

Competitive Research Article

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Seeing What Others Miss: A Study of Women Entrepreneurs in High-Growth Startups

Abstract: A pressing question in entrepreneurial research is where opportunities come from. Prior research indicates that some opportunities stem from known parameters and outcomes; some are discovered through engagement with unknown but knowable factors; and others are unknowable until brought into being through a creative process. This paper explores the second and more prevailing view in entrepreneurial research – that individuals discover business opportunity – and examines how high-growth entrepreneurs perceive opportunity through engagement with the world. Survey results, based on responses from 165 women entrepreneurs in high-growth startups, indicate that individuals with a strong discover mindset act and think in ways that support opportunity perception. Coupled with a belief in her abilities, the entrepreneur is more likely to move from opportunity perception to new venture creation. Results from semi-structured interviews with women from the same population elucidate the survey findings and yield implications for entrepreneurial theory and practice.

Keywords: opportunity perception, behaviors, cognition, high-growth startups, women entrepreneurs

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1 Introduction

A central question to the field of entrepreneurship is why some persons but not others perceive opportunities for new products or services that can be exploited profitably (Baron 2004; Dimov 2011; Gaglio and Katz 2001; Mitchell et al. 2004). This study seeks to address this question by examining the behaviors and thinking that allow certain individuals to perceive opportunity better than others. Building on past research that considers the individual characteristics of entrepreneurs (e.g. Baron 2007; Busenitz and Barney 1997; Dyer, Gregersen, and Christensen 2008), this study examines specific behavioral and cognitive factors that enable entrepreneurs to discover opportunity. In doing so, the study focuses on a special class of individuals – women who found high-growth startups – and investigates the generative mechanisms through which entrepreneurs within this population perceive themselves as being better able to recognize opportunities. The study argues that this heightened ability comes from how these entrepreneurs engage with the world.

This paper offers multiple contributions. First, it investigates both behavioral and cognitive factors that enable and encourage the high-growth entrepreneur to perceive opportunity. Specifically, this research investigates how individuals, who engage in inquiry behavior, infer patterns from limited data and explore the unknown while exploiting the known, discover opportunity in overlooked possibilities. Second, this study examines these relationships among growth-oriented women entrepreneurs, who pursue opportunities continuously. Third, the paper contributes by examining the effect of a discover mindset on the development of business ventures and the amplifying effect of self-efficacy.

The question guiding this research is: what roles do behavior and cognition play in the perception of opportunity by entrepreneurs who found high-growth businesses? In examining this question, the paper presents a conceptual framework and hypotheses, tested via survey responses from women entrepreneurs. The paper concludes with a discussion of the implications this research brings to the theory and practice of entrepreneurship.

2 Discover mindset: conceptual framework and hypotheses

While opportunity for value creation is considered the distinctive domain of entrepreneurship (Venkataraman 1997), researchers continue to question its

definition and the processes that bring it into being (Dimov 2011; Venkataraman et al. 2012; Shane 2012; Short et al. 2010). Opportunities may emerge differently: (a) some opportunities are more easily recognized from known parameters and outcomes; (b) some more elusive opportunities are discovered through engagement with unknown but knowable factors; and (c) other opportunities are unknowable until brought into being through a creative process (Sarasvathy et al. 2010). This paper addresses the second and more prevailing view in entrepreneurial research – that individuals, who see and take advantage of information that others do not, discover business opportunity (Drucker 2007; Shane and Venkataraman 2000). In doing so, the paper examines opportunity perception as a process whereby opportunities are discovered through engagement (i.e. behaving and thinking) that connects the entrepreneur with insight.

Opportunities do not exist in ready-made form; rather, individuals discover opportunities through a transformative process, based on subjective beliefs (Alvarez and Barney 2007; Klein 2008; Shane 2012). Opportunity is inseparable from individual beliefs that are formed by overcoming ignorance and doubt (McMullen and Shepherd 2006; Shepherd, McMullen, and Devereaux Jennings 2007). “Opportunity, by definition, is unknown until discovered” (Kaish and Gilad 1991, 38), existing only when perceived by the individual. As such, opportunities form as imagined possibilities in the mind of the entrepreneur.

One view is that certain individuals are more alert to shifts and see gaps based on an acute ability to scan and to search for new information that others are not prepared to perceive (e.g. Kirzner 1978; Tang, Kacmar, and Busenitz 2012). This approach does not assume a prescient individual who is already aware of what is unknown; it assumes the individual is able to become aware of opportunity by interacting with varied information sources. Based on how individuals engage with their environments, they come to perceive information differently. Rather than prescience, the individual exhibits entrepreneurial alertness or attitudinal receptivity to available opportunity (Kirzner 2000). As such, opportunities are not known to all parties due to the limitations of entrepreneurial engagement (i.e. behaving and thinking). The concept of the discover mindset follows naturally from this perspective on entrepreneurship and represents “seeing what others miss.” Through a discover mindset, entrepreneurs perceive opportunities that others do not with self-efficacy facilitating the translation of perception into action.

A number of behavioral and cognitive factors explain how entrepreneurs perceive opportunity (e.g. Baron 2007; Dyer, Gregersen, and Christensen 2008). Prior research indicates that entrepreneurs perceive opportunities by engaging with the environment and by interacting with experiences, ideas, and people. Extensive

search and scan activities provide an entrepreneur with a broader range of information and knowledge (Tang, Kacmar, and Busenitz 2012). Exposure to different, and possibly ambiguous, information offers source material for market insights. Similarly, social networks perform an important role in exposing entrepreneurs to information (Ozgen and Baron 2007; Singh, Hybels, and Hills 2000). Dyer, Gregersen, and Christensen (2008) identify four specific behaviors – observing, questioning, experimenting, and networking – that enable entrepreneurs to acquire a volume and variety of information that facilitates the discovery of opportunity through the linkage of potentially disparate ideas.

Opportunity perception also stems from cognitive factors. Chief among these are heuristics and schema, which are embedded in the experiences of entrepreneurs and used in recognizing business opportunity. As Busenitz and Barney (1997) note, certain heuristics serve as simplifying mechanisms, which enable entrepreneurs to make more rapid decisions than if more complete information relating to a situation were amassed. Subsequent research demonstrates that among these, belief in the law of small numbers, or representativeness bias, affects opportunity recognition (Keh, Foo and Lim 2012). Schema, like heuristics, may also aid in opportunity recognition by heightening the individual's perceptual and information processing acuity (Gaglio and Katz 2001). Schema use may be either top-down, where past experience shapes information processing, or bottom-up, where new information and ideas shape individual interpretation and action (Walsh 1995). With experience, schema become increasingly helpful in detecting patterns among trends and events in the environment (Baron and Ensley 2006), and individuals are better able to apply cognitive abilities to identify and value incoming information as opportunity (Shane 2000; Shane and Venkataraman 2000; Shepherd and DeTienne 2005). For entrepreneurs, opportunity recognition involves an ongoing interplay between opening up to new ideas and possibilities (relying on experiences to shape schema as a form of exploration) and leveraging what is known (relying on schema to shape experiences as a form of exploitation).

This study examines behavioral and cognitive factors that lead to a heightened belief in the high-growth entrepreneur's ability to discover opportunity. Additionally, the study focuses on how an entrepreneur's belief in herself translates perceived opportunity into successive new ventures – to act on discovery.

2.1 Mechanisms effecting a discover mindset

To further understanding, this research examines how ways of behaving and thinking predispose high-growth women entrepreneurs to discover opportunities.

These cognitive and behavioral factors are instruments for discovery, which individual entrepreneurs may engage in to varying degrees to acquire and value information. The following hypotheses examine how a discover mindset extrapolates opportunity from new interactions, repurposed knowledge, and weak signals.

2.1.1 Discovery behaviours

Opportunity recognition demands that the individuals participate in the world and engage in behaviors that allow exposure to ideas, people, and experiences. Entrepreneurs favor experimentation, interact early and often with customers, and engage in iterative learning (Politis 2008; Fisher 2012). As noted above, Dyer, Gregersen, and Christensen (2008) identify four behaviors that enable entrepreneurs to make connections that reveal opportunity.

- **Observing:** Entrepreneurs observe events around them. They do not seek a single transformative observation; instead, they look for a pattern (Baron and Ensley 2006). Additionally, entrepreneurs listen to and learn from the experiences of others, including customers and suppliers (Fisher 2012; Sarasvathy and Dew 2005).
- **Questioning:** Entrepreneurs ask what if? why? and why not? According to Dyer, Gregersen, and Christensen (2008), innovative entrepreneurs are more likely to ask questions to challenge the status quo, than they are to ask questions designed to make existing systems better.
- **Experimenting:** Entrepreneurs engage in experimentation and seek to validate opportunity with a hypothesis-testing mindset. In addition, entrepreneurs experiment to solve problems and to learn (Fisher 2012).
- **Networking:** Entrepreneurs seek exposure to different ideas and people, in order to expand their perspectives. They actively seek unique sources of information, such as specialized publications, conferences, and personal contacts with diverse backgrounds (Baron 2006; Dyer, Gregersen, and Christensen 2009). They network to extend their own knowledge, to test ideas with a range of individuals, to mobilize resources, and to solve problems (Dyer, Gregersen, and Christensen 2009; Fisher 2012; Sarasvathy and Dew 2005).

Dyer, Gregersen, and Christensen (2008) propose that entrepreneurs are likely to engage in all of these behaviors to some degree. Moreover, they suggest that engaging in these behaviors enables entrepreneurs to perceive opportunity that others overlook.

Hypothesis 1. Discovery behaviors are positively related to a discover mindset.

2.1.2 Representativeness bias

Representativeness bias, also referred to as a belief in the law of small numbers, is the tendency to overgeneralize from a few characteristics or observations. Entrepreneurs may make significant and non-linear leaps in their thinking, based on a few facts or observations (Mitchell et al. 2007). Entrepreneurs are unlikely to have access to or the resources for large, confirmatory data sets, so they rely on limited information inputs upon which to base conclusions and to perceive opportunities (Busenitz and Barney 1997; Keh, Der Foo, and Lim 2002; Murmann and Sardana 2013); therefore, a stronger representativeness bias encourages a discover mindset.

Hypothesis 2. Representativeness bias is positively related to a discover mindset.

2.1.3 Exploring

While exploiting existing knowledge and prior experience is important, over-reliance on the familiar may make it difficult to identify new opportunity (Ucbasaran, Westhead, and Wright 2009). Exploring involves search, experimentation, and the pursuit of new knowledge (March 1991). Entrepreneurs engage in both active search for opportunity (Baron 2006) and passive search, which leads to accidental discoveries (Ardichvili, Cardozo, and Ray 2003). Sigrist (1999) notes that entrepreneurs spend time and effort engaging in learning that advances and deepens their capabilities. Likewise, Politis (2005) suggests that entrepreneurs need to deviate from the “tried-and-true” in order to learn something new. They have to venture into unknown domains, because opportunities stem from new ideas, technologies, and markets (Dyer, Gregersen, and Christensen 2008). In short, entrepreneurs seek to acquire new capabilities and information and transform them into entrepreneurial opportunity (Corbett 2007).

Hypothesis 3. Exploring is positively related to a discover mindset.

2.1.4 Exploiting

Exploiting emphasizes existing knowledge and alternatives (March 1991). Entrepreneurs do rely on expertise and past experience (Baron 2006; Sarasvathy

and Dew 2005). They rely on prior knowledge of a market, technology, industry, or customers as a basis for detecting new opportunities (Ardichvili, Cardozo, and Ray 2003; Shane 2000), leveraging what they know to “connect the dots.” For example, entrepreneurs may relate evolving customer needs to new technologies that might meet those needs (Baron and Ensley 2006). Utilizing cognitive frameworks developed through experience, entrepreneurs recognize opportunities that others overlook (Baron and Ensley 2006; Ucbasaran, Westhead, and Wright 2009). Reliance on existing knowledge is an important element of discovery (Corbett 2007; Shane 2000).

Hypothesis 4. Exploiting is positively related to a discover mindset.

2.2 Discover mindset and the number of new ventures

The continual pursuit of high-growth startups requires a heightened ability to discover business opportunity, coupled with the will to act. Prior research in serial entrepreneurship has examined principally either the effects of experience on firm performance or differences among novice and repeat entrepreneurs (Sarasvathy, Menon, and Kuechle 2013; Westhead, Ucbasaran, and Wright 2005; Westhead et al. 2005; Zhang 2011). In a study of habitual starter and acquirer entrepreneurs, Ucbasaran et al. (2003) examine the role of experience and behavior on learning and resource accumulation; however, the role mindset performs on serial startup behavior has not been examined. Entrepreneurs who perceive themselves as having an ability to discover opportunities are more likely to start new businesses. Those who can see what others miss have more opportunities upon which to act.

Hypothesis 5. A discover mindset is positively related to the number of new ventures.

2.2.1 The moderating effect of self-efficacy

Self-efficacy is formed by one’s collection of skills, experiences, and assets and is the belief in one’s ability to perform and to achieve goals (Bandura 1997; Kasouf, Morrish, and Miles 2013). Perceptions of self-efficacy are more important than actual skills as a determinant of behavior; the beliefs

regarding what one can do with the basket of skills and experiences that one possesses is key (Krueger and Dickson 1994; Kickul et al. 2009). Self-efficacy influences the level of accomplishments one realizes, one's resilience, and whether one's thoughts are limiting or expansive (Krueger and Dickson 1994; Markman, Balkin, and Baron 2002). Individuals with high self-efficacy pursue more challenging careers and display higher staying power in those pursuits (Markman, Balkin, and Baron 2002). Prior research shows a positive relationship between self-efficacy and the likelihood of becoming an entrepreneur (Chen, Greene, and Crick 1998; Cassar and Friedman 2009), entrepreneurial self-efficacy and entrepreneurial intentions (Zhao, Seibert, and Hills 2005), the pursuit of valuable opportunities (Ardichvili, Cardozo, and Ray 2003), business creation and success (Rauch and Frese 2007), and the likelihood of continuing an entrepreneurial venture (Hechavarria, Renko, and Matthews 2012). Self-efficacy is a key ingredient to the ongoing pursuit of high-growth opportunity (Gundry and Welsh 2001; Sweida and Reichard 2013). This belief in one's capability enables the entrepreneur to move from vision to action.

Hypothesis 6. The greater the self-efficacy, the stronger the positive relationship between a discover mindset and the number of new ventures.

3 Methods

To test the hypotheses, measures were derived from the literature, and data were gathered from women who had sought funding from a west coast investment firm, which specializes in high-growth businesses founded by women. For measurement, two established scales were used, and four new scales were developed. Measurement reliability was evaluated using exploratory factor and scale item analyses. Measures were further subjected to confirmatory factor analysis. To test the hypothesized model, structural equation modeling was used to examine fit with the observed model, significance of path estimates (representing the study hypotheses), and explained variance of the endogenous variables (*discover mindset* and *number of new ventures*). This technique allows for the simultaneous examination of a series of interrelated dependence relationships with path estimates used to test the hypotheses. Additional tests were performed to confirm the mediating and moderating effects. Semi-structured interviews with high-growth female entrepreneurs were then conducted to aid interpretation of the empirical findings.

3.1 Measurement development

Two measures – the scale for self-efficacy (Chen, Greene, and Crick 1998) and the scales for the four discovery behaviors (Dyer, Gregersen, and Christensen 2008) – were validated in prior research, while four measures were developed for this study: discover mindset, representativeness bias, exploring, and exploiting. Measure development began with conceptual definitions for each construct derived through a review of the literature. Next, an item pool reflecting each construct was generated and reviewed by a panel of three independent domain experts with expertise in entrepreneurial research. A pilot study was conducted using a sample of 32 entrepreneurs, in order to purify the scales and assess unidimensionality of scale items. Using these responses, unidimensionality was assessed based on (a) factor loadings of at least 0.50; (b) item-to-total correlations of at least 0.35; (c) average inter-item correlations of at least 0.15; and (d) Cronbach's alpha of at least 0.70 (Netemeyer, Bearden, and Sharma 2003). The measures were trimmed and revised after ensuring that face validity would not be compromised.

3.2 Survey data collection

Data on the new and established measures were gathered from 173 women who had previously sought one-time investment funding to sustain a new business. To be included in the study, respondents had to meet one or more of the following conditions: founding member, ownership share of at least 10%, senior (c-suite) manager, or board member. Given these requirements, eight respondents were removed from the study – two for low involvement and six for non-response on the involvement questions – leaving 165 usable responses. The remaining respondents were firm founders (93%) with over 10 years of work experience and had on average been highly involved in two business startups prior to the most recent. A majority of respondents were married (66%), had children (52%), and attained a graduate or professional degree (57%). Respondents also represented a broad mix of industries with the majority from software/internet (21%), healthcare/medical (15%), manufacturing (14%), and biotechnology (10%). Table 1 presents frequency percentiles of sample characteristics.

3.3 Semi-structured interviews

To illuminate the survey results, data from 14 semi-structured interviews with high-growth female entrepreneurs were used to capture essential aspects

Table 1: Sample background

Degree	Percent	Industry	Percent
Doctorate	16	Computer software/internet	21
Professional	5	Healthcare/medical	15
Masters	36	Manufacturer	14
Bachelors	34	Biotechnology	10
Associates	1	Retail	9
Other	8	Professional services	6
		Entertainment/arts	6
		Consumer services	5
		Finance/insurance/real estate	4
		Education	4
		Distributor/wholesale/warehousing/logistics	3
		Computer hardware	2
		Agribusiness	1
		Energy and natural resources	1
		Other	1
Discipline	Percent		
Math or Science	14		
Engineering	4		
Computing or IS	3		
Business	30		
Other	49		
Marital status	Percent		
Single	18		
Married	66		
Divorced/separated	16		
Children	Percent		
None	48		
1	12		
2	28		
3	10		
4	2		

of the behaviors and thinking underlying the startup journey from the perspective of study participants. The goal was to develop a greater understanding of the theoretically derived and empirically tested measures and hypotheses. The women interviewed responded to ten questions. The interviews typically lasted 60 minutes and were recorded and transcribed verbatim. The transcripts were coded, using the study constructs as categories. A comparison of the characteristics of the survey respondents and the interview participants showed that they were similar: firm founders (93%) with over 10 years of work experience who had on average been highly involved in the startup of two businesses prior to the most recent business. A majority of interview participants were married (71%) and had attained a graduate or professional degree (57%). Interview participants also represented a broad mix of industries: software/internet

(36%), professional services (29%), consumer goods (14%), energy (7%), biotechnology (7%), and healthcare/medical (7%).

4 Results

4.1 Measurement results

Applying the same criteria as used in developing the measures, unidimensionality was first assessed using exploratory factor and scale item analyses. Six items were removed: four from representativeness bias, one from exploring, and one from self-efficacy. This trimmed set was further subjected to confirmatory factor analysis with all six constructs modeled as first-order factors in LISREL 8.8 using the covariance matrix as input. An examination of both within- and across-factor loadings and measurement error led to the removal of five items: three from exploitation and two from self-efficacy. The appendix contains items, loadings, and response frequencies for each scale.

Measures of internal consistency and goodness-of-fit were used to assess the reliability, model fit, and discriminant validity of the measures. As evidence of internal consistency among scale items, composite reliability and average variance extracted measures are reported. For measures of fit, recommended indices are reported (Hair et al. 2006). Chi-square (χ^2) indicates the degree to which the observed input matrix is predicted by the estimated model. Although χ^2 is the only measure with an associated statistical test, relying solely on the statistic is not recommended, as it is sensitive to large sample sizes. Another recommended indicator of model fit is the standardized root mean square residual (SRMR), which measures the discrepancy between the observed and estimated covariances or correlations. To address sample-related inconsistency, the comparative fit index (CFI) is also recommended. This measure gauges the extent to which the estimated model is superior to a comparison model (e.g. the “null” model of no relationships within the data). The internal consistency estimates indicate adequate support, while the goodness-of-fit results indicate that the estimated measurement model adequately represents the observed input matrix ($\chi^2 = 501.33$ with 335 df; SRMR = 0.07; CFI = 0.92). To determine that each measure was empirically distinct, discriminant validity was assessed and supported in all cases, as the square of the parameter estimate (ϕ) between each pair of constructs was less than the mean of the pair’s average

variance extracted estimates (Fornell and Larcker 1981). Table 2 presents the internal consistency estimates, summary statistics, and correlations among constructs.

Table 2: Measurement results

Internal consistency and descriptive statistics							
	Composite reliability	Average variance extracted	Mean	Standard deviation			
Number of new ventures	–	–	1.83	1.48			
Discover mindset	0.72	0.30	5.68	0.80			
Discovery behaviors	–	–	5.67	0.79			
Representativeness bias	0.83	0.50	4.60	1.25			
Exploring	0.78	0.47	6.60	0.60			
Exploiting	0.84	0.57	3.50	1.35			
Self-efficacy	0.88	0.59	6.40	0.65			
Correlations among constructs							
	1	2	3	4	5	6	7
(1) Number of new ventures	1.00						
(2) Discover mindset	0.19 ^a	1.00					
(3) Discovery behaviors	0.15 ^b	0.43 ^a	1.00				
(4) Representativeness bias	0.15 ^b	0.12	0.05	1.00			
(5) Exploring	0.11	0.34 ^a	0.41 ^a	0.01	1.00		
(6) Exploiting	–0.21 ^a	0.08	–0.06	–0.09	–0.16 ^b	1.00	
(7) Self-efficacy	–0.01	0.27 ^a	0.32 ^a	0.07	0.26 ^a	0.02	1.00

Notes: ^aCorrelation is significant at the 0.01 level. ^bCorrelation is significant at the 0.05 level.

4.2 Structural model results

To control for measurement error, each loading estimate (λ) was fixed as the square root of the reliability estimate, and the error term (θ) was set to one minus the reliability (Hair et al. 2006). Given that the number of new ventures and discovery behaviors are not based on effect (reflective) items, a reliability of 0.80 was assumed, and the error term was fixed at 0.20 for each. Fixing the measurement aspect prior to estimating the structural relationships avoids the interaction of measurement and structural models. Table 3 contains the structural equation model results. The overall fit of the structural model was acceptable ($\chi^2 = 10.80$ with 4 df; SRMR = 0.06; CFI = 0.92). All

Table 3: Structural model results

Model	$\chi^2(\text{df})$	$\Delta\chi^2$ (Δdf)	SRMR	CFI	Explained variance	
					Number of new ventures	Discover mindset
Hypothesized model	10.80(4)		0.06	0.92	0.06	0.44
Alt1: Discovery behaviors	10.44(3)	0.36(1)	0.05	0.92	0.06	0.43
Alt2: Representativeness bias	8.30(3)	2.50(1)	0.05	0.94	0.08	0.43
Alt3: Exploring	10.59(3)	0.21(1)	0.05	0.92	0.06	0.43
Alt4: Exploiting	1.66(3)	9.14(1)	0.02	1.00	0.15	0.44

Notes: Alt = alternative model; df = degrees of freedom; $\Delta\chi^2$ values of 3.84 or greater are significant at the 0.05 level.

paths were statistically significant ($p < 0.05$ or better) with standardized path estimates presented in Figure 1. The structural equations account for 44% of the variance in discover mindset and 6% of the variance in the number of new ventures.

4.2.1 Confirming the mediating effects

While these results suggested a good fit that supports the mediating effect of discover mindset, post hoc analyses were performed to confirm the mediating function. Based on a series of steps (Hair et al. 2006), which included the addition of direct effects between the four antecedents and number of number of new ventures, full mediation effects were assessed. Four alternative models were estimated, one for each antecedent variable. For discovery behaviors ($\Delta\chi^2 = 0.36$), representativeness bias ($\Delta\chi^2 = 2.50$), and exploring ($\Delta\chi^2 = 0.21$), full mediation was confirmed as the direct effects were equal to zero, and there were no significant improvements in model fit based on chi-square difference tests ($p > 0.05$). However, full mediation is not supported for exploiting, as the direct effect is statistically significant ($\beta = -0.29$, $p < 0.05$), and the fit of the model significantly improves ($\Delta\chi^2 = 9.14$; $p < 0.01$). These results are summarized in Table 3.

4.2.2 Confirming the moderating effect

To test for moderation (i.e. hypothesis 6), a multi-group analysis was conducted for both low and high levels of self-efficacy. To determine group membership, a

mean split was performed and used to test for a moderating effect using structural equation modeling. The fit of the model with all hypothesized paths estimated freely was acceptable ($\chi^2 = 11.69$ with 8 df; SRMR = 0.07; CFI = 0.95). The model was then re-estimated with the path between discover mindset and number of new ventures constrained to be equal between the low and high self-efficacy groups. The model fit was not as good ($\chi^2 = 17.94$ with 9 df; SRMR = 0.11; CFI = 0.88); and a chi-square difference test indicated that the relationship for discover mindset and number of new ventures differed between the low and high self-efficacy groups ($\Delta\chi^2 = 6.25$; $p < 0.05$). Examining this relationship across groups supports this hypothesis in that the relationship is weaker and not statistically significant in the low self-efficacy group ($b = 0.13$, $p > 0.05$) and stronger and statistically significant in the high-self-efficacy group ($b = 0.39$, $p < 0.01$). This suggests that the effect of a discover mindset on the number of new ventures statistically differs based on the level of self-efficacy.

4.2.3 Summary of structural model results

The results confirm hypotheses 1–4. A discover mindset relies on discovery behaviors, representativeness bias, exploring, and exploiting. The results also provide evidence that a discover mindset has a positive effect on number of new ventures, confirming hypothesis 5. While a post hoc analysis confirmed that discover mindset fully mediates three of the relationships, the results indicate a direct, negative effect of exploiting on the number of new ventures. In support of hypothesis 6, greater self-efficacy strengthens the positive relationship between a discover mindset and the number of new ventures. These relationships are summarized in Figure 1 and discussed next along with implications.

5 Discussion

5.1 Key findings and contributions

Understanding the behavior and cognition of persons who do recognize opportunities that others miss, and, in doing so, create value and wealth is important to the field of entrepreneurship (Mitchell et al. 2007). The entrepreneur with a discovery mindset sees opportunity formed by exogenous shocks, as reflected in the empirical findings and in interviews with high-growth entrepreneurs.

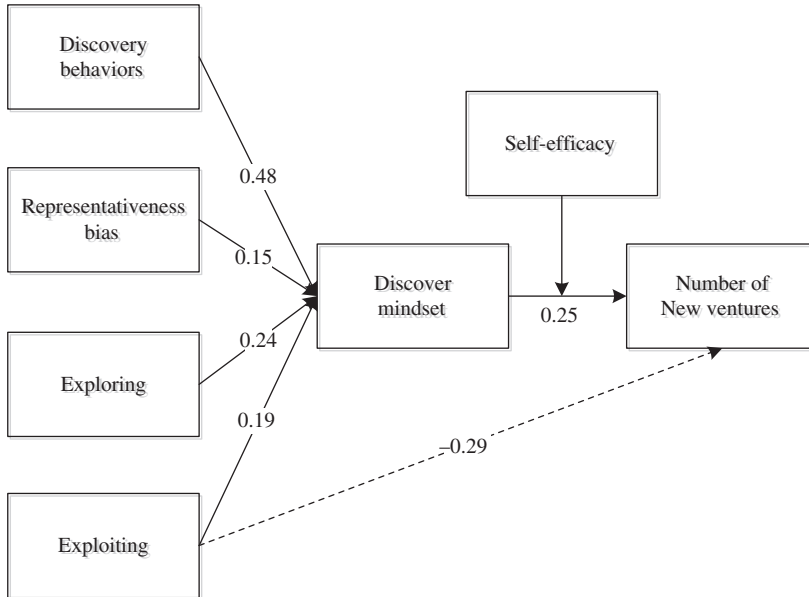


Figure 1: Hypotheses test results: completely standardized path estimates

I saw an opportunity. The healthcare industry is at an inflection point. We are seeing change in this industry at a rate that we've never seen before. When that happens, inflection points happen in an industry. Those are tie-ins of opportunity, especially for startup companies. (prior startups: four; industry: healthcare/medical)

The entrepreneur ultimately takes an idea and puts it in play – from discovery to action. For the entrepreneur with a discover mindset, a connection overlooked by others represents an opening, a possibility, from something imagined to something real.

The idea of taking concepts or new applications or new markets or new product ideas and doing something with them is kind of the only thing I know how to do. (prior startups: one; industry: biotechnology)

You have to think it, create it, bring it to fruition, put it into practice, and put it in play. (prior startups: two; industry: professional services)

The discover mindset underlies a belief in one's ability to perceive an opportunity that others have overlooked and to make the inferential leap to venture formation.

Discovery demands high levels of engagement to connect what others have overlooked. The catalyst for perceiving opportunities is a combination of (1) discovery behaviors, (2) representativeness bias, (3) the search for new ideas, and (4) existing capabilities. A discover mindset is dependent on a set of

underlying behaviors and the inferential leap to venture formation was commonly expressed.

Almost anybody that you talk to that has done something, [has] come to realize that it's tapping into some source, some energy something, whatever you want to call it. So you realize that it's not really you that's doing it but it's your ability to listen, observe and connect things together. (prior startups: one; industry: software/internet)

Connecting the dots that lead to opportunity recognition involves observing the world, asking questions, experimenting with ideas, and networking with people. These behaviors distinguish the entrepreneur with heightened acuity to opportunity. As further evidenced in interviews, high-growth entrepreneurs with a discover mindset...

1. observe the world and how people interact in it. They pay attention to everyday experiences to find new ideas or better ways of doing things. For example, they watch how customers use products and services and then develop new or better solutions on the basis of those observations.

We first got it out there and we started seeing how [customers] were using it and they took it far beyond what we had even thought about. [Customers] were asking us for new features that we hadn't considered because we didn't know they were going to use it that way. They were just kind of taking it well beyond what we had originally conceived and creating some amazing [products]. So, we enjoyed starting the day by looking at what people had created. (prior startups: four; industry: healthcare/medical)

2. question the status quo and other people's assumptions. Through questioning, overlooked connections are revealed and unknowns are discovered.

There's always something to learn and someone else has done it before and learned it the hard way. So, [its' important to] reach out to people and get that advice. Listen to people, write everything down, and sort through it yourself. (prior startups: three; industry: software/internet)

3. experiment with ideas to develop insight and experience new things. Learn by doing is a way of understanding how things work, testing suppositions, and exposing new ideas that lead to discovery.

Mindset...it's looking at things and thinking of how to grow the business out of an idea. And, looking at the bigger picture of the marketplace. "Who would need such an idea? How it would fit?" And, then knowing that you're probably wrong. So, you go out and experiment and see what happens, and [then] try different things. (prior startups: four; industry: software/internet)

4. network with associates and maintaining a web of individuals outside the entrepreneur's industry and profession. Entrepreneurs with a strong discover mindset tend to seek exposure to a broad spectrum of ideas and people.

One of the things I learned ... all leads are good leads. Because when you look backwards, you say, “Huh? How did we actually get to that next phase? How did we become successful? What panned out?” You know, it’s a convoluted web. It’s not a single-track pathway. It’s a mixture of experiences and exposure to people and being at the right place at the right time and a little bit of magic and a little bit of, you know, refinement. (prior startups: five; industry: energy)

Seeing what others miss is based on interactions that provide source material for the perception of opportunity.

An important cognitive factor in discovering opportunity is representativeness bias. The results confirm that seeing what others miss depends on an inferential leap of faith. In discovering opportunity, entrepreneurs act with less data and weak signals. Representativeness bias was evident, as big conclusions were drawn from a few cases.

You never have enough information, but you’ve got to make decisions with the information that you have. And, you can never complete anything to perfection because there’s not enough time for it, so you have to know when to stop. (prior startups: four; industry: healthcare/medical)

The results also support the role of exploration and exploitation in a discover mindset. Seeing what others miss often demands venturing into unknown territory. An ability to connect dots overlooked by others comes from exposure to new ideas and approaches and the application of new knowledge and skills. It also requires listening to voices that question your own.

[Y]ou have to be able to hear peoples’ criticism and be able to take that, interpret it and then turn it into something positive. (prior startups: zero; industry: consumer goods)

The relationship between exploiting and a discover mindset shows the importance of leveraging what one knows. Experience enables the entrepreneur to work with known parameters and apply them to new situations. Experience also leads to the refinement of schema and frameworks to recognize what is unique in new information.

I really thought about what are the tools I need to put in my tool kit to prepare me for this excursion or this adventure or this endeavor? I didn’t know what the idea was going to be, per se, or what type of company I was going to found but I knew I wanted to run a company of my own. And as I went through my corporate career, I really positioned myself to work on lots of new business launches. Because that inception point, or when you feel the fogs lifts, when you take something from ideation and start working on it, that really got me excited. And I got really good at that – going from a whiteboard to a project plan to bringing things to life. (prior startups: one; industry: professional services)

The empirical results also suggest that the familiar represents a place of comfort. As the entrepreneur relies on ideas proven by experience, the number of new businesses diminishes, which acts as a possible counterforce to a discover mindset.

Additionally, the results confirm that the greater the entrepreneur's perception of self-efficacy, the stronger the positive relationship between a discover mindset and the number of new ventures formed. Specifically, a belief in one's entrepreneurial ability strengthens the relationship between opportunity perception and action by amplifying the positive effect of a discover mindset on the launch of successive new ventures. High-growth entrepreneurs express the belief that they have the capacity to move their ideas forward and to bring them into being. Even though the external situation is largely out of her control, the entrepreneur has the confidence to make it work. With high self-efficacy comes confidence to develop and build something successful, as well as a belief that her preparation (behaviors and thinking) will allow her to gather the resources as needed.

I always believe it will work... Even when it doesn't work or it doesn't feel like it's an idea that's workable, you're one day away from making it workable. There's always a series of ups and downs. There are definitely times when you're worried that what you're doing right now won't work or this type of execution won't work. But I guess I start off with the idea that it will work. And, I've gotten more and more reassured over time... (prior startups: three; industry: software/internet)

The interview data offer support for the notion that it is not enough to notice new opportunities. Entrepreneurs have to transform ideas in order to create something new by drawing upon past experience and combining it with new resources and learning. Self-efficacy enables the individual who sees the opportunity to act on it.

[You have to] take an idea, and kind of create, and make it into a reality. It's the idea of wanting to solve a problem, using a new way that you have to pull together resources and create something from scratch. (prior startups: one; industry: software/internet)

5.2 Strengths and limitations

The findings enumerated in this paper advance theoretical perspectives in two ways. First, the discover mindset and its antecedents have not been examined previously. A prevailing view in entrepreneurial research is that opportunities exist as objective phenomena that gifted or fortunate individuals are able to notice and to exploit more readily. These results support the view that opportunity is entrepreneurial perception (Arenius and Minniti 2005; Neill and York 2012) and address the need for research on the antecedents of entrepreneurial cognition (Grégoire, Corbett, and McMullen 2011). Understanding opportunity

perception is contingent on the entrepreneur rather than objective facts – although reality will judge performance. The individual perceives opportunity based on thoughts and actions that form the linkages leading to venture formation. These linkages form through interactions with experiences, ideas, and people. If the objective environment does not agree with the entrepreneur's vision, then the entrepreneur may create the opportunity using available means (Baker and Nelson 2005; Sarasvathy 2001).

Second, the paper examines the role of mindset and self-efficacy on the founding of new businesses. Entrepreneurs learn through practice and develop unique knowledge structures and cognitive frameworks that enable them to use information; to engage in associational thinking and to connect seemingly unrelated ideas or fields; and to recognize opportunity better than novice entrepreneurs (Mitchell et al. 2007; Baron and Ensley 2006; Dyer, Gregersen, and Christensen 2009). They draw on their experience to develop their ideas and to bring them into being; they think about their business models in more sophisticated and pragmatic ways; and they know how to focus on issues and processes that would be of interest to major stakeholders in their new ventures (Baron and Ensley 2006). With that said, there is a caveat to exploiting only what is known. While a discover mindset benefits from experience, exploitation is negatively related to serial entrepreneurship. Knowledge structures are not static for serial entrepreneurs. An entrepreneur with a discover mindset is an entrepreneur who explores and engages in discovery behaviors in an effort to modify or to add to what she knows. As others have demonstrated, learning factors into serial business formation in important ways (Corbett 2005; Politis 2008; Chen 2013).

Our findings advance practice by drawing attention to behaviors that can be learned and to orientations that can be developed through practice, inspired by modeling, and learned by observing. The women in our study demonstrate the link between self-efficacy, the ability to see opportunity, and the capacity to build high-growth companies. They provide positive role models and begin to break down the gender stereotypes associated with high-growth entrepreneurship, which have been highlighted by Sweida and Reichard (2013).

There are limited studies on women who found high-growth ventures, particularly those who are serial or habitual entrepreneurs; however, the study's use of such a unique population also poses a weakness as the relationships are confirmed in a restricted population, which limits generalizability. Another possible limiting factor is the study's focus on beliefs held by entrepreneurs about their behaviors, thinking, and perceptions rather than actual actions or decisions. A further limitation is the reliance on cross-sectional data. These

limiting factors suggest some caution in interpreting the results but also create opportunities for future research.

5.3 Opportunities for future research

The results open up several avenues for future research in relation to entrepreneurial cognition. While the current paper examines the more established perspective of the individual discovering entrepreneurial opportunity, emerging perspectives propose that opportunities are created endogenously with available resources rather than via external shocks (Alvarez, Barney, and Anderson 2013; Baker and Nelson 2005; Sarasvathy 2001). Future research might examine the role that behavior and cognition play in new business creation by high-growth entrepreneurs, who utilize a create mindset. For new venture formation, researchers have begun to operationalize the elements of each perspective (Chandler et al. 2011; Dew et al. 2009; Dutta and Thornhill 2014; Fisher 2012); however, this work could be extended to examine the degree to which entrepreneurs rely on a discover or create mindset, including the factors that distinguish between and result from each. While the literature acknowledges that individuals may rely on both discover and create mindsets (Fisher 2012; Sarasvathy 2001) with context performing a discriminating role (Zahra 2008), research confirming how opportunity might derive from both represents an area for future study.

While this study represents an important step toward understanding the behavioral and cognitive factors that underlie a discover mindset, further understanding of the processes associated with objective and subjective opportunities might explain the nature of the opportunities unlocked and the startup activities enacted. If perception forms the narrative for action, then future research might simultaneously examine the role of behavioral and cognitive factors on opportunity perception and pursuit. As this research suggests, the positive effect on one (e.g. exploitation) may negatively affect the other – uncovering a paradox. In other words, researchers might explore how behavior and thought directs not only what gets noticed but also what gets done; i.e. entrepreneurial perception and action. This area of study is not unexplored, with prior research suggesting important roles for uncertainty, experience, and motivation (e.g. Chandler et al. 2011; Dew et al. 2009; McMullen and Sheppard 2006). The research challenge lies in the reciprocal relationship between perception and experience. For example, prior research shows that entrepreneurial experience influences opportunity discovery (Ucbasaran et al. 2003; Ucbasaran, Westhead, and Wright 2009) and increases the entrepreneur's abilities to identify and exploit additional opportunities (Politis 2008). In contrast, our research shows that perception influences

the number of new ventures. The cross-sectional design used in this study limits further exploration.

Given that the sample in this study consisted of female founders of high-growth companies, there are implications for research regarding gender and entrepreneurship as well. While no attempts were made to compare genders in the current study, several questions arise because of the issues relating to women as high-growth entrepreneurs (Gundry and Welsh 2001; Morris et al. 2006). A growing focus of entrepreneurial research has been driven by the realization that we know less about women entrepreneurs and their particular motivations and behaviors than we do about men (Ahl and Nelson 2010; Green, Hart, Gatewood, Brush, & Carter et al. 2003). This is particularly important because women are underrepresented in the entrepreneurial space. As Robb, Ballou, DesRoche, Potter, Zhao, and Reedy (2009) found in a study of a cohort of firms founded in 2004, only 30% of the primary owners were women and, of these, a much smaller proportion of women-owned firms (50% less than men-owned) were involved in high-tech, a field likely to provide more rapid growth. When the focus turns to “employer firms” (companies that create jobs), the representation of women drops further, to less than 50% of that of men (Kepler 2007). Because of this, studies of entrepreneurial characteristics have proliferated in the past decade. The literature has focused on questions such as: what kinds of women start companies; why more women don’t start companies; how female entrepreneurs are different from male entrepreneurs; and whether female entrepreneurs are as successful as male entrepreneurs.

Several questions then arise from this study that merit further attention. Are there any significant differences between male and female entrepreneurs with regard to discovery behaviors or other factors such as representativeness bias? There is evidence that women-founded companies do not perform as well as their male counterparts. Shane (2008) cites evidence that women-owned firms have lower sales, produce lower profits, employ fewer people, and create less income for the founder. He argues that this is because women have lower financial goals to begin with; thus, their growth aspirations are lower. This may correspond with the suggestion by Morris, Miyasaki, Watters, and Coombes (2006) that women who are “pulled” into entrepreneurship by opportunity may reflect higher growth aspirations than those who are “pushed” by life circumstances (loss of job, economic necessity, divorce, etc.). Does being “pulled” correspond to discovery behaviors and exploring, and being “pushed” correspond more closely to an overreliance on the familiar or the tendency to exploit only what is known? Are women “pulled” into entrepreneurship more likely to exhibit the confidence reflected in the representativeness bias that seems to correspond with growth aspirations?

5.4 Practitioner implications

Our findings advance practice by drawing attention to behaviors that can be learned and to orientations that can be developed through practice, inspired by modeling, and learned by observing. The women in our study demonstrate the link between self-efficacy, the ability to see opportunity, and the capacity to build high-growth companies. They provide positive role models and begin to break down the gender stereotypes associated with high-growth entrepreneurship, which have been highlighted by Sweida and Reichard (2013).

For aspiring and current entrepreneurs, the results of this study coupled with our discussions with high-growth entrepreneurs suggest an entrepreneurial to-do list. The key to discovering opportunity is engagement – learning by experimenting, networking, observing, and questioning – leveraging what one knows while stretching toward unknown. Entrepreneurs observe, unplug and sketch, listen, and make field notes. To see what others miss, they have worked to develop their abilities to frame and to ask questions. They consciously assemble networks by initiating meetings with people who interest them and by connecting people they meet with others in their network. Even with this preparation, connecting dots that others have overlooked still requires seeing patterns from small samples, without the certainty of extensive or confirmatory datasets. There is a relationship between one's belief in her entrepreneurial acuity and self-efficacy and the likelihood that further ventures will be started. It is this self-efficacy that creates the bias for action and the willingness to act without all of the data needed and the resources required.

6 Conclusions

This paper examines the discovery of opportunity at the individual level by offering a behavioral and cognitive explanation for opportunity perception by entrepreneurs who found high-growth businesses. A discover mindset allows some entrepreneurs to see what others have missed and to pursue opportunity in that open space. Furthermore, among the growth-oriented women entrepreneurs in this study, self-efficacy amplified the relationships between a discover mindset and the pursuit of serial ventures. These women entrepreneurs provide positive role models and begin to break down the gender stereotypes associated with high-growth entrepreneurship. This paper contributes to theory in important ways, suggests fruitful areas for future research, and provides direction for practitioners and educators.

Appendix: Scale content, loadings, and response frequencies

Construct	Content of scale items	Loading	Strongly disagree (%)	Mod. disagree (%)	Slightly disagree (%)	Neutral (%)	Slightly agree (%)	Mod. agree (%)	Strongly agree (%)
Discover mindset	I discover opportunities that others do not see	0.50	0	0	1	5	6	29	58
	Opportunities are already formed and awaiting discovery by my alertness	0.62	0	3	6	12	20	36	22
	Opportunities result from market or industry changes that I notice	0.68	0	1	2	6	12	37	42
	To discover opportunities, I must systematically scan the environment	0.46	1	1	4	9	15	28	42
	I believe external shocks form opportunities	0.47	1	1	3	19	18	31	27
	Opportunities exist as objective phenomena just waiting for me to discover them	0.52	4	6	9	21	28	23	11
Discovery behaviors ^a	Observing01	0.65	1	1	1	6	16	34	41
	Observing02	0.73	1	1	4	8	18	25	44
	Observing03	0.60	1	2	4	9	11	28	45
	Observing04	0.94	1	1	1	5	15	30	48
	Questioning01	0.65	0	0	2	5	10	14	68
	Questioning02	0.60	0	1	0	4	10	14	70
Questioning03	0.40	12	11	17	22	14	12	11	
Questioning04	0.84	0	1	2	9	13	33	42	
Questioning05	0.82	0	1	2	10	17	34	37	
Questioning06	0.66	0	2	2	5	15	28	49	

(continued)

Appendix: (Continued)

Construct	Content of scale items	Loading	Strongly disagree (%)	Mod. disagree (%)	Slightly disagree (%)	Neutral (%)	Slightly agree (%)	Mod. agree (%)	Strongly agree (%)
	Experimenting01	0.92	0	1	2	6	15	27	49
	Experimenting02	0.94	1	0	2	6	17	34	41
	Experimenting03	0.59	0	1	1	6	17	25	49
	Experimenting04	0.81	1	1	4	8	16	34	37
	Experimenting05	0.54	7	6	13	20	21	16	18
	Networking01	0.67	1	1	4	6	18	20	50
	Networking02	0.73	8	9	16	13	23	17	14
	Networking03	0.81	4	7	12	10	21	24	21
	Networking04	0.83	4	7	10	7	14	25	33
Representativeness bias	I can recognize opportunities by observing just a small number of cases	0.44	1	5	7	7	20	38	23
	I only need a few observations to have confidence in my decisions	0.69	4	3	15	11	28	26	13
	If a few potential buyers like an idea, it's a valid opportunity	0.75	12	10	20	17	22	12	6
	I don't require a lot of data to identify a marketable opportunity	0.84	11	13	23	15	18	11	10
	I am able to recognize opportunities from a few direct experiences	0.75	5	7	6	12	26	29	15

Exploring	My preference is to develop new knowledge and skills	0.72	0	1	1	4	9	22	64
	I like to develop original ideas	0.59	0	0	0	3	4	17	76
	I like to experiment with new approaches	0.67	0	0	1	2	4	24	69
	I believe it is important to develop new knowledge and skills	0.76	0	0	1	2	3	12	82
Exploiting	I would rather work with familiar routines	0.79	19	21	14	28	13	6	0
	Given a choice, I stick to what I know best	0.85	18	21	15	16	17	8	4
	I like to work with proven ideas	0.73	9	21	13	20	21	12	4
Self-efficacy	I think it is best to work with what you know	0.63	9	17	20	19	15	16	4
	I will be able to achieve most of the goals that I have set for myself	0.76	0	1	2	3	11	32	51
	When facing difficult tasks, I am certain that I will accomplish them	0.79	0	1	1	3	10	43	42
	In general, I think that I can obtain outcomes that are important to me	0.63	0	0	1	0	7	30	63
	I believe I can succeed at most any endeavor to which I set my mind	0.89	0	0	1	1	5	38	55
	I will be able to successfully overcome many challenges	0.74	0	0	0	1	3	28	68

Notes: All items evaluated on seven-point agree–disagree scale. ^aSee Dyer, Gregersen, and Christensen (2008) for scale items.

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