



THE DOWNSIDE OF BEING 'UP': ENTREPRENEURS' DISPOSITIONAL POSITIVE AFFECT AND FIRM PERFORMANCE

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Previous research indicates that dispositional positive affect (DPA) is related to many beneficial outcomes (e.g., enhanced career success, development of high-quality social networks, improved performance on many tasks). Past research, however, has not directly investigated three crucial issues: (1) Are there limits to these beneficial effects? (2) Is dispositional positive affect related to firm performance as well as to individual entrepreneur performance? (3) Are the effects of entrepreneurs' DPA moderated by specific variables? The present study provides evidence relating to these issues. Findings indicate significant relationships between entrepreneurs' DPA and two measures of firm performance (product innovation and sales growth rate). However, there are indeed limits to these effects, such that beyond certain upper bounds, further increments in entrepreneurs' DPA are associated with declines in firm performance. These effects are moderated by firm size, such that the negative effects of entrepreneurs' DPA are stronger in small firms than in comparatively larger ones. Results contribute to the development of theory for understanding the role of entrepreneurs' affect in the entrepreneurial process. More generally, they contribute to ongoing efforts to understand how founding entrepreneurs influence the subsequent development and growth of their firms. Copyright © 2011 Strategic Management Society.

INTRODUCTION

Across hundreds of individual studies conducted in several different fields, positive affect has been found to be related to important benefits for individuals (Ashby, Isen, and Turken, 1999; Kaplan *et al.*, 2009; Lyubomirsky, King, and Diener, 2005; Weiss and Cropanzano, 1996). To highlight just a

few of the most consistently reported results, positive affect is associated with increased energy, enhanced cognitive flexibility, increased generation of new ideas, greater confidence, adoption of efficient decision making strategies (e.g., satisficing), augmented use of effort-reducing heuristics, and improved ability to cope with stress and adversity (Ashby *et al.*, 1999; Baron, 2008; Fredrickson, 2001). Further, high levels of positive affect have been found to be related to high levels of performance on a wide range of cognitive and work-related tasks (Kaplan *et al.*, 2009), increased career success, enhanced personal health, and formation of more extensive and higher quality personal relationships

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(Baas, De Dreu, and Nijstad, 2008; Lyubomirsky et al., 2005).

Recent studies have extended this research to entrepreneurship, reporting that in this domain, too, positive affect is related to beneficial outcomes such as increased focus and effort on future-oriented tasks (Foo, Uy, and Baron, 2009), as well as enhanced creativity (Baron and Tang, 2011). Further, Hayward et al. (forthcoming) have recently proposed that high levels of confidence among founding entrepreneurs facilitate positive emotions and expectations which then strengthen their resilience and capacity to found additional ventures. In addition, Cardon et al. (2009) suggest that entrepreneurial passion involves intense positive feelings toward engaging in meaningful roles associated with the entrepreneurial process (e.g., inventing, founding, developing). These authors propose that the positive feelings associated with involvement in such activities contribute to several beneficial outcomes, such as the adoption of more challenging goals, stronger goal commitment, and enhanced creative problem solving. In sum, there are strong grounds for proposing that high levels of positive affect among entrepreneurs can have beneficial effects both on entrepreneurs and the firms they develop.

While existing literature on the influence of positive affect in business contexts is extensive and provides relatively (although not entirely) consistent findings, it has not directly addressed three important issues. First, past research has not systematically examined the possibility that there are limits to the benefits of positive affect. This is somewhat surprising, given the fact that some findings (described in more detail later) indicate that high levels of positive affect may actually have an important 'downside' with respect to individual performance (Isen, 2000; Melton, 1995). Extrapolating from these findings, it could be expected that high levels of positive affect may similarly exert adverse effects with regard to entrepreneurs' performance on many tasks that contribute to firm performance. We address this possibility in the present research by investigating the overall function relating entrepreneurs' dispositional positive affect to firm performance.

Second, previous investigations on the impact of positive affect have focused on the relationship of positive affect with *individual* performance and outcomes. To the best of our knowledge, no research to date has examined the impact of entrepreneurs' positive affect on firm outcomes in the domain of entrepreneurship. A second goal of the present research

is that of addressing this gap in existing knowledge. Thus, it includes measures of firm performance. By so doing, this research responds to suggestions by several researchers (Alvarez and Busenitz, 2001; McMullen and Shepherd, 2006) that the field of entrepreneurship should seek increased understanding of the role of entrepreneurs in new venture creation and development. Other scholars (Baron, 2007; Baum and Locke, 2004; Locke and Baum, 2007; Shane, Locke, and Collins, 2003) have noted that relationships between entrepreneurs' characteristics (e.g., their skills, motives, goals, values) and firm outcomes are complex, involving numerous mediating and moderating variables. The findings of several studies (Baum and Locke, 2004; Hmieleski and Baron, 2008a; 2008b) offer support for this suggestion. For example, a promotion regulatory focus (a focus on attaining positive outcomes) has been found to be positively related to firm performance in dynamic environments, but not in stable ones (Hmieleski and Baron, 2008b). The present research seeks to contribute to continuing efforts to elucidate the role of entrepreneurs in firm performance by investigating the relationship between entrepreneurs' positive affect and measures of firm performance. We believe that this is important because recently there has been considerable emphasis on the benefits of promoting positive feelings among leaders as a means of enhancing organization performance (Erez et al., 2008; Sy, Cote, and Saavedra, 2005; Walter and Bruch, 2009). However, research has directed relatively little attention to the possible detrimental effects of high levels of positive affect (Judge and Ilies, 2004).

Third, previous research on the impact of dispositional positive affect has not considered important contextual factors. One contextual factor that is likely to have a particularly strong influence on the relationship between entrepreneurs' dispositional positive affect and firm performance is firm size. As explained below, there are grounds for anticipating that any effects of entrepreneurs' positive affect will be stronger in smaller than larger firms (Schneider, Ehrhart, and Macey, 2010). This logic is based on the fact that leaders tend to have more discretion over the strategic direction of smaller firms, which tend to have loosely coupled organizational structures (Hambrick and Finkelstein, 1987). For this reason, there is greater latitude for their dispositional characteristics to influence overall performance in small than in relatively larger firms (House, Shane, and Herold, 1996). Since entrepreneurs generally

lead the firms they establish, we investigate the potential moderating effects of firm size with respect to the relationship between entrepreneurs' positive affect and firm performance.¹

At this point, we should note that the present research is not specifically designed to investigate the wide range of complex mechanisms through which entrepreneurs influence firm performance (e.g., strategic decision making processes, development of organizational culture). That important task is somewhat beyond the scope of this investigation. Since dispositional positive affect is likely to diffusely influence firm performance through a variety of mechanisms, we have focused the current research on the basic task of exploring the nature of the relationship between entrepreneurs' dispositional positive affect and firm performance. However, in a later section, we describe several specific mechanisms through which such effects can potentially occur. Here, we turn next to the task of explicating the theoretical basis for the three **goals** described earlier.

Potential limits to the benefits of positive affect for firm performance

As we noted, existing evidence generally supports the conclusion that positive affect is related to a wide range of beneficial outcomes for individuals, such as enhanced performance on many tasks (Kaplan *et al.*, 2009) and increased career success (Lyubomirsky *et al.*, 2005). While the evidence supporting this conclusion is quite robust, it is not clear from past research whether there are limits to these findings. Do rising levels of positive affect ever reach a point at which benefits decrease or, perhaps, are replaced by detrimental effects? This is an important issue because it has often been assumed in extant literature that the effects of positive affect are generally, if not exclusively, beneficial (Baron, 2008; Lyubomirsky *et al.*, 2005). In a similar vein, the benefits of 'positivity' have recently been emphasized in research on positive organizational behavior (Luthans, 2002) in

the growing field of positive psychology (Seligman and Csikszentmihalyi, 2000), and positive organizational scholarship (Cameron, Dutton, and Quinn, 2003). Moreover, implications based on findings from these areas of research have quickly made their way into the popular press and the practitioner literature (Fredrickson, 2009; Hess and Cameron, 2006; Lyubomirsky, 2008; Seligman, 2002). Thus, some degree of caution may be both appropriate and useful in this context. In fact, careful review of extant evidence indicates that although most studies on the influence of positive affect have reported beneficial effects (Lyubomirsky *et al.*, 2005; Ashby *et al.*, 1999), some findings are contrary to this overall pattern (Judge and Ilies, 2004).

For example, previous research has reported that high levels of positive affect increase susceptibility to cognitive errors that can potentially interfere with effective decision making (Isen, 2000) and can reduce performance on judgment tasks and logic problems (Melton, 1995). Similarly, *dual-tuning theory*, proposed by Zhou and George (2007) indicates that high levels of positive affect may not always be beneficial in terms of facilitating creativity. In addition, high levels of positive affect have been found to reduce attention to negative information—especially input that contradicts currently held beliefs and attitudes (e.g., Forgas, 2001). This can have detrimental effects in situations where such input is crucial and, as will be explained below, may be especially harmful for entrepreneurs, who must pay careful attention to negative market information in order to be effective at meeting customer needs.

Finally, it should be briefly noted that two extant theories of affect—optimum level of affect theory (Oishi, Diener, and Lucas, 2007) and extended broaden-and-build theory (Fredrickson and Losada, 2005)—converge in suggesting that there may be limits to the beneficial effects of positive affect and that the relationship between such affect and performance on many different tasks may be curvilinear in nature. In sum, several findings and theoretical frameworks suggest that there may be definite limits to the beneficial effects of positive affect observed in many previous studies. One goal of the present research, therefore, is that of obtaining evidence on the existence of such limits—evidence concerning the shape of the overall function relating entrepreneurs' positive affect to firm outcomes. As noted earlier, a related goal is that of obtaining such evidence with respect to firm performance rather than individual performance.

¹We focus on the moderating effects of firm size rather than firm age because the rate at which firms grow varies greatly. Some may remain very small for several years, while others grow very rapidly. Research on organizational culture (Schneider *et al.*, 2010) suggests that the effects of founding entrepreneurs on their new ventures decrease with growing size which, again, is only moderately correlated with age. Thus, we focus in the current study on the moderating role of firm size and treat firm age as a control variable.

Moderating effects of firm size

A third major goal of the present research is suggested by the fact that as firms grow in size, the influence of founding entrepreneurs on their operations generally decreases. For instance, as noted by Staw (1991), the impact of founding entrepreneurs is maximum when their firms are small. The broad influence of founding entrepreneurs is often reduced as firms grow because standards and norms are put into place (Schein, 1997), and firms typically become more hierarchical and complex in structure (Miller, 1990). Therefore, as their companies grow, entrepreneurs tend to have less control over the actions of their firm (Hambrick and Finkelstein, 1987). Indeed, prior research has shown that the influence of a CEO's personality on organizational outcomes tends to be greater in smaller firms than in larger ones (Miller and Dröge, 1986). Additional research offers support for this proposal with regard to the fact that, as firms grow, they often reach a point at which founding entrepreneurs must 'let go'—surrender authority over operations to professional management—if their firms are to continue to develop and become established players within their industries (Wasserman, 2003). In short, firm size may moderate the relationship between founders' positive affect and firm performance, so that this relationship is stronger when firms are small than when they are larger in size. The present research is designed, in part, to investigate the moderating effects of firm size.

Focus of the present research on dispositional positive affect

Specific hypotheses relating to the goals noted earlier are described in the next section of this article. Before turning to the development of these predictions, however, it is important to clarify the fact that this research focuses on founders' *dispositional positive affect* rather than on their *state* (event-generated) *affect*. Existing theoretical frameworks concerned with affect (Lyubomirsky, King, and Diener, 2005) generally distinguish between these two aspects of positive affect. Dispositional positive affect (DPA) refers to stable tendencies to experience positive affect often and across many situations, while state (event-generated) affect refers to reactions to specific events. Although state and dispositional affect appear to derive from different sources (e.g., specific events versus stable biological

processes), existing evidence suggests that, in general, they produce parallel effects in many contexts (Baron, 2008). Thus, both could, potentially, be related to firm performance. Because the process of launching and operating new ventures unfolds over extended periods of time, we reason that dispositional positive affect on the part of founding entrepreneurs may be more directly relevant to firm performance. The present investigation, therefore, focuses on dispositional positive affect (hereinafter labeled 'DPA') rather than state (i.e., event-generated) affect. It is fully recognized, however, that both aspects of positive affect have important implications for entrepreneurship (Baron, 2008; Cardon et al., 2009) and should be carefully considered in future research. Having clarified this point, we turn next to the development of the specific hypotheses investigated in this study.

THEORETICAL DEVELOPMENT AND HYPOTHESES

The findings and theory summarized thus far suggest that entrepreneurs' DPA is significantly related to individual performance on many tasks and to a wide range of beneficial outcomes. However, this previous work has not specifically addressed the question of whether, and to what extent, entrepreneurs' DPA is related to firm performance. While entrepreneurs' DPA might potentially influence many aspects of firm performance, we suggest that it may be especially relevant to two such measures, both of which closely reflect the actions and dispositions of founding entrepreneurs. These measures are new product innovation and sales growth rate.

Entrepreneurs' DPA and new product innovation

Product innovation is an important aspect of firm performance. Research findings indicate that firms that engage in high levels of product innovation are more likely to survive and prosper than ones that do not (Damanpour, 1991; Shepherd and DeTienne, 2005). The innovation process enables firms to increase market share and market value (Chaney and Devinney, 1992), improve performance (Roberts, 1999), adapt to the market context in which they are embedded (Brown and Eisenhardt, 1995), create new markets (Burgelman, 1991), and enhance visibility and legitimacy among customers and com-

petitors (Schoonhoven, Eisenhardt, and Lyman, 1990).

In this context, Amabile (1996) has suggested that individual creativity underlies product innovation and, in a key sense, provides the 'raw materials' for innovation—the ideas and creative thought that are the basis for such innovations. Positive affect has been found to facilitate creativity in many contexts (Baron and Tang, 2011). Indeed, in summarizing available evidence on this issue, Ashby *et al.* (1999: 531) note that 'it is now well recognized that positive affect leads to greater cognitive flexibility and facilitates creative problem solving across a broad range of settings.' While there are certainly important exceptions to this overall pattern (see, e.g., George and Zhou, 2007), it appears that in many situations, positive affect enhances certain aspects of creativity. If, as Amabile (1996) suggests, creativity provides the basis for innovation, then high levels of DPA among founding entrepreneurs might well be expected to encourage product innovation by their firms. As noted earlier, however, there may be limits to this relationship. At very high levels of dispositional positive affect, processes that interfere with both creativity and innovation may be activated. For instance, as noted by Oishi, Diener, and Lucas (2007) and described above, very high levels of positive affect may encourage the belief that things are currently going so well that the need to expend additional effort on current tasks is relatively low. This might lead to reduced motivation on many tasks, including efforts to develop new products or services. Evidence for the occurrence of such effects has been reported by Foo *et al.* (2009).

Similarly, very high levels of positive affect have been found to encourage persons experiencing them to form unrealistically favorable evaluations of ideas or objects with which they have contact. Unrealistically high evaluations of their current products and services might lead entrepreneurs to conclude that there is little reason for further product development, since current offerings are already excellent. For this reason, entrepreneurs who are high in DPA may decide to allocate fewer resources toward activities that would lead to innovations (e.g., research and development). Finally, as noted earlier, high levels of positive affect tend to reduce attention to and processing of negative information (Forgas, 2001; Klayman and Ha, 1987). Thus, entrepreneurs high in DPA might be less likely to notice and consider negative information about current products or services—information often crucial for

effective innovation. On the basis of existing evidence and this reasoning, we offer the following hypothesis:

Hypothesis 1 (H1): The relationship between entrepreneurs' dispositional positive affect and firm innovation is curvilinear in nature, such that innovation rises with positive affect up to an inflection point, but then decreases beyond this point.

Entrepreneurs' DPA and sales growth

Another measure of firm performance that may be influenced by entrepreneurs' dispositional positive affect is sales growth rate. Growth is a key goal of many (although, not all) new ventures (Ireland, Hitt, and Sirmon, 2003). A large body of evidence in the field of marketing suggests that 'being positive sells' (Cialdini, 1993)—that individuals who are enthusiastic and positive about the products or services they offer or even, more generally, simply positive in their approach to customer interactions (Arun and Levy, 2003), are more effective at closing new business than ones who are not. This suggests that high levels of DPA on the part of entrepreneurs might be positively related to the effectiveness of sales efforts and, hence, to sales growth. However, additional evidence indicates that at very high levels, DPA may interfere with cognitive flexibility and resilience—factors that could impede effective sales efforts. For instance, literature on *persuasion* and *social influence* (Cialdini, 2008) suggests that very high levels of positive affect (and enthusiasm) are sometimes interpreted by the targets of such efforts as signs of insincerity, thus reducing the overall effectiveness of persuasion (Conger, 1998; Sharma and Levy, 2003). Similarly, very high levels of DPA on the part of an entrepreneur might generate a tendency on the part of entrepreneurs and others to ignore or downplay negative information from potential customers concerning products or services (Forgas, 2001; Forgas, Baumeister, and Tice, 2009). In part, this occurs because negative information can serve to reduce or undermine positive affect, and individuals may seek to avoid such effects by cognitively 'screening out' negative information (Raghunathan and Trope, 2002). However, failure to carefully consider such information in strategic decisions may result in reductions in the venture's dynamic capabilities—the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly

changing environments (Teece, Pisano, and Shuen, 1997). On the basis of this reasoning, we offer the following hypothesis:

Hypothesis 2 (H2): The relationship between entrepreneurs' dispositional positive affect and firm sales growth is curvilinear in nature, such that sales rise with increasing positive affect up to an inflection point, but then decrease beyond this point.

Moderating effects of firm size

As noted earlier, it has been found that the effects of entrepreneurs on their firms decrease as firms grow in size and complexity (e.g., Schneider *et al.*, 2010). This reduction in entrepreneurs' impact occurs through several different processes, including reduced creative influence on product and service offerings, the enactment of entrepreneurs' strategic decisions, and the development of norms and procedures that, over time, contribute to the formation of a distinct organizational culture (Miller, 1990; Miller and Dröge, 1986; Schneider *et al.*, 2010). For instance, Staw (1991) specifically suggests that the impact of founding entrepreneurs will be maximum when their firms are small in size. Research by Barrick and Mount (1993) has demonstrated that the relationship between personality dimensions and performance tends to be moderated by the level of job autonomy held by the individual. Similarly, Hambrick and colleagues (Hambrick and Abrahamson, 1995; Hambrick and Finkelstein, 1987) have suggested that the influence of upper echelons on firm performance is greatest under conditions of high, as opposed to low, levels of managerial discretion, which implies high levels of autonomy. Due to the more loose coupling or organic structure of smaller organizations (e.g., less need for standard operating procedure and assigned roles), leaders of smaller organizations are likely to have greater autonomy and managerial discretion than leaders of larger firms (Greening and Gray, 1994). Together, these findings and proposals suggest that any impact of entrepreneurs' DPA will decrease as firms grow in size and become more developed in terms of their internal structure. This reasoning, plus previous results confirming the fact that entrepreneurs' impact on the performance of their firms declines over time suggests the following hypotheses:

Hypothesis 3 (H3): The relationship between entrepreneurs' dispositional positive affect and product innovation is moderated by firm size, such that the strength of this relationship is greater for small firms than for larger ones.

Hypothesis 4 (H4): The relationship between entrepreneurs' dispositional positive affect and sales growth is moderated by firm size, such that the strength of this relationship is greater for small firms than for larger ones.

METHODOLOGY

Sample and procedures

We identified entrepreneurs, defined as current owners or co-owners who participated in establishing their businesses, on the basis of three sources. First, 354 entrepreneurs were randomly selected from the *Reference USA* database, which contains verified and accurate data (such as business name, sales volume, firm size, and year established) on more than 14 million U.S. businesses. This database is developed through more than 20 million phone calls to firms per year and is updated monthly. We selected those listed as *owners* (rather than managers) under the *contact person* category. In the survey, we asked respondents if they participated in the founding process of their ventures. The business owners who answered *yes* to this question were considered to be entrepreneurs and their completed surveys were used for analysis. These entrepreneurs were located in the Southeast United States and operated their businesses in a variety of industries. An additional 146 entrepreneurs were identified by business students at a large university located in this region. These entrepreneurs were included in a database of supporters of the school's entrepreneurship program. Third, we contacted 158 entrepreneurs on the distribution list maintained by the entrepreneurship center at a private university in the Midwest. The director of the development office contacted these entrepreneurs twice per semester to update them on the various activities of the entrepreneurship center and to request mentors/judges for entrepreneurship students' business plan projects and other school activities. Our survey (described below) was included in these requests, along with the director's endorsement of our research.

Table 1. Characteristics of subsamples

Variable	1st source (n = 99)		2nd source (n = 23)		3rd source (n = 35)		ANOVA test	
	Mean	Std. deviation	Mean	Std. deviation	Mean	Std. deviation	F	p
Entrepreneur age	3.42	1.20	3.91	0.95	2.94	1.11	5.09	0.01
Gender	0.82	0.42	0.78	0.42	0.79	0.41	0.08	0.92
Education	4.16	0.94	4.48	0.85	4.38	0.70	1.64	0.20
Experience	14.01	9.32	16.30	10.05	11.97	8.72	1.46	0.24
Firm size	63.21	179.52	19.04	26.19	41.38	124.99	0.86	0.43
Firm age	10.24	9.55	13.74	13.33	7.54	8.88	2.61	0.08
Positive affect	4.14	0.50	4.30	0.42	4.10	0.48	1.40	0.25
Innovation	1.88	2.91	3.09	3.09	2.40	2.55	1.77	0.18
Sales growth rate	0.00	0.07	0.01	0.05	-0.01	0.04	0.95	0.39

Entrepreneurs participated in the study by completing a survey designed to measure several of the variables of interest. In designing the survey, we conducted face-to-face interviews and discussions with eight entrepreneurs located in the Southeast. Each interview lasted from 40 minutes to an hour to ensure that items included were clear and readily interpreted by participants. The surveys were accompanied by self-addressed and stamped return envelopes. The invitation letter explained that we sought to survey entrepreneurs who participated in the founding process of their businesses. A copy of IRB approval was attached to guarantee confidentiality and assure respondents that participation was voluntary. A total of 658 surveys were mailed. Three rounds of mailing were sent to generate more responses. Between the mailings, phone calls and personal emails were used to follow-up with these entrepreneurs and encourage them to reply to the survey. After eliminating unusable surveys (e.g., some subjects responded that they did not participate in the founding process; in other cases, cover letters were mistakenly returned instead of the surveys), the final sample size was 157, reflecting a 23.9 percent response rate. We determined it was justifiable to combine the three samples to reach this total sample of 157 for the following reasons: (1) all participants in each sample were founding entrepreneurs; (2) no significant differences were found in terms of positive affect (the main independent variable), innovation, or sales growth rate (the two dependent variables) between the three samples; and (3) the three samples were highly similar with respect to entrepreneurs' gender, education, experience, and other basic firm information. The only significant difference is related to entrepreneurs' age: entrepre-

neurs in Sample 2 were slightly older than those in Samples 1 or 3. Table 1 summarizes the characteristics of the three subsamples and results of one-way ANOVA.

The *Reference USA* database provided firm information such as number of employees, sales, industry, and year established. We checked for nonresponse bias in terms of these firm characteristics. The results did not reveal any bias in the sample. The firms led by the entrepreneurs in our sample were operating in a wide array of industries, from agriculture and manufacturing to health care and social assistance. Among the 157 participating entrepreneurs, 80 percent were male, 7.4 percent were less than 25 years old, 17.6 percent were 25 to 34 years old, 25.6 percent were 35 to 44 years old, 30.7 percent were 45 to 54 years old, and 18.8 percent were 55 years or older.

Measures

Data were obtained from two sources: surveys completed by participating entrepreneurs and from archival data provided by the *Reference USA* database. Whenever possible, we used existing measures in order to maximize validity and enhance our ability to connect the findings to extant literature.

Positive affect

Positive affect was assessed using the 10 positive affect items from the Positive and Negative Affect Schedule (PANAS) (Watson, Clark, and Tellegen, 1988). Participants were asked on a five-point rating scale from 1 (not at all) to 5 (very much) how they generally (across situations and time) experienced

various feelings and emotions by referring to a list of adjectives indicating positive affect (e.g., interested, excited, enthusiastic). The PANAS has been used to measure dispositional affect in previous studies by asking respondents' to indicate how they feel on average (Barsky et al., 2004; Watson et al., 1988). The measure produced a Cronbach's coefficient alpha for the positive affectivity scale of 0.82 in the current study. It should be noted that although the mean level of positive affect reported by entrepreneurs is high (mean = 4.16), there was considerable variability among entrepreneurs. Indeed, the positive affect values range from 2.8 to 5, with approximately 50 percent of the respondents reporting their positive affect lower than the mean and 15 percent within one standard deviation of the mean. Thus, there appears to be sufficient variability to allow for investigations of the predicted curvilinear relationships.

Innovation

Innovation has often been measured through new product introductions (Katila, 2002). In our survey, the entrepreneurs were asked 'how many new products or services has your firm introduced in the past five years?' This item was used to obtain data on the *number of innovations* developed by firms. This measure of innovation has been found to be robust over a wide variety of research settings (Damanpour, 1991; Smith, Collins, and Clark, 2005).

Sales growth rate

Sales growth rate was measured in the same manner as in previous studies, by calculating the average rate of growth for each firm over the most recent five-year period (Covin, Green, and Slevin, 2006; Florin, Lubatkin, and Schulze, 2003; Walter, Auer, and Ritter, 2006). Sales data were gathered from the *Reference USA* database. In the survey, we also asked the entrepreneurs to report the sales generated in the previous year. We then compared the self-reported sales with the sales information obtained from the *Reference USA* database. Paired samples t-test revealed no noticeable differences ($t = 0.91$, $p = 0.36$). This cross-validation procedure ensured the accuracy of sales data obtained from the *Reference USA* database.

Because our sample represented many different industries and the growth rates of these industries differ, to control for industry differences, we calculated the average growth rate of the firm's principal

industry. Data for total industry sales were obtained from the *Fundamental Annual* section of the *Standard & Poor's Compustat*® database which provides U.S. and Canadian fundamental and market information on more than 30,000 active and inactive publicly held companies. The average growth rate of the firm's principal industry was then subtracted from the firm's growth rate. This industry-controlled growth rate has been used in previous studies (Amason, Shrader, and Tompson, 2006; Covin, Slevin, and Heeley, 1999; Covin et al., 2006) and is based on sales information drawn from the *Reference USA* database, adjusted by growth in specific industries.

Firm size

Firm size was measured by the number of current employees in the firm. It was investigated as a potential moderator of the relationship between entrepreneurs' DPA and firm performance. Previous research indicates that firm size is related to innovation and other aspects of entrepreneurial development (Baron and Tang, 2011; Ucbasaran, Westhead, and Wright, 2009). Thus, it was of interest within the present framework. Since firm size was negatively skewed (skewness statistic = 4.02), we calculated the logarithm of the number of employees (skewness statistic = 1.05).

Control variables

A total of eight control variables were included: entrepreneurs' age, gender, education, previous experience, creativity, firm age, firm net worth, and industry. *Entrepreneurs' age* was measured with five categories: (1) <25; (2) 25 to 34; (3) 35 to 44; (4) 45 to 54; and (5) >55 years old. *Gender* was coded as female = 0 and male = 1. *Education* was coded as '1' for less than high school degree; '2' for high school graduate; '3' for some college; '4' for four-year college graduate; and '5' for 'some graduate study beyond four-year college degree.' We measured entrepreneurs' *previous experience* with a three-item scale that asked respondents to report the number of years of previous managerial, entrepreneurial, and industrial experiences (alpha = 0.90, indicating that the three items were highly intercorrelated). These personal demographic characteristics were controlled to partial out any potential confounding effects on various indices of innovation-related outcomes (Reynolds, 2000). As we've indicated, creativity has a significant influence on

product innovation (Amabile, 1996; Baron and Tang, 2011). Thus, *creativity* was also controlled in our analysis. We employed the measure used extensively in creativity research (Shalley and Perry-Smith, 2001, and modified by Perry-Smith, 2006; alpha = 0.74).

Previous research has shown that firm age and firm net worth influence innovation and other aspects of entrepreneurial development (Baron and Tang, 2009; Ucbasaran *et al.*, 2009). Thus, *firm age*, calculated as the number of years from founding to present, was entered as another control variable. We adopted Reynolds' (2000) measure to gauge *firm net worth*: 'If you and other owners sold the business today, as a going concern, about how much would you get, after all debts were paid, including loans to the business by the owners? In other words, what is your estimate of the net worth of the business?' *Industry* was controlled because whether firms are operating in high-technology or low-technology industries may impact the firm's introduction of innovations (Thornhill, 2006). To control for industry, the survey listed 17 categories of industries following the North American Industrial Classification (NAIC) code, from which the entrepreneurs chose. Next, the 17 industries were categorized as high- or low-technology using Thornhill's (2006) categorization, which was developed based on the standardized scores for R&D intensity and the percentage of knowledge workers in each industry. As a result, high-technology industries (e.g., professional, scientific, technical services, manufacturing, and mining) were coded as '1,' and low-technology industries (e.g., construction, transportation, and warehousing) were coded as '0.'

RESULTS

Table 2 summarizes the means, standard deviations, and correlations for all variables. Table 3 presents the results of the analyses performed to examine the moderated curvilinear relationship of dispositional positive affect and firm size to number of innovations. Table 4 presents the results of the corresponding analysis for sales growth rate.

Hypotheses were analyzed using hierarchical regression analysis. Both the linear and curvilinear positive affect terms were mean centered before they were added to the regression. In testing the curvilinear effects predicted by the hypotheses, we followed Janssen (2001) and entered the predictor variables

Table 2. Means, standard deviations, and correlations

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Entrepreneur age	3.34	1.24											
2. Gender	0.81	0.41	-0.12										
3. Education	4.28	0.86	-0.16*	0.04									
4. Experience	13.88	9.49	0.73**	0.01	-0.16*								
5. Creativity	3.95	0.89	-0.15*	-0.15	0.19**	-0.17*							
6. Firm age	10.24	10.38	0.58**	-0.07	-0.17*	0.86**	-0.20**						
7. Firm size	51.75	150.16	0.21**	0.02	0.02	0.37**	-0.09	0.37**					
8. Firm net worth (in millions)	9.52	44.57	0.18*	0.08	-0.02	0.31**	-0.05	0.31**	0.69**				
9. Industry	0.18	0.39	-0.03	0.02	0.01	-0.06	0.02	-0.02	0.04	0.08			
10. Positive affect	4.16	0.47	-0.03	-0.21**	0.00	-0.00	0.33**	0.06	0.03	-0.02	-0.06		
11. # of innovations	2.40	3.39	0.16*	0.14	0.12	0.23**	0.21**	0.18*	0.01	-0.03	0.04	0.06	
12. Sales growth rate	0.09	0.05	0.04	-0.25**	0.12	-0.01	0.21**	0.09	0.08	0.05	-0.18*	0.43**	0.08

*p < 0.05; **p < 0.01.

Table 3. Results of the moderated curvilinear effects of dispositional positive affect and firm size on number of innovations

Variables	Number of innovations					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Entrepreneur age	-0.03	-0.03	-0.04	-0.05	-0.06	-0.06
Gender	0.24**	0.24**	0.27**	0.26**	0.26**	0.25**
Education	0.08	0.08	0.08	0.05	0.05	0.05
Experience	0.28	0.29	0.29	0.28	0.28	0.29
Creativity	0.31**	0.33**	0.32**	0.31**	0.31**	0.30**
Firm age ^a	0.11	0.12	0.15	0.07	0.07	0.06
Firm net worth	-0.14	-0.14	-0.15	-0.20*	-0.21*	-0.21*
Industry	0.03	0.03	0.01	0.00	0.00	0.01
Positive affect		0.03	0.09	0.09	0.09	0.09
Positive affect squared			-0.18*	-0.19*	-0.19*	-0.17*
Firm size ^a				0.18	0.18	0.22
Positive affect * firm size ^a					0.01	0.00
Positive affect squared * firm size ^a						-0.06
R ²	0.22	0.22	0.24	0.26	0.26	0.26
Adjusted R ²	0.16	0.15	0.17	0.19	0.18	0.18
ΔR ²	0.22	0.00	0.02	0.02	0.00	0.00
ΔF	3.87**	0.11	3.90*	2.80*	0.02	0.25

Note: Standardized coefficients are displayed in the table.
 N = 157; ^aLogarithm; *p < 0.05; **p < 0.01.

Table 4. Results of the moderated curvilinear effects of dispositional positive affect and firm size on sales growth rate

Variables	Sales growth rate ^a					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Entrepreneur age	-0.04	0.04	0.03	0.03	0.05	0.08
Gender	-0.10	-0.06	-0.03	-0.03	-0.02	0.01
Education	0.15	0.15	0.15	0.15	0.15	0.19*
Experience	0.06	-0.02	-0.02	-0.02	-0.04	-0.07
Creativity	0.32**	0.20*	0.20*	0.20*	0.17	0.22*
Firm age ^a	-0.15	-0.17	-0.14	-0.13	-0.14	-0.10
Firm net worth	0.06	0.06	0.05	0.05	0.07	0.10
Industry	-0.11	-0.09	-0.11	-0.11	-0.11	-0.11
Positive affect		0.30**	0.21*	0.21*	0.23*	0.24*
Positive affect squared			-0.20*	-0.20*	-0.18*	-0.25*
Firm size ^a				-0.03	-0.05	-0.20
Positive affect * firm size ^a					0.11	0.07
Positive affect squared * firm size ^a						0.24*
R ²	0.20	0.26	0.30	0.30	0.31	0.34
Adjusted R ²	0.15	0.21	0.24	0.23	0.23	0.25
ΔR ²	0.20	0.06	0.04	0.00	0.01	0.03
ΔF	3.58**	9.42**	5.45*	0.06	1.49	4.26*

Note: Standardized coefficients are displayed in the table.
 N = 157; ^aLogarithm; *p < 0.05; **p < 0.01.

in the following steps: (1) control variables; (2) the main effect of positive affect; (3) the quadratic term of positive affect; (4) firm size; (5) the interaction term between positive affect and firm size; and (6) the interaction term between positive affect squared and firm size.

Multiple analyses were conducted to investigate the threat of multicollinearity and for potential outliers. In terms of examining the threat of multicollinearity, no variance inflation scores were greater than 4.88 and all condition index scores were less than 30.00. Each of these statistics falls within acceptable ranges (Fox, 1997; Neter *et al.*, 1996; Tabachnick and Fidell, 2001), suggesting that multicollinearity is not a major threat to the integrity of the results. Potential outliers were assessed using leverage values and DfBetas. These analyses found no leverage scores higher than 0.76 and no standardized DfBetas greater than an absolute value of 0.29. The evidence from the leverage scores and DfBetas are well within accepted ranges (Neter *et al.*, 1996; Tabachnick and Fidell, 2001) and suggest that there are no outliers. We now consider results relevant to the individual hypotheses. Hypotheses 1 and 2 predicted that the relationship of entrepreneurs' dispositional positive affect with innovation and sales growth is curvilinear in nature, such that these variables increase with positive affect, but only up to a specific inflection point beyond which they decrease with further increments in positive affect. Results offered support for each of these hypotheses (coefficient $\text{positive affect squared} = -0.18$, $p < 0.05$ for innovation; and coefficient $\text{positive affect squared} = -0.20$, $p < 0.05$ for sales growth). In each case, the slope of the function was positive up to an inflection point, but negative beyond that point. As seen in Model 3 in Table 3 and Model 3 in Table 4, the addition of the squared term of positive affect explained an additional 2 percent for innovation and 4 percent for sales growth. Thus, results offered support for Hypotheses 1 and 2 and provided evidence for the predictions of curvilinear relationships between entrepreneurs' dispositional positive affect and each firm outcome measure.

To further examine the nature of the relationships between positive affect and the dependent measures (innovations and sales growth rate), we used the unstandardized coefficients to plot these relationships. Figure 1(a) indicates that the relationship between positive affect and innovation does indeed take the form of an inverted U-shape, as predicted. The slope of the function is initially positive, but

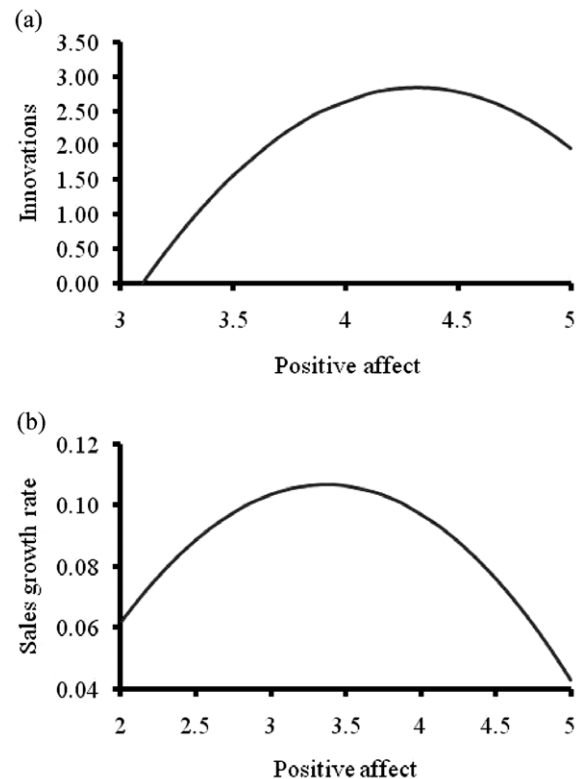


Figure 1. Curvilinear plots for the relationship of positive affect with number of innovations and sales growth rate

turns negative at high levels of dispositional positive affect. Figure 1(b) presents a similar function for sales growth. This figure, too, shows a curvilinear relationship between dispositional positive affect and innovations.

Hypotheses 3 and 4 suggest that the relationship between entrepreneurs' dispositional affect and both product innovation and sales growth is moderated by firm size, such that the strength of this relationship is greater for small firms than for large ones. Model 6 in Table 3 shows that the relationship between positive affect squared \times firm size on innovation is not significant (coefficient = -0.06 , n.s.). Thus, no support was obtained for H3. Model 6 in Table 4 shows that positive affect squared \times firm size has a significantly positive relationship with sales growth rate (coefficient = 0.24 , $p < 0.05$), indicating that, as proposed, the curvilinear relationship between positive affect and sales growth rate is stronger for smaller firms. Thus, support for H4 was obtained. Again, to further understand the nature of the interaction, we followed the graphing method

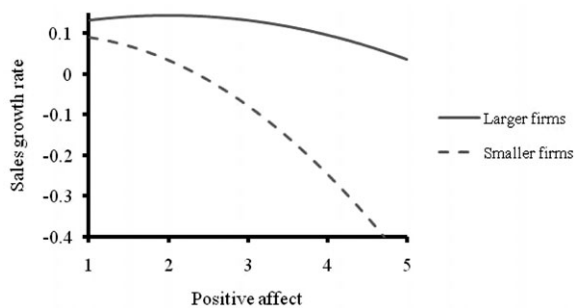


Figure 2. Sales growth rate as a function of positive affect and firm size

outlined by Aiken and West (1991) to form the figure to illustrate this moderating effect. Figure 2 reveals that the curvilinear relationship between positive affect and sales growth rate depends on the firm size. Specifically the rate of decline in sales growth rate is steeper for smaller firms, which suggests, consistent with Hypothesis 4, that detrimental effects of very high levels of dispositional positive affect among founding entrepreneurs are especially detrimental in small companies, when the impact of founders is at maximum levels.

DISCUSSION

The results of this study add to current knowledge in three important ways. First, although many previous investigations indicate that positive affect (both state and dispositional) is related to a wide range of beneficial effects with respect to task performance and life outcomes (Kaplan *et al.*, 2009; Lyubomirsky *et al.*, 2005), other findings contrary to this general pattern have also emerged (Melton, 1995). This suggests that there may be discrete limits to the benefits of positive affect. The results of the present study offer support for this suggestion. Entrepreneurs' DPA was found to be positively related to product innovation and sales growth rate, but only up to a discrete level. Beyond an inflection point, further increments in DPA were not related to additional improvements in performance and were, in fact, associated with actual declines. Although the possibility of such a curvilinear relationship between positive affect and task performance or other outcomes has been predicted by previous theorists (Oishi, Diener, and Lucas, 2007), no empirical evidence for such a relationship in the domain of entre-

preneurship currently exists. From a broader perspective, there have, to our knowledge, been no studies demonstrating a negative relationship between the DPA of upper echelons leaders (at any levels of DPA) with the performance of their firms. Thus, the present research adds to existing knowledge in this respect. This is an important contribution because recent literature on 'positivity' has strongly emphasized the benefits of positive emotions or feelings (Fredrickson, 2009; Hess and Cameron, 2006; Lyubomirsky, 2008; Seligman, 2002). For this reason, it is important to call attention to the fact that there may be limits to such outcomes.

It is interesting to note that the inflection point (i.e., the downturn) in performance on the functions shown in Figure 1 occurred at higher levels of dispositional positive affect for innovation than sales growth. This may reflect the fact that creativity—an important factor in innovation—is facilitated by positive affect (Baron and Tang, 2011). Thus, dispositional positive affect on the part of founding entrepreneurs may be positively related to innovation up to very high levels. Sales growth, in contrast, stems from many different factors, several of which, as noted earlier, may be adversely influenced by very high levels of positive affect. Thus, the inflection point occurs at a somewhat lower level. These suggestions are, of course, largely speculative in nature and should be carefully investigated in further research.

Second, previous research on the impact of positive affect has focused almost exclusively on measures of individual performance and outcomes. The present findings extend this body of research by providing direct empirical evidence that entrepreneurs' DPA is also significantly related to key aspects of firm performance. Specifically, entrepreneurs' DPA was related to both new product innovations and sales growth rate of firms. Thus, consistent with a growing body of findings and theory (Baron, 2008; Cardon *et al.*, 2009; Foo *et al.*, 2009), the present results indicate that entrepreneurs' positive affect is related to firm performance, as well as to individual performance. This finding is relevant to the suggestions by several researchers (Hitt *et al.*, 2007), that the field of entrepreneurship should seek to obtain greater understanding of the role of individual founders in the success of the ventures they launch. A small but growing body of evidence suggests that the characteristics of founding entrepreneurs (e.g., their skills, motives, values, and goals) are signifi-

cantly related to firm performance (Hmieleski and Baron, 2008a). The present findings add to this body of evidence by indicating that entrepreneurs' DPA should be included in the list of variables that can ultimately impact firm performance. It should be noted that these findings are consistent with results regarding the relationship between the characteristics of an organization's upper echelons and firm performance (Hambrick, 2007). We comment on this fact in more detail later.

A third contribution of this study involves the finding that the relationship between entrepreneurs' DPA and firm performance is moderated by firm size. As expected on the basis of suggestions by Staw (1991), Schneider *et al.* (2010), and others (Miller, 1990; Miller and Dröge, 1986), the relationship between entrepreneurs' DPA and firm performance is stronger for small ventures than larger ones. This is consistent with evidence indicating that the impact of founders on the structure, operations, and strategies of their firms is greatest when they are relatively small (Schneider *et al.*, 2010). To the best of our knowledge, however, firm size has not been investigated as a potential moderator of this relationship in previous research. Thus, the present research adds to current knowledge in this respect as well.

It should be noted that although firm size significantly moderated the relationship between entrepreneurs' DPA and sales growth rate, comparable findings were not obtained for new product innovation. This difference may reflect the fact that while the measure of sales growth rate was based on actual financial data, the measure of product innovation—although similar to measures employed in previous studies (Smith *et al.*, 2005)—was based on self-reports by the entrepreneurs. It is possible that the question used to assess this variable ('How many new products or services has your firm introduced in the past five years?') was subject to a degree of ambiguity. For instance, entrepreneurs may have varied greatly in their personal criteria for 'new,' with some interpreting this word as applying only to radically new products or services, while others interpreted it as applying to more incremental innovations. This would increase variability in responses to this question and, hence, reduce the likelihood that clear findings could emerge. This possibility can be examined in future studies by including additional measures of product innovation—for instance, reports by outside observers or by multiple persons within the firm.

Despite these and other limitations (discussed later), the findings of this research appear to have both theoretical and practical implications. With respect to theory, they indicate that although positive affect is indeed related to a wide range of beneficial outcomes in many different contexts, there are limits to these benefits, at least with respect to firm performance. Thus, as suggested by previous research (Isen, 2000), positive affect is not an unmixed blessing. It does indeed generate beneficial effects with respect to cognition, behavior, social networks, and even personal health; but at very high levels, it may initiate or be associated with processes that are counterproductive. Given the recent emphasis on the important benefits of positive affect among managers and other leaders (Erez *et al.*, 2008; Sy *et al.*, 2005; Walter and Bruch, 2009), it is important to emphasize this basic fact.

Second, the present research also indicates that DPA, a variable that has been found to exert strong and general effects on many aspects of individual behavior and performance, is also related to measures of firm performance. It has often been suggested that entrepreneurs do indeed play a key role in the launch and development of new firms. For instance, Baron (2007) describes them as the 'active principle' in entrepreneurship, since without their actions, no new firms would come into existence. Similarly, Shane *et al.* (2003) suggest that it is only because entrepreneurs decide to act that new firms are launched. In one sense, these statements are virtually 'truisms:' at some level and in many ways, entrepreneurs must indeed play a role in the structure, decisions, and actions of their firms. In another sense, however, such statements call attention to the fact that full understanding of the complex processes through which firms are conceived, launched, and successfully (or unsuccessfully) operated, must consider a very wide range of variables, including the skills, motives, and—as the present finding suggests—dispositional affect of entrepreneurs. This, of course, is in addition to many aspects of the environments and markets in which firms operate, technological advances, changes in social and demographic characteristics of populations, government policies and regulations, etc. Overall, the present research suggests that entrepreneurs are indeed an important part of the overall process and may, through complex intervening mechanisms and processes, play a role in forming the structure, strategies, and performance of their companies. We comment on the possible nature of these mediating processes later.

In addition to these theoretical implications, the present findings also have practical implications. Overall, they suggest that entrepreneurs' tendency to be higher than the general population in terms of dispositional positive affect can indeed be beneficial, but only up to a point. Thus, a key task for entrepreneurship education is that of equipping nascent or current entrepreneurs with appropriate *self-regulatory skills* they can use to adjust these reactions so that they work for their benefit rather than to their detriment. A large and growing body of research in cognitive science and related fields has focused on the nature of the cognitive mechanisms that permit individuals to control and direct their own behavior (Forgas *et al.*, 2009). This literature—particularly research on *metacognition* (individuals' understanding of their own cognition, especially recognition of what they know and do not know) and self-control (Baumeister, Vohs, and Tice, 2007)—can provide a rich source of information useful in developing techniques helpful to entrepreneurs. The present findings, then, help balance widespread beliefs that entrepreneurs' 'upbeat, enthusiastic' dispositions are important strengths on which they can, and often do, draw. Certainly, such suggestions are accurate, but only, it appears, up to a point. As with almost any other human characteristic, very high levels of dispositional level can indeed be 'too much of a good thing' and interfere with effective performance of key venture-creation tasks. However, it is important to note that entrepreneurs tend to be very high in DPA (Mean = 4.16 in the presents study). Thus, the potential negative effects observed in this research may have especially important implications for their effectiveness in generating high levels of performance by their firms.

Limitations and directions for future research

While the findings of the present research are generally consistent with our theoretically derived predictions, as is true of all empirical research, they are subject to important limitations. Perhaps the most significant of these relates to the scope and specific goals of this study. It was primarily designed to obtain evidence on the possibility that there are limits to the beneficial effects of positive affect reported in many previous studies and on the possibility that entrepreneurs' DPA is significantly related to firm, as well as individual, performance. Therefore, it was not specifically designed to examine in detail the mechanisms and processes that

mediate the impact of founders' DPA on firm performance. Explicating such processes is a crucial task for future research, but was somewhat beyond the scope of this initial study. However, several mechanisms through which entrepreneurs' DPA might influence firm outcomes can be briefly mentioned.

First, extensive literature indicates that the top management of an organization exerts powerful effects on organizational structure, function, and outcomes (Hambrick and Mason, 1984). Further, ongoing research in this area has identified several characteristics of top managers in an organization that are significantly related to firm performance, for example, top managers' education and experience (i.e., human capital, Wright *et al.*, 2007). Hambrick (2007) has noted that additional characteristics of top managers may also play a role and that these should be identified and investigated in further research, along with efforts to clarify the mechanisms through which they influence firm performance. The present research is consistent with these suggestions and contributes to upper echelon theory by suggesting that entrepreneurs' DPA may be an additional factor related to firm performance.

Second, research and theory on organizational culture—the shared values, beliefs, and ideologies with an organization—suggests that founders play an important role in the development of organizational culture; indeed, the culture of new organizations often closely reflects the values, interests, and beliefs of their founders (Schneider *et al.*, 2010). Further, certain aspects of organizational culture (e.g., a high value on cooperation within the organization, emphasis on development of individual skills) have been found to be positively related to measures of financial growth, such as product sales growth and ROA (Smerek and Denison, 2007). Entrepreneurs play a key role in forming organizational culture and, therefore, in making such values part of the organization's lasting culture. In this way, they may influence its performance or effectiveness. As Schneider *et al.* (2010: 404) note: '... organizational success is inextricably linked to the values possessed by those organizations that allow for the vision and expectations of the founders to persevere and guide aggregate behavior and effective decision making.' On the basis of these findings and suggestions, it seems possible that entrepreneurs' DPA may play a role in the formation of organizational culture and, through this mechanism, can influence firm performance. For instance, to mention one possibility, entrepreneurs high in DPA may promote development of cultures in their firms

that strongly emphasize cooperation and good relations between employees. This could facilitate new product innovation by enhancing creativity, but could, at very high levels, prove counterproductive if it minimizes or prevents the kind of 'cognitive conflict' that has been found to be related to both creativity and effective group decision making (i.e., strategic decisions, Amason, 1996).

Third, a large amount of previous research suggests that positive affect influences several basic cognitive processes. For instance, as noted previously, positive affect enhances cognitive flexibility and, hence, creativity, but may also increase susceptibility to important cognitive errors, such as the optimistic bias (Hmieleski and Baron, 2009). Similarly, positive affect may facilitate certain aspects of perception—broadening the scope of information noticed and stored for further processing. But at very high levels, it may broaden the scope of perception so much that important details are overlooked (Cardon *et al.*, 2009). Further, as noted earlier, very high levels of positive affect may interfere with noticing and processing negative information—information contrary to currently held views or beliefs (Klayman and Ha, 1987). In sum, entrepreneurs' DPA may be positively related to basic aspects of cognition, but at very high levels might facilitate processes that interfere with these processes. Recently, it has been suggested that basic cognitive processes (such as perception and memory) play a key role in important tasks—such as opportunity recognition and evaluation—performed by entrepreneurs (Baron, 2006; Grégoire, Corbett, and McMullen, forthcoming). Thus, to the extent high levels of DPA interfere with the capacity to perform such tasks effectively, they may reduce firm performance.

Additional limitations involve the fact that variables of focal interest in the present research were, for the most part, assessed through a single survey. This raises concerns with respect to common method variance and the inflated relationships it generates. Research has demonstrated, however, that artifactual second-order effects (such as curvilinear relationships) cannot be created by these potential problems, although true second-order effects can be attenuated (Evans, 1985). The magnitude of these potential measurement artifacts were evaluated by means of procedures outlined by Williams, Cote, and Buckley (1989) and recommended by Podsakoff, MacKenzie, and Lee (2003). We first estimated the fit of a measurement model that allowed the study's focal constructs (i.e., positive affect, innovation, and sales

growth) to covary. We then included a 'same source' factor for each item indicator of the three latent constructs and re-estimated the model. The chi-square difference test between the two models suggests that a same source factor is present ($\Delta X^2 = 64.64$, $\Delta df = 11$, $p < 0.01$). Nonetheless, a comparison of the latent correlations (ϕ) between constructs in both models indicates a marginal degree of method bias, since the latent correlations (i.e., corrected for unreliability) were inflated, on average, $\Delta\phi = 0.05$. Considered collectively, results of these procedures indicate that the complex pattern of curvilinear relationships observed between positive affect and each of the outcome variables measured in our survey is unlikely to be a result of same source confounds.

Since the design of our study is cross-sectional and we have not examined the firms in our sample from their initial founding, it is possible that we have oversampled successful ventures and, as a result, there may be a degree of survival bias within our data. We used two different procedures to probe the extent to which such a bias may have influenced our results. First, we split our sample in half based on firm age and conducted t-tests of mean difference between the two groups on the study's focal variable (i.e., DPA). A significant mean difference in DPA was not observed ($t = -0.23$, $p > 0.05$). Second, following Cohen *et al.* (2003), we created a two-way interaction term of firm age x DPA, on both measures of firm performance (i.e., number of innovations and sales growth rate). If there is an age effect (i.e., survival bias) in our data for the relationship of DPA with our measures of firm performance, then we should detect such bias through a significant interaction term of firm age x DPA on these variables. In each case, however, the interaction coefficients of firm age x DPA on these dependent measures was nonsignificant. The results of these tests suggest that the relationship between entrepreneurs' DPA and firm performance identified in the current study is not significantly related to the early survival of new ventures. Therefore, it appears that survival bias does not pose a major threat to the integrity of our results.

Future studies should also investigate the potential moderating role of environmental variables on the relationship between entrepreneurs' DPA and firm performance. For instance, environmental benevolence may play a particularly important role in this respect. In relatively benevolent environments, the willingness to accept risks and act boldly, which are often associated with high levels of dispositional positive affect (Isen, Nygren, and Ashby,

1988), may be adaptive and contribute to success. In less benevolent environments, such as those typically faced by entrepreneurs, willingness to accept risk and act boldly may be somewhat less adaptive and can result in detrimental outcomes. Thus, among entrepreneurs, moderate levels of dispositional positive affect may be most appropriate in a wide variety of contexts, while very high levels may indeed prove counterproductive, especially in environments that are highly competitive and changing rapidly. Future research can investigate this and related possibilities through the inclusion of measures of environmental munificence (Covin and Slevin, 1989), competitiveness (Sharfman and Dean, 1991), and dynamism (Dess and Beard, 1984).

CONCLUSIONS

The results of the present research add to current knowledge concerning the role of affect in the domain of entrepreneurship and indicate that entrepreneurs' DPA is significantly related to the performance of their ventures. In a general sense, they suggest that entrepreneurs' tendencies to experience high levels of positive affect can indeed be a source of strength both for them and their firms—it can encourage innovation and rapid sales growth. However, this is true only up to a point. Beyond a specific level, further increments in dispositional positive affect are associated with declines, rather than further advances, in firm performance. A key task for entrepreneurs, then, is that of *managing* or *regulating* their own dispositional positive affect so they realize the benefits it can confer (Cardon et al., 2009; Hayward et al., forthcoming), but simultaneously minimize the potential dangers associated with being excessively, and unrealistically, upbeat.

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