



Beyond hubris: How highly confident entrepreneurs rebound to venture again[☆]

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ARTICLE INFO

Article history:

Received 6 May 2008

Received in revised form 10 March 2009

Accepted 11 March 2009

Keywords:

Confidence

Resilience

Serial entrepreneurship

ABSTRACT

This article outlines why highly confident entrepreneurs of focal ventures are better positioned to start and succeed with another venture; and therefore why overconfidence in one's capabilities functionally persists and pervades amongst entrepreneurs. By combining cognitive perspectives on confidence in decision making with Fredrickson's [Fredrickson, B.L. 1998. What good are positive emotions?. *Review of General Psychology*, 2, 300–319.; Fredrickson, B.L. 2001. The role of positive emotions in positive psychology: the broaden-and-build theory of positive emotions. *American Psychologist*, 56, 218–226.; Fredrickson, B.L. 2003. The value of positive emotions. *American Scientist*, 91: 330–335] 'broaden-and-build' theory of positive emotions, this paper elaborates the manner in which such entrepreneurs can develop emotional, cognitive, social and financial resilience that can be marshaled and mobilized for a subsequent venture.

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1. Executive summary

This article outlines why more confident founders of new ventures that fail are better positioned to start subsequent ventures; and therefore why overconfidence persists and pervades amongst founders. By combining cognitive perspectives on confidence in decision making with Fredrickson's (1998, 2001, 2003) 'broaden-and-build' theory of positive emotions, this paper elaborates the manner in which such founders can develop emotional, cognitive, social and financial resilience to their failure; and, therefore, become better equipped to start another venture. Here, such forms of resilience are characterized as 'second order' benefits which can potentially overcome the more immediate costs of being overconfident.

2. Introduction

An axiom of behavioral decision theory is that actors with better calibrated judgment are stronger decision makers. Within behavioral decision theory, overconfidence is often regarded as the most pervasive and damaging of the errors of judgment that managers can and do make. In particular, some theory and evidence suggests that overconfidence has predictable effects on key strategic outcomes, including over-entry into new markets (Camerer and Lovo, 1999) over-investment and commitment to risky, new projects and assets (Hayward and Hambrick, 1997; Simon and Houghton, 2003; Malmendier and Tate, 2005) and a failure to conserve sufficient resources for emerging opportunities (Hayward et al., 2006). Highly confident actors may also be more prone to 'throwing good money after bad' projects before abandoning them (Staw and Ross, 1989).

[☆] We thank Max Bazerman, Maw Der Foo, Adam Grant, Dale Griffin, Don Moore, Dean Shepherd, Gretchen Spreitzer and Bob Sutton for valuable comments. The first author would like to honor Sumantra Ghoshal for his supreme confidence which has forged enduring inspiration.

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But, while the highly, even supremely confident judgment that fuels overconfidence may be damaging in many settings, it may also be instrumental to success in others because it produces a crucial by-product – positive affect (Armor and Taylor, 2002; Lyubomirsky et al., 2005). A vast array of exploratory and inventive organizational activities – drug development, natural resources exploration and new venture formation to name a few – involve high base rates of failure and they call for highly resilient actors who must valiantly persevere for eventual success (Shepherd, 2003). In keeping with behavioral decision theory and the evidence on entrepreneurs' confidence, we define and would measure entrepreneurs' confidence as task specific – it is the emotion-laden belief that entrepreneurs have about their ability to ensure the success of their focal venture (Cooper et al., 1988; Lichtenstein and Fischhoff, 1977). This closely resembles confidence in one's self-efficacy: One's level of belief “in one's capabilities to organize and execute the courses of action required to produce given levels of attainments (i.e. new venture success, Bandura, 2000: 18)”, as we will elaborate. By contrast, optimism, narcissism and self-esteem are more enduring traits which are less changeable from one venture to the next.

This article informs the question of which entrepreneurs are more likely to become serial entrepreneurs by focusing on entrepreneurs' ability to bounce back. By serial entrepreneur, we are referring to individuals who start another venture after leaving one they previously founded. Some estimates of new venture performance suggest that roughly half of all ventures fail within five years of their inception and, therefore, most serial entrepreneurs are likely to have experienced a failed focal venture (Cooper et al., 1988; Dunne et al., 1989; Headd, 2003; Phillips and Kirschhoff, 1989). Since serial entrepreneurs may well have failed on a prior venture, and failure can carry tremendous personal and financial costs, their resilience is a crucial dynamic in new venture formation. Further, serial entrepreneurs present an important setting insofar as they help to drive the amount of new venture activity and prosperity within and between economies (Ucbasaran et al., 2003; Wright et al., 1997).

What then prepares an entrepreneur to press on to found again, especially after failure? Our answer to that question examines the ways in which confidence and emotion contribute to both firm founding and entrepreneurial resilience. That is because entrepreneurs are generally if not overwhelmingly confident about the success of their ventures; and confidence is a crucial element of new venture formation. In a sample of 2994 founders, Cooper, Woo and Dunkelberg (1988) found that 81% of them rated the likelihood that their ventures would succeed at over 70%; and about one third of these founders were entirely certain of success. This study highlights that even though entrepreneurs are highly confident, there is considerable variance in the level of confidence that founders have in launching subsequent ventures.

To study this context, we borrow from and develop Fredrickson's (1998) 'broaden and build' theory of positive emotions to posit that higher levels of confidence in ventures fuel positive emotions which in turn generates resilience for building new ones. Fredrickson's (1998, 2001) broaden and build theory describes the form and function of several discernable positive emotions and has been supported by a body of systematic evidence, both in the laboratory and the field (for a review, see Fredrickson and Cohn, in press). In the present context, broaden refers to founders' ability to generate and expand their own thought-action repertoires and to arrive at creative solutions to the novel problems they face on prospective ventures. Build refers to the ability of such expansive thought-action repertoires to help these entrepreneurs generate personal and social resources (e.g. relationships with founding members and capital providers) that can endure beyond any particular venture.

Our central thesis is that highly confident entrepreneurs are better positioned to start subsequent ventures, even if they are overconfident (i.e. their focal venture failed in spite of their confidence that it would succeed). By examining the *second order effects* of confidence in the context of *subsequent* founding, we integrate the existing literature on entrepreneurial confidence with relevant emotional aspects of entrepreneurial decision making. Second order effects concern entrepreneurs' ability to recover from the first order or direct effects of ostensibly 'faulty judgment' and failed ventures. Examining second order effects of critical judgments may inform whether behavioral decision theorists – with their focus on the immediate and proximate effects of errors from focal judgments – overstate the costs of overconfident judgment by confining their analysis to focal judgments (Armor and Taylor, 2002; Arkes, 1991).

This article is organized around its theoretical and practical contributions. It begins by outlining the literatures on entrepreneurs' experience and confidence in decision making to underscore our choice of constructs. The remaining bulk of the article links founder confidence to the second order effects of positive emotions associated with initial confidence and to their ability to subsequently recover – emotionally, cognitively, socially and financially – from venture failure.

3. Examining recovery from venture failure

3.1. Founding experience and subsequent venture performance

Our focus on serial entrepreneurs follows evidence that prior ventures can provide valuable resources for entrepreneurs' future use, consistent with the predictions of self efficacy theory (Bandura, 2000). Using a dataset of 149 new ventures that were founded by MIT graduates, Hsu (2004) shows that experience helps entrepreneurs develop new skills and generate social capital that can be used to, for example, recruit executive officers. Results from his analysis suggest that greater founding experience improves entrepreneurs' ability to get timely financing and better valuations from venture capitalists. He also shows that greater prior start up returns (any prior member of the founding team liquidated a prior venture at an average self reported internal rate of return of 100% or higher on Series A investment) increased the likelihood of being funded by a direct venture capital tie for a focal startup by 32% and increased the premium on pre-money venture valuation by 45%.

Hsu's results are supported by other evidence that more experienced entrepreneurs have greater access to financial resources (Zacharakis and Shepherd, 2005). Kaplan and Stromberg (2004) reviewed the investment analyses of 11 venture capital firms in 67

portfolio firms and found that investors usually cited founding experience as a reason for investing in ventures. Memoranda they cite includes statements like: “High sought-after entrepreneur/founder, who co-founded a successful company that subsequently went public” and negative ones like “Management is young and relatively inexperienced ...” (Kaplan and Stromberg, 2004: 2185). Some venture capital investors report a preference for entrepreneurs who have failed at least once, on the basis that these entrepreneurs will be more self-aware (Cope et al., 2004).

A similar pattern emerges from evidence on the effects of venture experience on entrepreneurs' social capital which is also positively related to entrepreneurs' access to financial capital. By starting ventures, entrepreneurs can receive third party endorsements and funding (Stuart et al., 1999), form managerial teams (Hsu, 2004), develop ties with venture capitalists (Shane and Cable, 2002; Shane and Stuart, 2002), suppliers and so forth (Baum and Silverman, 2004; Burton et al., 2002). Further, entrepreneurs with stronger prior venture performance should develop better reputations, social networks and positions within such networks.

Taken together, this evidence suggests that prior ventures are a source of resources for future ones, especially if they are more successful. Lacking in this literature, however, is theory and evidence on the focal question for this paper: Which entrepreneurs have greater resilience to form subsequent ventures? We analyze serial entrepreneurs because, for a variety of reasons, individuals may accumulate resources on a focal venture that they cannot readily apply to it (e.g. because these resources are not readily apparent or cannot be readily applied, say, because the venture has failed or is failing). In developing our theory, we recognize that entrepreneurs' prior success or failure may profoundly influence the likelihood that they gain support for subsequent ventures. However, where possible, our following analysis will focus on the more salient case of rebounding from failure because a) such outcome seems likely given the high base rates of venture failure and b) we believe that the dynamics that we describe will be even stronger amongst more successful entrepreneurs who already enjoy positive affect from their success.

We now turn to our choice of confidence as a causal mechanism. Given the robust evidence that entrepreneurs are both highly confident and self-efficacious (Boyd and Vozikis, 1994; Chen et al., 1998; Townsend et al., in press), there is reason to use confidence in self-efficacy as our central theoretical mechanism.

3.2. Relevance of high confidence in self efficacy for venture formation

Confidence beliefs come in three forms: in one's abilities; in the future and in general knowledge (Griffin and Varey, 1996; Hayward et al., 2006). We are unaware of any evidence that links entrepreneurs' propensity to start new ventures to the confidence in their results on tests on general knowledge questions. In general, these questions have been designed to ascertain the level of one's calibration in confidence, rather than to predict behavior (Lichtenstein et al., 1982). Moreover, there is some evidence that entrepreneurs' undue confidence in the future may damage their ability to gain important resources because it can convey the impression of arrogance and lack of commitment (see Hayward et al., 2006). Hence we focus on confidence in one's abilities which is very close to self efficacy, also defined as 'beliefs in one's capabilities to mobilize the motivation, cognitive resources, and courses of action needed to meet given situation demands' (Wood and Bandura, 1989: 408).

Although Confidence is closely related to self efficacy, in our use of the construct, confidence is an emotionally-laden belief that engenders the positive emotions that enable entrepreneurial resilience in respect to four types of resources that enable entrepreneurs to establish a new venture (see Sutcliffe and Vogus, 2003, for a related construct): (1) Emotional resilience refers to the positive behavioral adaptation that individuals can experience after adversity and loss (Fredrickson et al., 2003); (2) Cognitive resilience is the energy and enthusiasm with which entrepreneurs form positive judgments about starting new ventures after they leave prior ones (Heath et al., 1998). It entails a rebound in the creative and agentic styles of thinking that characterize serial entrepreneurs; (3) Social resilience concerns entrepreneurs' ability to maintain, sustain and build upon relationships with *team members on prior ventures* that may have been damaged by such failure (Fredrickson, 1998); and, (4) Financial resilience refers to entrepreneurs' ability to obtain capital on subsequent ventures as a result of their decisions and actions on their focal ventures. The second order effects of greater emotional, cognitive, social and financial resilience allow more confident entrepreneurs to found subsequent ventures, as depicted in Fig. 1 below.

For completeness, the grey box in Fig. 1 refers to the well-established result that greater confidence (i.e. confidence in the outcome and confidence in one's ability) positively relates to firm founding. To this, we add second order effects, elaborating the four forms of resilience that increase entrepreneurs' ability and likelihood of founding and succeeding with another venture.

As discussed, we argue that amongst entrepreneurs who have started a prior venture, greater confidence on focal ventures produces positive affect that enables emotional, cognitive, social and financial recover from that prior venture. We begin with emotional resilience because ventures can be sources of profound personal loss to entrepreneurs and can even engender grief (Nolen-Hoeksema et al., 1997; Parkes, 1988). Without sufficient emotional resilience, entrepreneurs' may lack the motivation to try again.

4. The consequences of founder confidence for entrepreneurs and their ventures

4.1. More confident entrepreneurs will have greater emotional and cognitive resilience

Greater grief intensifies negative thoughts surrounding the circumstances, if not the underlying causes, of venture failure (Lyubomirsky and Nolen-Hoeksema, 1995), thereby producing ruminations or passive and repetitive thoughts about one's distress. Ruminations can consume information processing capacity that could otherwise place one's loss in the broader perspective of

other matters that lie ahead (Bower, 1992; Lyubomirsky and Nolen-Hoeksema, 1995). Thus, negative emotions from failed ventures can stymie entrepreneurs' ability to allocate attention and process the information needed to evaluate and act on the prospect of starting subsequent ventures (Mogg et al., 1990).

Failed ventures cease to be vehicles for entrepreneurs to express their creative energies (Cova and Svanfeldt, 1993), gain greater control over their lives (Douglas and Shepherd, 2000; Katz, 1994), direct their own labor (Baumol, 1990) and so forth. One founder who has experienced three business failures observes that "...business failures leave considerable cognitive wreckage in their wake. That's why many failed entrepreneurs hesitate to try again" (Lancaster, 2005). Because failed ventures can induce material grief, entrepreneurs' emotional and cognitive resilience may affect their propensity to become serial entrepreneurs.

Fredrickson's broaden and build theory of positive emotions, and the empirical support for it, would suggest that entrepreneurs' greater confidence on focal ventures engenders positive emotions which help them to build relationships and otherwise strengthen their emotional resilience to venture failure. This research shows that, even if positive emotions themselves are transitory, such thought-action repertoires and the resources which they generate are sufficiently durable as to help entrepreneurs start subsequent ventures. That is, broadening attention and thinking expands our scope to learn from failure, promotes the discovery of novel ideas, actions and social bonds and enables physiological recovery from grief (Fredrickson et al., 2000; Fredrickson and Levenson, 1998).

But how does greater confidence engender positive emotions? First, greater confidence confers stronger conviction that actors can enact a desired future, heightening a sense of expectation, excitement and aspiration, amongst other forms of interest and motivation (Seligman and Csikszentmihalyi, 2000). Additionally, greater confidence can increase one's feelings of safety and security. The specific positive emotions studied by Fredrickson (1998) are likely to manifest themselves in a setting where an individual feels safe and secure. To the extent that confidence increases excitement, expectation, and aspiration, and also decreases feelings of uncertainty and uneasiness, entrepreneurs with greater confidence in their focal ventures are also likely to have stronger positive emotions towards their ventures and their capabilities and, in turn, this confers emotional resilience through a number of mechanisms. This leads us to our first proposition:

Proposition 1. *More confident entrepreneurs are more likely to experience positive emotions during the startup process.*

Resulting positive emotions broaden such tendencies by widening the array of thoughts and actions that come to mind, enabling people to enhance their displays of flexibility, creativity, openness to and integration of new information and efficiency (Fredrickson, 1998, 2001; Fredrickson and Branigan, 2005; Isen et al., 1987). By contrast, negative emotions elicit specific negative action tendencies (Frijda, 1986; Tooby and Cosmides, 1990a,b) which harm one's ability to recover from failure.

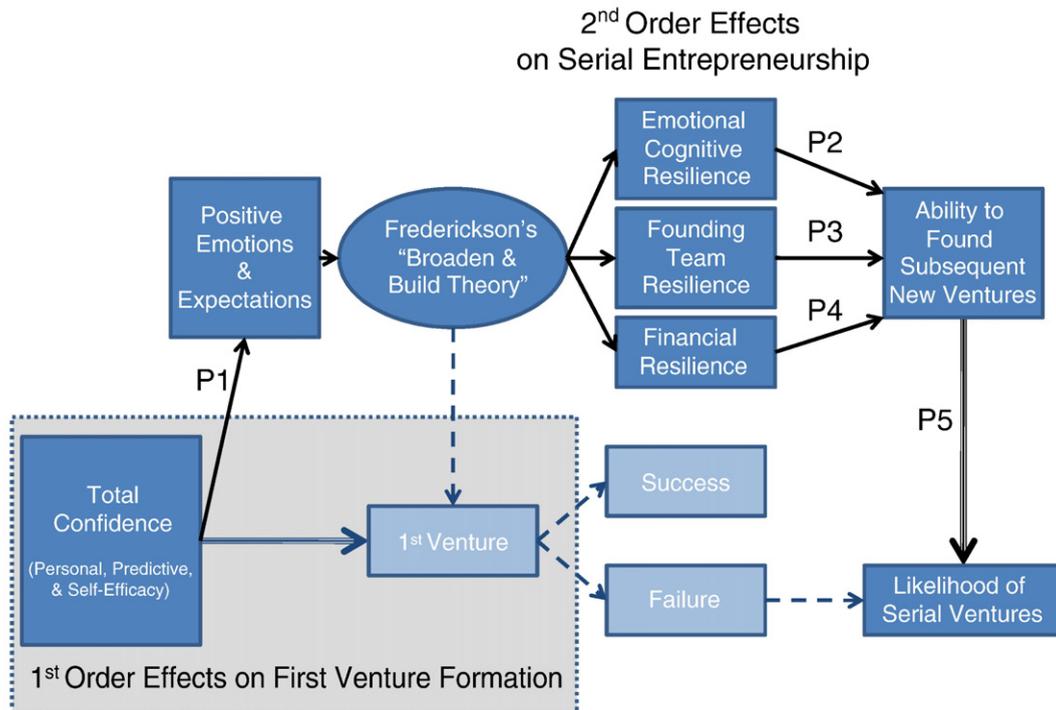


Fig. 1. Linking founders' confidence to new venture formation.

Positive emotions are akin to emotional reserves that can be drawn against when they are most needed, often after setbacks, strengthening one's resolve to persevere with a course of action (Fredrickson, 2001: 220). More confident entrepreneurs are more likely to persist with their confident judgment in a manner that will overcome their emotional loss from a failed venture and their sense of dread about a further loss (Seligman, 1998). Because such entrepreneurs are less likely to perceive business failure as a traumatic event that undermines their fundamental assumptions, they are also more likely to persevere with more confident beliefs about prospective ventures (Fredrickson, 2003; Seligman, 1998). Conversely, entrepreneurs who are less confident about the prospect of their focal ventures will also be more cautious – for instance, by being more sensitive to base rates of venture failure (Abramson et al., 1978). Together, this theory and evidence suggests that more confident entrepreneurs are better equipped, both emotionally and cognitively, to recover from the grief that they may experience following the loss of their ventures. In contrast, less confident entrepreneurs (who may well be better calibrated) will be more heedful of the conditions in which future ventures will fail. Put another way:

Proposition 2. *More confident entrepreneurs will experience greater emotional resilience from failed ventures.*

While more confident entrepreneurs may have the emotional and cognitive reserves to found new ventures, it is another issue whether they will have the social and financial resources to make such founding possible.

4.2. *More confident entrepreneurs will gain greater commitment from founding team members*

Though limited, some theory and evidence suggests that more highly confident actors deploy resources more quickly and liberally, 'burning other people's money' (Malmendier and Tate, 2005). In their 'hubris theory of entrepreneurship' Hayward et al. (2006) speculate that overconfident entrepreneurs tend to raise insufficient capital and over-commit resources to the initial opportunities which they set out to pursue. By underestimating the prospects of failure, such entrepreneurs also make fewer contingencies for it; and fail to see the scope for focal ventures to serve as platforms for prospective ones (Kahneman and Lovallo, 1993; Kahneman and Tversky, 1979). Through this financial mismanagement, entrepreneurs may deter stakeholders including prospective investors in a process of over promising and under delivering.

A picture can quickly emerge of the highly confident, but hapless serial founder who destroys social capital. Potentially, an adverse selection problem arises in which those most likely to start another venture are also those who are least likely to learn from their mistakes, and are perhaps the most mis-calibrated of all entrepreneurs. Similarly, overconfidence can pertain to one's forecasts and abilities; and there is emerging evidence that the latter is more strongly linked to the likelihood of starting a new venture (Griffin and Varey, 1996).

4.3. *Founder confidence and team commitments to subsequent ventures*

In this vein, more confident entrepreneurs are better placed to eventually translate their judgment into a self fulfilling prophecy or a prediction that "is in the beginning, a false definition of a situation evoking a behavior which makes the originally false conception come true" (Merton, 1957: 195). Self-fulfilling prophecies create expectations that prod actions and effort and may prove to be especially efficacious for those who are starting again after a failed experience (Weick, 1995).

Take the case of a hypothetical founder who predicts that the likelihood that her venture will win certain customers next year is 100% and that, therefore, she is 90% certain that her venture will succeed. The self-fulfilling prophecy concept would suggest that she will exert greater effort and commitment towards winning such customers, a result that is consistent with evidence that more confident actors exert greater effort (Gervais et al., 2004; Krahermer, 2003). Relative to better calibrated (or less confident) competitors who, say, predict that they are 50% likely to win such customers, she will treat her would-be customer as an actual one, making greater relationship-specific investments and invoking stronger norms of reciprocity for future interactions (Darley and Fazio, 1980; Miller and Turnbull, 1986).

Through similar dynamics, more confident entrepreneurs who exert greater effort may also attract more motivated co-workers, who also share the view that problematic ventures will eventually succeed. Gervais and Goldstein (2005) show that more overconfident entrepreneurs (defined as those who overestimate the degree to which their effort contributes to team success) become better positioned to hire harder working colleagues and extract greater effort and loyalty from them. While their model awaits testing, they theorize that overconfidence both overcomes free riding and coordination problems and thus makes the overall team better off. Stated differently, their loyalty and output is higher in the failed venture than it would have been at ventures with entrepreneurs who were less confident (Hsu, 2004).

Given the risks that are inherent in new venture formation, a self selection process for joining such a venture exists in which more confident entrepreneurs attract more risk-tolerant teammates (Gervais and Goldstein, 2005). If such entrepreneurs are also more decisive, risk seeking and passionate, they may well be better positioned to retain founding team members who covet those same attributes.

Support for this reasoning also comes from evidence that more confident entrepreneurs are more likely to undertake creative, decisive and risky work which carries a higher expectation of failure. That is, they perform more exploratory and creative work because they underestimate the nature, costs and likelihood of the risk that inheres in the outcomes of that work (Gervais and Odean, 2001; Loewenstein et al., 2001; March and Shapira, 1987; Simon and Houghton, 2003). In one study, Gervais, Heaton and Odean (2004) show that overconfidence induces more decisive decision making by those who worry less about protecting themselves from their errors. In their model of speculative traders, Kyle and Wang (1997) demonstrate that higher levels of

confidence (and overconfidence) are sustainable because they decisively and publicly signal entrepreneurs' commitments to stakeholders and competitors. Stakeholders who are drawn to high variance outcomes may especially value such decisiveness, relative to the hesitancy of more risk-averse entrepreneurs who exhibit greater caution in acting on promises (Gervais et al., 2004).

Furthermore, by performing more exploratory, creative and novel tasks, more confident entrepreneurs have greater scope to develop and leverage their private abilities and information, thus increasing the likelihood they will create and demonstrate new knowledge that can be leveraged on subsequent ventures (Banerjee, 1992; Sushil et al., 1998; Gromb and Scharfstein, 2004). Entrepreneurs' stakeholders expect that exploratory initiatives (e.g. wildcatting, developing new markets and products) are more likely to fail as a natural part of the discovery and creative process, such that the costs of erroneous judgment become more socially understandable, acceptable and manageable (March and Shapira, 1987; McGrath, 1999; Shapira, 1986; Tversky and Kahneman, 1986).

To summarize, more confident entrepreneurs are better positioned to socially recover from venture failure because they can maintain better relationships with their founding team members, and other stakeholders, as their focal venture fails. They signal their devotion to their customers; their passion and loyalty to their employees and fellow managers; and their commitment to other members of their founding team. By underestimating risks, they also embrace more creative initiatives with a higher expectation of failure. In the process of failing, more confident entrepreneurs develop individual and team specific capabilities that may be more difficult to transfer; and which continue to bind teammates who share the experiences that have built such capabilities (Kogut and Kulatilaka, 2001). For these reasons, more confident entrepreneurs reduce the damage caused by failed ventures to their relationships with founding team members. Hence they are better placed to gain support amongst such members for subsequent ventures. These arguments are also presented below:

Proposition 3. *More confident entrepreneurs will experience greater social support from founding team members during and after focal ventures.*

Having discussed the factors that can make more confident entrepreneurs more socially resilient, we now turn to a certain class of social resources, namely entrepreneurs' relationships with equity investors. Along the lines of the previous section, the following argues that more confident entrepreneurs will experience greater financial resilience, defined as a stronger ability to raise equity capital following their failure.

4.4. More confident entrepreneurs have greater financial resilience to form new ventures

Earlier, we defined financial resilience as entrepreneurs' ability to obtain capital on subsequent ventures as a result of their decisions and actions on their focal ventures. Entrepreneurs' relationships with investors can explain their ability to raise capital and the terms for doing so (Hsu, 2003, 2004). Venture capital investors, for instance, often state that they invest in individuals, rather than other resources or business models; and sometimes continue to invest in entrepreneurs whose prior ventures have failed (Kaplan and Stromberg, 2004). In part, this reflects a portfolio approach that recognizes that most portfolio companies will fail but that such losses will be more than offset by entrepreneurs who can forge highly successful ventures; and that investments in entrepreneurs represent investments in both their current and future ventures (Hsu, 2004). Therefore, such investors often invest in entrepreneurs who are capable of creating high volatility in their portfolio companies (Cochrane, 2005; Dushnitsky and Lenox, 2006; Hurry et al., 1992).

To illustrate, before investing in the Segway and its founder Dean Kamen, John Doerr – one of America's most celebrated venture capital investors as the lead partner of Kleiner Perkins Caulfield and Byers – told Kamen that

“Dean we've done more dot-coms than anyone. I never thought I'd see something in my life as big as the Internet, as far as making a difference. And I just saw it (the Segway). It was amazing, mind blowing, cosmic ... thanks for the scope of your ambition which is breathtaking and inspirational” (our brackets, Kemper, 2003: 104).

Even though the Segway has failed to yield satisfactory returns to Kleiner Perkins, this quote also highlights the high risk and high return portfolio approach of VC investing. More systematically, regarding returns Cochrane (2005) find mean arithmetic returns of 698% for VC backed firms that reached IPO; and 59% returns after adjusting for the selection bias on using IPO-bound firms. Peng (2001) estimates an average geometric return of 55%; and a very high 4.66 beta for VC funded IPO-bound firms. Gompers and Lerner (1997) measured risk and return by examining the investments of a single VC by periodically marking values to market; and find an average arithmetic annual return of 30.5% gross of fees from 1972–1997. Further, Jovanovic and Szentes (2008) provide a model that links the high return to venture equity to the impatience of the VCs. They believe that VCs are scarce, and hence, they have market power and a high return on their investments. As a result, VCs may quickly terminate future investments and interest in non-performing ventures so they can more readily move on to new ones.

Another way of characterizing venture capital investing, if not the mindset of venture capital investors, is in terms of a real options approach, as represented by contracts between venture investors and entrepreneurs and the staging of their investments (Gompers, 1995; Kaplan and Stromberg, 2003, 2004). Real options are defined as the “...right, but not the obligation, to take an action (deferring, expanding, contracting, or abandoning) at a predetermined cost called the exercise price, for a predetermined period of time – the life of the option” (Copeland and Antikarov, 2001). In making a series of investments in portfolio companies, venture investors can be viewed as buyers of a series of options whose value depends on six factors: the expected present value of

cash flows from investment; the exercise price or investment cost of buying the option; the time taken for the option to expire; the uncertainty or volatility inherent in realizing the present value of the cash flows; the risk free interest rate; and cash flows that are lost due to competitors who have committed to related opportunities defined by the options.

More confident entrepreneurs described in this study loom as more attractive to venture investors for related reasons. By virtue of their ability to broaden thought action repertoires more confident entrepreneurs are better placed to find innovative new business opportunities and relationships (Koellinger, 2008) which, in turn, increase the volatility of the cash flows under their control, thereby increasing the option value of their ventures (Black and Scholes, 1973; Cox et al., 1979; Bowman and Hurry, 1993). Returning to the earlier discussion, more confident entrepreneurs accept greater uncertainty and risk, leading them to perform more exploratory and creative work (Gervais and Odean, 2001; Loewenstein et al., 2001; March and Shapira, 1987; Simon and Houghton, 2003). They also take on more risk and therefore are better positioned to create and apply private, difficult-to-imitate knowledge that is associated with creative and novel ventures (Bernardo and Welch, 2001; Kogut and Kulatilaka, 2001; March and Shapira, 1987).

Second, as elaborated earlier, more confident entrepreneurs can be expected to persevere longer with their confident beliefs (Bernardo and Welch, 2001). In turn, this increases the life of the option(s) represented by their ventures, thereby increasing its value (Black and Scholes, 1973). It also makes it more likely they will survive to the stage of obtaining VC funding.

Third, the fact that the prior venture has been abandoned may be appealing to venture investors because it can reduce the entry price at which venture investors purchase their investments in more confident entrepreneurs' innovative new ventures; and is consistent with VCs readiness to move on to new investments.

Overall, more confident entrepreneurs may have greater financial resilience because among capital providers using option-based investment strategies, higher volatility increases the value of the options under the control thereby increasing the likelihood that ventures started by more confident founders will raise more equity capital. Amongst other things, such founders are better positioned to create new knowledge that they can appropriate and leverage in such ventures, creating more valuable options on focal ventures with greater capacity to attract risk seeking capital providers to subsequent ventures. These arguments are expressed more formally below:

Proposition 4. *More confident entrepreneurs will experience greater financial resilience.*

To summarize, this paper offers a framework by which more confident entrepreneurs are better able to emotionally, cognitively, socially and financially recover from their failed ventures. Holding other factors constant, especially the nature and extent of failure, this reasoning motivates the following governing proposition

Proposition 5. *More confident entrepreneurs are more likely to form subsequent ventures.*

Above we argued that more confident entrepreneurs have greater motivation and ability to start new ventures. And, naturally, by starting subsequent ventures, more confident entrepreneurs also become eligible for the prospect of success on such ventures. It is another question – one beyond the present scope – as to whether those ventures will be more successful.

Fig. 1, as presented earlier, visually traces our logic, highlighting how ex-ante confidence in the success of a failed venture increases entrepreneurs' emotional, cognitive, social and financial resilience, which in turn increases the likelihood that entrepreneurs will form a new venture. Our concluding remarks elaborate the implications of the foregoing arguments for behavioral decision theory and venture formation and management.

5. Brief conclusions

Reasoning here complements other explanations for why failed entrepreneurs will start subsequent ventures. To be sure, larger and more public failures that demonstrate entrepreneurs' mismanagement should damage their reputations and, thus, their social and financial capital will suffer as well. Likewise, entrepreneurs with more successful founding experience before their failed 'focal' ventures may have the reputation and other resources to buffer themselves against losses from such ventures. While important, these factors also miss the critical role played by entrepreneurs' judgment and volition: To found another venture with all its risks and investments, it is a necessary condition that entrepreneurs are confident that it will succeed (Camerer and Lovallo, 1999; Cooper et al., 1988 adopt similar approaches). Nevertheless, higher confidence will not always lead to greater resilience: Boundary conditions that pertain to entrepreneurs, their situation and the kind of confidence that they possess underscore the limits to which our core thesis holds.

5.1. Links with behavioral decision theory

Counter-intuitive contributions to behavioral decision theory also emerge from this reasoning. Some behavioral decision theorists rely on the premise that erroneous judgments on focal decisions are always problematic, and end their theorizing there (e.g. Bazerman, 1992). We challenge that premise in the vital setting of new venture formation on the grounds that more confident entrepreneurs are able to better recover from venture failure and are therefore likely to subsequently form a successful venture, even if that confidence technically made them overconfident. Founder overconfidence may in fact be beneficial even when it is clear that the first-order costs are high in terms of venture failure. If the second-order effects we have described here can overcome

the “overall” cost to more confident entrepreneurs, they also offer a functional explanation for why entrepreneurs are pervasively and serially overconfident. A fuller understanding of the emotional, cognitive, social and financial implications of decision making, in the kinds of contexts that we examine, warrants examination of the second-order or follow-on consequences of judgment (Fredrickson, 2003; Kahnemann, 1991).

5.2. Links with hubris theory

Perhaps the prosperity of some societies in part reflects an evolutionary process in which more confident entrepreneurs undertake more challenging and risky tasks with greater conviction. Survivors set up new businesses, achieve technology breakthroughs, develop new drugs, initiate and articulate novel ideas and theories and so on. Conversely, entrepreneurs who are preoccupied with establishing when and how they could be wrong are more timid, indecisive and defensive; they prefer to avoid mistakes, scrutinize others and resist opportunities (Brockner et al., 2004; Kahneman and Lovallo, 1993). Higher confidence increases the odds of securing coveted outcomes, from creating wealth to saving jobs and lives. Some active financial traders and fund managers routinely capitalize on others' (e.g. acquiring managers) overconfidence to create wealth for themselves and their stakeholders (Wang, 2001).

Take, for example, Thomas Edison who was extraordinarily confident in developing the first commercially practical incandescent light bulb. One biographer wrote that “... it was not until he had completed more than ten thousand experiments that he obtained any positive preliminary results whatever. Through all this vast amount of research there had been no previous signs of the electrical action he was looking for. These experiments had extended over many months of constant work by day and night, but there was no breakdown of Edison's faith in ultimate success—no diminution of his sanguine and confident expectations” (see Friedel and Israel, 1986; Josephson, 1959). Like other inventors and entrepreneurs, Edison could afford to be overconfident on his experiments because this promoted the positive affect that helped him to persevere and prevail.

By focusing on focal judgments, hubris theory may rush to the erroneous conclusion that overconfidence necessarily hurts actors, their organizations and societies (e.g. Hayward, 2007; Hayward et al., 2006). In practice, there may be many situations where heedful and risk conscious actors should be highly confident, and at high risk of overconfidence, because the longer term benefits of such confidence overwhelm any concern for an error of judgment.

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