DEVELOPING ENTREPRENEURIAL EXPERTISE:
COGNITIVE ENTRENCHMENT AND DECISION INCONGRUENCE

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INTRODUCTION

Recent work by Mitchell and colleagues (2012) raises concern about the stability of opportunity evaluation schemas or prototypes and a resulting decision incongruence—the gap between conveyed and actual decision rationale—in strategic opportunity evaluation. While current studies predominantly focus on examining cognitive strategies that would help managers lower decision incongruence, we have yet to understand what the roots of those disparities are in the first place. Questions arise as to whether and what characteristics of the individual are responsible for opportunity decision incongruence. Consequently, the purpose of this study is to identify a set of relevant differences between individuals and examine how these differences affect a person's ability to make congruent opportunity decisions.

OPPORTUNITY EVALUATION AND DECISION INCONGRUENCE

Opportunity evaluation decisions are made based on the fit individuals see between their schema of an attractive opportunity and the perceived characteristics of the opportunity at hand (Mitchell & Shepherd, 2010). During that process, discrepancies can occur between the decision rationale that individuals convey to others and the rationale that informs their actual decision. Such incongruence is caused by limits of introspection (Cyert & March, 1992; Newell & Simon, 1972; Simon, 1955), which is especially likely to occur in complex decision contexts such as opportunity evaluation. While prior research builds on the assumption that decision incongruence is equally likely for all individuals (Mitchell & Shepherd, 2012), we suggest that individual differences exist. We build our assertion on prior literature that provides insight into the extent to which individual characteristics impact opportunity evaluation (e.g., Baron & Ensley, 2006; Gruber, Kim, & Brinckmann, 2010; Keh, Foo, & Lim, 2002; Mitchell & Shepherd, 2010). We believe that individual characteristics not only lead to different opportunity schemas but also effect differences in schema stability. Unstable domain schemas will result in incongruent evaluation patterns whereas stable schemas will lead to congruent responses (Dane, 2010). Since stability and strength of domain schemas commonly result from domain expertise (Baron & Ensley, 2006; Baron & Henry, 2010; Dane, 2010) we propose:

Hypothesis 1. Individuals do not accurately introspect about the use of opportunity evaluation criteria.

Hypothesis 2. Entrepreneurs will generally exhibit less decision incongruence than non-entrepreneurs.

Images of Self and Decision Incongruence

The attainment of cognitive entrenchment not only varies with domain expertise but also with one's utilization of cognitive resources (Baron & Henry, 2010; Corbett, 2007; Dane, 2010) as well as motivational aspects (c.f. Mueller, 2011) depending on mental representations of the self (Fiske & Taylor, 1991). Building on recent studies we examine two important self-images—images of vulnerability and images of capability—that have been shown to be important in opportunity recognition (Mitchell & Shepherd, 2010) and explore to which extent they influence decision incongruence in the process of opportunity evaluation.

The image of vulnerability. Because of the pervasiveness of new venture failure concepts of vulnerability and avoidance-oriented emotions are highly relevant for entrepreneurship research (Shepherd, 2003). Several pathways exist, through which in particular risk avoidance and related images of vulnerability (Lerner & Keltner, 2001; Lopes, 1987) may impact the ability to obtain stable domain-schemas in the context of opportunity evaluation. For example, risk-aversion is associated with lower entrepreneurial intentions (Zhao, Seibert, & Lumpkin, 2010), which will lead to less exposure to opportunity evaluation (if not outright avoidance) and thus affects levels of expertise. Furthermore, negative emotions associated with risk and fears of failure will create barriers to productive information processing and will have individuals avoid the sustained engagement with the decision tasks (Baron, 2008; Forgas, 1995). That leads to lower rates of cognitive entrenchment with subsequently weaker opportunity prototypes and less congruent decision making. In line with that reasoning we propose:

Hypothesis 3. There is a positive relationship between individual risk aversion and decision incongruence in evaluating business opportunities.

The image of capability. Knowledge structures and heuristics are regarded central to entrepreneurial action (Baron, 2007; Haynie et al., 2009; Klein, 2008; McMullen & Shepherd, 2006). Mitchell and Shepherd (2010) demonstrate that individuals with higher human capital are more discerning in their opportunity schemas, which they hypothesize to be caused by higher clarity coming with both education and levels of experience. Both human capital through education and experience in form of entrepreneurial tenure have been linked previously to entrepreneurial outcomes (Baron & Markman, 2003). It should help the individual to acquire basic schemas pertaining to important variables in business environments. Second, it can be assumed that resulting images of business competence held by the individual will lead to continual engagement with and processing of business-related information (through observing news, reading business magazines, engaging in business conversations), over the course of the person's life. The repeated deliberation will help develop more stable domain patterns with respect to a business opportunity, and hence we suggest:

Hypothesis 4. There is a negative relationship between individual's business education and decision incongruence in evaluating business opportunities.

In line with this logic, strong images of entrepreneurial capability should lead to expert learning and cognitive entrenchment. However, the expert literature also cautions that repeated attention to tasks outside of the expertise domain attenuates the relationship between expertise and cognitive entrenchment (Dane, 2010; Hargadon, 2005). This becomes relevant considering common sense and suggestions in recent literature (e.g., Baron & Henry, 2010) that entrepreneurs commonly perform a wide variety of tasks. The demanding nature of erratic firm formation processes may indeed leave little time for the average entrepreneur to reflect, process and develop opportunity-related expert schemas; in fact it may even become detrimental to cognitive entrenchment, thus leading to rather opposite effects. That lets us believe that some incremental benefit of entrepreneurial experience should be reflected in an early improvement of decision incongruence, yet extended entrepreneurial experience may reverse that effect.

Hypothesis 5. There is a U-shaped relationship between the level of entrepreneurial experience and decision incongruence in entrepreneurial opportunity evaluation.

METHOD

We drew our study participants from several different sources, including the participants of MBA and executive courses, venture coaches and private investors. The final sample consisted of a total of 146 respondents, all residing in the US, of which 71% respondents were male and 64% had business education. The average age of the respondents was 37 years and the average years of founding experience was 4 years.

Research Instruments and Variables

Survey and choice-based conjoint experiment. To capture revealed preferences we used a choice-based conjoint experiment, a method that has seen increasing application in the study of entrepreneurial decision making (e.g., Haynie et al., 2009; Mitchell & Shepherd, 2010; Wood, McKelvie, & Haynie, 2013). The conjoint was built on six core opportunity dimensions—market growth, market size, number of competitors, time to first sale, product desirability and product innovativeness—that featured most relevant in prior research (e.g., Baker, Aldag, & Blair, 2002; Baron & Ensley, 2006; Zacharakis & Meyer, 1998). Applying an orthogonal factorial design, 12 choice sets of four opportunity alternatives each were developed. Participants had to choose from each choice set their preferred opportunity profile. A total of 7,008 usable opportunity evaluation decisions allowed us to compute the revealed decision policies. Those were then contrasted with the stated preferences from a Likert scale instrument administered through the adjoined survey. Participants independently rated the importance of each of the six attributes on a seven-point Likert scale, ranging from 1 (extremely unimportant) to 7 (extremely important). The same survey also captured a number of personal information about our respondents.

Variables. Our dependent variable *decision incongruence* was calculated in line with existing research on similar measure in that domain (Mitchell et al., 2011; Mitchell & Shepherd, 2012), which basically computes for each participant the distance between that stated attribute value and the comparable value that comes out of the conjoint experiment. As for the independent variables, contextual *risk aversion* serves as a proxy for fear of failure (refer to

Lerner & Keltner, 2001; Lopes, 1987), a construct used in prior studies when examining images of vulnerability (Mitchell & Shepherd, 2010). We adopted relevant items from Gomez-Mejia and Balkin's scale (1989) that captured the risk aversion construct unambiguously and in a context that would most likely put the respondent in situations in which they were required to evaluate potential entrepreneurial opportunities. *Entrepreneurial experience* was created as log of the years of founding experience as indicated by our survey respondents. Several *control variables* were included. Besides standard demographic variables we control for past performance reference, which could potentially drive systematic deviations from past evaluation profiles (see Baron, 2000), and we control for levels of aspiration, which have been highlighted in prior literature on decision-making (Sarasvathy, 2001; Simon, 1959).

RESULTS

We used a number of Wald tests for parameter equality to examine our two base line Hypotheses 1 and 2. We find full support for the effect that revealed and stated measures differ significantly (at the 5% or 1% level, z-value) and they do so for the different subgroups of entrepreneurs versus non-entrepreneurs in the direction as hypothesized. In a second step we performed regression analyses of the influence of individual characteristics on the levels of decision incongruence, as presented in Table 1.

Insert Table 1 about here

Model 1 is the base line model with control variables only. Model 2 shows the significant coefficient for *job risk aversion* (0.0352; $p < 0.05$), which provides support for Hypothesis 3 that the individual's contextual risk profile impact the decision makers incongruence. Adding the capability variables starting with Model 3 (coefficient=0.0773; $p < 0.05$) shows that there is a significant impact of an individual's contextual education and congruent opportunity decisions. Yet, the positive coefficient runs counter our hypothesized direction. Hypothesis 4 is not supported. In an extension to our analysis we hypothesize that certain levels of business education may actually lead to overconfidence, which in turn may negatively impact the actual deliberate engagement of the individual with the subject matter and thus negatively impact their development of stable opportunity patterns.

The negative coefficient for founding experience (coefficient = –0.1107; $p < 0.05$) and the positive coefficient for the square term of founding experience (coefficient = 0.0243; $p < 0.1$) as shown in Model 4 and 5 provide support for Hypothesis 5. Our results indicate that participants improve in their decision congruence up until about two and a half years of experience. After that a worsening effect occurs and after four and a half years the incongruence levels surpass even those of no entrepreneurial experience.

DISCUSSION AND CONCLUSION

The unique contribution of this article is to examine the degree of decision incongruence in opportunity evaluation and to present a detailed analysis of underlying individual cognitions that may cause such introspection disparity. We make in particular three primary contributions.

First, building on recent studies that raise concerns about incongruent opportunity decisions (Mitchell & Shepherd, 2012; Mitchell et al. 2011) we examine possible *antecedents of such incongruence*. We show empirically to which extent variance in 'images of self' impacts the development of consistent opportunity schemas as a pre-requisite for congruent decision making. Building on the literature on cognitive entrenchment, deliberate practice, and expertise development (e.g., Dane, 2010; Ericsson & Charness,1994), we demonstrate that images of the self not only impact patterns of first-person opportunity decisions (Mitchell et al., 2011) but also the congruence with which individuals make those decisions. Our study adds to prior literature on the sources of metacognitive ability and entrepreneurial outcomes, and provides some causal explanations that link inter-individual differences in cognitive aspects to strategic decision-making in the entrepreneurial venture, a recently emerging line of inquiry in the field of entrepreneurship (e.g., Fauchart & Gruber, 2011; Mitchell et al., 2011). Our findings are an important building block in enhancing our knowledge about individual differences in opportunity evaluation and provide deeper insight into the question of why some and not others identify and exploit opportunities (Shane & Venkataraman, 2000).

Second, by investigating who is at higher risk of developing inconsistent decision patterns, our study also has the potential to reinvigorate a discussion of what determines *entrepreneurial expertise* and whether individual differences impact the likelihood to develop such expertise. As recent conceptual work in the entrepreneurship literature suggests, maybe only those that gain expertise from repeated efforts to start new ventures may be deemed expert entrepreneurs (Baron & Henry, 2010). That stands in some contrast to the widely held notion in the expert literature that it takes 10 years of practice to become an expert (Ercisson et al., 2006). Given the specific breadth and domain-crossing nature of the entrepreneurial task set, the amount of time spent within the process of firm formation may play a lesser role than hypothesized in generating entrepreneurial expert performance. Our empirical findings lend support to that thesis.

Finally, while this study is not directly a study of entrepreneurial learning, our results nonetheless complement research that emphasizes the importance of *entrepreneurial learning in the formation of opportunity beliefs* (Dimov, 2007, 2010). Effective learning, we suggest, requires stable reference points, which individuals may not equally likely develop. This lends new impetus to Baron's (2008) propositions that accentuate the role of cognitive and emotional states on motive-dependent decisions in the entrepreneurial process. We show empirically that such states do indeed impact entrepreneurial learning and the formation of stable domain schemas, which may ultimately impact entrepreneurial success. This insight is particularly important given the strong reliance of the entrepreneurship literature on building insights from expert entrepreneurs. Our findings suggest caution towards the notion of entrepreneurial expertise and provide anchors to better understand the psychological conditions that lead individuals to develop such expertise.

REFERENCES AVAILABLE FROM THE AUTHORS

TABLE 1
Regression Models of Decision Incongruence

Incongruence Variables	Definitions	Model 1 Base	Model 2 Job Risk	Model 3 Bus Edu	Model 4 Ent Exp	Model 5 Ent Exp Sq.
jobrisk	Job-related risk aversion		0.0352 **			
			(0.0185)			
busedu	Business-specific education			0.0773 **		
				(0.0369)		
lfyrs	Years of founding experience (log)				-0.0453 **	-0.1107 **
					(0.0209)	(0.0521)
lfyrssq	Squared yrs of founding experience (log)					0.0243 *
						(0.0177)
cgtxa	Expected annual market growth	0.8757 ***	0.8757 ***	0.8820 ***	0.8616 ***	0.8792 ***
		(0.1917)	(0.1917)	(0.1892)	(0.1891)	(0.1889)
cgtxc	Number of current direct competitors	1.0335 ***	1.0335 ***	1.0490 ***	1.0547 ***	1.0499 ***
		(0.1772)	(0.1772)	(0.1751)	(0.1750)	(0.1744)
cgtxd	Time to first sales	1.0541 ***	1.0541 ***	1.0784 ***	1.0455 ***	1.0604 ***
		(0.1782)	(0.1782)	(0.1763)	(0.1758)	(0.1755)
cgtxf	Product innovativeness	0.8612 ***	0.8612 ***	0.8629 ***	0.8278 ***	0.8367 ***
		(0.1799)	(0.1799)	(0.1776)	(0.1780)	(0.1775)
tvent	Total number of ventures	-0.0012	-0.0012	-0.0011	-0.0014	-0.0008
		(0.0027)	(0.0027)	(0.0027)	(0.0027)	(0.0027)
rframe	Past performance reference	-0.0183	-0.0183	-0.0195	-0.0310 *	-0.0314 *
		(0.0175)	(0.0175)	(0.0173)	(0.0182)	(0.0181)
ambition	Extremely ambitious goals	0.0222	0.0222 *	0.0187	0.0221	0.0232
		(0.0176)	(0.0176)	(0.0175)	(0.0174)	(0.0173)
emerge	Emerging entrepreneur	0.0020	0.0020	-0.0169	0.0061	0.0142
		(0.0927)	(0.0927)	(0.0919)	(0.0914)	(0.0913)
serial	Serial entrepreneur	0.0095	0.0095	0.0204	0.0578	0.0681
		(0.0524)	(0.0524)	(0.0520)	(0.0563)	(0.0566)
mfield	Managerial experience areas	0.0000	0.0000	0.0000	0.0000	0.0000
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
bmaj	Business education area	0.0000	0.0000	0.0000	0.0001	0.0001
		(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
college	Bachelor academic experience	-0.0625	-0.0625	-0.0468	-0.0686	-0.0677
		(0.1208)	(0.1208)	(0.1194)	(0.1191)	(0.1187)
stud	Current student	-0.0749	-0.0749 *	-0.0911 *	-0.0896 *	-0.1040 **
		(0.0490)	(0.0490)	(0.0490)	(0.0488)	(0.0497)
vc	Venture capitalist	0.0025	0.0025	-0.0228	-0.0454	-0.0534
		(0.0931)	(0.0931)	(0.0927)	(0.0944)	(0.0943)
ba	Business angel	-0.0885	-0.0885	-0.1111	-0.1126	-0.1141
		(0.1020)	(0.1020)	(0.1013)	(0.1012)	(0.1009)
age	Current age	-0.0021	-0.0021 *	-0.0017	-0.0008	-0.0014
		(0.0018)	(0.0018)	(0.0018)	(0.0019)	(0.0019)
gender	Male	0.0225	0.0225	0.0273	0.0356	0.0400
		(0.0390)	(0.0390)	(0.0386)	(0.0389)	(0.0389)
_cons		-0.0421	-0.0421	-0.1295	-0.0473	-0.0229
		(0.1688)	(0.1688)	(0.1718)	(0.1665)	(0.1668)
Number of obs		146	146	146	146	146
F stat		3.12	3.12	3.27	3.29	3.24
Prob > F		0.00	0.00	0.00	0.00	0.00
R-squared		0.29	0.29	0.32	0.32	0.33
Adj. R-squared		0.20	0.20	0.22	0.22	0.23

*$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$*