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HOW EXPERIENCE SHAPES THE SUBJECTIVE EVALUATION OF BUSINESS OPPORTUNITIES

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ABSTRACT

The purpose of this paper is to build on a set of recent theoretical studies investigating the role of subjective insights and judgments in the resource-based view and to extend this important line of inquiry by offering a detailed assessment of how agents' knowledge and experience endowments systematically shape their subjective evaluations of business opportunities, and thus the firm's growth options. Our empirical analysis is based on a unique data set that combines experimental conjoint data and survey data obtained from 141 individuals. Our results not only provide evidence of heterogeneity in opportunity evaluations by individuals with different types of experience endowments (marketing, technology, management) but also demonstrate persistence of this heterogeneity. The findings provide a number of novel implications for strategy and entrepreneurship research.

INTRODUCTION

As one of the most widely accepted theoretical perspectives in the field of strategy, the resource-based view (RBV) suggests that a firm's resources underlie its ability to achieve competitive advantage (Penrose, 1959; Barney, 1991). For more than two decades, an extensive theoretical and empirical literature (e.g., Wernerfelt, 1984; Mahoney and Pandian, 1992; Amit and Schoemaker, 1993; McGrath, MacMillan and Venkataraman, 1995) has helped to shape our understanding of how firms' heterogeneous resource endowments contribute to inter-firm performance differences and competitive advantage. Yet, despite the important insights offered by extant RBV research, a number of recent contributions argue that the RBV presents an 'unfinished revolution'. Perhaps most importantly, critics point out that the key link between the firm's resources and value creation remains largely black-boxed – a serious shortcoming for a theory seeking to explain differential firm performance (Priem and Butler, 2001; Sheehan and Foss, 2007).

In this study, we investigate the extent to which heterogeneous knowledge and experience endowments of individuals influence their subjective evaluation of business opportunities. The purpose of the present paper is to build on a set of recent theoretical studies investigating the role of subjective insights and judgments in the resource-based view (Alvarez and Busenitz, 2001; Kor and Mahoney, 2004; Kor et al., 2007, Foss et al., 2008), and to extend this important line of inquiry by offering a detailed theoretical and empirical assessment of how agents' knowledge and experience endowments systematically shape their subjective evaluations of business opportunities, and thus the firm's growth options. Our empirical analysis is based on a unique data set that combines experimental and survey data obtained from 141 individuals. Specifically, we utilize choice-based conjoint analysis which has been shown to be particularly suitable for research on evaluation tasks, because it allows an experimental variation of the characteristics of evaluation objects (e.g., Priem and Harrison, 1994) – in our case the main dimensions of business opportunities stemming from the firm's resources. The conjoint method allows us to analytically infer participants' preferences by observing their choice behavior in real-time and with multidimensional evaluation objects, whereas questionnaire-based research attempting to capture

individual's choice preferences often suffers from the lack of insight that people have into their own decision-making, and a variety of additional methodological problems (Priem, 1992; Hauser and Rao, 2003; Choi and Shepherd, 2004). We combine the conjoint data with survey information capturing the experience backgrounds of all individuals participating in the study.

RESOURCES, MANAGERIAL COGNITION AND THE FIRM'S BUSINESS OPPORTUNITIES

Extant resource-based theory maintains that firms cannot appropriate economic rents from the deployment of valuable resources available in strategic factor market unless they have superior expectations about their future value creation functions or unless they are beneficiaries of random luck (Makadok and Barney, 2001). Underlying these core theoretical considerations is an important conceptual distinction between the firm's resources and the services that these resources can render for end-customers that was introduced in Penrose's (1959) widely acknowledged *Theory of the Growth of the Firm*. This distinction allowed Penrose (1959) to emphasize another key theoretical aspect, namely that the decision which services (growth options) the firm should pursue is not an ex ante given factum but relies on managers' *subjective* judgments and, thus, on their cognition or mental models. Until recently, however, resource-based studies generally ignored the role of subjective judgment in managerial decisions on heterogeneity and growth of the firm in favor of objective measures of resource characteristics (Kor et al., 2007; Foss et al., 2008).

In the current study, we investigate the extent to which heterogeneous knowledge and experience endowments of individuals influence their subjective evaluation of business opportunities, which may cause observed heterogeneity of the firms in terms of business opportunities pursued and, ultimately, in terms of firm-level value creation outcomes. Our theorizing considers three frequently encountered types of prior work experience – i.e., that of managers, engineers (technologists), and marketers – which consist of understandings derived from a person's occupation, on-the-job routines, job-related technology, and specialized education (Fiet, 2007; Venkataraman, 1997). Several arguments suggest that individuals with different types of work experience endowments will make systematically different opportunity evaluation decisions.

First, because knowledge derived from prior work experience is to a significant extent shaped by the types of activities an individual regularly engages in, individuals are not equally competent to judge the economic value creation potential of business opportunities – while some have developed deep experience in solving particular organizational problems such as evaluating and choosing between business opportunities, others may not have been confronted with a problem of that particular nature in their entire work life (Dougherty, 1992). People working in different areas thus possess different problem-solving experience and insights, and are also subject to different blind spots (Gagné and Glaser, 1987). For example, in research on organizations Eisenhardt, Kahwajy and Bourgeois (1997) point out that people "who have grown up in sales and marketing typically see opportunities and issues from vantage points that differ from those who have primarily engineering experience" (p. 48). Hence, we expect that depending on their type of work experience, individuals have different perspective on the opportunity-value creation link and thus are likely to possess different subjective insights on which opportunity characteristics can lead to firm-level value creation.

Second, both strategy and entrepreneurship researchers have highlighted that it is the relatedness of the existing human resources of the firm and business opportunities – that is important in making strategic decisions (Prahalad and Hamel, 1990). In fact, it appears that

individuals typically pursue opportunities that are related to knowledge they already possess (Fiet, 2007, Shane, 2000; Venkataraman, 1997). This focus on the role of individuals' existing, related knowledge is consistent with theories that posit that individual knowledge acquisition and learning is often constrained or promoted by the context in which that knowledge was acquired (Rozin, 1976). Further, it is likely that individuals will also subjectively assess their ability to make the most of an opportunity as being greater, when that opportunity is highly related to their existing knowledge which has been accumulated from prior work experience (Eisenhardt and Schoonhoven, 1990). Individuals consider whether they have recognized an opportunity for him- or herself as opposed to third-person opportunity beliefs that one has recognized an opportunity for someone with the right knowledge and motivation (McMullen and Shepherd, 2006). It is thus likely that the evaluation of a given opportunity proceeds in light of the concomitant consideration of the attributes of the opportunity and the relatedness of the existing knowledge and experience endowments of an individual to the business opportunity. We predict:

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

The arguments presented thus far highlight the effects of knowledge heterogeneity in opportunity evaluation. From a resource-based perspective it is also important to examine whether such heterogeneity is likely to persist, or even becomes more pronounced, with increasing work experience of individuals. In this regard, cognition scholars suggest that the intensity of exposure to a particular domain or function shapes an individual's cognitive frameworks 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). Perhaps the most pertinent empirical finding related to the current research comes from Baron and Ensley (2006) who report that serial (experienced) entrepreneurs possess more detailed cognitive schemata and stress different opportunity characteristics than first-time entrepreneurs. Similarly, related research on venture capital decision making indicates that experienced venture capitalists emphasize different attributes in their evaluation of venture proposals than their novice counterparts (Franke et al., 2008). Taken together, we argue that heterogeneity in opportunity evaluation is driven by domain-specific experience and accumulated knowledge of individuals who specify and reinforce their cognitive schemata and evaluation procedures. We thus predict that the differences become more pronounced with increasing years of work experience.

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

THE EFFECTS OF TECHNOLOGY, MARKETING AND MANAGEMENT EXPERIENCE ON OPPORTUNITY EVALUATION

Technological Experience Endowments

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 and thus influence their decision-making in organizations (Dougherty, 1992; Griffin and Hauser, 1996). Technology professionals are hired primarily from engineering and science schools, and these schools focus their education on scientific methods and on solving technical

problems (Griffin and Hauser, 1996). Their education and socialization in technology not only promote skills in accomplishing technology-related tasks but also foster commitment to technology and self-selection into activities in which the acquired competences can be applied (Blau, 1999; Feldman, 1976; Griffin and Hauser, 1996). As a consequence, technologists typically favor projects in which technological characteristics feature prominently (Heilmeier, 1993; Black, Carlile, and Repenning, 2004). For instance, prior research indicates that people with technological experience have a particularly favorable perception of the attractiveness of technology alliances (Tyler and Steensma, 1998), prefer working on technology-push rather than market-pull innovations (Roberts, 1990) and are particularly alert to the economic potential of technological attributes in business environments (Tyler and Steensma, 1998).

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 innovativeness or functionality, many examples exist that suggest an extensive focus on technology-related aspects (e.g., Jolly, 1997). Initial insights on the question which attributes of business opportunities are particularly salient for technologists is offered by Dougherty's (1992, p.189) field research suggesting the 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." Hence, we posit:

Hypothesis 2a: People with a background in technology will put relatively stronger emphasis on product-related dimensions in their evaluation of business opportunities

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Marketing Experience Endowments

The thought worlds of marketers have been of considerable interest to prior research, especially in comparison to the thought worlds of technologists (Dougherty, 1992; Griffin and Hauser, 1996). Marketing professionals are hired primarily from business schools which focus their education on providing a general understanding of how firms function and typically offer specialized training in marketing, if the student decided to deepen her knowledge in this functional domain (Griffin and Hauser, 1996). Being concerned with a downstream function that links the firm with its customers, an education in marketing typically focuses on topics such as understanding markets and customer needs, the strategies and instruments available to influence consumer behavior as well as management of the firm's sales force (e.g., Kotler and Keller, 2008). This emphasis on market-related factors is usually reinforced in the culture of the firm's marketing department and its organizational routines (Lorsch and Lawrence, 1965; Griffin and Hauser, 1996). Case in point, Dougherty's study (1992) suggests that people with backgrounds in marketing perceive buyer needs as most critical in innovation projects. Following this reasoning, we propose that people with marketing experience will exhibit a relatively stronger focus on market characteristics in their evaluation of business opportunities.

Hypothesis 2b: People with experience in marketing will put relatively stronger emphasis on market-related dimensions in their evaluation of business opportunities.

Managerial Experience Endowments

The third type of experience endowment examined in this study is management experience. As discussed, management experience represents a general type of experience, whereas technological and marketing experience represent functional experience types. Management professionals oftentimes acquire their education at business schools which seek to provide 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. Although business school curricula comprise a range of courses – from human resource management to courses in organizational behavior and in 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. Given that firm performance is ultimately decided vis-à-vis competing firms, management students' outlook will be strongly oriented towards navigating their firm in the competitive landscape. In turn, 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 Dougherty (1992, p. 188) who suggests that the thought world of people with a management (planning) background is shaped by "competitive changes, new niches". Against this backdrop, we predict:

Hypothesis 2c: People with experience in management will put relatively stronger emphasis on competition-related dimensions in their evaluation of business opportunities.

METHODOLOGY

To explore the research question outlined above, we conducted an experiment with a sample of individuals with varying backgrounds with regard to technology, marketing, and management. We employ the methodology of choice-based conjoint analysis which allows an experimental variation of business opportunity attributes (Hauser and Rao, 2003). Choice-based conjoint analysis is particularly suitable for research on evaluation tasks (e.g., Priem and Harrison, 1994; Choi and Shepherd, 2004). In particular, this method allows researchers to *simulate* respondents' decision processes in real time and thus is in several ways superior to commonly used *post-hoc* methods which collect data on self-reported decision (e.g., questionnaires using Likert-type scales). In a conjoint experiment, respondents are asked to judge a choice set, consisting of several profiles, that is, combinations of levels for several attributes. From the preferences or choices stated in this way, conclusions can be drawn about the contribution of the various levels of each attribute to the overall attractiveness of a certain profile. In particular, this approach enables quantification of trade-offs between different attributes under investigation. The application of this research method to our study is presented in the following paragraphs.

In order to identify dimensions that hold relevance for the evaluation of business opportunities, we conducted a review of management, marketing, and entrepreneurship literature. We identified fourteen empirical studies that indicated criteria related to business opportunities and extracted the discussed dimensions and their measurements. Subsequently, two of the authors grouped the resulting business opportunity dimensions independently and compared their individual categorizations In an additional analysis, we compared our derived groups with the business opportunity dimensions identified by Baron and Ensley (2006). This procedure lead to six salient groups of business opportunity attributes (market growth, market size, number of competitors, time to first sale, desirability of the product and the innovativeness of the product). Following guidelines laid out for conjoint analysis, building on prior measurements and by incorporating suggestions from practitioners, we developed a three level measurement for each of these six dimensions. Additional dimensions pertaining to the evaluating individual, venture progress and resources needed were kept invariant and included in the scenario description (i.e., patentability of technology, level of development progress, target customer characteristics, competence of

executing individuals, level of prior business opportunity analysis, amount of financial resources needed). In the following, we tested the six attributes measured by three levels for relevance and clarity with 16 entrepreneurs. The questionnaire also included questions on background characteristics of the respondent including age, gender, country of origin, and experience with evaluating business proposals.

Using the OPTEX procedure in SAS 9.1 (Kuhfeld 2005), we developed 12 choice sets of four alternatives each for the conjoint study. The resulting choice design has a D-Efficiency of 100%, A-Efficiency of 100%, G-Efficiency of 100% with an average prediction standard error of .13. The questionnaire is available upon request. We employ the conditional logit model (McFadden, 1972) to analyze the data on choices. This model is based on the random utility theory with the following details. Denote the choice set by C_k; k = 1, …, 12. Let the items in the k-th choice set be k_1, k_2, k_3 and k_4. The random utility $\left(\tilde{U}_j\right)$ for an item j in any choice set can be written as:

$$\left(\tilde{U}_j\right) = V_j + \varepsilon_j$$

where V_j is the deterministic component of utility and ε_j is the random component. Assuming the Type I extreme value distribution for the errors, we can derive the probability of choice of an item in a choice set as:

$$P\left(j \in C_k\right) = \frac{\exp\left(V_j\right)}{\sum_{\ell \in C_k} \exp\left(V_\ell\right)}.$$ We specify the V_j in terms of the attributes of the choice set as:

$V_j = \beta' X_j$ where X_j is the profile of the j-th choice set and β is a vector of parameters to be estimated. For the purposes of estimation, we convert the three levels of each of the six attributes into two dummy variables. As an example, for the attribute A, the two dummy variables, XA_1 and XA_2 are defined as:

Level of Attribute A	XA1	XA2
Low: Growth rate of -3% to +3%	0	0
Medium: Growth rate of 5% to 10%	0	1
High: Growth rate of more than 35%	1	0

For all six attributes together, we estimate 12 parameters, two for each of the six attributes. These parameters will give us the part-worth functions for the attributes.

Data Collection and Sample

The sample consisted of a total of 141 respondents. These were drawn from various sources including personal contacts, as well as students of MBA and Executive MBA courses and their contacts. The experiment provides 48 observations per person and with 141 respondents provides complete, usable responses of 6728 observations to the choice questions.

RESULTS

Hypotheses 1a-b: Likelihood Ratio (LR) Test of Heterogeneity in Opportunity Evaluations

In the data analysis that follows we stratify the sample individuals based on the types of their prior work experience to provide initial insight and test into the heterogeneity of their opportunity evaluations. Estimations were carried out for (1) the pooled data, (2) the manager group, (3) the engineer group, (4) the marketer group, and (5) the novice group. We investigate whether opportunity evaluations, expressed as the coefficients of six attributes of a given business opportunity, are equal across different groups by using a likelihood ratio (LR) test.

Table 1 presents test results for parameter equality by estimating standard conditional logit models for the pooled and stratified subgroups and by calculating their test statistics for a series of LR tests. In order to test Hypotheses 1a and 1b, we use two different approaches in specific: (A) hierarchical assessment of heterogeneity in opportunity evaluations between subgroups of different types of knowledge endowments which are nested in the pooled sample, and (B) pairwise assessment of heterogeneity and divergence between each subgroup of experienced individuals and novice group. A positive χ^2 based on the LR test would suggest that the estimates of different conditional logit models are different.

The results in Table 1 show that opportunity evaluations are different between subgroups in all cases at the 1% level. Models with different underlying parameters indicate that respondents of different types of knowledge endowments (i.e., managers, engineers, and marketers) and years of experience (i.e., novice and experienced) placed different relative importance in the attributes as a result of heterogeneous mental models of making choices. These findings provide strong support for Hypothesis 1a that individuals with different types of knowledge endowments evaluate a given business opportunity differently, and strong support for Hypothesis 1b that opportunity evaluations by experienced individuals in the areas of knowledge endowments diverge from opportunity evaluations by novice individuals.

Table 2 presents the estimation results using standard conditional logit models with the interaction terms of each attribute levels and years of experience in three different types of knowledge endowments. As one can expect, the sign of the coefficients of the main effects are correct and consistent in both the base model and the full models with interaction terms: 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 results also showed that the estimates are found to be statistically significant in all cases at the 1% level in corresponding z-value.

As shown in Table 2 for the full models, the patterns of the interaction effects on opportunity evaluations are unique and divergent depending on the types of knowledge endowments. First, as predicted in Hypothesis 2a, we find that individuals with a background in technology put relatively stronger emphasis on product-related attributes in their evaluation of business opportunities: product innovativeness (xf1 and xf2, $p < 0.001$). In contrast, the coefficients of the same interaction terms are not statistically significant with an opposite sign with individuals with a background in management or marketing. The estimation results in the column of marketers indicate that, with greater experience in marketing, individuals put relatively stronger emphasis on annual market growth (xa1, $p < 0.01$), current market size (xb1 and xb2, $p < 0.05$), number of competitors (xc1, $p < 0.05$), and time to first sale (xd1, $p < 0.05$; xd2, $p < 0.01$). In the direction of their preference adjustment in market-related attributes, experienced marketers tend to discount the attribute of annual market growth but stress the attribute of current market size in their opportunity evaluation. However, none of the coefficients related to product are significant with marketers. The coefficients of the full model with managers indicate that, as predicted, individuals with experience in management put relatively stronger emphasis on the attribute of number of

competitors in their opportunity evaluation (xc1, $p < 0.01$; xc2, $p < 0.10$). None of other interaction coefficients are statistically significant in this column. Whilst experienced marketers are likely to avoid business opportunities with more than five competitors (xc1, -0.4095, $p < 0.05$), experienced managers are likely to pursue such opportunities (xc1, 0.0644, $p < 0.01$). Overall, these findings provide support for Hypotheses 2a, 2b, and 2c, respectively.

DISCUSSION AND CONCLUSION

We began this paper by noting Penrose's (1959) important observation that the decision which services (growth options) the firm should pursue with its resources is not an ex ante given factum but relies on agents' subjective judgments and, thus, on their cognition or mental models. To date, however, resource-based studies generally ignored the role of subjective judgment in managerial decisions on heterogeneity and growth of the firm in favor of objective measures of resource characteristics (Kor et al., 2007; Foss et al., 2008).

Analyzing unique data collected in conjoint experiments with 141 individuals, the objective of this research was to investigate and offer firsthand evidence on agents' subjective judgments regarding the economic attractiveness of value creation opportunities arising from firm resources, thereby helping to fill an important gap in our understanding of the role of subjectivity in resource-based theory. Our analyses have produced two primary findings.

In line with general resource-based thinking our results not only provide evidence of heterogeneity in opportunity evaluations by individuals with different types of knowledge and experience endowments (marketing, technology, management) but also demonstrate persistence of this heterogeneity as observed in the divergence of opportunity evaluations by experienced and novice individuals in these domains. Notably, this heterogeneity in knowledge and experience endowments may cause observed heterogeneity of firms in terms of opportunities pursued and, ultimately, in terms of firm-level value creation outcomes.

Although prior research has shown that people from different parts of an organization tend to possess different thought worlds and thus look at organizational problems from different vantage points (Dougherty, 1992), (quantitative) evidence on distinct business opportunity preferences has so far been absent from the literature, resource-based theory included. Our findings document how individuals with different experience endowments systematically vary in their preferences with respect to particular opportunity attributes. In line with our theory development, we find that managers emphasize competition-related dimensions in their evaluation of business opportunities, whereas people in technology emphasize product-related dimensions, and people in marketing emphasize market-related dimensions.

Given their largely novel character, these findings have a number of interesting implications for theory development in strategy, for the related literatures on entrepreneurship and on organizations, and also for managerial practice.

IMPLICATIONS

Contributions to Strategy Research

First, following Penrose (1959) and a string of recent studies (Kor et al., 2007; Foss et al., 2008) the present research adds to the resource-based framework by explicitly acknowledging subjectivism as a central feature of the RBV. Given that most extant research on subjectivism in the RBV is theoretical and not empirical, our findings provide a rare empirical account of the

fundamental role that subjective insights and judgments play in the resource-based framework. Notably, we have seen that the subjectivism of knowledge renders the information relevant to business opportunities inherently subjective, as differences in individuals' knowledge and experience endowments have a systematic influence on their evaluations decisions regarding the economic value of the growth options derived from the firm's resources.

Second, scholars have repeatedly criticized that the crucial link between a firm's resources and value creation is largely black-boxed, leaving an important theoretical gap in RBV theory and limiting the ability of the RBV to provide guidance for managerial action (Sheehan and Foss, 2007; Sirmon, Hitt and Ireland, 2007). By introducing the concept of cognitive business opportunity prototypes (Baron and Ensley, 2006) into the strategy literature and by showing distinct empirical features of prototypes possessed by different types of organizational actors, the present research critically adds to our understanding of the resource–value creation link.

Third, these findings also have novel implications for the literature on firm diversification. In particular, this literature emphasizes the role of resource-relatedness in terms of the firm's physical resources as a key determinant of the direction of diversification moves (e.g., Miller, 2006). The present results add to this body of work by highlighting the key role that human resources play in explaining which new business opportunities are seen as attractive options for firms, and thus help to extend our understanding as to why firms decide to pursue some growth (diversification) options, and not others.

Finally, from a methodological perspective our study presents one of the first applications of choice-based conjoint analysis in strategy research and, as such, can provide a useful example for other researchers wishing to examine strategic decision making practices. Notably, this experimental method can overcome some of the key limitations associated with commonly applied post-hoc research methods, because the latter typically rely on cross-sectional survey or interview data where respondents are asked to list and rank their own evaluation criteria. They thus depend on the accuracy of insight of decision makers into their own decision processes and therefore may suffer from cognitive and perceptual limitations such as recall or post-hoc rationalization biases.

Contributions to Entrepreneurship and Organizational Research

Researchers in entrepreneurship have a core interest in understanding the factors shaping opportunity identification and exploitation (Shane and Venkataraman, 2000). The current results significantly extend the concept of business opportunity prototypes (Baron and Ensley, 2006) by showing in detail which types of opportunities are systematically preferred by people with a technology, marketing or managerial background.

Along these lines, the results of our study also contribute insights into organizational research on firm emergence and market entry. Work in this area has either focused on the consequences of market entry, or has investigated how the firm's pre-entry resource and capability endowments affect its entry decision (Helfat and Lieberman, 2002). By showing systematic differences in opportunity evaluation decisions of people with different types of experience endowments, our results emphasize that pre-entry knowledge and experience endowments not only shape the types of opportunities individuals identify (Shane, 2000) or imprints the design of new organizations (Baron, Burton and Hannan, 1996) but also plays a major role in shaping the market selection decision.

Finally, the results of the present paper also contribute to the literature on organizational search which so far has largely neglected to study alternative generation and selection (Knudsen and

Levinthal, 2007). Investigating a selection problem that likely ranks among the most important organizational problems, the present research helps to explain heterogeneity in opportunity selection by agents with different types of knowledge and experience endowments.

Managerial Implications

The findings of the present study also offer interesting insights for managerial practice, as they indicate in some detail how the knowledge and experience background of agents systematically shapes the types of business opportunities they will perceive as being attractive. While CEOs are typically selected based on their past performance in a particular firm function or as the manager of an organizational unit, our results highlight that the firm's board needs to be aware of the critical implications that the selection of a CEO with a particular background has in terms of that person's business opportunity preferences. Given the systematic relationships revealed in this study, one can expect that the growth/diversification paths of firms lead by individuals with different types of experience endowments will differ in key ways. In this regard, knowledge of the distinct business opportunity prototypes of different types of people can also help to understand why conflicts regarding the pursuit of particular growth opportunities may arise among members of management boards – especially since such boards are often constructed in a way that different functional areas are represented.

Limitations

In interpreting the results of this study, certain limitations must be kept in mind. Although a conjoint experiment has several key advantages when it comes to studying evaluation decisions, due to a conjoint design we are limited to investigating six dimensions of business opportunities. Our analysis finds significant effects for market-, product- as well as competition-related characteristics of business opportunities. Yet, it may well be that other market-related (e.g., market maturity), product-related (e.g., ease of use) or competition-related (e.g., size of competing firms) characteristics of business opportunities affect individuals' perception of opportunity attractiveness. Future research on this issue is necessary.

Furthermore, one needs to consider that while real-time methods collect information about a person's evaluation as the evaluation decisions are being made, the decision situation presented to the person in an experiment is nonetheless one that simplifies the opportunity evaluation context. For instance, in order to provide a common experimental setting to all evaluators, we had to keep key dimensions of the evaluation context constant such as financial resource requirements.

CONCLUSION

The evaluation of new business opportunities is one of the most critical tasks of firms' agents, as the results of such evaluations determine the growth options that a firm pursues and thus the value creation potential that it seeks to exploit beyond its accustomed business.

Several interesting opportunities for further research emerge from the present study. For instance, as the present study has focused on opportunity evaluation decisions by individuals, future research may examine how management teams evaluate business opportunities. In this vein, we reckon that beyond the formal decision power attributed to one or several team members, the composition of the team in terms of knowledge and experience backgrounds is likely to have a major influence on which team members (e.g., subgroups with marketing or technology experience) will coalesce in promoting the pursuit of some opportunities, and not others. Furthermore, by examining marketing, technology and managerial experience endowments, the

present research has focused on three main human capital types encountered in business organizations. Future research may, however, want to examine the influence of other types of experience endowments such as those of people with a functional background in finance or in operations. Notably, insights such as these can provide future strategy research critical information on the trail to a more refined understanding as to how firm resources contribute to firm-level value creation. Given the centrality of opportunity evaluation decisions for firm performance, improved insights on how agents make such decisions would prove interesting not only to strategy researchers, but also to entrepreneurship, innovation and marketing scholars.

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TABLES

Table 1
Likelihood Ratio (LR) Test Results for Overall Parameter Equality
1A. Hierarchical Test of Heterogeneity: Managers, Engineers, and Marketers

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
engyrs	192	-66.54	-44.26	12	112.52	151.61
mktyrs [a]	480	-166.36	-100.88	12	225.76	275.85
pooled	6728	-2331.75	-1622.06	12	3268.13	3349.89
mgtyrs	672	-232.90	-166.28	12	356.57	410.69
engyrs [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
mktyrs [c]	480	-166.36	-100.88	12	225.76	275.85
pooled	6728	-2331.75	-1622.06	12	3268.13	3349.89
engyrs	192	-66.54	-44.26	12	112.52	151.61
mktyrs [d]	480	-166.36	-100.88	12	225.76	275.85
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
engyrs [f]	192	-66.54	-44.26	12	112.52	151.61
pooled	6728	-2331.75	-1622.06	12	3268.13	3349.89
mktyrs [g]	480	-166.36	-100.88	12	225.76	275.85

Note: Hypothesis 1a: $\beta_{pooled} = \beta_{managers} = \beta_{engineers} = \beta_{marketers}$
a. LR χ^2 (12) = 2621.27, Prob > χ^2 = 0.0000
b. LR χ^2 (12) = 2823.03, Prob > χ^2 = 0.0000
c. LR χ^2 (12) = 2709.79, Prob > χ^2 = 0.0000
d. LR χ^2 (12) = 2953.84, Prob > χ^2 = 0.0000
e. LR χ^2 (12) = 2911.56, Prob > χ^2 = 0.0000
f. LR χ^2 (12) = 3155.60, Prob > χ^2 = 0.0000
g. LR χ^2 (12) = 3042.36, Prob > χ^2 = 0.0000

1B. 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	5384	-1865.95	-1293.29	12	2610.57	2689.67
mgtyrs [a]	672	-232.90	-166.28	12	356.57	410.69
pooled	6728	-2331.75	-1622.06	12	3268.13	3349.89
novice	5384	-1866.00	-1293.29	12	2610.57	2689.67
engyrs [b]	192	-66.54	-44.26	12	112.52	151.61
pooled	6728	-2331.75	-1622.06	12	3268.13	3349.89
novice	5384	-1866.00	-1293.29	12	2610.57	2689.67
mktyrs [c]	480	-166.36	-100.88	12	225.76	275.85

Note: Hypothesis 1b: $\beta_{pooled} = \beta_{novice} = \beta_{experienced\ (managers,\ engineers,\ or\ marketers)}$
a. LR χ^2 (12) = 324.98, Prob > χ^2 = 0.0000
b. LR χ^2 (12) = 569.03, Prob > χ^2 = 0.0000
c. LR χ^2 (12) = 455.79, Prob > χ^2 = 0.0000

Table 2
Estimation Results from Conditional Logit Models with Interactions

Variables	Base Model	Full Models with Interactions		
	Pooled	Managers	Engineers	Marketers
xa1: annual market growth	1.3145***	1.3078***	1.3251***	1.3564***
(more than 35%)	(.1166)	(.1186)	(.1193)	(.1208)
xa2: annual market growth	.7532***	.7391***	.7396***	.7866***
(5% to 10%)	(.0998)	(.1014)	(.1014)	(.1021)
xb1: current market size	.4282***	.4448***	.4565***	.3938***
(100 million)	(.0977)	(.1048)	(.0970)	(.0987)
xb2: current market size	.3300***	.3268***	.3477***	.3040***
(50 million)	(.0844)	(.0890)	(.0852)	(.0842)
xc1: number of competitors	-1.4000***	-1.4754***	-1.4012***	-1.3476***
(more than 5 competitors)	(.1124)	(.1170)	(.1153)	(.1123)
xc2: number of competitors	-.8172***	-.8417***	-.8263***	-.7966***
(2-5 competitors)	(.0892)	(.0943)	(.0918)	(.0912)
xd1: time to first sale	-1.2489***	-1.2560***	-1.2622***	-1.2175***
(more than 24 months)	(.1191)	(.1275)	(.1237)	(.1216)
xd2: time to first sale	-.6874***	-.6910***	-.6972***	-.6693***
(12 to 24 months)	(.0851)	(.0878)	(.0872)	(.0879)
xe1: product desirability	1.1069***	1.1166***	1.1283***	1.1027***
("must have" product)	(.1059)	(.1109)	(.1081)	(.1080)
xe2: product desirability	.4731***	.4667***	.4589***	.4831***
("should have" product)	(.0919)	(.0948)	(.0941)	(.0947)
xf1: product innovativeness	.8717***	.8774***	.9281***	.8725***
(radically new features)	(.1300)	(.1362)	(.1301)	(.1332)
xf2: product innovativeness	.6497***	.6504***	.6981***	.6436***
(established features)	(.1041)	(.1100)	(.1041)	(.1066)
xa1 x mgtyrs, engyrs, or mktyrs		.0122	-.0613	-.1590***
		(.0293)	(.0977)	(.0464)
xa2 x mgtyrs, engyrs, or mktyrs		.0160	.0156	-.2089
		(.0224)	(.0719)	(.1386)
xb1 x mgtyrs, engyrs, or mktyrs		-.0115	-.1561	.2882**
		(.0185)	(.1852)	(.1213)
xb2 x mgtyrs, engyrs, or mktyrs		.0079	-.0747	.2377**
		(.0224)	(.0685)	(.0962)
xc1 x mgtyrs, engyrs, or mktyrs		.0644***	-.0733	-.4095**
		(.0206)	(.0841)	(.1680)
xc2 x mgtyrs, engyrs, or mktyrs		.0229*	.0006	-.1779
		(.0125)	(.0734)	(.1141)
xd1 x mgtyrs, engyrs, or mktyrs		.0040	-.0863	-.2937**
		(.0274)	(.2526)	(.1265)
xd2 x mgtyrs, engyrs, or mktyrs		.0041	.0542	-.1659***
		(.0228)	(.1058)	(.0444)
xe1 x mgtyrs, engyrs, or mktyrs		-.0052	-.1336	.1237
		(.0292)	(.1409)	(.1089)
xe2 x mgtyrs, engyrs, or mktyrs		.0085	.0240	-.0976
		(.0243)	(.0459)	(.0727)
xf1 x mgtyrs, engyrs, or mktyrs		-.0033	-.3171***	.0969
		(.0361)	(.0734)	(.0684)
xf2 x mgtyrs, engyrs, or mktyrs		.0016	-.2797***	.0972
		(.0212)	(.0354)	(.0654)
LL	-1622.06	-1616.00	-1609.82	-1609.99
LR	1419.37	1431.50	1443.86	1443.52
Prob > LR	0.0000	0.0000	0.0000	0.0000
McFadden's R^2	0.3044	0.3070	0.3096	0.3095

*N = 6728; * p < 0.10; ** p < 0.05; *** p < 0.01; Robust standard errors are in parenthesis.*