What is an Attractive Business Opportunity?
An Empirical Study of Opportunity Evaluation Decisions by Technologists, Managers and Entrepreneurs

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Abstract

The subjective belief that an opportunity allows value generation is a key driver of entrepreneurial action. We advance research on opportunity evaluation by investigating how people may diverge in their views of what defines an attractive business opportunity, that is, we seek to understand heterogeneity among individuals' "opportunity templates". Using unique data from a conjoint experiment with 141 respondents (6,728 opportunity evaluations), our analysis reveals significant differences in the opportunity preferences of individuals with technological, management and entrepreneurship experience. We also find that people with specialist experience (technology) emphasize fewer opportunity dimensions than people with generalist experience (management, entrepreneurship).

Debating Points:

- Influence of opportunity selection on performance?
- Relevance for SMEs and large firms?
- How can the insights be used in teaching?

INTRODUCTION

The subjective belief of an entrepreneur that an opportunity allows value generation is a key driver of entrepreneurial action throughout the new firm creation process and crucial to our understanding of entrepreneurial behaviors and outcomes (Krueger, 1993; McMullen and Shepherd, 2006; Barreto, 2012). It is thus not surprising that a rapidly increasing number of studies seek to shed light on how entrepreneurs evaluate business opportunities and, in particular, how their person-specific endowments affect their judgment as to what constitutes an attractive opportunity (Keh, Foo and Lim, 2002; Haynie, Shepherd and McMullen, 2009; Foo, 2011; Wood, McKelvie and Haynie, 2013). For instance, work in this domain has shown how novices and experienced entrepreneurs diverge in their views as to what an attractive business opportunity is (Baron and Ensley, 2006), which helps to explain why a given opportunity may not be equally appealing to all people (Choi and Shepherd, 2004; Dimov, 2010).

What is surprising, however, is the fact that although an individual's cognitive resources are considered fundamental to opportunity evaluation decisions (Haynie *et al.*, 2009), the existing literature offers limited insights into how *heterogeneity* of people's experience endowments affects their subjective judgments of opportunity attractiveness – i.e., their opportunity "prototypes" (Baron and Ensley, 2006) or opportunity "templates" (Barreto, 2012). Because we know from related work on strategic decision-making that substantial differences exist in how people with prior entrepreneurial experience and with prior managerial experience engage in decision-making (e.g., Busenitz and Barney, 1997), one can assume that people with different experience backgrounds will draw on distinct opportunity prototypes or templates when evaluating business opportunities. And yet we neither know the extent to which such heterogeneity exists among people's business opportunity templates, nor do we know which aspects of opportunities are particularly appealing to people with different experience backgrounds.

In the present paper, we address this key desideratum of entrepreneurship research by investigating how people with heterogeneous experience may diverge in their views as to what constitutes an attractive business opportunity, thereby providing insights into their distinct business opportunity templates. Drawing on cognitive theory (e.g., Gagné and Glaser, 1987) and, in particular, work on mental models (e.g., Johnson-Laird, 1983; Evans, 1993), our analysis focuses on three main types of experience backgrounds that are frequently encountered in new firm creation – i.e., people with experience in *management*, in *technology* and in *entrepreneurship*. Introduced by Schumpeter (1939) in his seminal examination of the entrepreneurial capacities of different types of organizational agents, this particular distinction is arguably one of the classic conceptualizations of human capital endowments in the field of entrepreneurship. It is also popular in the strategy literature, where Penrose (1959: 36) pointed out that “entrepreneurial versatility is a somewhat different quality from managerial or technical versatility. The latter two qualities are primarily questions of administrative and technical competence, the former is a question of imagination, which may or may not be ‘practical.’”

Core to our theoretical development are recent insights from research on entrepreneurial cognition (Baron and Ensley, 2006; Wood *et al*., 2013) suggesting that agents’ experience will shape their understanding of what an attractive business opportunity is (their opportunity template). Specifically, our theoretical development will proceed in two key steps:

First, in a baseline analysis we analyze the extent to which heterogeneity of opportunity evaluations by individuals with technological, managerial and entrepreneurial experience exists, and whether this heterogeneity persists over time (as observed in the divergence of opportunity evaluations by more or less experienced individuals).

Second, we seek to understand which characteristics of opportunities are systematically preferred by individuals with technological, managerial and entrepreneurial experience, that is, we explore the content and shape of their opportunity templates.

Our empirical analysis of business opportunity evaluations is based on a unique data set that combines experimental and questionnaire data. In total, our data captures 6,728 opportunity evaluation decisions nested in a sample of 141 individuals. We combine the conjoint data with questionnaire information on the experience backgrounds of all individuals participating in the study.

THEORETICAL BACKGROUND

Opportunity Evaluation in Discovery and Creation Settings

Following economic theorizing, business opportunities can be understood as market imperfections that allow agents to obtain economic benefits by introducing new and/or improved offerings to better serve customer needs (Alvarez, Barney and Anderson, 2013). Given that the exploitation of opportunities typically requires agents to commit substantial amounts of resources (in terms of time, attention, financial investments, social capital etc.), their evaluation is critical in determining whether it is worthwhile for the agent to (further) exploit the opportunity, adapt the chosen course of action, switch to an alternative opportunity, or abandon the entrepreneurial endeavor altogether (Lumpkin, Hills and Shrader, 2004; Haynie *et al*., 2009). Because opportunities are multi-dimensional constructs (Baron and Ensley, 2006), the evaluation of the potential value inherent in a business opportunity relies on subjective judgments regarding different characteristics of an identified opportunity (Simon, Houghton and Aquino, 2000; Mitchell *et al*., 2002; Dimov, 2007). In their evaluation activities, agents interpret the signals that they acquire from information channels (Fiet, 2007) – such as information relating to market demand and the level of competition in the venture's industry (Baron and Ensley, 2006).

At this point, it is important to recognize the different informational settings that agents may find themselves in when creating their new firms. Specifically, in recent years the entrepreneurship literature has developed different epistemological perspectives for the concept of opportunity, distinguishing between opportunities that are offered exogenously and can be identified through discovery (the "discovery approach") and opportunities that are created by the social (inter-) actions of entrepreneurs (the "creation approach") (Alvarez and Barney, 2007; Alvarez *et al*., 2013).

Specifically, in the *discovery* approach, agents identify business opportunities by being alert to exogenous changes that establish the possibility to obtain economic benefits. They observe the external environment and assess business opportunities arising from changes in technology, customer preferences and/or other attributes in their context (Kirzner, 1979; Fiet, 2007). Because opportunities are created by exogenous changes, they are objective phenomena and, in principle, observable (Alvarez and Barney, 2007). Thus, in this approach, agents are considered to either have sufficient information on the major dimensions of specific opportunities when assessing the opportunity's potential for value creation (Shane and Venkataraman, 2000) or can scan specific information channels in order to obtain missing pieces of information (Fiet, 2007). In other words, agents develop an understanding of the opportunity and form their opportunity beliefs by interpreting environmental information cues (McMullen and Shepherd, 2006). Given that the opportunity is discovered and critical information cues are presented to them, they expend limited cognitive or analytical effort when imposing their opportunity template(s) on the opportunity-related information (Barreto, 2012).

In the *creation approach* (Alvarez and Barney, 2007; Alvarez *et al*., 2013), would-be firm founders embark on their formation process with a set of aspirations, but limited information as to whether a market exists for their product, whether any revenues can be achieved, whether the revenues will exceed the costs and, hence, whether they are on a path towards a business opportunity (Sarasvathy, 2001; Alvarez *et al*., 2013). From this perspective, agents create their opportunities by combining what they have at hand (Baker and Nelson, 2005), by experimenting with a given set of means and by actively engaging with customers and other stakeholders. In other words, following a creation perspective, business opportunities are created based on social interaction (Sarasvathy, 2001; Fauchart and Gruber, 2011). When judging the merits of diverse courses of action to create a business opportunity, the agents' informational setting is characterized by missing and equivocal information. Although over time further information is obtained (e.g., through market feedback), in the early stages of firm formation agents face information deficits regarding the future development of their business, and will aim to control the current resource configuration and deployment through social interaction and iterations (Sarasvathy, 2001; Alvarez *et al*., 2013). Nonetheless, similar to the agents in the discovery process, individuals will continuously make conscious or subconscious judgments about their next step(s) to create a value-generating configuration (Wiltbank *et al*., 2006). They will interpret their setting and give meaning to the current data by imposing their opportunity template on the opportunity-related information (Fiske and Taylor, 1991; Barreto, 2012).

Opportunity Evaluation and Individuals' Mental Models

Cognition research indicates that through their everyday experiences individuals develop cognitive schemas or scripts that encode information about a concept (in our case business opportunity templates), including its features and the relationships between those features (Fiske and Taylor, 1991). People with experience in a given domain will differ in their cognitive representations (mental models) of certain concepts, as they encode information and process pieces of information in a more abstract, complex way than people who lack experience in that domain (Gagné and Glaser, 1987). In particular, their mental models help individuals to organize perceived reality, to form explanations of system functioning and to make predictions of distant or near-future outcomes (Johnson-Laird, 1983; Rouse and Morris, 1986; Evans, 1993).

As discussed, the evaluation of opportunities involves judgments about different opportunity characteristics. Depending on their a priori beliefs about which opportunity characteristics are key for value creation, individuals may ascribe different meanings to pieces of opportunity-related information and, given such differences in their opportunity templates, arrive at diverging judgments about the value creation potential of an opportunity. For instance, a large market may be seen as a desirable opportunity characteristic by some people, yet not by others.

In spite of its importance for understanding entrepreneurial action, however, research that links the cognitive structures of individuals to their opportunity preferences remains scant. The few existing studies in this realm provide important insights into how person-specific factors shape opportunity evaluations, although they have not examined how heterogeneity of experience affects people's opportunity templates. For instance, using a case method, Keh *et al*. (2002) examine how individuals' cognitive dispositions in terms of number of biases (e.g., overconfidence) affect opportunity evaluations under risky conditions. Haynie *et al*. (2009) use conjoint analysis to show that entrepreneurs view those opportunities as attractive candidates for exploitation that are complementary to the knowledge, skills and abilities that they already possess, because such opportunities could be exploited in a more effective way. Most recently, Wood *et al.* (2013) employ conjoint analysis in their examination of how person-specific factors (such as knowledge relatedness and fear of failure) affect a person's willingness to pursue an opportunity. In the following, we examine the opportunity preferences of three main types of agents that have been extensively examined in the entrepreneurship and strategy literatures: people with managerial experience, with entrepreneurial experience and with technological experience (Schumpeter, 1939; Dougherty, 1992; Busenitz and Barney, 1997; Baron, 1998).

HYPOTHESIS DEVELOPMENT

In this study, we develop three sets of hypotheses in order to provide a thorough investigation of the “experience background–opportunity evaluation” relationship:

Our first set of hypotheses seeks to establish a general relationship suggesting that individuals with different experience backgrounds will differ in their opportunity evaluations and investigates whether such differences become more pronounced with increasing experience.

Our second set of hypotheses will then focus on the content of individuals’ opportunity evaluations. That is, we examine particular characteristics of opportunities and seek to uncover systematic differences in the types of opportunity characteristics that people with technological, management and entrepreneurial experience will prefer.

Finally, our third hypothesis investigates whether systematic differences exist in the overall, multi-dimensional opportunity template (i.e., the set of opportunity characteristics) that is preferred by people with technological, management and entrepreneurial experience.

Heterogeneity of Experience & Business Opportunity Evaluation

We begin our investigation of the “experience background–opportunity evaluation” relationship with a general (baseline) analysis of the heterogeneity of experience endowments among organizational agents and their effect on opportunity evaluation decisions. In particular, we argue that individuals with different types of experience endowments will have systematically different opportunity preferences. This is because knowledge derived from prior work experience is to a significant extent shaped by the types of activities in which an individual regularly engages (Sørensen and Fassioto, 2011). While some individuals have developed extensive experience in solving particular organizational problems (such as evaluating business opportunities), others may not have been confronted with a problem of that particular nature in their entire working life (Dougherty, 1992; Eisenhardt, Kahwajy and Bourgeois, 1997). Thus, people working in different areas possess different problem-solving experience and insights, and are also subject to different blind spots (Gagné and Glaser, 1987; Finkelstein, Hambrick and Cannella, 2009). Depending on their type of work experience, individuals will have different perspectives on the drivers of firm-level value creation and are likely to have different insights and assumptions concerning which opportunity characteristics can lead to firm-level value creation. Following this line of reasoning, our first baseline hypothesis predicts:

Hypothesis 1a: *Individuals with different types of experience are likely to evaluate a given business opportunity differently.*

The arguments presented thus far emphasize the effects of heterogeneous experience in opportunity evaluation. It is also important to examine whether such heterogeneity is likely to persist, or becomes even more pronounced, with individuals' increasing work experience. Cognition scholars suggest that the intensity of exposure to a particular domain or function shapes an individual's mental models or schemata, as they become more refined with more frequent usage (Matlin, 2005). For example, Lurigio and Carroll (1985) find that experienced individuals possess more complete and detailed schemata than inexperienced individuals. Experienced individuals also integrate domain-specific knowledge in more meaningful ways than those with little experience, draw on clearer concepts, create richer connections between concepts, and are able to apply domain-specific problem-solving procedures they have developed over time (Adelson, 1981; Gobbo and Chi, 1986).

Taken together, these findings suggest that heterogeneity of opportunity evaluation is driven by the domain-specific experience and accumulated knowledge of individuals who specify and reinforce their cognitive schemata and evaluation procedures over time. Our second baseline hypothesis thus predicts that the aforementioned differences become more pronounced with increasing years of work experience.

Hypothesis 1b: *Opportunity evaluations by individuals with different types of experience are more likely to diverge with greater years of work experience.*

Technological, Management and Entrepreneurial Experience

The previous section has examined two fundamental effects of heterogeneity of experience endowments on opportunity evaluation decisions. Extending our theorizing, we explore the *content* of individuals' business opportunity preferences by investigating the opportunity evaluation decisions of people with technological, managerial and entrepreneurial experience and asking whether they have systematic preferences for particular opportunity characteristics.

Technological experience represents a specialized, functional type of experience (Kirzner, 1979). While greater expertise in this functional area is beneficial for performing the corresponding specialized activities, there is also evidence suggesting that individuals gravitate towards interpretations of organizational problems that mirror their functional backgrounds (Dearborn and Simon, 1958; Finkelstein *et al.*, 2009). In contrast, *management experience* and *entrepreneurial experience* represent general types of experience endowments. Whereas managerial experience provides individuals with knowledge regarding how established business organizations operate and can be administered, entrepreneurial experience connotes knowledge in launching and establishing a new firm. All three types of experience are acquired by investing a substantial amount of time in studying, observing, and engaging in activities in the respective domain (Becker, 1964). Hence, these types of knowledge have a high tacit component and thus cannot be readily acquired (Sørensen and Fasiotto, 2011).

Technological Experience

Prior research has shown that people with a functional background in technology possess distinct cognitive frameworks or thought worlds that shape their understanding of how firms function (Dougherty, 1992; Griffin and Hauser, 1996). Building on this body of work, we expect that an individual's background in technology also provides a lens through which they evaluate the attractiveness of business opportunities, that is, in their view promising opportunities should possess certain features, and not others. In order to understand which features of opportunities could be relatively more salient to technologists, it is necessary to look more closely at technologists' thought worlds.

Technology professionals are hired primarily from science and engineering schools. These schools focus their education on scientific methods and on solving technical problems (Bailyn and Lynch, 1983). Their education and socialization in technology not only promote skills in accomplishing technology-related tasks, but also foster commitment to technology and self-selection of activities in which the acquired competences can be applied (Feldman, 1976; Blau, 1999). Although it has become somewhat of a cliché that technologists typically have a lower inclination to deal with market-related issues and believe that products can be sold based purely on criteria such as product characteristics or functionality, many examples exist that suggest a strong focus on technology-related aspects (Jolly, 1997). Initial insights on the question of which attributes of business opportunities may be relatively more critical for technologists is offered by Dougherty's (1992) qualitative study on innovation projects. This research identifies a product-centric orientation of technologists, as they "define the market in terms of what the product does, and may overlook business aspects such as how many people will pay how much for the product" (Dougherty, 1992: 189). As a consequence, experienced technologists may see greater challenges, or greater upside potential, in the product-related aspects of business opportunities. With these arguments in mind, we propose the following hypothesis:

Hypothesis 2a: Individuals with a background in technology will be more sensitive to product-related dimensions in their evaluation of business opportunities than individuals without this type of experience.

Management Experience

The second type of experience examined in this study is management experience – i.e., a general type of experience endowment that comprises knowledge of how to manage and operate a business (Schumpeter, 1939; Busenitz and Barney, 1997).

Management professionals oftentimes acquire their education at business schools. By attending a business school, they obtain a general understanding of how different firm functions contribute to value creation and how firms should be managed to achieve superior performance outcomes in a competitive market system (Walsh, 1995). Although business school curricula comprise a range of courses (from human resource management to organizational behavior and strategic management) underlying and guiding the structure and content of the curriculum is the fundamental goal of increasing a firm's competitive performance. This primary goal is discussed most explicitly in strategy courses, where market- as well as resource-based approaches to strategic management start with the premise that competitive advantage must be achieved so that a firm can survive and prosper (Barney and Hesterly, 2009). Given that firm performance is ultimately decided vis-à-vis competing firms, management students will be strongly oriented towards navigating their firm in the competitive landscape.

This emphasis on outperforming the competition and achieving competitive advantage is likely to be reinforced in their everyday work as managers, as their firms' performance relative to other firms in the industry is a primary indicator of their own job performance (Finkelstein *et al.*, 2009). Preliminary support for this line of reasoning can again be gleaned from the innovation management literature, suggesting that the thought world of people with a management (planning) background is shaped by "competitive changes, new niches" (Dougherty, 1992: 188). Building on and extending these ideas, we predict that individuals with management experience will find competition-related characteristics more salient when evaluating business opportunities.

Hypothesis 2b: Individuals with experience in management will be more sensitive to competition-related dimensions in their evaluation of business opportunities than individuals without this type of experience.

Entrepreneurial Experience

People with prior entrepreneurial experience possess first-hand experience of the firm creation activity, which provides them with an in-depth understanding of what it takes to start a new firm (McGrath and MacMillan, 2000). Existing research indicates that there are key idiosyncratic characteristics of entrepreneurial experience that people with managerial experience do not possess (Busenitz and Barney, 1997).

Specifically, an increasing number of studies indicate that persons with entrepreneurial experience can be viewed as having a set of common characteristics that together form an entrepreneurial mind-set, which prompts them to search for a greater number of opportunities and to pursue only the very best ones (McGrath and MacMillan, 2000; Gruber, MacMillan and Thompson, 2008; Ucbasaran, Westhead and Wright, 2009).

The most relevant insights for the present study can be garnered from research by Baron and Ensley (2006), who find that people with entrepreneurial experience have developed particular "opportunity prototypes", that is, insights on the features that constitute an attractive business opportunity. Drawing on the results of Baron and Ensley (2006: 1139), it seems that experienced entrepreneurs would be more sensitive to the "ability to generate positive cash flow" and "speed of revenue generation" – that is, factors and conditions related to actually starting and running the firm. Notably, their opportunity prototypes do not entail features such as novelty or competitive superiority, which could also suggest that they would not emphasize these attributes.

Building on and extending these early insights, we argue that experienced entrepreneurs emphasize those dimensions in their opportunity evaluations that refer to those factors that allow quick cash generation. We posit:

Hypothesis 2c: *Individuals with experience in entrepreneurship will be more sensitive to dimensions related to cash generation in their evaluation of business opportunities than individuals without this type of experience.*

Experience and Overall Opportunity Preference Patterns

Our theorizing in the previous section has focused on those opportunity dimensions that we expect to be relatively more salient. The overall evaluation of the business opportunity will depend, however, on the overall perceived attractiveness of the opportunity as a multi-dimensional construct. We argue that there will be key differences in the opportunity preferences of individuals with generalist types of experience in management and entrepreneurship, and individuals possessing technological experience, which is a specialist type of experience.

Individuals with management experience and individuals with entrepreneurial experience possess a more holistic knowledge of what it means to run a business (Dougherty, 1992) and thus should have a fairly comprehensive understanding of the requirements that have to be met in order for an opportunity to be an attractive candidate for exploitation (Finkelstein *et al*., 2009). For instance, people with these types of experience may not only consider the competitive situation, but will also be likely to take market characteristics, cash generation characteristics, product characteristics, etc. into account, as they know that several elements are key to determining the value creation potential that is inherent in an opportunity. As a result, we expect that while individuals with management experience will be more sensitive to competition-related dimensions (H2B) and while individuals with entrepreneurial experience will be more sensitive to dimensions related to cash generation (H2C), people with these types of experience will also consider other dimensions of business opportunities when making decisions regarding the attractiveness of a particular opportunity. In other words, they will possess a *balanced* opportunity template.

In contrast, individuals with functional experience in technology seem to have a more focused understanding of the overall requirements that have to be met so that an opportunity is attractive (Dougherty, 1992). For instance, they may be particularly concerned about certain dimensions of business opportunities, while placing much less importance, or none at all, on other dimensions. We thus expect that the overall opportunity template of people with specialist experience will be more *rugged* than that of persons with managerial or entrepreneurial experience – that is, they emphasize particular dimensions, while largely neglecting others.

Taken together, these arguments indicate a key difference in the opportunity templates of individuals with generalist, managerial or entrepreneurial experience and individuals with specialist, functional experience in technology. We predict:

Hypothesis 3: The opportunity preferences of individuals with management experience and of individuals with entrepreneurial experience will be more balanced than the preferences of people with technological experience.

METHODOLOGY

Empirical Data: Choice-based Conjoint Method and Questionnaire

To examine opportunity evaluation decisions, we conducted a choice-based conjoint experiment with a sample of individuals possessing different experience backgrounds (technology, entrepreneurship, management). Choice-based conjoint analysis allows an experimental variation of business opportunity characteristics (Hauser and Rao, 2003) and is particularly suitable for research on evaluation tasks (e.g., Priem and Harrison, 1994; Choi and Shepherd, 2004), including the evaluation of business opportunities (Haynie *et al*., 2009). In particular, this method allows researchers to simulate respondents' decision processes in real time and is thus in several ways superior to commonly used post-hoc methods which collect data on self-reported decisions (e.g., examining the importance of different attributes with Likert scales). In a conjoint experiment, respondents are asked to evaluate a choice set, consisting of several profiles. Each profile (the description of an opportunity) is portrayed with multiple attributes (such as market size and product innovativeness). In addition to the conjoint experiment, we also administered a questionnaire in order to capture key information about the respondents. In particular, we asked about their education and work experience so that we could assess their experience background.

Development of Choice Sets for the Experiment and Analysis of Conjoint Data

In order to identify dimensions that hold relevance for the evaluation of business opportunities, we conducted a review of research in the management and entrepreneurship literatures. Drawing mainly on the work by Baker *et al*. (2003) and Baron and Ensley (2006), we identified six salient groups of business opportunity attributes that were deemed most relevant in prior research (i.e., market growth, market size, number of competitors, time to first sale, desirability of the product and innovativeness of the product). Table 1 shows the final set of opportunity attributes and their values.

[[Please insert Table 1 about here]]

Sample

In total, the sample consists of 141 respondents. Because we wanted to examine how differences in experience affect opportunity evaluation decisions, it was important to gain access to people with different experience backgrounds. Respondents were thus drawn not from various sources.

RESULTS

Hypotheses 1A-B: Likelihood Ratio (LR) Test of Heterogeneity in Opportunity Evaluations

In order to examine heterogeneity in opportunity evaluations, we carried out estimations for (1) the pooled data, (2) the managers, (3) the technologists, (4) the entrepreneurs, and, in order to highlight differences arising with increasing years of experience, a group of (5) pure novices. Whereas the estimations with the pooled data comprised information from all respondents, the remaining estimations (2)-(5) were based on distinct subgroups among our respondents. Specifically, for the three subgroups managers, technologists and entrepreneurs, we stratified the sample based on the respondent's type of work experience (i.e., experience in only one of the aforementioned fields and non-zero years of experience). This procedure led to the following subgroups: technologist (N = 192), manager (N = 672), or entrepreneur (N = 3144), with the average experience being about 4 years for technologists, 10.21 years for managers, and 8.59 years for entrepreneurs. To define the novice subgroup (5), we examined two different approaches: (1) "pure novices" with zero years of experience in any field, and a relaxed definition of (2) "novices" with zero years of experience in their respective field (technologist, manager, entrepreneur). The results obtained with both approaches were consistent; however, because of their greater clarity, we chose to report the results for the group of "pure novices" (N = 2768 out of 6728 in total).

Our first analysis uses a likelihood ratio (LR) test to investigate whether opportunity evaluations, expressed as the coefficients of six attributes of a given business opportunity, are equal across different subgroups. In order to test H1A and H1B, we use two different approaches: (A) hierarchical assessment of heterogeneity in opportunity evaluations between subgroups with different types of experience that are nested in the pooled sample, and (B) pairwise assessments of divergence between each subgroup of experienced individuals and the group of pure novices. A positive LR χ^2 would indicate that the estimates of different conditional logit models are significantly different. In this regard, Table 2 presents test results for parameter equality obtained by estimating standard conditional logit models for the pooled and stratified subgroups, and by calculating their test statistics for a series of LR tests.

[[Please insert Table 2 about here]]

Tables 2A and 2B indicate significant differences (for all cases at the 1% level) in opportunity evaluations among the subgroups. Models with different underlying parameters indicate that respondents with different types of experience (i.e., managers, technologists and entrepreneurs) and years of experience (i.e., pure novice and experienced) place significantly different relative importance on the opportunity attributes. Given these results, we claim support for both our baseline hypotheses H1A and H1B.

Hypotheses 2A-C: Experience & Sensitivity to Opportunity Attributes

Table 3 presents the results obtained from standard conditional logit models that include interaction terms capturing each attribute level and the years of experience in management, technology or entrepreneurship. In order to investigate the evaluations of people with these types of experience, we define them in the purest possible sense, i.e., these groups have experience only in management, in technology, or in entrepreneurship. We also test the robustness of these analyses using overlapping experience endowments below.

[[Please insert Table 3 about here]]

The signs of the coefficients in the base model without interaction terms are what one expects: positive for annual market growth, current market size, product desirability, and product innovativeness, but negative for the number of competitors and time to first sale. The estimates are also found to be statistically significant at the 1% level (z-value). The coefficients in the full models with interaction terms represent the conditional effects of different knowledge endowments, and the non-interaction terms cannot be interpreted in isolation without accounting for their corresponding interaction terms.

As shown in the full models in Table 3, the patterns of opportunity evaluations are unique and divergent between experience types. As predicted, experienced technologists are more sensitive to product-related dimensions as their evaluations significantly diverge in the product-related dimension, whereas managers' evaluations significantly diverge in the competition-related dimension. Experienced entrepreneurs' evaluations significantly diverge in the dimensions of "time to first sale", "market size" and "market growth" – i.e., dimensions that are important for achieving successful sales and respective cash flows from operations. We thus claim support for H2A, H2B, and H2C, respectively.

Interestingly, while some of the directions of the interaction effects are straightforward to understand, others are counterintuitive. Prior research on opportunity evaluations has highlighted this key feature of conjoint analysis, as it captures actual decision tasks and thus allows researchers to uncover effects that "are rather counterintuitive, which adds to the conceptual conversation on opportunity beliefs" (Wood *et al*., 2013: 3). In this regard, three findings stand out: First, we find an interesting pattern for technologists. Accounting for the negative interaction effects (xf1 and xf2 interaction terms: -0.3171 and -0.2797, $p < 0.01$), the combined coefficients imply that they pay more attention to product-related dimensions in their opportunity evaluations, yet with increasing years of experience they value product innovativeness less than novices and other subgroups. For example, with one year of technology experience, the combined effect becomes 0.6110 for the technologist subgroup, which is smaller than those of managers (0.8741) and entrepreneurs (0.9694). Together, these results suggest that experienced technologists see more challenges than upside potential in business opportunities with highly innovative products.

Second, the positive coefficients of the interaction terms for managers indicate that individuals with greater experience in management become less concerned about the number of competitors when evaluating business opportunities (xc1 and xc2 interaction terms: 0.0644, $p < 0.01$ and 0.0229, $p < 0.10$). None of the other interaction coefficients are statistically significant in this column. In their combined effects, we find that entrepreneurs with one year of founding experience are more likely to avoid business opportunities with more than five competitors (as shown in the combined coefficient of -1.7571 with the negative and significant xc1 interaction term: -0.4095, $p < 0.05$) than managers with one year of managerial experience (as shown in the combined effect of -1.4110).

Finally, individuals with more years of entrepreneurial experience are less concerned about annual market growth (xa1 interaction term: -0.1590, $p < 0.01$), yet place greater emphasis on current market size (xb1 and xb2 interaction terms: 0.2882 and 0.2377, $p < 0.05$), number of competitors (xc1 interaction term: -0.4095, $p < 0.05$), and time to first sale (xd1 and xd2 interaction terms: -0.2937, $p < 0.05$ and -0.1659, $p < 0.01$). However, none of the interaction coefficients related to the product are significant. We will comment in more detail on these

Hypothesis 3: "Balanced" vs. "Rugged" Opportunity Templates

Thus far, our analysis (H2A to H2C) has focused on those characteristics of opportunities that are emphasized by individuals with different types and years of experience. These analyses have yielded important insights with respect to systematic differences in how agents shift their emphasis on opportunity attributes as they gain experience over time in their respective field. However, these analyses do not yet provide insights on the overall opportunity templates of agents. Hypothesis 3 proposed that the opportunity templates of managers and entrepreneurs will be more balanced than that of technologists, i.e., theirs will take on a more rugged form. We analyze this hypothesis by computing a ruggedness score. Specifically, the ruggedness score was computed in four steps. Following the procedures outlined in prior conjoint research (e.g., Franke *et al*., 2008), we first computed the overall benefit that the maximum opportunity receives (i.e., an individual's "ideal" opportunity, see the first line in Table 4). Second, we computed the relative benefit contribution of the highest parameter value of each opportunity dimension. Third, because in a perfectly balanced opportunity prototype each of the n dimensions would contribute 1/n to the overall benefit of that opportunity (in our case 1/6, or 16.67%), we subtracted the relative benefit contribution derived in step 2 from the balanced contribution to arrive at a deviation score for each opportunity dimension. Fourth, the absolute value of each deviation score was summed up to produce an overall ruggedness score for an individual's opportunity prototype. As Table 4 indicates, the ruggedness score for technologists is considerably higher than the scores obtained for managers and entrepreneurs, indicating that they place particular importance on a few dimensions while largely neglecting others. We thus claim support for H3.

[[Please insert Table 4 about here]]

DISCUSSION AND CONCLUSION

By collecting and analyzing a unique data set capturing the opportunity evaluations of 141 persons with different experience backgrounds, our study has produced three main findings:

First, our baseline results not only provide evidence of heterogeneity in opportunity evaluations by individuals possessing different types of experience (i.e., technology, management and entrepreneurship), but also demonstrate persistence of this heterogeneity over time.

Second, although prior research has shown that people from different parts of an organization look at organizational problems from different vantage points (Dougherty, 1992), we have lacked evidence on agents' distinct business opportunity preferences. Specifically, our results document how individuals with different types of experience systematically vary in their preferences for particular opportunity attributes. Beyond several findings that were in line with what one may commonly expect, our analysis has uncovered a number of counterintuitive insights – which is one of the strengths of conjoint-based research (Wood *et al*., 2013). For instance, in developing H2A, we argued that technologists would be more sensitive to product-related attributes. In fact, we found support for this hypothesis, as the associated interaction is significant. However, beyond greater sensitivity to this type of opportunity attribute, the direction (sign) of the interaction coefficient indicates that with increasing years of experience, technologists attribute less importance to product innovativeness than other agents. At first glance, this finding is striking, but two main arguments provide some rationale for this type of evaluation behavior. First, people with this type of experience have probably learned from their own R&D work that when one performs more innovative types of (technical) experiments, one will also experience more failures (e.g., which is a common occurrence in technology labs). Thus, in their minds, innovative products could be associated with higher likelihood of failure – which is why their opportunity templates indicate a preference for products that are more similar to the competing offerings (which also provides the bonus of proven customer demand, while customers may refrain from novel offerings). Second, knowing that they have limited understanding of business settings, they may seek to limit the overall newness of their new business endeavor: knowing that new firm creation provides them with novel types of challenges in a number of areas, they may at least want to limit the typical risks and uncertainties associated with novel products (Wincent and Örtqvist, 2009). In addition, we found support for H2B proposing that managers are more sensitive to opportunity attributes capturing the competitive situation. We were surprised to see, however, that with increasing years of work experience managers become less concerned about greater numbers of competitors. Perhaps, for them the number of competitors implies that the target market is “real” and legitimate – i.e., there is business waiting to be made. Also, they may become less concerned over time because they develop better abilities in outmaneuvering other firms (Santos and Eisenhardt, 2009).

Third, examining the overall preference pattern in opportunity evaluation decisions, we find that the opportunity templates of entrepreneurs and managers are more balanced than the template of technologists, i.e., technologists view fewer opportunity attributes as salient in their evaluations. Hence, people with generalist experience evaluate opportunities in a more holistic way than people with specialized, functional experience.

Implications for Entrepreneurship Research

First and foremost, our findings contribute to entrepreneurship theory by providing largely novel evidence on the distinct opportunity preferences held by three main types of organizational actors, and thus help to explain why individuals may arrive at different conclusions regarding the attractiveness of the very same opportunity, and why they may decide to pursue, or forego, that opportunity. In other words, our results offer an important explanation as to why some opportunities remain 3rd person opportunities, and why some will be 1st person opportunities – i.e., opportunities that will be exploited by the focal agent (McMullen and Shepherd, 2006; Shepherd, McMullen and Jennings, 2007).

Along these lines, one core finding of research on opportunities has been that the founder's prior knowledge affects which opportunities they are able to identify (Shane, 2000; Gruber, MacMillan and Thompson, 2013). The present study extends this important theme by showing that the founder's existing knowledge also shapes their views of what an attractive opportunity is. These divergent preferences are likely to cause observed heterogeneity in new firm creation, resource deployment and, ultimately, diverging firm-level value creation outcomes.

These insights also suggest that research on the relationship between the founder's human capital and firm success (or failure) should take into account systematic differences that exist in founders' opportunity choices. Given that the choice of a particular opportunity underlies the value creation potential that can be exploited, systematic differences in opportunity choices may to a significant extent explain differential firm performance outcomes. Existing research in this field, however, typically looks at the skills founders have for setting up and managing a firm, and neglects (to account for) opportunity choices when explaining new firm performance.

Implications for Strategy Research

Research in strategy offers plenty of evidence on how the experience of the firm's leaders imprints their organizations (Hambrick and Mason, 1984; Helfat and Lieberman, 2002). Yet, in spite of a long tradition, we have lacked insights on how individuals' experience backgrounds affect their opportunity preferences and the types of growth options that the firm will exploit.

Our findings also contribute to resource-based theory. In particular, Penrose (1959) emphasized that the decision regarding which growth options the firm pursues is not an ex ante given factum but relies on managers' subjective judgments and, thus, on their mental models. Except for a few notable studies, however, research has ignored the role of subjective judgment in managerial decisions in favor of objective measures of resource characteristics (Alvarez and Busenitz, 2001; Kor, Mahoney and Michael, 2007; Foss *et al*., 2008).

Conclusion

By uncovering key differences in the opportunity preferences of agents with technological, management and entrepreneurship experience, the present study offers fundamental new insights on how heterogeneity arises in firm creation processes and outcomes. Furthermore, they offer a compelling argument as to why established firms that are run by executives with different types of experience backgrounds may systematically diverge in the types of growth options they prefer to pursue with their firms. In this regard, future research may extend the present study by examining other frequently encountered experience endowments in organizations, such as experience in finance, marketing or operations. Value lies in the eye of the beholder.

REFERENCES AVAILABLE UPON REQUEST

TABLES AND FIGURES

Table 1
Business Opportunity Attributes and Levels

Attributes	Description of attributes	Levels		
1. Expected annual market growth	How fast your target market is expected to grow	-3% to +3%	5% to 10%	More than 35%
2. Market size	The current size of the market you are targeting	10 Million	50 Million	100 Million
3. Number of competitors	Number of direct competitors you will have that target the same market	1 competitor	2-5 competitors	More than 5 competitors
4. Time to first sale	The time it will take you to generate your first sale	Less than 12 months	12 to 24 months	More than 24 months
5. Desirability of product	How strongly the customer desires products from your product category	"Nice to have" product	"Should have" product	"Must have" product
6. Innovativeness of the product	How innovative your own product offering is relative to the competition.	Offering resembles competitors' offerings	Offering outperforms along established dimensions	Offering outperforms on radically new dimensions

Table 2

Likelihood Ratio (LR) Test Results for Overall Parameter Equality

2A. Hierarchical Test of Heterogeneity: Managers, Technologists and Entrepreneurs

Model	Obs	LL(null)	LL(model)	df	AIC	BIC
pooled	6728	-2331.75	-1622.06	12	3268.13	3349.89
mgtyrs	672	-232.90	-166.28	12	356.57	410.69
tecyrs	192	-66.54	-44.26	12	112.52	151.61
entyrs [a]	3144	-1089.63	-100.88	12	1572.78	1645.42
pooled	6728	-2331.75	-1622.06	12	3268.13	3349.89
mgtyrs	672	-232.90	-166.28	12	356.57	410.69
tecyrs [b]	192	-66.54	-44.26	12	112.52	151.61
pooled	6728	-2331.75	-1622.06	12	3268.13	3349.89
mgtyrs	672	-232.90	-166.28	12	356.57	410.69
entyrs [c]	3144	-1089.63	-100.88	12	1572.78	1645.42
pooled	6728	-2331.75	-1622.06	12	3268.13	3349.89
tecyrs	192	-66.54	-44.26	12	112.52	151.61
entyrs [d]	3144	-1089.63	-100.88	12	1572.78	1645.42
pooled	6728	-2331.75	-1622.06	12	3268.13	3349.89
mgtyrs [e]	672	-232.90	-166.28	12	356.57	410.69
pooled	6728	-2331.75	-1622.06	12	3268.13	3349.89
tecyrs [f]	192	-66.54	-44.26	12	112.52	151.61
pooled	6728	-2331.75	-1622.06	12	3268.13	3349.89
entyrs [g]	3144	-1089.63	-100.88	12	1572.78	1645.42

Note: Hypothesis 1a: $\beta_{pooled} = \beta_{managers} = \beta_{technologists} = \beta_{entrepreneurs}$

a. LR χ^2 (12) = 1274.25, Prob > χ^2 = 0.0000
b. LR χ^2 (12) = 2911.56, Prob > χ^2 = 0.0000
c. LR χ^2 (12) = 2823.03, Prob > χ^2 = 0.0000
d. LR χ^2 (12) = 3155.60, Prob > χ^2 = 0.0000
e. LR χ^2 (12) = 1362.77, Prob > χ^2 = 0.0000
f. LR χ^2 (12) = 1695.34, Prob > χ^2 = 0.0000
g. LR χ^2 (12) = 1606.82, Prob > χ^2 = 0.0000

2B. Pairwise Test of Heterogeneity: Novice vs. Experienced Individuals

Model	Obs	LL(null)	LL(model)	df	AIC	BIC
pooled	6728	-2331.75	-1622.06	12	3268.13	3349.89
novice	2768	-959.32	-642.09	12	1308.19	1379.30
mgtyrs [a]	672	-232.90	-166.28	12	356.57	410.69
pooled	6728	-2331.75	-1622.06	12	3268.13	3349.89
novice	2768	-959.32	-642.09	12	1308.19	1379.30
tecyrs [b]	192	-66.54	-44.26	12	112.52	151.61
pooled	6728	-2331.75	-1622.06	12	3268.13	3349.89
novice	2768	-959.32	-642.09	12	1308.19	1379.30
entyrs [c]	3144	-1089.63	-774.39	12	1572.78	1645.42

Note: Hypothesis 1b: $\beta_{pooled} = \beta_{novice} = \beta_{experienced\ (managers,\ technologists,\ or\ entrepreneurs)}$

a. LR χ^2 (12) = 1627.37, Prob > χ^2 = 0.0000
b. LR χ^2 (12) = 1871.42, Prob > χ^2 = 0.0000
c. LR χ^2 (12) = 411.16, Prob > χ^2 = 0.0000

Table 3
Results from Conditional Logit Models with Interactions

Variables	Base Model	Full Models with Interactions		
	Pooled	Managers	Technologists	Entrepreneurs
xa1: annual market growth	1.3145***	1.3078***	1.3251***	1.3564***
(more than 35%)	(0.1166)	(0.1186)	(0.1193)	(0.1208)
xa2: annual market growth	0.7532***	0.7391***	0.7396***	0.7866***
(5% to 10%)	(0.0998)	(0.1014)	(0.1014)	(0.1021)
xb1: current market size	0.4282***	0.4448***	0.4565***	0.3938***
(100 million)	(0.0977)	(0.1048)	(0.0970)	(0.0987)
xb2: current market size	0.3300***	0.3268***	0.3477***	0.3040***
(50 million)	(0.0844)	(0.0890)	(0.0852)	(0.0842)
xc1: number of competitors	-1.4000***	-1.4754***	-1.4012***	-1.3476***
(more than 5 competitors)	(0.1124)	(0.1170)	(0.1153)	(0.1123)
xc2: number of competitors	-0.8172***	-0.8417***	-0.8263***	-0.7966***
(2-5 competitors)	(0.0892)	(0.0943)	(0.0918)	(0.0912)
xd1: time to first sale	-1.2489***	-1.2560***	-1.2622***	-1.2175***
(more than 24 months)	(0.1191)	(0.1275)	(0.1237)	(0.1216)
xd2: time to first sale	-0.6874***	-0.6910***	-0.6972***	-0.6693***
(12 to 24 months)	(0.0851)	(0.0878)	(0.0872)	(0.0879)
xe1: product desirability	1.1069***	1.1166***	1.1283***	1.1027***
(“must have” product)	(0.1059)	(0.1109)	(0.1081)	(0.1080)
xe2: product desirability	0.4731***	0.4667***	0.4589***	0.4831***
(“should have” product)	(0.0919)	(0.0948)	(0.0941)	(0.0947)
xf1: product innovativeness	0.8717***	0.8774***	0.9281***	0.8725***
(radically new features)	(0.1300)	(0.1362)	(0.1301)	(0.1332)
xf2: product innovativeness	0.6497***	0.6504***	0.6981***	0.6436***
(established features)	(0.1041)	(0.1100)	(0.1041)	(0.1066)
xa1 x mgtyrs, tecyrs, or entyrs		0.0122	-0.0613	-0.1590***
		(0.0293)	(0.0977)	(0.0464)
xa2 x mgtyrs, tecyrs, or entyrs		0.0160	0.0156	-0.2089
		(0.0224)	(0.0719)	(0.1386)
xb1 x mgtyrs, tecyrs, or entyrs		-0.0115	-0.1561	0.2882**
		(0.0185)	(0.1852)	(0.1213)
xb2 x mgtyrs, tecyrs, or entyrs		0.0079	-0.0747	0.2377**
		(0.0224)	(0.0685)	(0.0962)
xc1 x mgtyrs, tecyrs, or entyrs		0.0644***	-0.0733	-0.4095**
		(0.0206)	(0.0841)	(0.1680)
xc2 x mgtyrs, tecyrs, or entyrs		0.0229*	0.0006	-0.1779
		(0.0125)	(0.0734)	(0.1141)
xd1 x mgtyrs, tecyrs, or entyrs		0.0040	-0.0863	-0.2937**
		(0.0274)	(0.2526)	(0.1265)
xd2 x mgtyrs, tecyrs, or entyrs		0.0041	0.0542	-0.1659***
		(0.0228)	(0.1058)	(0.0444)
xe1 x mgtyrs, tecyrs, or entyrs		-0.0052	-0.1336	0.1237
		(0.0292)	(0.1409)	(0.1089)
xe2 x mgtyrs, tecyrs, or entyrs		0.0085	0.0240	-0.0976
		(0.0243)	(0.0459)	(0.0727)
xf1 x mgtyrs, tecyrs, or entyrs		-0.0033	-0.3171***	0.0969
		(0.0361)	(0.0734)	(0.0684)
xf2 x mgtyrs, tecyrs, or entyrs		0.0016	-0.2797***	0.0972
		(0.0212)	(0.0354)	(0.0654)
LL	-1622.06	-1616.00	-1609.82	-1609.99
Prob > LR	0.0000	0.0000	0.0000	0.0000
McFadden’s R^2	0.3044	0.3070	0.3096	0.3095

N = 6728: Managers (672), Technologists (192), and Entrepreneurs (3144)
** p < 0.10; ** p < 0.05; *** p < 0.01; Robust standard errors in parentheses.*

Table 4

Analysis of the Ruggedness of Individuals' Opportunity Prototype

	Managers		**Technologists**		**Entrepreneurs**	
Maximum Opportunity (Total Benefit)	6.26		6.99		6.10	
Relative Benefit Contribution of Highest Level	Rank	%	Rank	%	Rank	%
xa1: annual market growth	2	21.71 %	2	21.90%	1	21.47%
xb1: current market size	6	7.42%	6	4.86%	6	6.38%
xc1: number of competitors	3	17.71%	1	33.20%	2	20.75%
xd1: time to first sale	1	22.94%	3	18.48%	3	20.56%
xe1: product desirability	4	15.23%	4	14.65%	4	19.21%
xf1: product innovativeness	5	14.98%	5	6.90%	5	11.63%
Deviation from the Average (Ruggedness Score)		24.72%		47.18%		30.64%