideas for new ventures (e.g., viability of the

Table 2 Items Describing the Idea on Which the New Venture was Based

	Factor				
Item	Solve	+NCF*	Risk	Superior	Δ Industry
Meets needs	**−0.8620**	0.0662	0.0014	0.0986	0.0833
Long-term demand	**−0.7705**	0.0663	−0.0535	0.1094	−0.1049
Relieves pain	**−0.7950**	0.2033	0.0143	0.1103	−0.0972
Life improved	**−0.6433**	0.1584	−0.0269	−0.3132	0.0663
Customers want it	**−0.7924**	0.0913	−0.1242	−0.1666	0.2138
Profitable	−0.1178	**−0.6548**	0.1120	−0.1861	0.0769
Lots cash	−0.0786	**−0.4287**	0.1459	−0.1331	0.0649
Take home cash	−0.1941	**−0.6840**	−0.0509	−0.3537	−0.0139
Quick cash	0.1313	**−0.7801**	−0.0863	0.0819	−0.2893
Short cash burn	−0.2479	**−0.4409**	0.0461	0.0846	−0.1187
Customer accept	0.1527	−0.0613	**0.7615**	−0.0830	0.0695
Less tech. change	−0.1936	0.0627	**−0.7881**	−0.1610	0.0439
Less liability	−0.2100	0.0474	**−0.8053**	−0.0995	0.0516
Prod. risk	−0.2041	0.2566	**−0.5862**	−0.1840	−0.0976
Greater features	−0.0021	0.0599	−0.2167	**0.7174**	−0.0827
Better	0.1847	−0.0205	−0.1940	**0.6281**	0.0568
Improve functioning	0.0077	−0.0041	0.1506	**0.6527**	−0.3249
Faster	0.0788	0.1888	−0.0097	**0.6881**	−0.1809
Does more	−0.2614	0.1660	0.0469	**0.5660**	−0.0680
Change market	0.0867	0.0149	0.0635	−0.2974	**−0.6222**
Big player	−0.0803	−0.0551	0.0708	−0.2158	**−0.7281**
No. 1 seller	0.2173	−0.0217	0.1143	−0.0174	**−0.5229**
Dominate	0.0584	−0.0731	0.1746	−0.0214	**−0.4892**

* = Positive net cash flow.

idea, extent to which a liquidity event was possible, the market impact of the technology, and an ability to dominate the market). Twenty-four attributes were rated by the judges as pertaining primarily to the reasons entrepreneurs viewed these as good ideas, worth pursuing (e.g., short sales cycle, unique technology, few direct competitors, and advice from friends or a financial advisor). Separate factor analyses employing Quartimax Rotation were then performed on these two sets of indicators (see, e.g., Kerlinger and Lee 2000, Nunnally and Bernstein 1994). We used Nunnally's criterion for factor loadings of greater than 0.4 and the Eigenvalues greater than one criterion (Kaiser's Rule) for developing factors. The results of these analyses (see Tables 2 and 3) indicated that five clear factors related to the question, "Describe the idea on which your venture was founded," and five clear factors related to the question, "Why did you feel it was a good idea—one worth pursuing?"

As shown in Table 2, the following factors emerged from the data for the question, "Describe the idea for your new venture": (1) solving a customer's problems, (2) ability to generate positive cash-flow (+NCF), (3) manageable risk, (4) superiority of product/service, and (5) potential to change the industry. As shown in Table 3, a different set of factors emerged for the question, "Why did you feel it was a good idea—one worth pursuing?": (1) a favorable financial model, (2) positive assessments or advice from others (friends, financial advisors, and industry experts), (3) how novel the idea was, (4) the existence of a large untapped market, and (5) intuition or gut feeling. These factors, which can be viewed as reflecting the basic dimensions of the entrepreneurs' business opportunity prototypes, were then used as the basis for testing the major hypotheses. It important to note that these factors emerged from data provided by all entrepreneurs who participated in the study. In other words, they relate to the content of "business opportunity" prototypes generally, across both novice and experienced entrepreneurs. Differences in the opportunity prototypes of these two groups are described below.

Comparing the Business Opportunity Prototypes of Experienced and Novice Entrepreneurs: Tests of Major Hypotheses

Hypothesis 1 predicts that the prototypes of experienced entrepreneurs will be more clearly defined than the prototypes of novice entrepreneurs. This implies that experienced entrepreneurs will show greater agreement concerning the basic dimensions of their prototype for "business opportunity" than novice entrepreneurs. (Such agreement on key dimensions has often been used as a measure of prototype clarity in basic cognitive research on this topic;

Table 3 Items Describing What Made the Idea a Good One, Worth Pursuing

	Factor				
Item	Financial model	Advice	Unique	Big market	Intuition
Fav. financial model	**0.6142**	0.1742	0.2141	0.1125	0.1822
High margins	**0.7145**	0.0689	−0.0042	0.2247	−0.0964
Quick cash flow	**0.4251**	0.0912	0.0143	0.3654	−0.1487
Short sales cycle	**0.8128**	0.0445	−0.0269	0.0971	−0.0119
High return/low inv.	**0.5718**	0.1719	−0.1242	0.2174	−0.0058
Friends told me	−0.2141	**−0.8425**	0.1120	−0.1881	0.2785
Financial advisor	−0.2756	**−0.7127**	0.1459	−0.1242	0.1987
Consultant	−0.2163	**−0.5284**	−0.0509	−0.2213	0.0584
Legal council	−0.0561	**−0.4992**	0.1243	−0.1814	0.2117
Unique	0.1273	−0.2893	**−0.8327**	−0.1125	0.1564
Nothing like it	−0.2158	−0.1187	**−0.5613**	−0.0964	0.2484
Different than others	0.1975	−0.2159	**−0.6972**	0.0281	0.2718
New technology	−0.0528	0.1954	**−0.8053**	0.1174	0.0961
Different application	−0.1467	0.2716	**−0.5862**	−0.0917	0.1208
Large market	−0.5164	0.1127	−0.0917	**0.5812**	−0.1981
Unmet need	0.1784	0.1824	−0.1157	**0.6714**	0.0457
Easy market entry	0.2143	0.0721	−0.2234	**0.6984**	−0.2145
Few competitors	0.1624	0.0956	−0.1841	**0.8107**	−0.1311
Mass market	0.1125	0.0644	−0.0248	**0.7814**	−0.1691
Very logical	−0.1341	−0.0027	−0.0051	−0.0957	**−0.6178**
It will work	−0.0481	−0.1943	0.0112	−0.1117	**−0.8719**
Good deal	0.2182	−0.2254	0.2058	−0.2354	**−0.6751**
No doubt	0.1672	−0.2856	0.1824	−0.1675	**−0.5716**
Gut feel	0.0921	−0.3156	0.2281	−0.2238	**−0.8124**

e.g., Knowlton 1997, Matlin 2005.) To assess such agreement, we employed a measure of within-group agreement developed by James et al. (1993), known as the *reliability within groups on j procedure*, $r_{WG(J)}$. The $r_{WG(J)}$ yields a value between 0 and 1.0, with scores above 0.70 denoting acceptable agreement. We calculated $r_{WG(J)}$ for both experienced and first-time entrepreneurs, and then compared the resulting indices by means of appropriate *t*-tests. We calculated $r_{WG(J)}$ for each factor created by the factor analysis and then averaged the $r_{WG(J)}$ for these factors, for response to each of the two open-ended questions.

Results indicated that consistent with Hypothesis 1, $r_{WG(J)}$ was indeed significantly higher for experienced entrepreneurs than first-time entrepreneurs for both questions. For experienced entrepreneurs, $r_{WG(J)}$ was 0.77 for the descriptions of the ideas on which entrepreneurs based their new ventures, and 0.81 for what they considered a "good" idea. The corresponding values for first-time entrepreneurs were considerably lower, 0.41 and 0.53, respectively. *T*-tests indicated that both differences (0.77 versus 0.41 and 0.81 versus 0.53) were significant, $p < 0.001$. Thus, as predicted, the opportunity prototypes of experienced entrepreneurs were indeed clearer, in one sense, than those of novice entrepreneurs.

As a check on the validity of the $r_{WG(J)}$ measure, we calculated Interclass Correlation Coefficients (ICCs). These coefficients ranged from 0.76 to 0.83 for experienced entrepreneurs and from 0.43 and 0.57 for novice entrepreneurs, a pattern very similar to that obtained with the $r_{WG(J)}$ measure. Finally, as a further check on the validity of the $r_{WG(J)}$ measure, we used SAS to calculate Cohen's Kappa (Cohen 1968), an index of the extent to which agreement within groups of people is greater than would be expected on the basis of chance. For both experienced and novice entrepreneurs, the level of agreement was found to be beyond chance (Cohen's Kappa ranged from 0.36 to 0.42 for novice entrepreneurs and from 0.66 to 0.74 for experienced entrepreneurs).

Hypothesis 2 predicts that the business opportunity prototypes of experienced entrepreneurs will be richer in content (i.e., involve more discrete dimensions) than the business opportunity prototypes of novice entrepreneurs. To test this hypothesis, we examined the number of dimensions employed by entrepreneurs in both groups in describing the ideas for their new ventures and why they felt these were good ideas (i.e., viable). Each dimension mentioned was scored as 1, thus generating a possible range of 0–23 for descriptions of ideas for new ventures, and 0–24 for descriptions of why these were viewed by the entrepreneurs are being good ideas. (Recall that 47 distinct attributes were previously identified in the entrepreneurs' responses to the two open-ended questions.) Separate chi-square

tests were then conducted for each of the two open-ended questions. Results indicated that for both questions, the prototypes of experienced entrepreneurs did indeed involve more discrete dimensions than the prototypes of novice entrepreneurs. That is, the "business opportunity" prototypes of experienced entrepreneurs included a significantly larger number of different dimensions (chi $\text{square}_{\text{ideas}} = 20.41$, $p < 0.05$, $df = 11.56$; chi $\text{square}_{\text{goodness}} = 27.93$, $p < 0.01$, $df = 13.26$). Experienced entrepreneurs averaged nearly 14 different dimensions in their prototypes, versus approximately four dimensions for novice entrepreneurs.

Hypothesis 3 suggests that the business opportunity prototypes of experienced entrepreneurs will be more clearly focused than those of novice entrepreneurs on factors and conditions related to actually starting and running a new venture. To test this hypothesis, we conducted two discriminant analyses. (Such analyses indicate the extent to which individuals can be grouped or identified on the basis of a given set of factors.) In the first analysis, age was included as a variable, along with the 10 basic factors identified earlier (Tables 2 and 3). In the second discriminant analysis, age was not included as a variable. This two-stage assessment allowed us to test the change in canonical R^2 using the technique suggested by Cohen and Cohen (1987). This test indicated that the change in R^2 produced by including age in the analysis was not significant; $F = 1.17$, $p > 0.10$. When age was included in the analysis, the canonical R^2 was 0.72 (Wilks's lambda = 7.94, $p < 0.001$). When age was not included in the analysis, the canonical R^2 was 0.67; this reduction in R^2 was not significant ($p > 0.05$; see Table 4). This suggests that age was not a significant factor in the contrasting prototypes of novice and experienced entrepreneurs. The discriminant technique utilized was suggested by Hand (1981) and is based on the *K*-Nearest Neighbor technique available in SAS. Nonparametric discriminant methods were utilized because of their robustness to violations of normality and other assumptions.

Table 4 **Discriminant Analysis *F*-Ratios and Probability Levels for Differences Between Novice and Experienced Entrepreneurs**

Variable (canonical $R^2 = 0.72$)	*F*
Overall model (Wilks's lambda)	7.84*
Age of respondent (as a control variable)	5.28*
Solves customers problems	4.17*
Positive net cash flow characteristics	5.32*
Manageable risk	3.14**
Superior product or service	5.51*
Ability to change industry	1.21
Overall financial model	4.68*
Advice from experts	8.91*
Unique product or service	4.42*
Big market	6.77*
Intuition	9.54*

*$p < 0.05$; **$p < 0.01$.

Table 5 **Contrasting Prototypes of Novice and Experienced Entrepreneurs**

Discriminant profile: Novice entrepreneurs	Discriminant profile: Experienced entrepreneurs
How novel the idea is	Solving a customer's problems
Extent to which idea is based on new technology	Ability to generate positive cash flow
Superiority of product or service	Speed of revenue generation
Potential to change the industry	Manageable risk
Intuition or gut feel	Others in their network with whom to develop the venture

The discriminant function developed through the above procedures was then applied to the respondents in both samples to assess the extent to which it could correctly classify the entrepreneurs as "novice" or "experienced." Fully 94% of participants were correctly classified in this manner. These findings provide additional support for Hypothesis 3, suggesting that entrepreneurs can be accurately classified as experienced or novice on the basis of the profiles of their responses to questions asking them to describe the ideas for their new ventures and why they viewed these ideas as good. The discriminant profile for the experienced entrepreneurs included the following dimensions: solving a customer's problems, ability to generate positive cash flow, manageable risk, speed of revenue generation, and others in their network with whom to develop the venture. In contrast, the discriminant profile for first-time entrepreneurs included the following dimensions: how novel the idea was, whether it was based on new technology, superiority or product/service, potential to change the industry, and intuition or gut feel (see Table 5). In other words, as suggested by Hypothesis 3, the business opportunity prototypes of experienced entrepreneurs seemed to focus—to a greater extent than the business opportunity prototypes of novice entrepreneurs—on factors and conditions directly related to actually starting and running a new venture (e.g., the ability to generate positive cash flow and meeting customers' needs). In contrast, the business opportunity prototypes of novice entrepreneurs tended to emphasize the "newness" or "uniqueness" of their product or service and their "gut-level" belief in its potential.

Rejected Ideas: Further Comparisons of Novice and Experienced Entrepreneurs

As noted earlier, entrepreneurs participating in the study were also asked to describe ideas for new products, services, etc., they had considered but ultimately rejected, and to indicate why they had rejected

these ideas. The data from these items were analyzed in the same manner as described previously for ideas entrepreneurs decided to pursue. We predicted that the contrasting cognitive frameworks for business opportunities of novice and experienced entrepreneurs would be reflected in their reasons for rejecting various ideas. Specifically, we expected that novice entrepreneurs would reject ideas for new products or services because they did not seem to be sufficiently "novel," were not based on new technology, did not offer the potential to change an industry or market in a major way, or were simply not sufficiently "new" or "unique." In contrast, we expected experienced entrepreneurs to reject ideas for new products or services because they did not offer sufficient promise of favorable financial returns, short sales cycles, manageable risk, and so on. Findings provided support for these predictions. The discriminant profile for novice entrepreneurs indicated that they rejected ideas they did not perceive to be sufficiently "novel," based on "new" technology, and that were not intuitively appealing. In contrast, the discriminant profile for the experienced entrepreneurs indicated that they ultimately rejected ideas for new products or services that did not offer clear potential for favorable financial returns, short sales cycles, manageable risk, and the potential for obtaining helpful input from advisors. In short, novice entrepreneurs appeared, again, to emphasize the "novelty," "newness," or "personal excitement" of identified ideas, and to reject as potential opportunities ideas for new products or services that were not high on these dimensions. In contrast, experienced (repeat) entrepreneurs emphasized factors relating to financial returns, and rejected ideas that they perceived to be relatively low on such dimensions.

Discussion

Overall, results offer support for the suggestion that the basic cognitive process of pattern recognition may indeed play a role in identifying new business opportunities. By extension, theories of pattern recognition suggest that the cognitive frameworks (prototypes) used by experienced and novice entrepreneurs to identify business opportunities will differ in predictable ways—specifically with respect to clarity, richness of content, and focus on factors or conditions directly relevant to starting and running a new venture. Results are consistent with these predictions. Experienced entrepreneurs showed greater agreement than novice entrepreneurs concerning the central attributes or dimensions of the concept "business opportunity"—one indication that their prototypes are more clearly defined (Hypothesis 1). In addition, the "business opportunity" prototypes of experienced entrepreneurs were richer in content—they included more distinct dimensions than those of novice entrepreneurs (Hypothesis 2). Finally, experienced entrepreneurs appeared to focus more attention than novice entrepreneurs on factors and dimensions closely related to actually starting and running new ventures—to converting identified opportunities into realized financial gains (e.g., manageable risk, meeting customers' needs, and generation of positive cash flow; Hypothesis 3). Consistent with the opening quotation of this paper, and with research concerning environmental threats and opportunities (e.g., Dutton and Jackson 1987), experienced entrepreneurs included awareness of "danger" as well as "opportunity" in their thinking. In contrast, the opportunity prototypes of novice entrepreneurs were more focused on "newness," "novelty," perceived superiority of the entrepreneurs' new products or services, and intuition (i.e., "gut-level feelings"). In light of these findings, it is, perhaps, far from surprising that a large proportion of new ventures fail—especially new ventures started by novice entrepreneurs (e.g., Azoulay and Shane 2001, Thornhill and Amit 2003). If their founders are, in a sense, "cognitively dazzled" by the novelty and perceived potential of the ideas behind their new businesses, they may fail to devote sufficient attention to several financial and business factors that strongly affect the success of new ventures; lack of attention to these factors can indeed prove fatal. One reason why novice entrepreneurs may place so much emphasis on these factors is that lacking experience with respect to actually starting new ventures, their prototypes of business opportunities are strongly shaped by stories in the popular business press—stories that often emphasize the "newness" or "uniqueness" business entrepreneurs have developed into highly successful new ventures (Baron and Shane 2006).

Overall, these differences between the opportunity prototypes of experienced and novice entrepreneurs suggest that, as might be expected, experienced entrepreneurs are much more concerned with issues and processes that would be of interest to major stakeholders in their new ventures. In other words, they think about opportunities in more sophisticated and pragmatic ways from a business-model point of view, than novice entrepreneurs. In this way, their experience in starting new ventures does appear to be highly beneficial to them.

Findings for ideas entrepreneurs rejected offered additional support for this overall pattern. Again, novice entrepreneurs emphasized newness, novelty, and intuition in rejecting ideas for new products, services, etc. In contrast, experienced entrepreneurs tended to focus on factors pertaining to financial success, rejecting ideas for new products or services that

did not appear to offer manageable risk, the capacity to generate positive cash flow, and so on. Together, the findings for ideas entrepreneurs did identify as constituting business opportunities and ideas they rejected as falling outside this category suggest that the cognitive frameworks employed by entrepreneurs do indeed develop with increasing experience, as theories of pattern recognition suggest (e.g., Whittlesea 1997).

Another reason why the tendency of novice entrepreneurs to emphasize newness, uniqueness, and intuition in their prototypes of "business opportunity" may have negative consequences for their new ventures is suggested by a large body of evidence concerning the impact of emotional states on cognitive performance. This research indicates that when individuals experience strong, positive affect (positive emotions or feelings), their capacity to think systematically and evaluate information carefully may be significantly reduced (e.g., Ruder and Bless 2003). It seems possible that novice entrepreneurs tend to "fall in love with their own ideas," and so experience extremely high levels of enthusiasm, optimism, and positive affect. While these intense affective states can sometimes contribute to creativity (Estrada et al. 1997), they have also been found, in many studies, to strongly interfere with the ability to engage in systematic thought (e.g., Forgas 2004).

At this point, it should be emphasized, once again, that experienced entrepreneurs acquire these well-developed cognitive frameworks through processes of learning—processes that occur as they gain experience in the intricacies of starting new ventures. The importance of learning in key organizational processes has been emphasized in a large body of recent research (e.g., Honig 2001, March 1991, Moorman and Miner 1998, Miner et al. 2001), and it certainly plays a role—along with pattern recognition—in equipping entrepreneurs with the "cognitive raw materials" on which to base opportunity recognition. In fact, it seems reasonable to suggest that learning is the process through which individuals acquire the cognitive frameworks they then use in identifying viable business opportunities. In this respect, we are reminded of the words of one experienced entrepreneur with whom we are acquainted—an individual who has started numerous companies in a wide range of industries. As he puts it: "When I look at many situations, I think, 'There has to be a better way.' And then I draw on my experience to figure out what that could be." In other words, this entrepreneur's experience helps him to "connect the dots" and recognize opportunities he can then develop. It should also be noted that well-developed prototypes are not necessarily an unmixed blessing where identifying new business opportunities are concerned. Such frameworks can indeed assist individuals in noticing links between various changes or events in the external world; however, they can also inhibit individuals from noticing such connections by directing their thinking into specific, well-established channels that are, in one sense, inimical to innovation (e.g., Garud and Rappa 1994). Thus, it should certainly not be assumed that development of increasingly strong, developed prototypes is beneficial in all respects or all instances.

One interesting implication of the present findings relates to the question of what, specifically, experienced entrepreneurs acquire from their growing experience in starting new ventures. While it seems clear that they obtain many forms of knowledge and a wide array of skills, the results of this study suggest that one key thing they acquire is increasingly focused and refined mental frameworks for identifying business opportunities. In other words, through their experience in founding new ventures, repeat entrepreneurs acquire cognitive frameworks (e.g., more fully developed prototypes) that are increasingly helpful to them in "connecting the dots" between seemingly unrelated changes or events and in detecting meaningful patterns in these links. In short, the cognitive frameworks developed by experienced entrepreneurs assist them in recognizing opportunities that others overlook, and in selecting those opportunities most likely to yield positive financial outcomes.[6]

At this point, it is interesting to note that in several respects, experienced entrepreneurs may be similar to experts in any field. Research on expertise suggests that as individuals gain experience in a given domain, they learn to focus attention primarily on key dimensions—the ones most relevant to the activity they are performing (e.g., Choo and Trotman 1991). Similarly, they also gain increasingly refined, well-developed, and useful mental frameworks (e.g., categories and prototypes) for performing many tasks (e.g., Gobbo and Chi 1986). In addition, recent findings (e.g., Ericsson 2006) suggest that through participation in prolonged deliberate practice, experts may actually enhance their basic cognitive systems. For instance, they may acquire closer links between working memory and long-term memory and, as a result, be better able to draw on previously acquired information when making current decisions or judgments

[6] As suggested by reviewers, it would be interesting to compare novice entrepreneurs with ones having moderate experience (e.g., entrepreneurs who have started 2–3 companies), and ones having more extensive experience (e.g., four or more companies). Such comparisons would provide information on the rate at which entrepreneurs acquire, through learning, increasingly refined prototypes for "business opportunities." Unfortunately, the number of entrepreneurs in the present sample who had started four or more companies was very small (a total of only 16), so such analyses were not feasible with the present data set.

(e.g., Ericsson 2006). It seems reasonable to suggest that similar processes may be at work among experienced entrepreneurs who, in a sense, become experts in recognizing opportunities and in starting new ventures. These and related possibilities can be readily examined in future research.

Theoretical Implications

The present findings appear to have important theoretical implications. As noted earlier, the results of this study underscore the potential value of applying existing theories of cognitive science—and especially, theories of pattern identification—to important aspects of the entrepreneurial process. This conclusion is consistent with a large, rapidly growing literature on entrepreneurial cognition, research focused on the potential role of cognitive factors and processes in entrepreneurship (e.g., Baron 2004b, Gaglio 2004, Busenitz and Arthurs 2006, Krueger 2003, Mitchell et al. 2004). This previous research has been based, to a large degree, on the findings and theories of cognitive science. The present findings suggest that further insights into various aspects of entrepreneurship can be gained through careful application of additional findings and theories of cognitive science, for instance, from basic research on the cognitive foundations of expertise (e.g., Ericsson 2006) or from research on the origins of creative thought (e.g., Ward 2004). Similarly, research on signal detection theory, one cognitive theory of decision making, may provide important insights into the mechanisms through which entrepreneurs distinguish between bona fide opportunities and false alarms—opportunities that are more illusory than real (e.g., McMullen and Shepherd 2006). In short, extant theories and principles of cognitive science may provide the field of entrepreneurship with theories, principles, and research methods useful in understanding important aspects of the entrepreneurial process (e.g., Baron and Ward 2004).

Limitations of the Present Research

Before concluding, several limitations of the present research should be carefully noted. First, although we attempted to match experienced and novice entrepreneurs as closely as possible, the two groups differed in one respect aside from their experience in starting new ventures: The experienced entrepreneurs in our sample were somewhat older than the novice entrepreneurs. Given that age and experience are often highly correlated, and that starting new ventures requires significant amounts of time, this difference is not surprising. However, its presence raises the possibility that differences in the cognitive frameworks (i.e., prototypes) of experienced and novice entrepreneurs observed in the present research might have derived—at least in part—from this factor. Two findings suggest that cognitive differences between experienced and novice entrepreneurs did not stem from differences in age: (1) the discriminant analyses in which age was, and was not, included as a variable produced very similar results (canonical R^2 of 0.72 and 0.67, respectively, which did not differ significantly); and (2) classification accuracy was not increased (by only 1%) when age was included in the discriminant function. However, future studies seeking to compare the cognitive frameworks of experienced and novice entrepreneurs to determine how these frameworks change as a result of increased experience should make strenuous efforts to minimize any age disparity between these groups.

Another limitation of the present research is that all the data collected are retrospective in nature: Both novice and experienced entrepreneurs reported on events that had occurred in the past. Cognitive scientists have found that memory is subject to considerable distortion and change over time. Information entered into memory is frequently altered over the course of days, months, or years through selective forgetting and other processes (e.g., Seamon et al. 2002). Given the scope and breadth of such memory-distortion processes, the present data must be interpreted with caution. To minimize such effects, we focused, in this study, on entrepreneurs' descriptions of events relating to their current companies. Because both groups (novice and experienced entrepreneurs) reported on the company they were now running, memory distortion would be expected to be relatively equal in both groups. Thus, it seems unlikely that the differences between the two groups with respect to their prototypes stemmed primarily from this factor. However, because all retrospective data are subject to potential sources of distortion, only additional research specifically designed to examine the impact of such factors can provide direct evidence on their effects or eliminate them as potential contributors to the present findings.

Third, we should note that in this research, we did not include industry or type of new venture (e.g., technology versus nontechnology) as a variable. Because the process of new venture creation may well vary as a function of such factors, this, too, is a limitation with respect to generalizing the present results.

Fourth, as noted by one reviewer of this paper, the tendency of experienced entrepreneurs to focus their business opportunity prototypes on factors or conditions related to actual business processes to a greater extent than novice entrepreneurs might reflect, in part, that these persons have left previous companies to start new ones. This could lead them to emphasize such factors as cash flow and risk to a greater extent than novice entrepreneurs lacking such experiences. The present findings may reflect this factor rather

than differences in prototype development. Finally, we should note that the novice entrepreneurs in this study headed companies that had existed for several years. Thus, in a sense, they were not "raw beginners;" rather, they had already achieved at least modest success because the companies they had founded were still operating.

Despite these limitations, the findings of the present research do appear to offer several useful contributions. First, they suggest that opportunity recognition may be related to pattern recognition. This, in turn, provides a useful means for applying well-developed theories of cognitive science to the task of understanding the basic nature of opportunity recognition. Second, the present results shed new light on why some persons are better at recognizing opportunities than others: In essence, they may possess better-developed cognitive frameworks for accomplishing this task. Finally, and perhaps most important, the findings of this research suggest that experienced entrepreneurs do indeed acquire increasingly refined cognitive frameworks (prototypes) for identifying new business opportunities. As a result, they may gain an important advantage over novice entrepreneurs in terms of choosing the opportunities most likely to lead to profitable new ventures. To put it succinctly, one reason that experienced entrepreneurs may be more successful than novice entrepreneurs in identifying excellent business opportunities may be that experienced entrepreneurs have learned to think in ways that help them keep their eyes firmly on what is "feasible" and "potentially profitable," while avoiding the potential trap of being swept away by what is merely "new" or "unique."

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