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# ENTREPRENEUR BEHAVIORS, OPPORTUNITY RECOGNITION, AND THE ORIGINS OF INNOVATIVE VENTURES

JEFFREY H. DYER,[1]* HAL B GREGERSEN,[2] and CLAYTON CHRISTENSEN[3]
[1]*Marriott School, Brigham Young University, Provo, Utah, U.S.A.*
[2]*INSEAD, Fontainebleau, France*
[3]*Harvard Business School, Harvard University, Cambridge, Massachusetts, U.S.A.*

*This study traces the origins of innovative strategies by examining the attributes of 'innovative entrepreneurs.' In an inductive grounded theory study of innovative entrepreneurs, we develop a theory that innovative entrepreneurs differ from executives on four behavioral patterns through which they acquire information: (1) questioning; (2) observing; (3) experimenting; and (4) idea networking. We develop operational measures of each of these behaviors and find significant differences between innovative entrepreneurs and executives in a large sample survey of 72 successful and unsuccessful innovative entrepreneurs and 310 executives. Drawing on network theory, we develop a theory of entrepreneurial opportunity recognition that explains why these behaviors increase the probability of generating an idea for an innovative venture. We contend that one's ability to generate novel ideas for innovative new businesses is a function of one's behaviors that trigger cognitive processes to produce novel business ideas. We also posit that innovative entrepreneurs are less susceptible to the status quo bias and engage in these information-seeking behaviors with a motivation to change the status quo.*


## INTRODUCTION

One of the central questions addressed in the field of entrepreneurship is *why entrepreneurs recognize opportunities that nonentrepreneurs fail to recognize*. (Baron, 2004, 2007; Kaish and Gilad, 1991; Shane, 2003). Because entrepreneurs play a central role in new venture creation, comparisons of entrepreneurs and managers have been prevalent in prior entrepreneurship research as scholars have sought to identify the distinguishing characteristics of entrepreneurs. The three most popular explanations of why entrepreneurs and nonentrepreneurs differ in this ability are personality differences, cognitive differences, and social network differences.

The research on personality or psychological differences has, to the surprise of many, found that successful entrepreneurs and successful business executives do not differ significantly on personality traits (Brockhaus and Horwitz, 1986; Busenitz and Barney, 1997). In the psychological differences literature, a wide variety of individual psychological attributes, including locus of control and risk taking, have been shown to not vary significantly between entrepreneurs and managers in large organizations (Begley and Boyd, 1987; Brockhaus, 1980). Some relatively small but consistent psychological differences—such as the need for achievement, tolerance for ambiguity, and the need for conformity—have

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*Correspondence to: Jeffrey H. Dyer, Marriott School, Brigham Young University, 790 Tanner Building, Provo, UT 84602, U.S.A. E-mail: jdyer@byu.edu

been found in some studies (Begley and Boyd, 1987; Miner, Smith and Bracker,1989). According to Busenitz and Barney (1997: 11) 'After a great deal of research it is now often concluded that most of the psychological differences between entrepreneurs and managers in large organizations are small or nonexistent' (Brockhaus and Horwitz, 1986; Low and MacMillan, 1988).

Although there has been little empirical support for personality differences between entrepreneurs and nonentrepreneurs, there has been some emerging empirical support for cognitive differences and social network differences. For example, research has shown that entrepreneurs are prone to cognitive biases, notably the overconfidence bias and representativeness bias (Busenitz and Barney, 1997; Parlich and Bagby, 1995). These biases do not appear to directly influence opportunity recognition, but rather seem to motivate entrepreneurs to persist in pursuing new venture ideas, thereby increasing the probability of venture creation (Busenitz and Barney, 1997). A related stream of research on cognition has suggested that entrepreneurs recognize opportunities because they are superior at *pattern recognition*—noticing connections between trends, changes, and events that appear, at first glance, to be unconnected (Baron, 2006). While the notion that entrepreneurs have better pattern recognition skills than nonentrepreneurs is intuitively appealing, there is limited empirical research to support this premise. Finally, social network theorists have argued that the structure of one's social relationships determines the quantity of information, the quality of information, and how rapidly people can acquire the information necessary to discover entrepreneurial opportunities (Aldrich and Zimmer, 1986; Marsden, 1983; Rodan and Galunic, 2004; Uzzi and Spiro, 2005). Entrepreneurs may have superior access to information because they have larger and more diverse social networks that provide a conduit for information, thereby allowing them to recognize opportunities. Empirical research supports the premise that entrepreneurs have more diverse social networks than nonentrepreneurs (Renzulli, Aldrich, and Moody, 2000; Burt and Raider, 2002; Stuart and Ding, 2006). However, Stuart and Sorenson (2007) caution that social networks may enhance venture creation because they enhance resource mobilization, not necessarily opportunity recognition.

Building on the more behavioral approach of social network researchers, the research in this article focuses on the behaviors that *innovative* entrepreneurs engage in that may enable them to identify new venture opportunities. Gartner (1989: 57) has argued for a more behavioral approach to entrepreneurship research claiming that 'research on the entrepreneur should focus on what the entrepreneur does, not who the entrepreneur is.' Using a grounded theory approach, this article inductively identifies several of these specific behaviors through indepth interviews with innovative entrepreneurs and individuals who work with them. Then, using survey methods, we compare the extent to which a sample of innovative entrepreneurs display these behaviors compared to a sample of managers. Consistent with grounded theory, these behaviors are much more common and pronounced among innovative entrepreneurs than among managers, including senior managers, in large organizations. Through this process, we develop a theory regarding behavioral patterns that contribute to innovative entrepreneurs' ability to recognize opportunities for new venture creation.

## THEORY DEVELOPMENT

### Definition of opportunity recognition

The notion of entrepreneurs recognizing opportunities has led to a threefold categorization (Sarasvathy *et al.*, 2003; Miller, 2007) of how this occurs: (1) *opportunity recognition* refers to connecting known products with existing demand to exploit a previously recognized opportunity; (2) *opportunity discovery* starts with a known supply and proceeds in search of an unknown demand, or from a known demand that motivates search for an unknown supply; and (3) with *opportunity creation*, neither the supply nor demand exists prior to entrepreneurial action—the entrepreneur participates in creating both. We use *recognize opportunities* or *opportunity recognition* to refer to all three processes for starting an innovative business, even though we believe that technically speaking the innovative entrepreneurs we study are more likely to engage in *opportunity discovery* or *opportunity creation* since they are introducing something new to the market (Sarasvathy *et al.* 2003; Miller, 2007).

### Definition of innovative entrepreneur

Most prior research has examined differences between entrepreneurs (defined as anyone who



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founds a business) versus managers or executives (mostly in large organizations), rather than *innovative entrepreneurs*. As a result, findings regarding entrepreneurs may not necessarily translate to innovative entrepreneurs. Building on Cliff, Jennings, and Greenwood's (2006) study of imitative versus innovative entrepreneurs (i.e., founders of firms that exhibit novelty) we define an *innovative entrepreneur* (IE) as: (1) the founder of a new venture that offered a unique value proposition relative to incumbents (e.g., new or different feature set, pricing, convenience, customizability); and (2) the person who came up with the original idea to start the venture. The classic definition of an entrepreneur is anyone who starts a new venture (Lazear, 2004). When someone opens a dry cleaner or a new mortgage business—or even a set of Toyota dealerships or McDonald's franchises—researchers typically put them all in the same category of entrepreneur as the founders of innovative new ventures such as Pierre Omidyar (eBay), Jeff Bezos (Amazon.com), and Steve Jobs (Apple)—individuals we would classify as innovative entrepreneurs. Prior research suggests that only a relatively small percentage of all entrepreneurs start innovative ventures (Case, 1989; Bhide, 2000). For example, Bhide (2000:32) reports that only 12 percent of the founders of 100 high profile start-ups identified in Inc. magazine attributed their companies' success to *an unusual or extraordinary idea* and 88 percent reported their success mainly to the *exceptional execution of an ordinary idea*.

## Recognizing/discovering innovative new venture ideas

Why might some individuals be more likely to recognize or discover an opportunity to launch an innovative new venture? This is a fundamental question for the field of entrepreneurship because opportunity recognition is the catalyst for the entrepreneurial process. Thus, it is not surprising that opportunity recognition has long been a central concept in the field of entrepreneurship. However, according to Baron (2007: 170) until recently 'little effort was made to examine it as a process.' Indeed, Baron (2007: 170) claims that prior research 'largely ignores the question of *how* opportunity recognition occurs; in other words, how do specific persons actually identify opportunities?'

Research on this topic to date has tended to focus on two categories of factors—access to information (differences in search behavior or social networks) and cognition (differences in *pattern recognition* abilities and *alertness*). Prior research suggests that individuals may recognize opportunities to start ventures because they have superior access to information due to differentiated search behavior or social networks. Not surprisingly, the more time one spends searching for and assimilating information, the greater the probability that he/she will serendipitously discover a new business opportunity. Empirical support for the relationship between search behavior and opportunity recognition is offered by Kaish and Gilad (1991) who found that entrepreneurs spend significantly more time searching for information through nonverbal scanning and in their off hours. Unfortunately, there is still limited research on entrepreneurs' search behaviors, particularly those specific behavioral patterns that might contribute disproportionately to opportunity recognition.

Social network theorists have argued that the structure of one's social relationships determines the quantity of information, the quality of information, and how rapidly people can acquire the information necessary to discover entrepreneurial opportunities (Aldrich and Zimmer, 1986; Marsden, 1983). Recent studies provide empirical support for the importance of diverse social networks to new venture creation. For example, Renzulli *et al.*(2000) found that would-be entrepreneurs with networks that spanned *multiple domains of social life* founded new firms with greater frequency. Similarly, Burt and Raider (2002) studied female graduates from a prestigious MBA program and found higher rates of transitioning to self-employment among those with diverse social networks. However, while there is empirical evidence suggesting that individuals with more diverse social networks are more likely to start new ventures, Stuart and Sorenson (2007: 218) offer a caution with regard to interpreting a casual relationship between diverse social networks and opportunity recognition by saying 'we should note that most studies of egocentric network structure and entrepreneurial activity examine aggregate data in which the researcher cannot distinguish the network's effect on opportunity identification from its influence on resource mobilization . . . We consider the evidence to date to fall short of establishing as a stylized fact the idea that diverse networks (those rich in structural holes) enhance opportunity recognition.'

Access to information is likely to be an incomplete explanation for why some people are able to



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discover innovative new business opportunities because, according to Shane and Eckhardt (2003: 175) 'opportunities are identified only when people formulate a new means-ends framework in response to that information.' How does opportunity recognition actually occur in the minds of specific entrepreneurs? According to Baron (2007: 171) 'one cognitive process investigated by cognitive scientists—*pattern recognition*[1]—appears to be closely related to opportunity recognition in the domain of entrepreneurship.' Baron (2006: 171) builds on prior psychological research (e.g., Sternberg and Davidson, 1995) by noting that pattern recognition involves 'noticing meaningful patterns in complex events trends, or changes and includes: (1) recognizing links between trends, changes, and events that appear, at first glance, to be unconnected; and (2) noticing that these connections form an identifiable pattern.' Unfortunately, given the difficulty of measuring pattern recognition capabilities in individual entrepreneurs, little empirical support exists. Moreover, we have little understanding of why some individuals may have superior pattern recognition capabilities or what might be the catalyst (antecedent) for pattern recognition.

## INDUCTIVE STUDY: RESEARCH METHODS

### Sample

The purpose of our inductive grounded theory study was to attempt to answer two questions: what contributes to an innovative entrepreneur's ability to recognize an innovative new business idea, and do innovative entrepreneurs differ from typical executives on any particular behavioral dimensions. To explore possible answers to these questions, we conducted semistructured interviews with a sample of 25 innovative entrepreneurs (see Table 1) and 25 senior executives of large companies. The definition of an innovative entrepreneur was provided in the theory development section.

Our sample of innovative entrepreneurs came from using three different approaches. First, we identified innovative ventures by examining a list of the *top 100 innovative companies* as identified through a survey of executives by Business Week and the Boston Consulting Group (Business Week, 2005, 2006, 2007). We then identified and contacted founders of a subset of those companies that offered a unique value proposition when they launched. This included a set of very high profile innovative entrepreneurs such as Pierre Omidyar (eBay), Jeff Bezos (Amazon.com), Michael Dell (Dell), Mike Lazaridis (Research-in-Motion), Herb Kelleher (Southwest), Marc Benioff (Salesforce.com), Scott Cook (Intuit), David Neeleman (JetBlue), Diane Greene (VMware), Niklas Zennstrom (Skype), and Peter Thiel (PayPal). This was not a random sample of innovative entrepreneurs, but rather of founders of at least one highly successful new venture (but they often had also launched failed innovative ventures as well). The majority of these interviews were conducted over the phone and the interviews were taped and transcribed.

Second, we identified innovative entrepreneurs who were visiting two business schools in the eastern United States, one in the western United States, and one in Europe. These IEs were typically visiting one of these universities to give a talk or attend a conference or seminar on entrepreneurship. These innovative entrepreneurs had typically founded at least one innovative venture that was moderately successful and included Mike Collins (Big Idea Group), Jeff Jones (CampusPipeline, NxLight), Aaron Garrity (Xango), and John Pestana and Josh James (Omniture). This sample of innovative entrepreneurs is a *convenience sample* that primarily includes somewhat successful innovative entrepreneurs.

Third, we identified innovative entrepreneurs who were attending executive education or executive MBA programs at the business schools mentioned above. The majority of these innovative entrepreneurs had founded ventures that had failed or perhaps had been moderately successful (hence, they were enrolled in an executive MBA program or participating in an executive program). This group included innovative entrepreneurs like Sam Allen (ScanCafe), Corey Wride (MovieMouth), and Spencer Moffat (Fast Arch of Utah).

The sample of senior executives (title of vice president or above) came primarily from executives who were visiting the previously mentioned business schools to give a talk or attend an event. At least 10 of the senior executive interviewees were CEOs of billion dollar companies and virtually all were

[1] *Associational (also biassociative) thinking* or *lateral thinking* are other terms used for the cognitive process of connecting concepts (ideas, problems, fields of study, events, and trends) that appear, at first glance, to be unconnected.



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Table 1. Sample of innovative entrepreneurs interviewed

| Name | Company founded | Innovative aspect of company* |
|---|---|---|
| Sam Allen | ScanCafe.com | Among the first to offer a fully digital and low-cost (pricing one-fifth of competitors) photo scanning and restoration service by incorporating next generation Web technologies and by creating a secure logistics chain with a fulfillment center in Bangalore, India |
| Marc Benioff | Salesforce.com | Among the first to offer online/on-demand CRM/salesforce automation software |
| Jeff Bezos | Amazon.com | Among the first online book retailers; developed online fulfillment capabilities |
| Mike Collins | Big Idea Group | Intermediary between product inventors and innovative product-buying companies/distribution channels |
| Scott Cook | Intuit | Among the first to offer personal finance and tax software—Quicken and Turbo Tax |
| Michael Dell | Dell Computer | Developed direct-to-customer sales model in PCs, allowing for mass customization |
| Aaron Garrity | Xango | Among the first to offer juice and other nutritional products using the mangosteen and a network marketing approach |
| Diane Green | Vmware | Among the first to offer virtualization software technology allowing virtual servers and desktops to host multiple operating systems and multiple applications locally and in remote locations |
| Eliot Jacobsen | Freeport.com | Developed free ISP with unique reach to local retailer community |
| Josh James | Omniture | Among the first to develop and deploy Web analytics software |
| Jeff Jones | NxLight; Campus Pipeline | Among the first to offer a digital offering to campus allowing users to access data remotely |
| Herb Kelleher | Southwest Airlines | Codeveloped the Southwest Airlines strategy and business model of low-priced fares based on fast turnarounds and point-to-point air travel versus hubs |
| Mike Lazaridis | Research in Motion | Developed *Blackberry*, a handheld wireless communication device that has frequently been first with new features/technologies |
| Masha Merchant | Angiologix Inc. | Angiologix Inc. developed a novel medical diagnostic device for the assessment of risk for heart attacks |
| Spencer Moffat | Fast Arch of Utah | Among the first to offer home builder/framers premade sheet metal archways instead of traditional stick framed archways |
| David Neeleman | Jet Blue; Morris Air | Founded Morris Air, which pioneered ticketless air travel and Jet Blue, which offered unique features such as LiveTV, larger leather seats, and a unique codesigned 100-seat jet with Embraer |
| Pierre Omidyar | eBay | Developed software to allow for person-to-person auctions |
| John Pestana | Omniture | Among the first to develop and deploy Web analytics software |
| Peter Thiel | PayPal | Developed software to *beam* money by essentially attaching it to an e-mail |
| Mark Wattles | Hollywood Video | Emphasized *Star Treatment* guest service at inception; among the first to rollout Five-Day Rentals nationally and offer Guaranteed New Releases |
| Corey Wride | Movie Mouth | Movie Mouth is building an interactive, Web-subscription application that has an embedded media player accessing copyrighted media such as DVDs and CDs on the local machine and remote content from the Web |
| Niklas Zennstrom | Skype | Used *supernode* technology to place calls via the Internet and deployed a unique viral marketing approach |

*We use the wording *among the first* to launch a product or service offering because we have not verified that the company was indeed the first to offer the product or service. However, the innovative entrepreneur claimed that the new venture value proposition was his/her original idea and he/she was not simply imitating another company's offering.



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viewed as successful. While this was a convenience sample, we consider it to be essentially a random sample because these executives came from all different types of industries and no criteria was used to screen senior executives.

## Methods

We conducted exploratory interviews, comparing the innovative entrepreneurs' and executives' responses to the following questions:

1) Tell us about the most valuable strategic insight/novel business idea that you've generated during your business career. Please describe the details of the idea. (For example, how was it novel and how did you come up with the idea?)
2) In your opinion, do you have any particular skills that are important to helping you generate novel business ideas? Do you think the skills you have that have enabled you to be creative/ innovative (start an innovative business) are just part of your genetic makeup? Or do you think much of this ability was learned?
3) Are there any techniques you use or habits you have developed to help you come up with innovative ideas?

The goal of our interviews with the innovative entrepreneurs was to understand as much about them as possible, including when and how they personally came up with the creative ideas on which new innovative businesses were built. To get an outside perspective, we also interviewed senior executives who were well acquainted with the innovative entrepreneur whenever possible. For example, we interviewed Dell CEO Kevin Rollins about Michael Dell and former eBay CEO Meg Whitman about eBay founder Pierre Omidyar. We also interviewed the founders of Skype (Niklas Zennstrom and Janus Friis) and PayPal (Peter Thiel), with whom Whitman became well acquainted when eBay acquired those companies. We augmented our -interviews with the high-profile entrepreneurs with a review of other interviews they had given or articles or books they had written.

As we conducted the interviews with innovative entrepreneurs and executives, we used the constant comparative method as described by Browning, Beyer, and Shetler (1995: 121) to extract categories and themes from the interviews.

> 'As the research proceeds and new data are collected, they are constantly being compared to prior data in terms of categories and hypotheses. When new data yield new or inconsistent information, conceptual categories and the emerging theory are modified to take them into account. This process is repeated until theoretical saturation is reached: until no new categories are emerging and no new information inconsistent with the categories and tentative hypotheses is being generated' (Glaser and Strauss, 1967; Strauss and Corbin, 1990).

Through the interviews with both the innovative entrepreneurs and managers, we identified four behavioral patterns that seemed to be more pronounced in IEs than managers. Moreover, the behaviors were often direct antecedents to the innovative entrepreneur generating the novel business idea. In particular, innovative entrepreneurs were more likely to exhibit behavioral patterns that involved: (1) *questioning*, or their propensity to frequently ask questions, particularly those that challenge the status quo and ask *what if* about the future; (2) *observing*, or the extent to which they spend time intensely observing the world around them, paying attention to everyday experiences to find new ideas; (3) *experimenting*, or the frequency with which they experiment in and explore the world with a hypothesis-testing mindset: visiting new places, trying new things, seeking new information, and experimenting to learn new things, as experimenters constantly explore the world intellectually and experientially, holding convictions at bay, testing hypotheses along the way; and (4) *idea networking*, or the extent to which they actively find and test ideas with a network of individuals who are diverse in both background and perspective. Moreover, the innovative entrepreneur would often refer to one or more of these behavior patterns as an important habit or technique that was used to increase the probability of generating an innovative idea. Senior executives did not report engaging in these behavioral patterns to the same extent as the innovative entrepreneurs. Data collection was concluded when a level of saturation was reached (Glaser and Strauss, 1967; Burgelman, 1994). This study is subject to the general limitations of generalizability associated with field research, which are well documented (see Eisenhardt, 1989).



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In the sections that follow, we provide quotes from many of the innovative entrepreneurs we interviewed. Although the names of interviewees in this type of research are typically not disclosed, we have decided to disclose the names of all interviewees who are quoted because many of them are well known and we feel that most readers will find the source of the quote to be of interest.

## INDUCTIVE STUDY: RESULTS

When analyzing the data from the IE interviews, four consistent behaviors and two cognitive patterns emerged as relevant to acquisition of information that could potentially be used in the generation of novel ideas for new ventures. The four behaviors were questioning, observing, experimenting, and idea networking. The two cognitive patterns were associational thinking (or pattern recognition) and a desire to change the status quo.

### Questioning

Most IEs relied on questioning behavior as a key behavioral mechanism for acquiring information that led to a new venture idea. Of course, both managers and executives claimed they used questions in their work. However, IEs were more likely to ask questions that challenged the status quo, whereas the questions asked by managers were much more about understanding how to make existing processes (i.e., the status quo) work a little better. Meg Whitman, former CEO of eBay, has worked directly with a number of innovative entrepreneurs in our sample, including Pierre Omidyar (eBay founder), Niklas Zennstrom and Janus Friis (founders of Skype and Kazaa), and Peter Thiel and Elon Musk (founders of PayPal). When asked how these folks differ from typical executives Whitman said 'My experience is that they get a kick out of screwing up the status quo. They can't bear it. So they spend a tremendous amount of time thinking about how to change the world. And as they think and brainstorm, they like to ask i*f we did this, what would happen*?' During our interviews with executives, they less frequently mentioned asking *what if* questions and some claimed they were even careful to not openly ask questions that challenge their company's strategy or business model. As one executive stated, 'If I openly question our strategy or key initiatives this could create a crises of confidence within the company. People don't like that kind of uncertainty and it can paralyze the organization.'

Most innovative entrepreneurs could identify specific questions they were asking at the time they recognized the new venture opportunity. For example, part of Michael Dell's initial opportunity recognition in the computer industry resulted from a single question asked with deep interest: 'I was a frustrated consumer, and I would open computers up, I'd take them apart; I knew what was inside them and would observe that $600 worth of parts were sold for $3,000. That didn't make any sense to me. *I really questioned why* it cost five times more to buy the darn thing than the parts cost.'

Such questioning also seemed to influence part of Dell's top management team dynamic as illustrated in this comment about Michael Dell's working dynamics with former CEO Kevin Rollins: 'Kevin gave me a toy bulldozer driven by a little girl with a huge smile on her face. Sometimes I'll get really excited about an idea and I'll just start driving it. Kevin put the bulldozer on my desk, and it's a signal to me to say *wait a second, I need to push it a little more and think through it for some others and kind of slow down on this great idea that I'm working on*.' I gave Kevin a Curious George stuffed animal. *The Curious George is for Kevin to ask questions, to be a little more inquisitive.* We don't use them that much, but they're subtle little jokes between us.'

Finally, not only did Dell describe his attempts to prod his CEO counterpart into more questioning, but he also shared how he worked to extend questioning behavior beyond the TMT: 'If I had a favorite question to ask, everyone would anticipate it, which wouldn't make it very good. Instead, *I like to ask people things that they don't think that I'm going to ask them.* This is a little cruel, but I kind of *delight in coming up with questions that nobody has the answer to quite yet*. But it challenges them and they have to go back and think about it.'

Other innovative entrepreneurs also viewed questioning (either implicitly or explicitly) as central to their capacity for innovative idea generation. For example, Jeff Jones (founder Campus Pipeline, NxLight) made the observation that 'I think there's a certain personality type that just keeps asking *why*. Like my two-year-old son, they ask *why, why, why?* They don't stop. Once you discover that asking *why* in a different way and not being content with what the answer is, it's interesting what happens. You just have to go a little bit deeper asking questions one or two more times in a different way.'



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Pierre Omidyar (eBay founder) also framed questioning as a mechanism for generating counterintuitive responses:

> 'When addressing a new problem where there's sort of conventional wisdom or consensus around a particular thing, I will often test out the opposite. I'm always the devil's advocate in the room. You know, *Well what if it really didn't work this way? Or what if we really did do the opposite of this? What would happen?* I have been this way since I was a kid. I've always been the devil's advocate, slightly argumentative. My learning process has always been around disagreeing with what I'm being told and *taking the opposite position and pushing and asking questions,* and pushing others to really justify themselves. I remember it was frustrating, very frustrating, for the other kids when you do this.'

Mark Wattles (Hollywood Entertainment) also said he relies heavily on questioning:

> 'In my company, I try to get everybody to ask *why*. It's easier to do it with young people than for somebody who's a seasoned vet in business. You take some of these executives who have been doing the same thing for 20 years and, yes they're valuable, but they don't tend to come up with anything new. You know why? Because they stop using their minds because they've moved into this execution mode which is a necessity to make a company work, but they stop really thinking. Young people though don't yet know what to do and it forces them to think. I tell them *when you come to an organization, just ask why. Now you need to understand the appropriate places to ask why because you can't be wasting a bunch of people's time, but don't accept anything at face value. Just ask yourself why and try to figure it out. It's the what ifs and whys that make all the difference.'*

In the same way, Herb Kelleher (Southwest) suggested the potential power of soliciting challenging questions from subordinates. 'I just watch, I listen. And I want them to ask me questions. I want them to ask me tough questions. I want them to ask me their toughest questions.'

Overall, compared to executives, IEs in this study asked more questions that were targeted at surfacing underlying assumptions (individual, team, organizational, and societal) as well as directly challenging the status quo. As Xango founder Aaron Garrity observed, 'I am questioning, always questioning, with a revolutionary mindset.' For IEs these questions appeared to increase their capacity to see or initiate new ventures.

*Proposition 1: Compared to managers in large organizations, innovative entrepreneurs more frequently ask questions, particularly those that challenge the status quo.*

### Observing

A second behavioral pattern that emerged from our interviews was intense observation in novel situations as well as ordinary encounters. Such observations often engaged multiple senses and were frequently associated with the existence of compelling questions. Mike Collins (founder and CEO of Big Idea Group) explained that 'the most successful inventors have incredible observation skills. It isn't just a one day *aha* day. It happens all of the time. They are observing the world around them and asking questions all the time. It's part of who they are. For other people, it is an untapped skill.' Our interviews seemed to bear out the persistency of this pattern.

To illustrate, Howard Shultz kept his eyes and ears open to hit on the idea for Starbucks by observing the characteristics of espresso bars in Italy. During a trip to Milan, Italy, to attend an international housewares trade show, Schultz decided to walk to the trade show, which was 15 minutes from his hotel. Just as he started off, he noticed a little espresso bar. He ducked inside to look around. After drinking an espresso, he continued on and a block later he saw another espresso bar. This one was even more crowded. Schultz noticed that the gray-haired man behind the counter greeted each customer by name. He and his customers were laughing, talking, and enjoying the moment. He could tell that the customers were regulars and that the espresso bar 'offered comfort, community, and a sense of extended family.' That afternoon, after his trade show meetings, Schultz noted that

> 'I set off again, walking the streets of Milan to observe more espresso bars . . . As I watched, I had a revelation: Starbucks had missed the point—completely missed it. *This is so powerful*, I thought. *This is the link*. What we had to do



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> was unlock the romance and mystery of coffee, firsthand, in coffee bars. It was like an epiphany. It seemed so obvious. Starbucks sold great coffee beans, but we didn't serve coffee by the cup. If we could recreate in America the authentic Italian coffee bar culture, it might resonate with other Americans the way it did with me. Starbucks could be a great experience, and not just a great retail store. I stayed in Milan about a week. I continued my walks through the city, getting lost every day. One morning I took a train ride to Verona. Its coffee bars were much like Milan's, and in one, I mimicked someone and ordered a *caffe latte*, my first taste of that drink . . . Of all the coffee experts I had met, none had ever mentioned this drink. *No one in America knows about this*, I thought. *I've got to take it back with me*.' (Shultz and Yang, 1997: 51).

Most IEs shared how they regularly engaged in observing behavior, which often triggered new ideas.

Similarly, Scott Cook (founder and CEO of Intuit) founded the company based on a simple observation of his own family at home. He revealed:

> 'I came up with the idea for the software by watching my wife work and hearing her complain. She's very good at accounting. She's got a good mind for math and is quite organized. So she does the bills for us. But she was complaining about it. It was a waste of time and bookkeeping was a hassle. So it was that observation and then combining that with two other things—an understanding of what personal computers could do well and not do well—that started Intuit . . . Often the surprises that lead to new business ideas come from watching other people work and live their normal life. You see something and ask *why do they do that? Well that doesn't make sense. I never expected that.*'

Interestingly, Cook had relied on these observational skills much earlier in his career:

> 'One of the concepts that I brought into Intuit came by observing what Apple was doing. I got a buddy of mine who worked at Apple to show me the Apple Lisa before its launch. I was so struck by the insights from seeing the Apple Lisa. It wasn't trying to do financial software at all, but the concepts behind that user interface. I can remember leaving the Apple headquarters in Cupertino and driving to the nearest restaurant so I could just sit down with a pad of paper and write out the various insights that I'd observed from watching the concept of the graphical user interface, the concept of making the items that you work with on screen look and work just like their real world counterparts.'

Further, some IEs explained how they saw the importance of replicating their own observational skills more broadly within their organizations. Cook put it simply: '*Basic observation is the big game changer in our company*. Some paradigm shifts are, I find, better initiated by watching customers or watching things happen in the marketplace, as opposed to talking to other experts. But surprises [from observation] are typically lost because our minds try to conform what we see to fit our preexisting beliefs. It's particularly true in organizations where sociologically the organization tries to conform things to fit the organizations view and we tend to lose those surprises. So one thing that I teach is when people go out and watch people work, then come back and ask just one question—*What's different than you expected?*—that often generates surprising responses,'

Beyond these examples, the interview data consistently revealed that IEs actively observe the world around them, listening, seeing, etc. In fact, Bezos (Amazon) revealed that 'I take pictures of really bad innovations, of which there are a number' as part of his approach to seeing the world in different ways through observation.

> *Proposition 2: Compared to managers in large organizations, innovative entrepreneurs more frequently engage in active observation, primarily of consumers and end users.*

### Experimenting

The innovative entrepreneurs in this study frequently engaged in some form of active experimentation to generate novel information. Such experimentation ranged from mental explorations (e.g., Omidyar, eBay), to physical explorations (e.g., Schultz, Starbucks), to tinkering with things as children and adults (e.g., Jobs, Apple; Lazardis, RIM; Bezos, Amazon). Benioff (founder Salesforce.com) described the experimentation side of this behavior quite simply with his self-proclaimed identity that



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'I am a tinkerer.' Others were the same, either with their hands or minds. They all had in common a hypothesis testing mindset to approaching their explorations and experiments.

Some IEs approached experimentation from an intellectual foundation. Omidyar represents this category of experimentation well by saying '. . . intellectual exploration is something that I frequently do and so I think probably my nature is a little bit more introverted and I have a *tendency to sort of be in my own laboratory*. But if within my own laboratory I can be exposed to really different points of view, different types of thinking either by research, reading, or by asking the point of view of people I run into at conferences or meetings or even on the street, that's something that I do.' He actively explores intellectual terrain in search of new information that he can explore and experiment with intellectually.

In contrast to Omidyar's intellectual exploration and experimentation, a significant proportion of interviewees were likely to engage in more tangible experimentation—even as young children. Bezos (Amazon) admitted that he turned his family garage into his own little laboratory, and his mother claims he tried to take his crib apart when he was three years old. Lazardis (RIM) and others were similar to Bezos in that they grew up experimenting by taking things apart. Lazridis described how in his electronics lab in high school he built his own computer and described how he and his friends spent additional time 'writing our own operating systems, writing our own graphics environments, and building everything from scratch . . . I hung out with others who liked to build things and explore interesting ideas. And I was also, in a quirky way, very involved in physics. I was exploring the theory of relativity with friends of mine when we were in high school together.' Jobs (Apple) does the same today as he attempts to figure out how things work and how to make them work better. For example, he obtained one of the first Sony Walkmans to be produced and immediately took it apart to figure out how it worked and how it could work better. Dell did the same with his first computer.

Pushing tinkering to a different level, many IEs, like Wattles (Hollywood Video), actively engaged themselves and others in experimentation. Wattles said 'I do tons of experimenting . . . I just have no fear of trying things. Just go try them. When you have 1,800 stores, maybe you'll ruin a store. That could be the worst that could happen to you. I wouldn't want that to happen. But you're not going to ruin a company, so we're gonna try stuff.'

Most IEs were conscious of their own tendency to experiment frequently, and they were equally adamant about enlisting others to do the same in their organizations. Cook (Intuit) explained:

> 'The two companies I learned the most from are Procter & Gamble and Toyota, and both have *experimentation cultures*. Toyota enables huge numbers of experiments done throughout the organization at all levels. And I think you see in some young Web businesses, the ability to do lots of experiments and try a bunch of things as the business is trying to get things to click. I think our culture opens us to scientific experimentation, not just random attempts. To harvesting the learning and allowing lots of failures. They know that a bunch of them will fail. But it's okay as long as we're learning, because I think it is an important theme that separates an innovation culture from a normal corporate culture. And particularly when the experiments can be done by young people without getting approvals. Or if there's an approval involved, it's just one layer; it's just their boss.'

Other IEs were not only more likely to experiment, but they were also more likely than typical executives to take a similar experimental approach organizationally. Bezos (Amazon) explained that 'if you're trying to build a better customer-facing experience, you need to know what consumers think about your invention and so the thing that we've tried to do as a company, to keep Amazon innovative, is we're constantly trying to figure out what the lowest cost of experiments is. Because we want to be able to do as many experiments as we can every time. If we can get processes decentralized to do a lot of experiments without it being very costly, then you'll get a lot more innovation. If you can do a 100 experiments a year, you'll get a tenth as much innovation as you would get if you could do 1,000 experiments in a year.'

Bezos continued:

> 'We've got a lot of people here at Amazon with a combination of stubbornness and flexibility. And even though those two things seem at odds with one another, I don't think they are because I think there are stubborn visions that are flexible on the details. And when I see that in somebody, when they just won't give up on their vision, they're



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> relentless on their vision but they're very, very flexible on the details. Flexible of mind. I mean, *they'll try one approach and if it doesn't work, they'll circle back around and try another*.'

Whitman, former CEO of eBay, claimed that experimenting behavior was one of the things that distinguished the innovative entrepreneurs she worked with. She said that 'they really love to tinker and experiment. I'd say that is one of the attributes that is common to all of these folks.'

In contrast, some executives expressed a reluctance to do too much experimenting because experiments were viewed as costly and inefficient, or perhaps they were beyond the scope of the company's business model. One executive said that 'we will do experiments as long as they fit within the current business model. But I don't want to try new things that take us away from our business model.'

> *Proposition 3: Compared to managers in large organizations, innovative entrepreneurs more frequently experiment and explore, particularly doing so with a hypothesis testing mindset.*

### Idea Networking

Interviews with innovative entrepreneurs revealed that building and maintaining diverse social networks was another behavioral skill they engaged in more frequently than typical executives. It's not that executives didn't also network, but executives were more likely to network to further their careers, to *sell* what they or their current company had to offer, or to build friendships with people who possessed desired resources. IEs were less likely to use networks primarily for friendships or career progression; rather, they were actively creating networks of people with diverse ideas and perspectives that they could tap into for new ideas and insights. Scott Cook (Intuit) shared that 'the majority of my ideas come from networking.'

Putting idea networks into regular practice, Eliot Jacobsen (Freeport.com) made the observation that 'one of the things I try to do on a regular basis is meet and talk to new people to get their perspective on different issues. I tend to do this during mealtime. Each week, I try to schedule breakfast, lunch, or dinner with someone I've never met before. I also frequently meet with people I know who are creative and who I've found are helpful in offering a different perspective. Networking is important to my success in coming up with new business ideas, and mealtime is for networking.'

Though Omidyar tends to rely on thought experiments for many of his insights, idea networking also surfaced on his behavioral patterns as key to information acquisition:

> 'Most of my new ideas really come from what I would call a synthesis of outside inputs. So rather than saying *I want to figure out what to do in philanthropy. So who should I go talk to? Let me get a list of philanthropy experts and talk to them*. Instead, what I try to do is just be exposed to some different styles of thinking. I really look for insights from unexpected—usually nonexpert—directions. I value ideas from unusual places; the cliché would be rather than talking to the CEO I would want to talk to someone in the mailroom, something like that. But really looking for people that have diverse backgrounds, diverse ways of thinking about things, and getting input from these different directions just in a very open-ended way, not in a directed way like, *hey I'm trying to figure some new, innovative idea for philanthropy, what should I do?* Just in a very open-ended way. And then I think what my brain does is kind of synthesizes all of that, and at the end of the day I'll have some sort of an insight that will pop up and I can't tell you where it came from necessarily.'

For Omidyar and other IEs, idea networks served a similar purpose in generating a diverse set of inputs for potential problem solving or opportunity recognition.

Most innovative entrepreneurs interviewed in this study had an identifiable network of people with diverse experiences and perspectives to challenge the IEs' viewpoints. These networks typically crossed industry and geographical boundaries, as well as generational ones. For example, Ingvar Kamprad (founder IKEA) regularly met with teenagers, even in his 70s and 80s, to get different perspectives on potential innovation at IKEA. IEs seem to realize that ideas and ways of viewing the world are more similar within social groups (e.g., within the same family, business function, organization, industry, etc.) than they are across groups. So they make a conscious effort to bridge a *structural hole* to talk to people from different social networks—essentially building a bridge from their network into a network of people that differs in background,



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education, experience, etc. (Burt, 1992; Rodan and Galunic, 2004). This seems to help them acquire early access to diverse, often contradictory, information and interpretations, which gives them an advantage in seeing and developing novel ideas.

*Proposition 4: Compared to managers in large organizations, innovative entrepreneurs spend more time talking with a network of individuals who are diverse in both background and perspective.*

### Associational thinking/pattern recognition

We also found that diverse new information and ideas—which come through questioning, experimenting, observing, and networking behaviors—were often the catalyst for associational thinking/pattern recognition.[2] The more new diverse knowledge acquired through these four *discovery* behaviors, the more naturally and consistently associational thinking occurs as the brain attempts to understand, recategorize, and store new knowledge.

As previously described in the theory section, associational thinking is a cognitive skill that helps one make connections across seemingly unrelated questions, problems, disciplines, fields, or ideas. Mike Lazaridis (RIM) was successful at connecting computer technology with wireless handheld devices to create the Blackberry. He recognized the importance of *cross disciplinary* thinking and described his first experience with it.

> 'When I was in high school, we had an advanced honors program and we had a shop program. And there was this great divide between the two departments, and I was in both. And I became, inadvertently, the ambassador between the two disciplines, and saw how the mathematics we were learning in shop was actually more advanced than some of the mathematics we were learning in advanced math because we're using trigonometry, we're using imaginary numbers, we're using algebra, and even calculus in very real, tangible ways. So I was then tasked with bridging the gap and showing how math is used in electronics and how electronics is used in math.'

Lazaridis noted that [a teacher] alerted him to the link between computers and wireless by telling him '. . . don't get too distracted with computer technology because the person that puts wireless and computers together is really coming up with something special.'

Similarly, Pierre Omidyar (eBay) noted that *connecting ideas* was an important skill, and he gave a recent example of associational thinking:

> 'I recently spoke with some consultants about the food distribution problem of how to quickly get produce from the farm to consumers before it spoils. The first question I asked, which may turn out to be an incredibly stupid question but I was happy to ask it was, 'What about the Post Office? Doesn't the Post Office go to everybody's house six times a week? Why don't we just mail the head of lettuce?' You know, it's probably an incredibly stupid idea and there are probably a dozen reasons why it won't work, but it's an example of how *I put two things together that haven't been put together before*. The Post Office is an organization that visits every household six times a week! Do you know any other organization that does that? So using those assets in novel ways might be interesting.'

Steve Jobs (founder and CEO Apple) appears to be strong at associational thinking and recognizes its importance to creativity. For example, he connected calligraphy to computers, based on his college experience:

> 'Reed College at that time offered perhaps the best calligraphy instruction in the country. Throughout the campus every poster, every label on every drawer, was beautifully hand calligraphed. Because I had dropped out and didn't have to take the normal classes, I decided to take a calligraphy class to learn how to do this. I learned about serif and san serif typefaces, about varying the amount of space between different letter combinations, about what makes great typography great. It was beautiful, historical,

[2] We prefer the term *associational thinking* (Howard-Jones and Murray, 2003; Mednick, 1962; Mednick, Mednick, and Jung, 1964; Mendelsohn and Griswold; 1964; Milgram and Rabkin, 1980) to *pattern recognition* because the latter term seems to suggest that there is an identifiable *pattern* IEs recognize. As they described how they discovered or recognized ideas for innovative new ventures, it seemed to us that while they connected disparate ideas together, they often did not necessarily recognize a pattern, or even recognize that it would be a viable business opportunity. They often discovered that things fit together through trial and error and adaptation.



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> artistically subtle in a way that science can't capture, and I found it fascinating. None of this had even a hope of any practical application in my life. But 10 years later, when we were designing the first Macintosh computer, it all came back to me. And we designed it all into the Mac. It was the first computer with beautiful typography. If I had never dropped in on that single course in college, the Mac would have never had multiple typefaces or proportionally spaced fonts. And since Windows just copied the Mac, it's likely that no personal computer would have them.' (Stanford University, 2005)

Jobs did the same by looking at Cuisinart food processors to get insights into the plastic case properties that might work for the first Mac, and he later examined Mercedes Benz cars in the corporate parking lot to gain perspective on a different product design challenge that was ultimately resolved by associating car parts with computer parts.

One of the innovative entrepreneurs tried to explain the process based on his experience. Zennstrom (founder of Skype) said: 'You have to think laterally. You know, seeing and combining certain things going on at the same time and understanding how seemingly unrelated things could have something to do with each other. You need the ability to grasp different things going on at the same time and then to bring them together. For example, I can look at the bigger picture and also have a very good feel for the details. So I can go between high-level things to really, really small details. The movement often makes for new associations.'

*Proposition 5: Compared to managers in large organizations, innovative entrepreneurs more frequently engage in associational thinking (pattern recognition) which is triggered by their behavioral patterns of frequently questioning, observing, experimenting, and idea networking.*

### Desire to change the status quo: less susceptible to the status quo bias

Finally, the innovative entrepreneurs in our study more frequently expressed a desire to *change the world* or *do something that has never been done before* As previously mentioned, Meg Whitman, former CEO of eBay, claimed that the IEs she has worked with 'get a kick out of screwing up the status quo. . . . So they spend a tremendous amount of time thinking about how to change the world.' This observation was supported by Skype cofounder Niklas Zennstrom, who remarked that 'I thrive on changing the status quo; that's what motivates me. I definitely want to change the world. And I think this is very important where sometimes people think of *disruptive* and *destructive* being the same thing. But to me, this is about making the world a better place.' In similar fashion, Jeff Bezos (Amazon.com) said that one of his goals in starting Amazon.com was to 'make history,' while Steve Jobs (Apple) claimed that 'I want to put a ding in the universe.'

An emergent theme from the interviews was that these entrepreneurs were not satisfied to simply start financially successful new businesses. Offering something new to the market was an important part of the allure of starting a new business. As Jeff Jones, founder of Campus Pipeline and NxLight observed, 'I've had numerous opportunities to start new businesses, but haven't followed up on some of them because they didn't offer something new to the market. I want to do something new, not offer something that is already out there.' The desire to *change the world* was far less frequently mentioned by executives as a motivator for their actions and behaviors. They more frequently expressed the sentiment that they were highly motivated to see their business succeed financially.

Given the frequency with which innovative entrepreneurs indicated a desire to *change the world* relative to executives, we believe that they are less susceptible to a cognitive bias referred to as the *status quo bias*. The status quo bias has been defined as the tendency of individuals to prefer an existing state of affairs—to prefer what they have chosen before (the current state) or even what someone else has chosen for them. A variety of prior experimental and field studies offer evidence that most individuals are subject to the status quo bias (Porter and McIntyre, 1984; Samuelson and Zeckhauser, 1988; Roca et al., 2005; Burmeister and Schade, 2006). The innovative entrepreneurs in our study seemed to engage in the information-seeking behaviors described above with a *cognitive bias against the status quo*. They seemed to be actively engaged in information search with the purpose of changing the current state of affairs. As Xango founder Aaron Garrity put it, 'If you were to characterize me as an individual, I would say I am a revolutionary. My law is different . . . you tell me the way it is and I'm going to say *to heck with you all, I'm going to do it this way*.' While prior research has shown that



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entrepreneurs are prone to cognitive biases—notably the overconfidence and representativeness biases (Busenitz and Barney, 1997; Parlich and Bagby, 1995)—little work has been done to examine the status quo bias among (innovative) entrepreneurs. One unpublished study found that a sample of German entrepreneurs was less prone to the status quo than a sample of German bankers, but no different than a sample of college students (Burmeister and Schade, 2006). Another study somewhat related to challenging the status quo bias found that innovative Canadian law firm founders were more likely to challenge the ethicality of prevailing legal practices than imitative firm founders (Cliff *et al.*, 2006). We believe that additional research in this area would demonstrate that innovative entrepreneurs are less susceptible to the status quo bias.

*Proposition 6: Compared to managers in large organizations, innovative entrepreneurs are less susceptible to the status quo bias and more likely to be motivated to change the world.*

## QUANTITATIVE STUDY: COMPARING BEHAVIORS OF INNOVATIVE ENTREPRENEURS AND EXECUTIVES

Our inductive study allowed us to develop some theoretical propositions regarding the relationship between IE behaviors and opportunity recognition. We then developed measures of those behaviors to shed additional light through a large sample quantitative study about whether IEs are more prone to the behaviors identified in the inductive study.

### Sample

During a two-year period from 2007–08, we invited 512 managers and executives to take our survey. These respondents were participating in executive programs and executive MBA programs at three business schools—one in the eastern United States, one in the western United States, and one in Europe. After eliminating surveys with incomplete data, we had 382 respondents. Among the 382 respondents, 72 individuals had started a total of 137 innovative business ventures based upon positive responses to 'How many new businesses (e.g., not franchises or a business where identical or close product substitutes were already on the market) have you started or cofounded as an entrepreneur based on *your own, original (novel, unique) idea*?' Seventy-two percent of these innovative business ventures were identified as financially successful (n = 99), meaning they achieved sales of greater than $1 million and a return on invested capital of greater than 10 percent. *Thus, 28 percent of the innovative business ventures started were not successful based on our study criteria. This suggests that we were not sampling on successful innovative business ventures only.*

### Measures

During our inductive study, we developed survey measures we wanted to test in a large sample study of innovative entrepreneurs and managers in large organizations. Based on the four behavioral patterns that emerged from the interviews, we developed a set of survey items to operationalize the constructs (e.g., behavioral patterns) that seemed to distinguish the innovative entrepreneurs from executives (see Appendix). The survey items attempted to measure specific behavioral patterns: questioning (six items), observing (four items), experimenting (five items), and idea networking (four items). Response options ranged from 1 or *strongly disagree* to 7 or *strongly agree*. We also used four social desirability survey items to identify and exclude (if necessary) respondents who were prone to provide extreme levels of socially desirable responses on the survey. Analysis indicated that such socially desirable responses did not appear problematic or systematic in this sample.

### Methods

Initially, we conducted an exploratory factor analysis (EFA) to uncover the underlying factor structure of the 19 items attempting to measure innovative behaviors. As shown in Table 2, the rotated factor matrix produced a four-factor solution. There was only one potentially problematic cross-loading across factors in this exploratory analysis (indicated by a cross-loading greater than 0.40). The item 'I often ask questions that challenge the status quo' exhibited a loading of 0.52 on the main factor, as well as 0.42 on the experimenting factor. As this cross-loading did not appear seriously problematic, the item was retained in the questioning scale. Table 2 also indicates that the alpha reliabilities for these



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scales ranged from 0.74–0.78 (each being above the 0.70 criterion suggested by Hair *et al*., 1988).

We also ran a confirmatory factor analysis (CFA) to test the factor structure of the 19 items representing the innovative entrepreneur behaviors uncovered in the qualitative study. The CFA for each of the individual innovative behaviors showed a Goodness of Fit Index (GFI) above 0.90 for each innovative behavior factor. Observing had the best fit (GFI = 0.99), followed by questioning (GFI = 0.95), experimenting (GFI = 0.94), and idea networking (GFI = 0.90). However, the CFA of our four-factor model did not show particularly good fit, with GFI = 0.63, a chi-square of 1864, RMSEA = 0.14, and Standardized Root Mean Square Residual (SRMR) = 0.16. It seems plausible that common variance among many of the items that comprised each of the innovative behavior factors compromised the fit of the four-factor model (see Table 3, which shows significant correlations between several of the innovative behavior factors). As a result, we dropped the items related to experimenting and idea networking and ran the CFA with the remaining 10 items, representing questioning and observing. The CFA for the two-factor model had a GFI = 0.94, a chi-square of 1292.8, RMSEA = 0.08, and Standardized Root Mean Residual (SRMR) = 0.06, suggesting that the 10 items were strong measures of questioning and observing. However, to maintain consistency with the innovative entrepreneur behaviors identified in the qualitative study and the results of the exploratory factor analysis (see Table 2), we adopted the four-factor model in the subsequent analysis of the potential relationships between these behaviors and starting an innovative new business.

Table 2. Results of exploratory factor analysis of innovative entrepreneur behavior items

| Items | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| **1. Experimenting** | | | | |
| E1 | 0.71 | | | |
| E2 | 0.67 | | | |
| E3 | 0.64 | | | |
| E4 | 0.59 | | | |
| E5 | 0.45 | | | |
| **2. Questioning** | | | | |
| Q1 | | 0.77 | | |
| Q2 | | 0.70 | | |
| Q3 | | 0.70 | | |
| Q4 | | 0.63 | | |
| Q5 | | 0.60 | | |
| Q6 | 0.42 | 0.52 | | |
| **3. Observing** | | | | |
| O1 | | | –0.72 | |
| O2 | | | –0.72 | |
| O3 | | | –0.70 | |
| O4 | | | –0.44 | |
| **4. Idea networking** | | | | |
| IN1 | | | | 0.77 |
| IN2 | | | | 0.76 |
| IN3 | | | | 0.70 |
| IN4 | | | | 0.69 |
| Alpha | 0.78 | 0.74 | 0.78 | 0.78 |
| Eigenvalue | 6.05 | 2.13 | 1.21 | 1.16 |
| Percentage of variance | 31.88 | 11.21 | 6.38 | 6.09 |

The cutoff point was 0.40. Item numbers reflect the items provided in the Appendix.

## Results

Table 3 provides means, standard deviations, and correlations for all independent and dependent variables. As seen from the correlation matrix, the four behavioral patterns we measured were significantly correlated with starting an innovative new business. The behavioral patterns were also significantly correlated with each other—with correlations typically greater than 0.50—suggesting that an individual

Table 3. Means, standard deviations, and correlations

| Variable | Mean | S.D. | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| 1. Questioning | 5.48 | 0.83 | 1.0 | | | |
| 2. Observing | 4.93 | 1.05 | 0.43** | 1.0 | | |
| 3. Experimenting | 4.93 | 0.94 | 0.39** | 0.53** | 1.0 | |
| 4. Idea networking | 4.29 | 1.26 | 0.30** | 0.54** | 0.51** | 1.0 |
| 5. Innovative new business | 1.29 | 0.86 | 0.12** | 0.22* | 0.15** | 0.24** |

*indicates $p < 0.10$, **indicates $p < 0.05$, and ***indicates $p < 0.01$.



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who engages in one of the behaviors is more likely to engage in some level of the other behaviors.

To test the relationships between innovative behaviors and starting innovative ventures, we concluded that negative binomial regressions were most appropriate for our data. The dependent variable in this quantitative study measured the number of innovative new businesses started. As this data was an integer count without normal distributions and with restricted ranges (Cohen *et al.*, 2003), ordinary least squares (OLS) regression would yield inefficient and biased estimates. Consequently, negative binomial regressions were used to test the predicted relationships more accurately (Ramaswamy, Anderson, and DeSarbo, 1994).

The negative binomial regression analysis results shown in column 1 of Table 4 indicate that, controlling for age and education, observing and experimenting have significant positive relationships with innovative new venture creation. Questioning and idea networking did not have significant relationships with venture creation when included in the model with observing and experimenting. In fact, while idea networking had a significant positive relationship with new venture creation as shown in the correlation matrix, the relationship was negative in the negative binomial regression, suggesting that the model is prone to some degree of multicollinearity among the independent variables. The fact that there were strong correlations among the innovative behaviors, however, led us to examine the interaction of questioning with each of the other independent variables. We chose to interact questioning with the other innovative behaviors for a theoretical reason. When reconsidering the results of the inductive study, we realized that questioning was virtually always described as being done at the same time the IE was engaged in observing, experimenting, or idea networking behaviors. The results shown in columns 2–4 in Table 4 indicate that questioning is a significant predictor of innovative new venture formation when interacted with observing, experimenting, and idea networking behaviors. Thus, questioning on its own does not appear to have a direct effect on opportunity recognition and innovative new venture creation, but when combined with one of the other three innovative behaviors, it is a solid predictor of new venture creation. Each of the overall models shown in columns 1–4 are solid, as suggested by a Pearson's chi-square, which ranges from 348–381, and a log likelihood of -738–741 (the model in column 4 appears to be the best fit model).

**Summary**

The results from our quantitative study provide preliminary support for the assertion that innovative entrepreneurs are more likely than managers to engage in questioning, observing, experimenting, and idea networking behaviors. The regression results indicate that observing and experimenting were the most robust predictors of new venture creation, whereas questioning and networking were significant predictors of new venture creation when interacted with each other or the other discovery behaviors. Questioning is only a consistent predictor of new venture creation when interacted with each of the other behaviors separately. These results suggest that an individual who simply asks questions without actively observing, experimenting, or networking is unlikely to discover or act upon ideas for new venture creation.

## TOWARD A THEORY OF ENTREPRENEURIAL BEHAVIORS AND OPPORTUNITY RECOGNITION

The theory that emerged from our inductive and quantitative studies regarding behavioral differences of innovative entrepreneurs (IEs) compared to managers in large organizations is summarized in Figure 1. Study results suggest that IEs are more likely to recognize opportunities for new businesses because they are more likely to engage in observing and experimenting behaviors, and questioning when combined with any one of the other three innovative behaviors (observing, experimenting, and idea networking). These are all information-seeking behaviors that appear to give IEs superior access to information—a factor that is believed to be central to opportunity recognition.

These behaviors appeared to be the catalysts to cognitive processes of associational thinking that allowed the innovative entrepreneur to generate an innovative business idea. Prior research suggests that innovative breakthroughs often happen at the *intersection* of disciplines and fields (Johansson, 2006; Hargadon and Sutton, 1997; Rodan and Galunic, 2004). Put simply, innovative thinkers have managed to connect fields, problems, or ideas that we thought were unrelated. We propose that the behavioral patterns noted above are what trigger the *intersections* that are the catalysts for innovative ideas. The more diverse knowledge acquired through



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Table 4. Regression results

| Method | Column 1 Negative binomial | Column 2 Negative binomial | Column 3 Negative binomial | Column 4 Negative binomial |
|---|---|---|---|---|
| Dependent variable | Innovative ventures founded | Innovative ventures founded | Innovative ventures founded | Innovative ventures founded |
| **Behavioral factors** | | | | |
| Questioning | 0.008 (0.01) | –0.013 (0.03) | –0.102 (1.28) | –0.113 (1.50) |
| Observing | 0.149 (4.86)** | 0.076 (1.00) | 0.157 (5.39)** | 0.149 (4.88)** |
| Experimenting | 0.436 (5.67)*** | 0.436 (5.72)*** | 0.255 (1.62) | 0.394 (4.62)** |
| Networking | –0.223 (1.67) | –0.230 (1.80) | –0.193 (1.27) | –0.320 (2.32) |
| Question * observing | | 0.152 (4.26)** | | |
| Question * experiment | | | 0.278 (4.81)** | |
| Question * networking | | | | 0.296 (4.84)** |
| **Control variables** | | | | |
| Age | 0.003 (0.39) | 0.003 (0.54) | 0.003 (0.51) | 0.003 (0.38) |
| Education | 0.056 (5.10)** | –0.054 (4.68)** | –0.051 (4.23)** | –0.052 (4.32)** |
| Intercept | 0.950 (19.93)*** | 0.928 (19.08)*** | 0.955 (20.32)*** | 0.970 (20.91)*** |
| Number of observations | 382 | 382 | 382 | 382 |
| DF | 375 | 374 | 374 | 374 |
| Pearson chi-square | 381.5 | 379.1 | 378.7 | 348.5 |
| Log likelihood | –741.1 | –739.1 | –738.9 | –738.7 |

Notes:
All significant tests are two-tailed. *indicates $p < 0.10$, **indicates $p < 0.05$, and ***indicates $p < 0.01$.
For the regression coefficients, the t-statistic (Wald chi-square) is provided in parenthesis.




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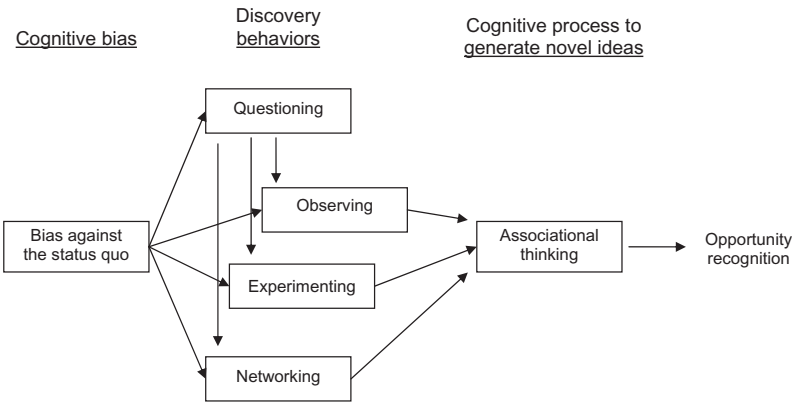


Figure 1. A model of entrepreneurial opportunity recognition

the information-gathering behaviors we've described, the more naturally and consistently associational thinking occurs as the brain attempts to understand, categorize, and store new knowledge.

To illustrate, the innovative entrepreneurs we studied rarely invented something entirely new—they simply combined existing ideas and technologies in new ways, which allowed them to offer something new to the market. Individuals who more frequently observe, experiment, and network while questioning the status quo build larger and richer stocks of *building block* ideas in their heads, thereby triggering associational thinking and increasing the probability of combining the newly acquired knowledge to generate an innovative idea. This process is akin to someone building more unique structures from Lego blocks as a result of having access to a larger stock of diverse Lego blocks. The more you add different kinds of Legos to your total stock of Legos, the more varied and innovative structures you can build. Innovative structures spring from the innovative combination of a wide variety of existing Legos. And acquiring new and different Legos triggers ideas for new structures as they are considered with one's existing stock of Legos. In a similar fashion, the more you add knowledge or ideas from varied knowledge domains (through observing, experimenting, networking) to your total stock of ideas, the greater the variety of ideas you can produce. Conceptually, as the number of building block ideas in one's head grows linearly (e.g., by N), the number of potential ways to combine those ideas to create something new grows even faster, or geometrically (by N(N-1)/2) (see Figure 2). Thus, the behaviors of questioning, observing, experimenting, and idea networking are tied to associational thinking/pattern recognition because they bring in new building block ideas that are often the catalyst for creating new associations among ideas, fields, and technologies.

We acknowledge that cognitive processes are at work within IEs and that some had superior natural cognitive ability to make connections across fields and technologies. There are undoubtedly differences in the cognitive ability of individuals to engage in associational thinking. We have no way to measure these differences. However, *even if we assume that two individuals have the same natural cognitive ability to engage in associational thinking, we would predict differences in novel idea generation if one individual engages in more of the information-gathering behaviors we have described, thereby triggering more novel associations*. As Steve Jobs observed regarding the link between broad experience and creativity:

> 'Creativity is connecting things. When you ask creative people how they did something, they feel a little guilty because they didn't really do it, they just saw something. It seemed obvious to them after a while. That's because they were able to connect experiences they've had and synthesize new things. And the reason they were able to do that was that they've had more experiences or they have thought more about their experiences than other people' (Wolf, 1996: 6).

Finally, the IEs seem to engage in the information-gathering behaviors because they are actively looking for opportunities to change the status quo. This desire to change the status quo was an



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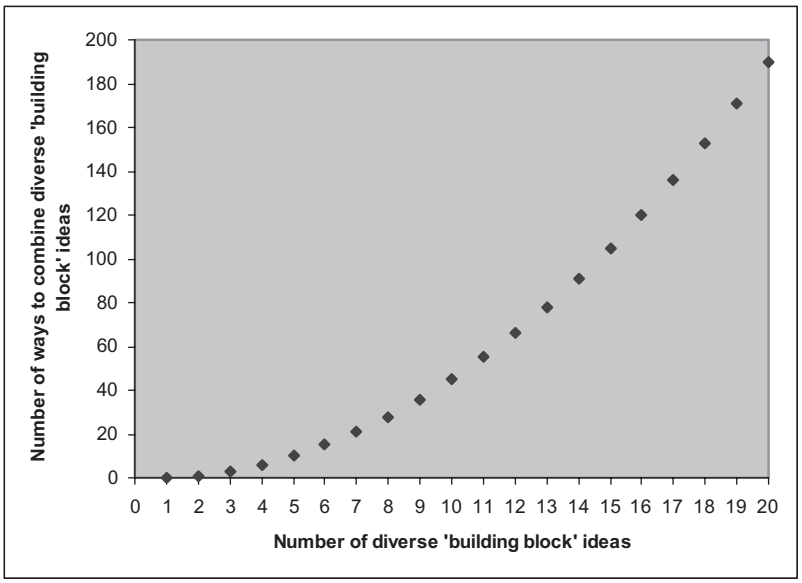


Figure 2. Why increasing 'idea stock' increases innovation
Note: As the number of diverse ideas (knowledge elements) in a person's head increases arithmetically, the number of ways the ideas can be combined to create a novel combination increases geometrically ($n^2$ growth). Innovation is typically the result of synthesizing or combining ideas from different knowledge domains.

important motivator for IEs and coincides with the *active search for opportunities* that has been identified in the entrepreneurship literature.

## CONCLUSION

The purpose of this study was to investigate differences between *innovative* entrepreneurs and executives who had never started an innovative venture. We conducted a grounded theory study of innovative entrepreneurs to examine behavioral and cognitive patterns that appeared to contribute to their ability to recognize opportunities and generate innovative business ideas. We posit that innovative entrepreneurs differ from executives on four behavioral patterns: (1) questioning, particularly asking questions that challenge the status quo; (2) observing, or the extent to which they spend time intensely observing the world around them in a search for new ideas; (3) experimenting, or the frequency with which they experiment and explore the world with a hypothesis-testing mindset; and (4) idea networking, or the extent to which they find and test ideas with a network of individuals who are diverse in both background and perspective. We developed operational measures of each of these behaviors and found that observing and experimenting behaviors were robust predictors of innovative new venture creation in a large sample of innovative entrepreneurs and executives. We found that questioning and idea networking were significant when interacted with each other or the other discovery behaviors. These findings suggest that one's ability to generate novel ideas for innovative businesses is a function of one's behaviors, which trigger cognitive processes that spawn ideas for novel business ventures.

Our study suggests that innovative entrepreneurship is indeed an *active* endeavor. Innovative entrepreneurs are behaviorally active—asking questions, observing, experimenting, and networking with diverse people. In his seminal work on risk and uncertainty, Knight saw entrepreneurs as a class of individuals who had the *disposition to act* in spite of the uncertain context in which they operated (Knight, 1921: 269). Our research lends support to this assertion and provides insights into what types of actions are likely to be catalysts for innovative business ideas. Of course, once the idea is generated, the entrepreneur must then quickly implement the idea if it is to be perceived as *new* in the marketplace.[3]

A limitation of this study was that we did not have a sample of *noninnovative* entrepreneurs (e.g., those

[3] Execution of novel business ideas is beyond the scope of this article, but it is important to recognize that effective execution is also critical to the success of an innovative venture.



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who had started franchises) in our sample to compare with the innovative entrepreneurs. Also, we relied exclusively on individuals to report on the extent to which they behaved in particular ways. Future research might explicitly compare a sample of non-innovative entrepreneurs with innovative entrepreneurs on the behaviors we identified. We also recommend that future research of this type gather input on the behaviors of entrepreneurs from others who are well acquainted with the entrepreneurs' behaviors. Finally, we were not able to measure the degree or extent to which individuals engage in associational thinking, which limits our ability to test whether or not the behaviors we identify are correlated with associational thinking. Future research that could measure associational thinking and interact this measure with the discovery behaviors we identify could test the proposition that the discovery behaviors trigger assocational thinking, as well as the proposition that the interaction of discovery behaviors and associational thinking increase the probability of innovative new venture creation.

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## Appendix: individual survey items for innovative behavior scales

Questioning (alpha = 0.74)

1. I am always asking questions.
2. I am constantly asking questions to get at the root of the problem.
3. Others are frustrated by the frequency of my questions.
4. I often ask questions that challenge the status quo.
5. I regularly ask questions that challenge others' fundamental assumptions.
6. I am constantly asking questions to understand why products and projects underperform.

Observing (alpha = 0.78)

1. New business ideas often come to me when directly observing how people interact with products and services.
2. I have a continuous flow of new business ideas that comes through observing the world.
3. I regularly observe customers' use of our company's products and services to get new ideas.
4. By paying attention to everyday experiences, I often get new business ideas.

Experimenting/exploring (alpha = 0.78)

1. I love to experiment to understand how things work and to create new ways of doing things.
2. I frequently experiment to create new ways of doing things.
3. I am adventurous, always looking for new experiences.
4. I actively search for new ideas through experimenting.
5. I have a history of taking things apart.

Idea networking (alpha = 0.78)

1. I have a network of individuals whom I trust to bring a new perspective and refine new ideas.
2. I attend many diverse professional and/or academic conferences outside of my industry/profession.
3. I initiate meetings with people outside of my industry to spark ideas for a new product, service, or customer base.
4. I have a large network of contacts with whom I frequently interact to get ideas for new products, services, and customers.

NOTE: The above items are the property of Innovator's DNA Inc. and are not available for private use without written permission from Innovator's DNA Inc.



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