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INTEGRATING DISCOVERY AND CREATION PERSPECTIVES OF ENTREPRENEURIAL ACTION: THE RELATIVE ROLES OF FOUNDING CEO HUMAN CAPITAL, SOCIAL CAPITAL, AND PSYCHOLOGICAL CAPITAL IN CONTEXTS OF RISK VERSUS UNCERTAINTY

KEITH M. HMIELESKI[1]*, JON C. CARR[1], and ROBERT A. BARON[2]
[1]*M.J. Neeley School of Business, Texas Christian University, Fort Worth, Texas, U.S.A.*
[2]*Spears School of Business, Oklahoma State University, Stillwater, Oklahoma, U.SA.*

Research summary: *This study examines the relationships of founding CEOs' intangible resources (human, social, and psychological capital) with the performance of their firms in environmental contexts of discovery (stable industry conditions that are characterized by risk) versus creation (dynamic industry conditions that are characterized by uncertainty). Results from a national (USA) random sample of founding CEOs (n = 223) found entrepreneurial experience (an aspect of human capital) to be positively related to performance in discovery contexts, whereas educational attainment, strong ties, and psychological capital (a composite index of optimism, self-efficacy, resilience, and hope) were positively related to performance in creation contexts. These findings extend theorizing concerning discovery and creation perspectives from the pre-entry phase (opportunity recognition) to the post-entry phase (opportunity exploitation) of the entrepreneurial process.*

Managerial summary: *This research investigates the relationships of founding CEOs' intangible resources with the performance of their firms in industry environments that are stable (slow changing and predictable) versus dynamic (fast changing and unpredictable). The results indicate that entrepreneurial experience (number of prior new ventures founded) is positively related to performance in stable environments, whereas educational attainment (highest educational degree earned), strong ties (social connections to family members and friends who provide support relating to the firm), and psychological capital (inner cognitive, emotional, and behavioral resources used to cope with adversity) are positively related to performance in dynamic environments. The findings highlight the importance of fit between the intangible resources of founding CEOs and the characteristics of the industries in which they attempt to develop and grow their firms. Copyright © 2015 Strategic Management Society.*

INTRODUCTION

Is a discovery or creation theoretical perspective a more appropriate lens for viewing entrepreneurial action? This question has long been debated in the field of entrepreneurship (Kirzner, 1973; Schumpeter, 1934). A new approach to this debate

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*Correspondence to: Keith M. Hmieleski, M. J. Neeley School of Business, Texas Christian University, TCU Box 298530, Fort Worth, TX 76129, U.S.A. E-mail: k.hmieleski@tcu.edu

has, however, recently begun to emerge—one suggesting that these theoretical perspectives may be integrated by considering that each is based on different, yet complementary, contextual assumptions about entrepreneurial action (Alvarez and Barney, 2007). In other words, theories of discovery and creation have important contextual implications for how businesses are best developed and grown, independent of how business ideas are initially conceived (Hmieleski and Baron, 2008). This view is consistent with the growing recognition that all businesses, regardless of industry, need to continually evolve and develop in order to remain viable (Aldrich, 1999). Therefore, our use of the terms 'discovery' and 'creation' is focused on the environmental context subsequent to business launch (Alvarez and Barney, 2005) and, thus, linked to the development and growth phase of the entrepreneurial process.

A discovery context is distinguished by *risk*, such that information is available for entrepreneurs to evaluate new opportunities to further develop and grow their businesses (Alvarez and Barney, 2005). Within such a context, entrepreneurs are able to formulate and execute specific plans to capitalize on such opportunities. A creation context is the theoretical complement to a discovery context and is characterized by *uncertainty*, such that information is not readily available for entrepreneurs to make calculated decisions about the likelihood that exploiting new business opportunities will produce desired outcomes (Baker, Miner, and Eesley, 2003). In this context, entrepreneurs are not able to develop and grow their firms on the basis of clearly defined opportunities since the relevant information necessary for doing so is not available and/or does not exist. Instead, entrepreneurs leading new businesses in such an environment must adopt a broad and flexible view of the firm that they wish to develop and grow, essentially testing the waters to see what might be possible as they move forward through the entrepreneurial exploitation process (Sarasvathy, 2001).

Each of these contexts carries with it different sets of resource requirements necessary for effectively developing and growing new businesses (Alvarez and Barney, 2007). Thus, as noted, the current research applies extant theory related to discovery versus creation contexts to the opportunity exploitation phase of the entrepreneurial process. Specifically, our study seeks to address the following question: which intangible resources of founding CEOs are most critical to the development and growth of firms operating in industry environments characterized by risk (a discovery context) versus uncertainty (a creation context)? As an organizing framework, we adopt a contingency approach that applies well-established theory regarding the importance of fit between a firm's resources and its competitive environment (Sirmon, Hitt, and Ireland, 2007) to argue that different intangible resources are required for effectively developing and growing firms in contexts of discovery versus creation (Alvarez and Busenitz, 2001). Overall, we suggest that contrasting combinations of founding CEOs' human, social, and psychological capital may be pertinent to the performance of firms in each of these contexts. We focus on the intangible resources of founding CEOs since many businesses must initially make do with little more than the intangible resources of their founders (e.g., their skills and abilities, social connections, and personal resilience), which are subsequently used to attract and/or develop tangible resources such as venture financing, employees, and physical infrastructure as their businesses mature and grow (Baker and Nelson, 2005; Khaire, 2010).

The present study seeks to contribute primarily to the literature on discovery and creation theoretical perspectives which, to date, has mainly focused on the prelaunch phase of the entrepreneurial process (Edelman and Yli-Renko, 2010). Following Alvarez and Barney (2007), our research extends theorizing about the role of discovery and creation environmental contexts to the post-entry phase of the entrepreneurial process and adds empirical content intended to further integrate these important views. In so doing, we build on current efforts to bridge and integrate discovery and creation approaches—an effort that is fundamental to the field of entrepreneurship (Venkataraman *et al*., 2012).

The current research is also expected to contribute to the upper echelons literature on firm development and growth (Klotz *et al*., 2014). Studies within this literature have typically begun from the assumption of 'the more, the better' with respect to various types of intangible resources, without differentiating when certain forms of human capital, social capital, or psychological capital might be more or less strongly associated with firm performance (Davidsson and Honig, 2003). We take a more comprehensive and nuanced approach by examining the degree to which the human capital, social capital, and psychological capital of founding CEOs contribute to the performance of their firms within different environmental conditions. To our knowledge, no previous research

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has jointly examined these three types of intangible resources or considered differences in their relative influence on firm performance across different environmental conditions. Thus, the present research is expected to provide new insights into the relative contribution of each form of intangible resource on the part of founding CEOs to the performance of their firms.

Before moving forward, we provide a few important clarifications. First, Alvarez and Barney (2007, 2010) describe critical assumptions regarding the nature of opportunities, entrepreneurs, and the decision-making context while explicating differences between theories of discovery and creation. In the current research, we focus primarily on assumptions regarding the decision-making context (i.e., it is characterized by risk in a discovery context and uncertainty in a creation context), since these assumptions are most relevant to our contingency framework and offer important implications for leading firms through the development and growth phase of the entrepreneurial process. Second, we depart from Alvarez and Barney (2007, 2010) in terms of considering the decision-making context to be a dichotomy of either risk or uncertainty. We instead consider the decision-making context to range along a continuum from risk to uncertainty. In so doing, we follow in line with the operationalization of others (e.g., Hmieleski and Baron, 2008; Edelman and Yli-Renko, 2010) who have attempted to empirically examine differences between contexts of discovery versus creation. Third, while Knight (1921) considers the primary role of entrepreneurs to be one of reducing the subjective level of uncertainty in their decision-making context from a state of uncertainty to one of risk (Miller, 2007), we assume that there is an objective degree of predictability that exists in industry environments (ranging from risk to uncertainty) and that the degree of objective predictability carries important implications for whether a discovery or creation lens is most appropriate for guiding entrepreneurial action. Finally, our goal in the present research is not to inform recent dialogues regarding the ontological underpinnings of discovery and creation theories (e.g., see Alvarez *et al*., 2014; Ramoglou, 2013). Rather, our efforts are aimed at shifting the conversation away from philosophical debate and toward a practical integration and empirical examination of discovery and creation perspectives of entrepreneurial action.

THEORETICAL DEVELOPMENT AND HYPOTHESES

Contingency theory as an organizing framework

In general, a contingency theoretical approach suggests that the nature of the relationship between two variables is dependent on a third variable. The use of contingency theory in organizational research has evolved from the generalized determination that there is no single best way of leading and/or organizing a firm and that best practices in so doing (e.g., leadership, strategy, structure, resource configurations) depend on characteristics of the environment (Burns and Stalker, 1961; Donaldson, 2001; Morgan, 2006). Consistent with this logic, the recent movement to integrate discovery and creation perspectives is based on a contingency theory approach. Specifically, Alvarez and Barney (2007: 22) suggest that 'when entrepreneurs operate in a discovery context, a variety of specific entrepreneurial actions are likely to be most effective; when operating in a creation context, a different set of entrepreneurial actions are likely to be most effective.' As an extension of this logic, we draw from the resource-based view of the firm (Alvarez and Busenitz, 2001) to suggest that different combinations of founding CEOs' intangible resources are likely to contribute to firm performance in contexts of discovery (characterized by risk) as compared to contexts of creation (characterized by uncertainty).

Following the theoretical lead of Alvarez and Barney (2007, 2010) and also the empirical operationalization of Hmieleski and Baron (2008) and Edelman and Yli-Renko (2010), we treat *environmental dynamism*—the unpredicted rate of change in the industry environment (Dess and Beard, 1984)—as the primary moderating variable in our contingency model of intangible resources and firm performance. This approach is consistent with arguments made by Sirmon *et al*. (2007), who position dynamism as a key contingency factor in determining the relationship between a firm's resources (including those that are intangible) and its performance. Thus, dynamism represents a continuum such that stable industries represent 'risk' and carry with them the resource demands of a discovery context, while dynamic industries involve 'uncertainty' and, therefore, involve the resource demands of a creation context. This does not imply that industry change is necessarily absent from environments characterized by risk, but rather that change—when

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it occurs—takes place in a stable fashion that can be predicted in advance and is, therefore, less of a shock to entrepreneurs as they lead their firms through the development and growth phase of the entrepreneurial process.

Finally, we follow a rich tradition of research that considers firm performance to be a reflection of the characteristics, behaviors, and actions of its founders (Baron, 2013; Covin and Slevin, 1991). It has been argued that the performance of young firms should reflect the effectiveness of their founding CEOs because such persons have a major impact on the development and growth of their ventures (Baum, Locke, and Smith, 2001). For example, approximately 80 percent of CEOs leading privately held businesses also chair their firms' board of directors and have ultimate authority in determining the composition of their top management teams and the strategic directions taken by their organizations (Hambrick, 2007). Due to the high level of 'managerial discretion' and wide 'latitude of action' inherently held by founding CEOs (Hambrick and Abrahamson, 1995), the influence of their intangible resources (e.g., human, social, and psychological capital) on firm performance is arguably clearer and more direct than for persons leading large, established firms (Staw, 1991). Therefore, consistent with prior research deriving from a contingency theoretical framework (Donaldson, 2001), we consider firm performance as the primary outcome variable of interest in our study.

Entrepreneurial action in a context of discovery versus creation

From a contingency view, when entrepreneurs' judgments about the nature of the environment in which they function are accurate in terms of the degree to which it reflects a discovery versus creation context and their actions align with the associated implications for that context, it follows that their performance with respect to the development and growth of their new business will be relatively effective (Alvarez and Barney, 2007). Therefore, understanding the requirements for successful performance in discovery and creation contexts is both theoretically and practically important. As mentioned earlier, these assumptions are grounded in fundamental differences based on the degree to which the environment is characterized by risk or uncertainty.

Since a discovery context is characterized by risk, information is available for making calculated decisions regarding the probability that exploiting given opportunities will lead to successful outcomes; further, the means for so doing are relatively transparent (Alvarez, Barney, and Anderson, 2012). As such, opportunities can be tangibly described and business plans can be updated and executed in a systematic manner (Allen, 2011). Within discovery contexts, entrepreneurs can move forward with clear goals and fixed targets in mind. In this setting, success is most often achieved when: (1) decision making is data driven and systematic (Hmieleski and Baron, 2008); (2) human resource practices entail the recruitment of workers to fill specific functional roles (Charan, Hofer, and Mahon, 1980); (3) corporate strategy is thorough, relatively fixed, and based on industry standards (Castrogiovanni, 1996); (4) funding for growth comes from formal sources, such as banks loans (Colombo and Grilli, 2007); (5) marketing practices are relatively consistent over time (Lee and Miller, 1996); and (6) competitive advantage is sustained through explicit learning, the development of internal operating efficiencies, and erecting barriers to entry (Porter, 1980).

In contrast, a creation context is characterized by uncertainty—that is, information is not readily available for making calculated decisions about the probability that exploiting specific opportunities will lead to successful firm outcomes. Moreover, the path for converting ideas into successful products and services is unclear (Alvarez *et al*., 2012). At best, in this situation, entrepreneurs can only move forward with a generalized goal and indefinite target in mind (Sarasvathy, 2001). Within a creation context, opportunities cannot be tangibly described and business plans cannot be effectively updated or executed because they would be based mostly on conjecture and weak assumptions (Baker *et al*., 2003). In this setting, success is most often achieved when: (1) decision making is inductive (Baum and Bird, 2010); (2) human resource practices entail the recruitment of employees who can fill a wide range of roles (Leung, 2003); (3) corporate strategy is emergent and continually being updated (Wiltbank *et al*., 2006); (4) funding for growth comes from informal sources, such as family members and friends (Slavec and Prodan, 2012) and, in special cases,[1] from venture capitalists who are willing to accept uncertainty as a trade-off for the potential of realizing inordinate gains (Matusik and Fitza, 2012);

[1] Approximately 99.95 percent of start-ups that are launched do *not* receive venture capital funding (Rao, 2013).

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(5) marketing practices are under continual revision as the firm's products/services shift and evolve (Read *et al*., 2009); and (6) competitive advantage is sustained through tacit learning and innovation (Mintzberg, 1994).

As we have described, the nature of the opportunity context—which can vary across a continuum ranging from one characterized by risk (i.e., a discovery context) to one characterized by uncertainty (i.e., a creation context)—has clear and meaningful implications for how firms develop and grow (Alvarez and Barney, 2007). Adding further complexity to this point, it has been argued that opportunity contexts may naturally cycle between states of discovery and creation (e.g., industry conditions may become more or less dynamic) (Zahra, 2008). We agree with this view, but also suggest as a basis for the current research that it is important to first determine which resource configurations are best suited for each context—while understanding that the stock of necessary resources for developing firms may need to shift over time, not only to adjust for growth and maturation, but also to maintain strategic alignment with the external environment. Adopting this approach, we now develop specific hypotheses regarding how different forms of human, social, and psychological capital relate to performance in contexts of discovery versus creation.[2]

Human capital: contextual differences in the value of 'what you know'

Human capital is the stock of personal knowledge, skills, and abilities that are accumulated by individuals through investments in education, training, and other types of experience (Becker, 1964, Wright *et al*., 2007). The literature on human capital tends to differentiate between 'general' forms of human capital (e.g., level of educational attainment (DeTienne and Cardon, 2012)) and 'specific' forms of human capital (e.g., industry experience and entrepreneurial experience (Dimov, 2010)). Relevant to the current study, scholars have noted that research regarding the relationship between human capital and entrepreneurial performance has failed to yield consistently strong results (Davidsson and Honig, 2003), and they have suggested a need for applying a contingency approach to the study of human capital (Unger *et al*., 2011). Following this call, we derive hypotheses regarding the relationship of three particularly relevant sources of human capital with firm performance in contexts of discovery versus creation: educational attainment, industry experience, and entrepreneurial experience.

Educational attainment

The amount of formal education completed, in terms of the highest degree attained, is considered one of the most fundamental indicators of general human capital. Formal education, independent of the discipline studied, tends to reinforce the identification of standard practices and procedures, competition with peers, and analytically based judgment and decision making—skills and abilities related to left brain thinking and the development of explicit knowledge (Schilhab, 2007). As such, persons with high levels of educational attainment should be particularly well suited for working in predictive and logic-based environments—such as a discovery context. Reinforcing this point, educational attainment has been found to be positively related to entrepreneurs' ability to acquire formal sources of capital to develop and grow their businesses (Slavec and Prodan, 2012). For these reasons, entrepreneurs who have achieved high levels of educational attainment appear to be better positioned than those with less education to successfully lead their firms in a discovery context.

In contrast, when considering a creation context, it is important to note that in such environments, the rule-based reasoning and predictive logic that features prominently in formal education is often considered to be of less value. As Alvarez and Barney (2007: 16) state, 'under uncertainty, even entrepreneurs with a great deal of time, or with unusual analytical abilities, will not be able to estimate the relevant probability distributions.' In a creation context it is practical intelligence, street smarts, learning by doing, and tacit knowledge that have been argued to be more relevant for achieving high performance (Baum, Bird, and Singh, 2011)—and these are not commonly acquired through formal education (Sternberg, 2004). On the basis of these considerations, we offer the following hypothesis:

> *Hypothesis 1a (H1a): The relationship between founding CEOs' educational attainment and the performance of their firms will be significantly*

[2] In order to maintain conceptual clarity, discovery and creation contexts are presented here and in the following sections as distinct concepts, while acknowledging that the opportunity context of most firms falls somewhere along a continuum between these two extremes.

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more positive in a discovery context (stable environment) than in a creation context (dynamic environment).

Industry experience

The amount of experience working in a given industry (often measured in the number of years an individual has worked in an industry) has been a well-studied facet of human capital within the entrepreneurship literature. Individuals with high levels of industry experience tend to understand the competitive nature of the environment—including opportunities and threats, specific regulations, and how to build relationships with key customers and suppliers (Kor, 2003). Such industry-specific knowledge is important for both identifying entrepreneurial opportunities and developing specific plans for converting them into viable businesses (Delmar and Shane, 2006). It is, therefore, not surprising that industry experience has been found in recent research to be associated with the ability to obtain formal sources of venture funding and launch a business at a larger size than others with less industry experience (Roberts, Klepper, and Haywood, 2011). For these reasons, industry experience has been argued to be a particularly important form of human capital for entrepreneurs leading firms in a discovery context (Alvarez *et al*., 2012).

Since, in a creation context, opportunities do not necessarily emerge from preexisting industries or markets (Alvarez and Barney, 2007), industry experience is less likely to provide relevant knowledge regarding opportunity exploitation than it would in a discovery context. In fact, extensive industry experience has been found to sometimes constrain creativity and innovation by reducing cognitive flexibility and the willingness to adapt to change (Denrell and March, 2001). While constrained focus may be advantageous for gaining precision and producing efficiencies within a discovery context (Fiet and Patel, 2008), it may potentially hinder the ability of entrepreneurs to effectively navigate the uncertainty associated with a creation context (Hmieleski and Baron, 2008). This logic leads us to the following hypothesis:

Hypothesis 1b (H1b): The relationship between founding CEOs' industry experience and the performance of their firms will be significantly more positive in a discovery context (stable environment) than in a creation context (dynamic environment).

Entrepreneurial experience

There is an intuitive link between having prior experience founding and developing firms with performance in subsequent efforts to develop and grow a new business (Dimov, 2010). This assumption is largely based on the fact that entrepreneurs should learn from their past experiences and be better equipped to take on present- and future-related entrepreneurial undertakings (Corbett, 2005). Further, as Baum *et al*. (2011: 403) have argued, 'the new venture situation is dominated by newness; however, all is not totally new. Some decision processes, resource aggregation activities, customer fulfillment conditions, firm valuation, and market characteristics appear and reappear.' Despite the seemingly sound logic supporting the value of entrepreneurial experience, evidence supporting the relationship of this variable with measures of performance has been inconsistent (Delmar and Shane, 2006; Unger *et al*., 2011). We suggest that these findings may reflect the fact that the value of entrepreneurial experience, too, may differ in a discovery versus creation context.

Alvarez *et al*. (2012: 9–10) make a strong case for the value of entrepreneurial experience within a creation context, stating that 'actors who have already gone through this process may not be concerned with the uncertainty of outcomes, or the trial-and-error decision-making process through experimentation.' Similarly, Dimov (2010: 1131) has stated that 'more experienced entrepreneurs will likely demonstrate higher tolerance for decision uncertainty, having honed their ability to act in the context of missing information or lack of feedback.' Further, Alvarez and Busenitz (2001) have suggested that prior new venture development experience enhances founders' ability to recognize and assimilate valuable new information, which is a key ingredient for reducing uncertainty (Haynie and Shepherd, 2009). In a discovery context, the standards for running a business are more transparent and entrepreneurial experience, although likely to be helpful, is presumably less of a contributing factor toward achieving success than it is in a creation context (Alvarez and Barney, 2007). Thus, we offer the following hypothesis:

Hypothesis 1c (H1c): The relationship between founding CEOs' entrepreneurial experience and

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the performance of their firms will be significantly more positive in a creation context (dynamic environment) than in a discovery context (stable environment).

Social capital: contextual differences in the value of 'who you know'

Social capital refers to the benefits that individuals are able to extract from their social structures, networks, and memberships (Lin, 2001). Following Granovetter (1973), we distinguish between social capital that results from 'weak ties' and 'strong tries.' Weak ties involve relationships with a diverse range of acquaintances with whom the individual tends to have interactions that are infrequent, transaction oriented, and non-affective (Jack, 2005). In contrast, strong ties characterize relationships with close friends and family members with whom the individual has interactions that are frequent, based on mutual trust, and have a strong emotional connection (Ruef, 2002). Both types of ties carry with them advantages and disadvantages and require a non-trivial amount of personal investment in order to develop (e.g., time, emotional resources, membership fees, etc. (Adler and Kwon, 2002)). For this reason, it is not surprising that there have been mixed findings regarding whether weak ties or strong ties are most valuable to entrepreneurs (Rowley, Behrens, and Krackhardt, 2000). In response, Hoang and Antoncic (2003: 174) have stated that 'resolution of the debate regarding the benefit of strong versus weak ties may ultimately require a contingency approach.' Consistent with this call, we now develop hypotheses regarding the value of strong and weak ties in discovery versus creation contexts.

Weak ties

Social capital resulting from weak ties has long been thought to be a particularly important intangible resource for entrepreneurs—dating back to Granovetter's (1973) foundational work on 'the strength of weak ties.' The importance of weak ties is central to theorizing about discovery contexts, particularly with respect to the importance of search in the opportunity identification process (Elfring and Huslsink, 2003). Having a large number of varied social contacts is reasoned to provide information inputs that enable alert individuals to identify and exploit entrepreneurial opportunities that others fail to recognize (Kirzner, 1997). Weak ties provide heterogeneous information inputs through which would-be entrepreneurs are able to 'connect the dots' by bridging otherwise disconnected sources of information (Baron, 2006; Dodgson, 2011). In terms of opportunity exploitation, weak ties can provide power and prestige for securing formal sources of funding (Lin, 2001), offer leads to customers and suppliers (Slavec and Prodan, 2012), and help market the firm's products/services through word of mouth (Evald, Klyver, and Svendsen, 2006). Each of these benefits is advantageous for executing in the information-rich environment of a discovery context (Baretto, 2012).

Within a creation context, weak ties are arguably not as useful because reliable information is rarer, more valuable, and less likely to be communicated through weak ties (Evald *et al*., 2006). Moreover, investments in building diverse networks could prove distracting and inefficient for entrepreneurs in a creation context (Dodgson, 2011), since the most critical source of information for such persons is feedback derived directly from experimentation and trial-and-error (Sarasvathy, 2001). In other words, engaging directly with the environment, rather than seeking information from others, is the most effective way of sensemaking in conditions of uncertainty (Weick, 1993). We, therefore, offer the following hypothesis:

Hypothesis 2a (H2a): The relationship between founding CEOs' weak ties and the performance of their firms will be significantly more positive in a discovery context (stable environment) than in a creation context (dynamic environment).

Strong ties

Social capital resulting from strong ties has traditionally been viewed within the entrepreneurship literature as less valuable than that gained from weak ties. This is because strong ties provide comparatively more redundant information, which is arguably not as useful for identifying entrepreneurial opportunities as the broad variety of information provided by weak ties (Granovetter, 1973). Strong ties do, however, offer many important benefits—particularly with respect to opportunity exploitation (Jack, 2005). For example, strong ties can provide sources of labor (Leung, 2003), informal access to capital from friends and family members (Slavec and Prodan, 2012), social support (Evald *et al*., 2006),

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and sensitive information that is most often available only through high trust relationships (Krackhardt, 1992). Each of these benefits is particularly useful in a creation context because formal sources of funding are limited and reliable information is rare and, therefore, exceptionally valuable (Alvarez and Barney, 2007). As Leung (2003: 306) has stated, 'friends and family members are probably more likely to invest in a newly found firm with little resources and a very uncertain future than people from arm's-length ties (acquaintances).' Sequeira, Mueller, and McGee (2007: 278) have similarly stated that, 'strong ties (i.e., family members and close friends) often serve as sources of assistance in uncertain situations.' Finally, Lowik *et al*. (2012: 241) have further suggested that strong ties are essential for the 'exchange of tacit and complex knowledge' and have argued that the benefits of such ties 'entail reduced transaction costs through established trust and collaborative routines.' Therefore, strong ties appear to provide essential resources for developing and growing a firm within a creation context—particularly for entrepreneurs who are forced to bootstrap the growth of their firms (Bhide, 1992).

In a discovery context, entrepreneurial opportunities and the routes through which they can be successfully exploited are more transparent than in a creation context (Alvarez *et al*., 2012). Thus, founders are more easily able to secure formal sources of funding, hire and recruit employees, and efficiently and inexpensively identify information needed to develop and execute strategic plans for their firm (Baretto, 2012; Edelman and Yli-Renko, 2010). As such, founders are unlikely to be as dependent on strong ties in a discovery context. This is not to say that strong ties are not beneficial in such a context, but simply that they are not as crucial to the performance of firms as they are in a creation context. On this basis, we offer the following hypothesis:

> *Hypothesis 2b (H2b): The relationship between founding CEOs' strong ties and the performance of their firms will be significantly more positive in a creation context (dynamic environment) than in a discovery context (stable environment).*

Psychological capital: contextual differences in the value of 'who you are'

Psychological capital reflects the cognitive, behavioral, and emotional resources that individuals draw from when responding to a wide range of challenging circumstances (Luthans *et al*., 2007b). It is comprised of four core elements: optimism, self-efficacy, resilience, and hope. In alignment with work on psychological capital from the positive organizational behavior literature (Baron, Franklin, and Hmieleski, forthcoming), we consider here only the context-specific (i.e., work-related) forms of these core elements, as opposed to generalized forms of optimism, self-efficacy, resilience, and hope—which are considered to be more fixed and less malleable.

Optimism is the degree to which individuals possess a positive outcome expectancy, such that they believe that good things will happen for them regarding their work (Schmitt *et al*., 2013). Self-efficacy relates to the general belief in one's ability to produce high levels of performance in tasks relating to one's work (Stajkovic and Luthans, 1998). Resilience is characterized by two factors (Masten, 2001): the extent to which an individual has experienced previous setbacks or failures in his/her work and the degree to which he/she was able to overcome and/or thrive after exposure to those negative events. Hope has three interacting components: goals, agency, and pathways (Snyder, Cheavens, and Sympson, 1997). Individuals rating high in hope have short- and/or long-term work-related goals, the motivation to achieve those goals, and the ability to imagine multiple routes through which those goals can be achieved.

All four elements of psychological capital are fairly stable, but can be developed or expanded over time (Luthans *et al*., 2007a). Further, each element has been found to be a robust predictor of work performance and job satisfaction (Avey *et al*., 2011). For these reason, psychological capital has been commonly evaluated by grouping together its four core elements (Luthans *et al*., 2007a). Taken together, these elements act jointly as an enabling resource (psychological capital) that allows persons to productively focus attention on, and effectively perform, crucial work-related tasks under challenging conditions (Csikszentmihalyi, 2003).

We suggest that there are three primary reasons why the psychological capital of founding CEOs is likely to be more positively related to firm performance in creation contexts than in discovery contexts: (1) differences in the level of situational strength; (2) the degree to which there is a need to respond to unpredicted events and operate under high levels of stress; and (3) the amount of confidence and trust that must be conveyed and developed

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with key stakeholders (e.g., employees, investors, suppliers, and customers).

First, the uncertainty of a creation context implies that situational strength is weaker than it is in the more predictable environment of a discovery context (Mischel, 1977). This is to say that when the outcomes of following specific plans, behaviors, tactics, and strategies cannot be reasonably predicted in advance, the course of action is unclear and leaders must draw upon their own ingenuity to develop and implement strategic decisions (Hmieleski, Corbett, and Baron, 2013). Important for leadership in such environments, aspects of psychological capital have been found to relate to innovative behavior (Jafri, 2012), creative performance (Sweetman *et al*., 2011), and effective improvisational decision making (Hmieleski and Corbett, 2008). In contrast, when situational strength is high, the appropriateness of specific actions is fairly clear. Since routes to success versus failure are more certain (or predictable) in strong situations, there is less opportunity for ingenuity to influence important decisions or alter the odds of success (House, Shane, and Herold, 1996).

Second, since the probability that specific actions will lead to success is unknown in a creation context, founding CEOs leading their firms in such environments must be able to respond to greater adversity and more frequent unpredicted events than what is likely to be faced by those leading firms in a discovery context. Of particular relevance in this regard, aspects of psychological capital have been found to be related to recovery from failure (Lopez, Snyder, and Pedrotti, 2003), thriving following a crisis (Fredrickson *et al*., 2003), and resistance to stress (Baron *et al*., forthcoming). Therefore, we expect that the emotional hardiness (Luthans, Youssef, and Avolio, 2007) and ability to remain focused under pressure (Csikszentmihalyi, 2003) that are possessed by those who are high in psychological capital will be more strongly linked to firm performance for founding CEOs leading their firms in creation contexts than to those who lead their firms in a discovery context.

Third, because the future is less predictable for firms operating within the dynamic environment of a creation context than it is for those operating in the more predictable and stable environment of a discovery context (Alvarez and Barney, 2007), founding CEOs leading firms in a creation context must be able to inspire confidence and trust with key stakeholders (Slavec and Prodan, 2012). In a discovery context, founding CEOs are likely to be able to point to data and forecasts to inspire confidence and trust from employees, investors, suppliers, and customers. In contrast, within a creation context, founding CEOs are not able to rely upon such data and forecasts. Instead, it is their individual ability to remain focused and steady while navigating through uncertain conditions that is of particular importance for building confidence and obtaining trust from key stakeholders in a creation context. Importantly, entrepreneurs who are high in psychological capital tend to excel at conveying confidence and building trust (Jensen and Luthans, 2006). Thus, the psychological capital of founding CEOs should be particularly important and more strongly related to firm performance in creation contexts than in discovery contexts. Therefore, we offer the following hypothesis:

> *Hypothesis 3 (H3): The relationship between founding CEOs' psychological capital and the performance of their firms will be significantly more positive in a creation context (dynamic environment) than in a discovery context (stable environment).*

METHODOLOGY

Sample and procedures

We used the *Dun and Bradstreet Market Identifiers* database to generate a random sample of 1,500 businesses founded in the United States to use in the current research. The database contains what is considered to be the most extensive listing of start-up firms founded in the country. Within the database, *Dun and Bradstreet* provides the addresses of companies, as well as CEO names and whether they are founders. To generate data for our study, a packet containing our survey, cover letter, and reply envelope was mailed to the CEO of each sampled firm. A follow-up mailing was sent to each CEO who did not respond to our initial request for participation. Nondeliverable survey packets were returned for 247 firms. Overall, we received 223 completed surveys from individuals who were both founders and CEOs of their firms, resulting in an overall usable response rate of 17.8 percent. The response rate is consistent with those produced by other studies using similar samples of young firms and their top management (Cycyota and Harrison, 2006.). Nonresponse bias

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was evaluated using *t* tests on the sex of respondents, firm age, revenues, number of employees, environmental dynamism, and firm growth. For each variable, nonresponse bias was nonsignificant. Therefore, based on these characteristics, respondents are representative of the population from which they were sampled.

Demographic items included in the survey confirmed that each participant was a founder and CEO of his/her company. Respondents included 160 males and 63 females, with a mean age of 48 years ($SD = 9.65$). The ethnicity of participants was mostly Caucasian ($n = 200$). Participants' highest degree earned were high school ($n = 61$), associates ($n = 30$), bachelors ($n = 84$), masters ($n = 38$), and doctorate ($n = 10$). The average age of the participants' firms was seven years, which is consistent with suggestions that firms tend to be in a critical stage of development and growth during this time period (Shrader, Oviatt, and McDougall, 2000). The sample covers a broad and heterogeneous scope, with participants' businesses being located in 42 different states, and having main operations in 53 different industries as classified at the three-digit level of the North American Industry Classification System (NAICS). Finally, on average, firms in the sample had about 23 employees and revenues of $5 million.

Measures

Unless otherwise noted, all measures were rated on seven-point response scales, with responses ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Human capital

Following prior research on founding CEOs, human capital was assessed in terms of educational attainment (DeTienne and Cardon, 2012), industry experience (Dimov, 2010), and entrepreneurial experience (Hmieleski and Baron, 2009). *Educational attainment* was measured as the highest academic degree earned, coded as: 1 = high school ($n = 61$), 2 = associates ($n = 30$), 3 = bachelors ($n = 84$), 4 = masters ($n = 38$), and 5 = doctoral ($n = 10$). *Industry experience* was measured as the number of years in which the participant had worked in the primary industry in which his/her current business operates ($M = 18.80$, $SD = 10.34$). *Entrepreneurial experience* was measured as the number of firms started prior to the founding of the participant's current business. Responses ranged from 0 to 5, with nearly half of the respondents ($n = 104$) having previously founded a business. A continuous measure of entrepreneurial experience was used because it was assumed that additional knowledge is gained about the process of developing and growing new ventures with each additional start-up that is launched. Even though the degree of new knowledge acquired by entrepreneurs with each start-up they launch may vary based on individual and environmental characteristics, a continuous measure of entrepreneurial experience, nonetheless, provides a richer indicator of human capital than does a dichotomous measure of entrepreneurial experience.

Social capital

Two facets of social capital, strong ties and weak ties, were measured using six items (three per facet) adapted from Reynolds (1999). Strong ties ($\alpha = 0.60$) was assessed as the degree to which the participant had family, friends, and other close social contacts within his/her social network who could help him/her be more effective with his/her work as an entrepreneur.[3] Weak ties ($\alpha = 0.59$) was assessed as the degree to which the participant had informal connections or associations with persons who could help him/her be more effective with his/her work as an entrepreneur. Items were averaged in order to form overall measures of strong ties and weak ties.

Psychological capital

Psychological capital was measured using the four core elements proposed in the literature (Luthans *et al.*, 2007b): optimism, self-efficacy, resilience, and hope. Following the approach of Luthans and *et al.*, (2007a), items were modified (when necessary) to reflect the respondent's work context.

[3] Two steps were taken to address the fact that Cronbach's coefficient alpha scores were on the low end of acceptability for the measures of strong ties and weak ties. First, it is important to note that Cronbach's coefficient alpha is a conservative estimate of reliability and is greatly influenced by the number of items used (Cortina, 1993). For example, using the Spearman-Brown prophesy formula, doubling the number of items used for each of these measures would raise their corresponding alpha coefficients to 0.75 and 0.74, respectively. Second, we applied Drewes' (2000) test of maximal reliability (Rmax), which calculates an estimate of reliability that uses structural equation coefficients and is less biased by the total number of items. The Rmax scores for the measures of concern were 0.82 and 0.85, respectively. Thus, we conclude that the composite reliability of these measures is unlikely to be a significant limitation influencing the results.

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For example, the phrase 'at work' was added to some items to ensure that work-related responses were elicited. Six items each were used to measure optimism (Scheier, Carver, and Bridges, 1994), self-efficacy (De Noble, Jung, and Ehrlich, 1999), resilience (Wagnild and Young, 1993), and hope (Snyder *et al*., 1996). All 24 items were averaged to form an overall index of psychological capital ($\alpha = 0.91$).

Environmental dynamism

The industry-level rate of unpredicted change was measured as the standard errors of three regression slopes based on research by Dess and Beard (1984), Sharfman and Dean (1991), and Castrogiovanni (2002). The independent variable for each regression was time. The dependent variables were the number of employees, amount of revenue, and number of firms for each industry, measured at the three-digit NAICS level. These data were obtained through the United States Bureau of the Census. Time was regressed against these variables for the most recent five-year period. The standard errors for each regression slope were divided by the associated mean scores in each case to form a measure of unpredicted change. The values of unpredicted change for each industry characteristic were then standardized and added to create an overall measure of environmental dynamism. Low levels of environmental dynamism represent stable industry conditions that are characteristic of risk and are representative of a discovery context, whereas high levels of environmental dynamism represent dynamic industry conditions that are characteristic of uncertainty and are representative of a creation context (Edelman and Yli-Renko, 2010; Hmieleski and Baron, 2008).

Firm performance

Growth is frequently referenced as a key indicator of performance for relatively young firms (Baum and Wally, 2003). Consistent with this view, we formed objective measures of revenue and employment growth using data from *Dun and Bradstreet* as indicators of firm performance. Prior research has confirmed the accuracy of *Dun and Bradstreet* data regarding the amount of revenue and number of employees per firm (e.g., Baum *et al*., 2001). These measures of performance were estimated as the average yearly growth in revenue and number of employees for the two-year period directly following the completed administration of our survey. We formed an index of firm performance by standardizing and then summing the measures of revenue and employment growth. This approach was taken because the performance indicators were highly correlated ($r = 0.80$, $p < 0.01$) and the analyses respective to each of our hypothesis tests followed the same pattern as when these variables were examined separately.

Control variables

Both firm-level and individual-level control variables were used. Firm-level control variables included the age, size, and prior growth of the firm. *Firm age* was measured using a survey item asking how many years the firm had been in business. *Firm size* was measured as the sum of the standardized revenue and employment totals for the year in which the survey data were collected. *Prior firm growth* was measured as the sum of standardized revenue and employment growth rates for the three-year period prior to when the survey data were collected. Data for firm size and prior firm growth were acquired from *Dun and Bradstreet*. Individual-level control variables included the *gender* (male = 0, female = 1) and *age* (in years) of the participants. Data for these control variables came from the study survey.

Statistical procedures

We utilized moderated hierarchical regression analysis as the main statistical procedure for examining the hypotheses. Following Cohen *et al*. (2003), significant two-way interactions were graphed and the simple slopes were analyzed. The interactions were plotted at one standard deviation above and below the mean of the focal independent variable.

RESULTS

Table 1 provides the means, standard deviations, and bivariate correlations for all study variables. The results of the hierarchical moderated regression model for firm performance are displayed in Table 2. Significant interactions are illustrated in Figures 1 to 3.

Multiple analyses were conducted to investigate the possibility of multicollinearity for the full model that was used to test our hypotheses (i.e., Model 3 of Table 2). No variance inflation scores were greater

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Table 1. Descriptive statistics and variable correlations

Variables	*Mean*	*SD*	*r*										
			1	2	3	4	5	6	7	8	9	10	11	12
1. Firm size	0.00	1.80												
2. Prior firm growth	0.00	1.73	0.73**											
3. Firm age	7.18	6.41	0.18**	0.25**										
4. Gender	0.28	0.45	−0.13	−0.13	−0.14*									
5. Age (of individual)	48.27	9.65	0.16*	0.15*	0.26**	−0.06								
6. Dynamism	9.77	0.99	−0.08	−0.12	0.02	0.01	−0.01							
7. Educational attainment	2.58	1.19	0.16*	0.14*	0.00	−0.05	0.09	−0.03						
8. Industry experience	18.80	10.34	0.21**	0.18**	0.39**	−0.21**	0.46**	−0.04	−0.14					
9. Entrepreneurial experience	0.92	1.23	−0.01	0.01	−0.12	−0.11	0.18**	0.04	0.05	0.03				
10. Strong ties	4.95	1.16	0.00	0.04	0.00	0.04	−0.08	−0.01	−0.09	0.07	0.03			
11. Weak ties	5.67	0.96	0.15*	0.07	−0.11	−0.04	−0.02	−0.02	−0.04	0.10	0.06	0.37**		
12. Psychological capital	5.87	0.68	0.10	0.12	−0.03	−0.05	0.10	0.02	−0.03	0.15*	0.18**	0.26**	0.68**	
13. Firm performance	0.00	1.90	0.15*	0.14*	0.06	−0.07	−0.02	0.14*	0.05	0.05	0.04	0.11*	0.06	0.08

$n = 223$; $^{*}p < 0.05$; $^{**}p < 0.01$.

than 4.63 (*Mean* = 1.93, *SD* = 1.08), and all conditional index scores were less than 4.71 (*Mean* = 1.95, *SD* = 0.93). Each of these statistics falls within acceptable ranges (Cohen *et al*., 2003), suggesting that multicollinearity is not a major threat to the integrity of the results. We now consider the results specific to the individual hypotheses.

Human capital

Hypothesis 1 suggested that the relationship of founding CEOs' educational attainment (H1a) and industry experience (H1b) with the performance of their firms will be significantly more positive in a discovery context than in a creation context, while the relationship of founding CEOs' entrepreneurial experience (H1c) with the performance of their firms will be significantly more positive in a creation context than in a discovery context. As shown in Table 2, the interaction of founding CEOs' educational attainment with dynamism is positive and significant ($\beta = 0.15$, $p < 0.05$), the interaction of founding CEOs' industry experience with dynamism is nonsignificant ($\beta = 0.07$, $p > 0.10$), and the interaction of founding CEOs' entrepreneurial experience with dynamism is negative and significant ($\beta = -0.21$, $p < 0.05$). As shown in Figure 1a, educational attainment has a significant positive relationship with firm performance in dynamic environments (creation context) ($t = 2.08$, $p < 0.05$) and a nonsignificant relationship with firm performance in stable environments (discovery context) ($t = 1.05$, $p > 0.10$). In contrast, Figure 1b shows that entrepreneurial experience has a marginally significant negative relationship with firm performance in dynamic environments (creation context) ($t = 1.84$, $p < 0.10$) and a significant positive relationship with firm performance in stable environments (discovery context) ($t = 2.14$, $p < 0.05$). Therefore, findings do not support H1b and support the opposite relationships of what was proposed in H1a and H1c.

Social capital

Hypothesis 2 suggested that the relationship of founding CEOs' weak ties (H2a) with the performance of their firms will be significantly more positive in a discovery context than in a creation context and that the relationship of founding CEOs' strong ties (H2b) with the performance of their firms will be significantly more positive in a creation context than

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Table 2. Hierarchical regression model of firm performance

Variable	*Firm performance*				
	Model 1 β	Model 2 β	Model 3 β	Model 4 β	Model 5 β
Controls					
Firm size	0.09	0.10	–0.02	0.03	–0.08
Prior growth	0.07	0.07	0.24*	0.20*	0.28**
Firm age	0.04	0.03	0.02	0.05	0.07
Age	–0.05	–0.07	–0.07	–0.04	0.04
Sex	–0.05	–0.04	–0.05	–0.07	–0.01
Main effects					
Dynamism		0.15*	0.14*	0.14*	0.38**
Educational attainment		0.04	0.06	0.08	0.10
Industry experience		0.03	0.03	0.06	0.04
Ent. experience		0.03	0.00	0.11	0.04
Weak ties		–0.04	–0.08	–0.10	–0.08
Strong ties		0.11	0.13*	0.22**	0.29**
Psychological capital		0.05	0.06	0.10	0.02
Two-way interactions					
Educational attainment × Dynamism			0.15*	0.16*	0.18*
Industry experience × Dynamism			0.07	0.10	0.29**
Ent. experience × Dynamism			–0.21*	–0.22**	–0.23*
Weak ties × Dynamism			–0.31*	–0.33*	–0.32*
Strong ties × Dynamism			0.35**	0.41**	0.55**
Psychological capital × Dynamism			0.37**	0.38**	0.39*
Quadratic effects					
Educational attainment^2				–0.13*	–0.18**
Industry experience^2				–0.13	–0.04
Ent. experience^2				–0.13	–0.06
Weak ties^2				–0.04	0.06
Strong ties^2				0.22**	0.16*
Psychological capital^2				0.09	–0.12
Quadratic two-way interactions					
Educational attainment^2 × Dynamism					–0.43**
Industry experience^2 × Dynamism					–0.40**
Ent. experience^2 × Dynamism					0.04
Weak ties^2 × Dynamism					0.09
Strong ties^2 × Dynamism					0.48**
Psychological capital^2 × Dynamism					0.03
F-Ratio	1.331	1.308	2.868**	2.994**	5.449**
R^2	0.030	0.070	0.202	0.266	0.460
Adjusted R^2	0.007	0.016	0.132	0.177	0.375

Note: All tests are two tailed. $n = 223$. *$p < 0.05$, **$p < 0.01$.

in a discovery context. As shown in Table 2, the interaction of founding CEOs' weak ties with dynamism is negative and significant ($\beta = -0.31$, $p < 0.05$), and the interaction of founding CEOs' strong ties with dynamism is positive and significant ($\beta = 0.35$, $p < 0.01$). As shown in Figure 2a, weak ties has a significant negative relationship with firm performance in dynamic environments (creation context) ($t = 2.36$, $p < 0.05$), while having a nonsignificant relationship with firm performance in stable environments (discovery context) ($t = 1.14$, $p > 0.10$). In contrast, Figure 2b shows that strong ties has a significant positive relationship with firm performance in dynamic environments (creation

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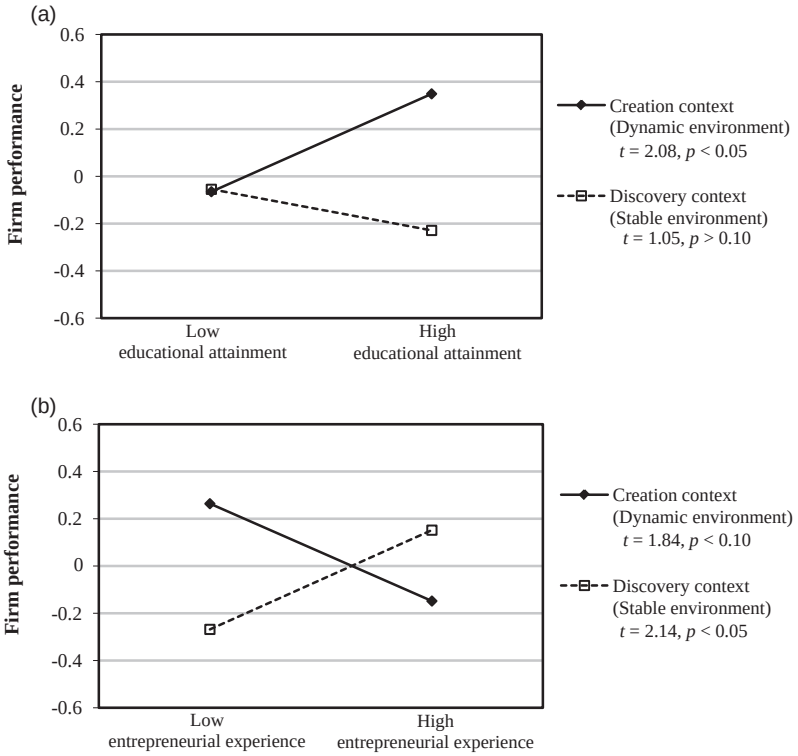

Figure 1. Interactions of human capital with dynamism on firm performance

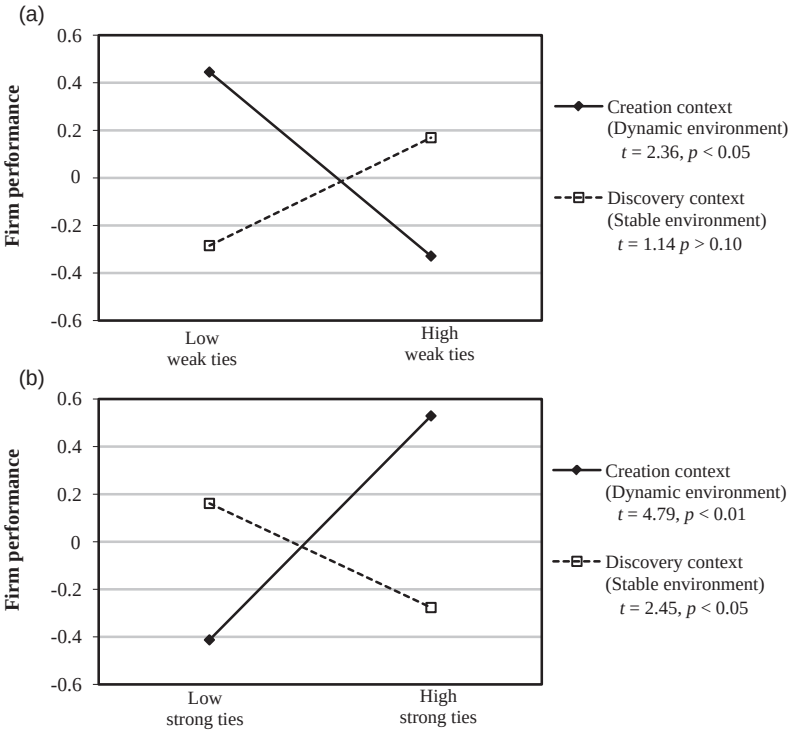

Figure 2. Interactions of social capital with dynamism on firm performance

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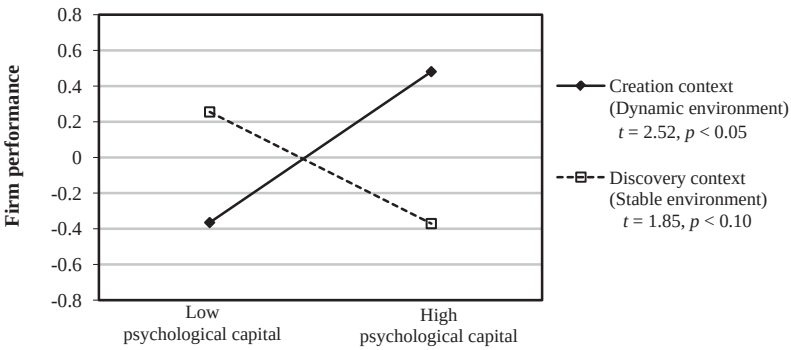

Figure 3. Interaction of psychological capital with dynamism on firm performance

context) ($t = 4.79$, $p < 0.01$) and a significant negative relationship with firm performance in stable environments (discovery context) ($t = 2.45$, $p < 0.05$). Therefore, findings support H2a and H2b.

Psychological capital

Hypothesis 3 suggested that the relationship of founding CEOs' psychological capital with the performance of their firms will be significantly more positive in a creation context than in a discovery context. As shown in Table 2, the interaction of founding CEOs' psychological capital with dynamism is significant and positive ($\beta = 0.37$, $p < 0.01$). As shown in Figure 3, psychological capital has a significant positive relationship with firm performance in dynamic environments (creation context) ($t = 2.52$, $p < 0.05$), while having a marginally significant negative relationship with firm performance in stable environments (discovery context) ($t = 1.85$, $p < 0.10$). These results support H3.

Overall, findings support the importance of taking a contingency approach toward examination of the opportunity exploitation process, specifically in terms of considering differences regarding the value of intangible resources in stable (discovery context) versus dynamic (creation context) environments. As evidence, our analysis of the main effects accounted for only 7 percent of the variance in firm performance, while our contextual analysis (the two-way interactions) accounted for an additional 13.2 percent of such variance.

Post hoc analyses: testing for curvilinear effects

Additional analyses were conducted to examine possible curvilinear relationships of the focal independent variables with firm performance in dynamic (creation context) versus stable (discovery context) environments. These tests involved developing hierarchical regression models by adding the quadratic terms of the independent variables in Model 4 of Table 2 and then entering the quadratic term of each focal variable x dynamism in Model 5 of Table 2. These analyses identified three significant quadratic interactions: the quadratic term of educational attainment with dynamism ($\beta = -0.43$, $p < 0.01$), the quadratic term of industry experience with dynamism ($\beta = -0.40$, $p < 0.01$), and the quadratic term of strong ties with dynamism ($\beta = 0.48$, $p < 0.01$). As shown in Figure 4a, the positive relationship of educational attainment with firm performance in dynamic environments (creation context) becomes negative at high levels of education attainment, whereas the relationship of educational attainment with firm performance in stable environments (discovery context) takes a more positive turn at high levels of educational attainment. Somewhat similarly, Figure 4b shows that industry experience has a generally positive relationship with firm performance in dynamic environments (creation context), but that relationship diminishes at high levels of industry experience. In contrast, the relationship of industry experience with firm performance is generally negative in stable environments (discovery context), but that relationship diminishes at high levels of industry experience. Finally, Figure 4c shows that the relationship between strong ties and firm performance is not meaningful until strong ties reaches a moderately high level, at which point it becomes positively related to firm performance in dynamic environments (creation context) and negatively related to firm performance in stable environments (discovery context). Overall, the results of the *post hoc* analyses provide more nuanced results

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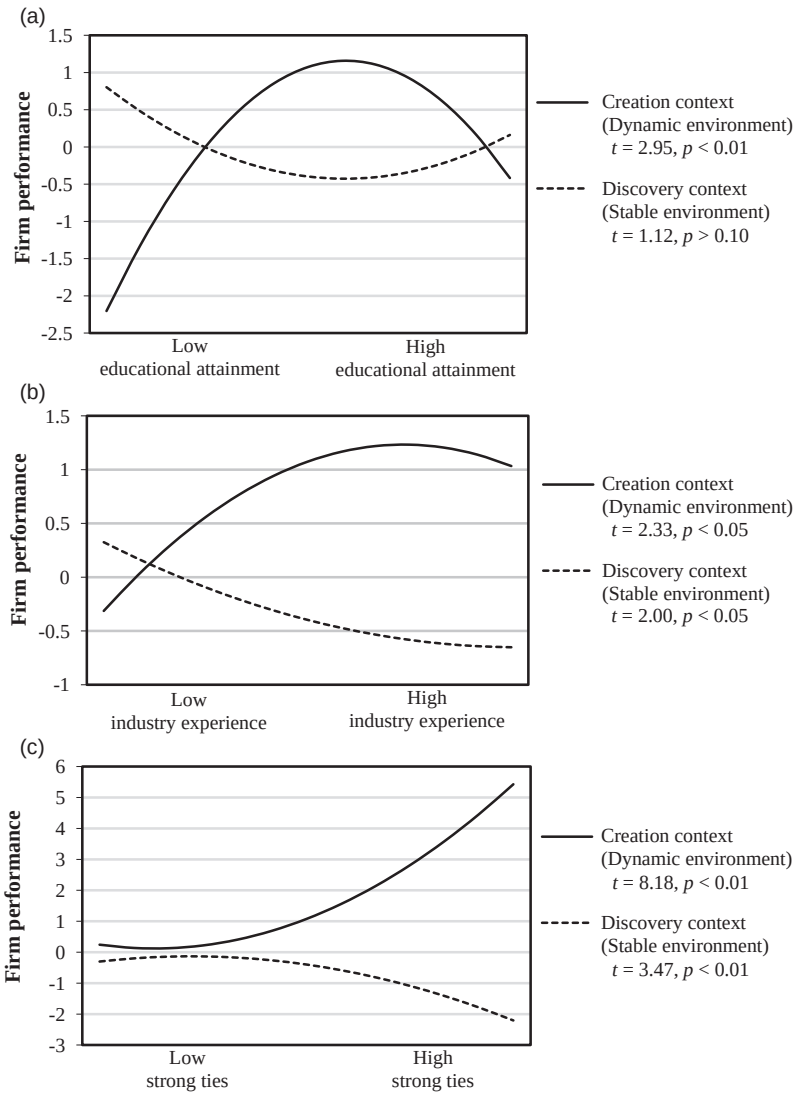

Figure 4. Interactions of quadratic effects of educational attainment, industry experience, and strong ties with dynamism on firm performance

regarding our main findings for educational attainment and strong ties and uncovered a contingent relationship (based on environmental dynamism) of industry experience with firm performance that was not identified in our primary analyses.

DISCUSSION

The findings of this study indicate that important contextual differences exist with respect to the value of founding CEOs' human capital, social capital, and psychological capital in environments of risk versus uncertainty—thus, providing further evidence for the benefits of integrating and extending discovery and creation theoretical perspectives (Alvarez and Barney, 2007). More generally, results offer robust support for recent proposals suggesting the importance of studying the alignment of firms' internal resources (including those that are intangible) with the external environment (Sirmon *et al*., 2007). We next discuss findings with respect to which intangible resources of founding CEOs appear to be more or less valuable in contexts of discovery versus creation. We then review implications for the advancement of entrepreneurship theory, note limitations of

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the current study, provide some suggestions for future research, and offer concluding thoughts.

Which intangible resources matter most in a 'discovery context?'

Findings from our moderated regression analyses identified forms of human capital (entrepreneurial experience) and social capital (weak ties) that are comparatively more valuable in contexts of discovery than in ones of creation. However, simple slopes analyses found only one intangible resource, entrepreneurial experience, to have a significant positive relationship with firm performance in a discovery context. The lack of significant findings for other useful intangible resources within a discovery context is not entirely surprising considering research on situational strength, which has demonstrated that characteristics of the environment can restrict the expression of individual preferences or predispositions (Meyer, Dalal, and Hermida, 2010). Essentially, within a discovery context, information is often available that can inform desirable behaviors and guide the actions of entrepreneurs (e.g., norms, policies, procedures, industry standards, etc.). This is one key reason why the development and execution of business plans is advisable, and often valuable, in such contexts. Conversely, within a creation context, entrepreneurs are, to some degree, entering uncharted waters in which reliable information is not as readily available to guide their actions. Having little else to rely upon, entrepreneurs operating in a creation context must draw more heavily on their own knowledge, connections, and psychological inclinations to inform their actions—that is, on their own intangible resources.

Despite the situational strength of a discovery context, our findings do provide some useful insights into specific resources that might be useful to founding CEOs within such environments, as well as some that might potentially undermine the efforts of such persons. On a positive note, it appears that prior experience in founding and developing a business provides knowledge that may be particularly useful when growing a firm within a stable environment. For example, basic knowledge about how to start and operate a new venture may allow founding CEOs leading their firms in a discovery context to operate more efficiently, freeing up cognitive resources that can be allocated toward more calculated and strategic decision making.

On a more negative note, our findings suggest that strong ties may play a detrimental role in founding CEOs' ability to develop and grow their firms in a discovery context. This result was somewhat surprising. We had anticipated strong ties would be comparatively more valuable in creation contexts, but we did not expect such ties to have a negative relationship with performance in discovery contexts. One possible explanation is that having many strong ties could prove unproductive if founding CEOs are pulled away from calculated decision making and toward trying to satisfy the potential wide range of preferences shared with them by their many friends and family members with whom they confer for business guidance. Our *post hoc* analyses of curvilinear effects provided further detail about this relationship, showing that such negative effects appear to arise only when the degree of strong ties is fairly high.

Which intangible resources matter most in a 'creation context?'

Our results identified aspects of human capital (educational attainment), social capital (strong ties), and the composite measure of psychological capital to be comparatively more valuable in contexts of creation than discovery. Further, simple slopes analyses confirmed each of these intangible resources to be significantly related to firm performance in a creation context. Since creation contexts lack reliable information to guide actions and behaviors (Alvarez and Barney, 2007) and are accordingly characterized as being relatively low in situational strength (Meyer *et al*., 2010), it is not surprising that intangible resources play an important role in founding CEOs' ability to achieve high performance in such contexts.

In particular, our findings suggest that educational attainment, strong ties, and psychological capital are particularly important in a creation context. With regard to educational attainment, our results support the opposite of what we had anticipated. We hypothesized that high levels of this form of human capital would be most advantageous in discovery contexts because highly educated persons tend to possess well-developed mental frameworks for identifying and conforming to standard practices. Such mental frameworks were reasoned to be particularly useful in discovery contexts because norms for attaining success are likely to be present and transparent to persons leading firms under stable industry conditions (Alvarez and Barney, 2007). However, it appears that, on balance, the additional benefits associated with educational attainment (such as

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ambition, curiosity, and creativity) may prove to be of even greater importance for founding CEOs to manage the uncertainty present in a creation context—an environment in which norms for attaining success do not exist (Kim, Aldrich, and Keister, 2006; Koellinger, 2008; Zaleski, 2011). Our *post hoc* analyses demonstrate that there are, however, limits to this conclusion. Specifically, there appear to be diminishing returns to having a high level of education in this context, and at very high levels, the relationship appears to become negative. Presumably, very high levels of education may constrain the thinking of founding CEOs, who need to remain flexible and open to a wide range of possibilities while leading their firms in a creation context.

Strong ties was also found to be an important resource for founding CEOs leading their firms in a creation context. This finding supports the logic that since firms are less likely to be able to acquire formal resources (e.g., employees, funding) in contexts of creation as compared to those of discovery, they are more likely to depend on informal sources of assistance from family and friends (Alvarez and Barney, 2007). For example, it has previously been suggested that strong ties are essential for supplying labor when forced to bootstrap the development and growth of a firm (Leung, 2003). Finally, our results add support to prior research findings that suggest strong ties provide social support helpful to entrepreneurs as they cope with the stress of leading firms in rapid and unpredictably changing environments (Evald *et al*., 2006). This, in turn, can free cognitive resources to help focus on achieving gains rather than minimizing psychological distress (Hobfoll, 2001). However, our *post hoc* analyses of curvilinear effects suggest that such positive effects may occur only at high levels of strong ties.

Results also indicate that psychological capital (a composite measure of optimism, self-efficacy, resilience, and hope) is an important resource for founding CEOs leading their firms in a creation context. Due to the fact that creation contexts are characterized by uncertainty and the need for focused persistence (Baretto, 2012), it is not surprising that this psychological resource may assist founding CEOs to function effectively. In particular, the emotional resilience and mental hardiness of founding CEOs who are high in psychological capital may inspire employees to persevere with their work (Luthans *et al*., 2007b) and help to build trust with external stakeholders (e.g., friends and family members who have invested in the firm) who may be nervous about the unpredictable future of the firm (Slavec and Prodan, 2012).

Our *post hoc* analyses additionally indicated that the industry experience of founding CEOs appears to have a positive relationship with firm performance in a creation context, but that there are limits to this relationship such that at very high levels of industry experience, the relationship becomes negative. This finding is consistent with research demonstrating that founders having very high levels of experience in their firms' primary industry fail to innovate or deviate from the status quo (Cliff, Jennings, and Greenwood, 2006); thus, presumably limiting their ability to attain high levels of performance for their firms when operating in a creation context.

Implications for entrepreneurship theory

The question of whether entrepreneurship is a distinctive scholarly domain continues to resonate among researchers in the field (Shane, 2012; Venkataraman *et al*., 2012). Underlying this question is the fact that entrepreneurship research has generally drawn from theories based in other branches of management (e.g., strategy, organizational behavior (Baron, 2002; Ireland, Hitt, and Sirmon, 2003)) or primary disciplines in the social sciences (e.g., economics, sociology, psychology (Aldrich, 1999; Baron, 2013; Kirzner, 1997)). Even though entrepreneurship research may, in turn, contribute to these other branches of management and/or primary disciplines by testing the theories it imports or adapts in arguably new contexts, such contributions do not distinguish entrepreneurship as a unique domain (Vecchio, 2003). Some researchers have suggested that for entrepreneurship to mature to a point of distinctiveness, it must develop its own unique set of theories (Busenitz *et al*., 2003). Theory regarding discovery and creation perspectives appears to hold the potential for contributing toward this goal (Alvarez and Barney, 2007). Taken together, an integrative view of discovery and creation perspectives suggests that contextual boundary conditions (e.g., the degree to which the industry environment is stable versus dynamic) can be used to inform which types of resources, actions, and behaviors are most crucial for exploiting entrepreneurial opportunities. This integrative framework is inherently anchored to entrepreneurial phenomena—an important aspect of developing and testing entrepreneurship theory (Zahra, 2007). Our research reinforces the value of applying such a framework and provides empirical

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content that further refines our understanding of the requirements for entrepreneurial achievement in contexts of discovery versus creation.

Our findings also contribute to the upper echelons literature regarding whether the characteristics, skills, motives, and goals of founding CEOs are related to the performance of their firms (Baron, Tang, and Hmieleski, 2011; Hambrick, 2007; Gartner, 1989; Staw, 1991). Research on such factors goes far beyond the investigation of 'traits,' which are generally viewed as involving dispositions that are relatively stable across time, context, and situation. As we have noted here, differences between entrepreneurs involve a broader range of variables—including factors encompassed by their human, social, and psychological capital. Such variables are far from fixed; rather, they can be developed over time and vary in their relevance and impact across situational and/or environmental contexts (Baron, Hmieleski, and Henry, 2012). We suggest that future research on characteristics of individual entrepreneurs, thus broadly conceived, may prove to be particularly fruitful if it is focused, to a degree, on these intangible personal resources. As evidence for this proposal, we note that when considered in light of contextual differences (i.e., discovery versus creation context), the relationship of founding CEOs' intangible resources with firm performance appears to be quite strong—in the current study, accounting for approximately 20 percent of the variance in firm performance. Therefore, as the field of entrepreneurship continues to develop, it would seem that investigating the nexus between individuals and opportunities would imply the need to integrate the study of entrepreneurs' actions, behaviors, and characteristics (such as their intangible resources) with that of the opportunity context (Shane and Venkataraman, 2000). As demonstrated in the current research, such a path requires a contingency approach—a route that has played a central role in the advancement of nearly every field of the social sciences (Donaldson, 2001).

Limitations and directions for future research

There are a few noteworthy limitations to the findings of the current study, and they suggest opportunities for future research. First, our examination of intangible resources was limited to those of founding CEOs. Even though there is good reason to believe that the intangible resources of founding CEOs may have an inordinately strong influence on firm performance (Baron, 2007; Hambrick, 2007; Staw, 1991), it is likely that the intangible resources of other founding team members also play a meaningful role in achieving high levels of firm performance (Beckman, 2006). It may be, for example, that in some situations, intangible resources of founding team members can substitute for those in which founding CEOs may be lacking (Klotz *et al*., 2014). Moreover, there might be important contextual differences with respect to how configurations of resources among team members relate to firm performance. For example, teams comprised of several members who have in-depth experience within the same industry might become too rigid in their decision-making processes, which could limit their firm's ability to innovate and effectively adapt to unpredicted change (Cliff *et al*., 2006).

Second, even though our findings identified important contextual differences in the relationships of founding CEOs' intangible resources with firm performance, the underlying mechanisms through which these effects occurred were not directly examined. A natural extension of the current research would be to study how different configurations of intangible resources along with specific behaviors and actions relate to firm performance in contexts of discovery versus creation. Such research would likely require the use of a more comprehensive set of measures than that which can be feasibly administered to a national random sample of founding CEOs or top management teams (Cycyota and Harrison, 2006); thus, possibly necessitating the use of convenience samples and/or incentives to solicit participation.

Third, as Zahra (2008) has argued, opportunity contexts are likely to cycle between states of discovery and creation. This assumption is consistent with research demonstrating that industries become more or less dynamic over time (Dess and Beard, 1984). The current research offers a first step toward understanding which intangible resources are most valuable with respect to opportunity exploitation in contexts of discovery versus creation. A logical next step would be for future research to longitudinally examine the utility of specific stocks of resources over time as the characteristics of the opportunity context shift between discovery and creation.

CONCLUSIONS

The successful development and growth of firms—their capacity to gain and maintain competitive

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advantage—derives, at least in part, from the ability of their founding CEOs to bring a wealth of resources to bear on the complex tasks they face (Alvarez and Busenitz, 2001). Any list of factors that play an important role in this regard must certainly include *human capital* (the knowledge, skills and abilities that founders bring with them to the task of developing and growing their firms), *social capital* (the benefits entrepreneurs obtain from their social structures, networks, and memberships), and *psychological capital* (the cognitive, behavioral, and emotional resources that provide entrepreneurs with the capacity to respond effectively to challenging conditions to maintain focus and enthusiasm, and to both persevere after, and benefit from, major setbacks). While there is an intuitive appeal to believing that 'more is better' with respect to each of these forms of capital, our findings suggest that a relatively nuanced view may, in fact, be more informative and accurate. These forms of capital each comprise unique intangible resources that carry with them important implications for founding CEOs and—of central importance—for the specific costs and benefits they provide in discovery versus creation contexts. This, in turn, suggests that careful attention to the moderating effects of these contrasting opportunity contexts is crucial for understanding how entrepreneurs can convert their intangible resources (e.g., human capital, social capital, and psychological capital) into sustainable competitive advantage for their firms.

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