



DIRECT AND INDIRECT EFFECTS OF PASSION ON GROWING TECHNOLOGY VENTURES

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Abstract

Entrepreneurial passion has gained credence in recent years in explaining entrepreneurial efforts, yet examination of the dynamics of this emotion and its effects on venture growth is still in its infancy. Building on the literature on entrepreneurial motivation and entrepreneurial passion, we develop and test a model of entrepreneurial passion, goals and venture growth. We utilize path analysis on a two-wave sample of founders from 122 high-technology firms. We find direct positive effects of passion for developing on venture growth, and an indirect positive effect mediated by goal commitment, but not goal challenge. Implications for research and practice are discussed.

Key words: *entrepreneurial passion, goal commitment, goal challenge, venture growth*

INTRODUCTION

Several researchers have examined the relationship between a founder and a firm at multiple points in the venture's life cycle, from the founding process (Gartner, 1990; Venkataraman, 1997) until separation of entrepreneur from venture (Shepherd, 2003; Shepherd & Haynie, 2009), to find that 'the overall enterprise is not viable without the entrepreneur' (Gartner, 1990: 18). This may be especially salient in the case of technology ventures (Beckman *et al.*, 2012) because a high tech entrepreneur is seen as a cornerstone in the development of technology related opportunities and ultimately in venture success (Arthurs & Busenitz, 2003).

One of the qualities associated with entrepreneurs, and one often referred to in work on individual motivation (e.g. Duckworth *et al.*, 2007) is the emotion of entrepreneurial passion. Entrepreneurial passion involves positive and intense feelings focused on particular roles that are central to the identity of an entrepreneur (Cardon *et al.*, 2009b). Academics and practitioners concur that passion is a critical aspect of the entrepreneurial process (Cardon *et al.*, 2009b; Smilor, 1997), with important implications for the motivation and energy (Bierly,

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3 Kessler & Christensen, 2000; Brännback *et al.*, 2008), persistence (Cardon & Kirk, 2015;
4 Smilor, 1997), and work effort (Chang, 2001) of entrepreneurs. Much of the published work
5 on passion in entrepreneurship is theoretical or focused on outcomes involving individual
6 behavior (Murnieks, Mosakowski & Cardon, 2014) rather than venture outcomes. The notable
7 exception is a study by Baum and Locke (2004) who found support for an indirect
8 relationship between passion for work and firm performance.
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16 In this research we build on prior work on entrepreneurial passion (Cardon *et al.*,
17 2009b), goal pursuit (Baum, 2013), and entrepreneurial motivation (Foo, 2011; Uy, M.D. &
18 Ilies, 2014), to propose a theory of how entrepreneurial passion relates to venture growth
19 through a motivated process of an individual's goal pursuit in high-technology ventures.
20 Drawing from Cardon *et al.*'s (2009) conceptual framework we emphasize the role of passion
21 for developing firms. The focus on entrepreneurial passion for developing stems from our
22 interest in technology ventures that have multiple growth goals, among others, including
23 taking a technological idea from its inception to a commercial use, and later market adoption.
24 We theorize that an entrepreneur's experience of passion for developing will evoke those
25 goal-setting mechanisms that facilitate engagement of entrepreneurial skills and acquisition of
26 resources that are needed for attaining entrepreneurial growth (Cardon *et al.*, 2009).
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41 Our first contribution is to the current literature on growth of high-technology ventures
42 by acting on the call of Baum and colleagues who suggested that, 'perhaps researchers ought
43 to look again at traits and motives, but through mediation models that test more complex
44 casual chains' (2001, p.299). By developing an integrative model of the motivation
45 mechanisms that connect individual level variables and venture growth, we respond to this
46 call and extend their work. While Baum and colleagues (2001) previously found that passion
47 for work has an impact on venture growth, and this impact is fully mediated by growth goals
48 of the entrepreneur (Baum & Locke, 2004), we build on this finding by examining the
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3 relationship between passion and venture growth, using passion for developing, which is
4 specific to the entrepreneurship domain (Cardon *et al.*, 2009b). We also contribute to the
5 literature exploring how cognitive and affective processes of entrepreneurs together relate to
6 firm level outcomes. In particular, we extend current knowledge about the specific role of
7 goal related processes as they relate to venture growth. While Baum and Locke (2004)
8 explored the effects of static quantitative goals that entrepreneurs set for a venture's sales
9 performance and employment, the focus of our study is on the more qualitative aspect of goal
10 related motivation that occurs through setting challenging goals and an entrepreneur's
11 commitment to these goals. In addition, we expand the nature of goals that entrepreneurs may
12 have beyond growth goals and focus on the level of goal challenge and goal commitment
13 entrepreneurs experienced for goals they have for their ventures; for the majority of them this
14 involved multiple goals, rather than just a single focus on growth goals. This approach gave
15 us a more personalized and a more precise set of goals that entrepreneurs focus on, and
16 allowed us to focus our tests on the potential association between passion for developing and
17 venture growth.
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36 Our second contribution is to the literature on emotions, where the majority of extant work
37 examines how emotions of individual entrepreneurs impact their cognitions (i.e. self-efficacy)
38 and behaviors (i.e. persistence), but do not link entrepreneurial emotions to firm outcomes.
39 Although firm growth is central to entrepreneurship research, we still do not know enough
40 about how entrepreneur's cognitive processes shape growth through goal commitment and
41 goal challenge (Davidsson, Delmar & Wiklund, 2006; Wright & Stigliani, 2013). The broader
42 (economic) relevance of firm growth as a strategic option was recently empirically supported
43 in a study of technological regimes of industries (Delmar, Wennberg & Hellerstedt, 2011).
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54 Our specific contribution to firm growth research is in establishing empirical support for the
55 relationship between entrepreneurs' passion and venture growth. This relationship manifests
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3 through the specific type of passion; entrepreneurial passion for developing, where the role
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5 identity of “developer” is central to the intense feelings the entrepreneur experiences. The
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7 notion of identity has become a prominent construct in entrepreneurship research, including
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9 both a generalized identity as an entrepreneur (Murnieks, 2007; Murnieks et al., 2014),
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11 identities focused on more specific roles within the domain of entrepreneurship (e.g. Cardon
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13 et al., 2009b; Fauchart & Gruber, 2011; Ho & Pollack, 2014), and the ease within which an
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15 individual can hold multiple identities (Powell & Baker, 2014). We contribute to this growing
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17 work on entrepreneurial identity by focusing on the implications of passion for the role
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19 identity of venture developer on growth of high-tech ventures. Technology entrepreneurs are
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21 heroic individuals (Schumpeter, 1942) with a full-blown ability to discover, create and exploit
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23 opportunities that lie beyond the reach of most people (Garud & Karnøe, 2003). In the context
24
25 of technology entrepreneurship several individual related mechanisms by which entrepreneurs
26
27 effectively shape their ventures have been explored, such as talent and experience (Eesley and
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29 Roberts, 2012), personal networks (Vissa & Bhagavatula, 2012) and entrepreneurial bricolage
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31 (Garud & Karnøe, 2003). Yet the role of individuals’ emotions and cognitions has not yet
32
33 been examined in this context, despite the notion that technology entrepreneurs can become
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35 deeply emotionally embedded in their ventures (Kotler, 2014). While past research on high-
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37 tech ventures has focused on the role of experience and talent of entrepreneurs (Eesley &
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39 Roberts, 2012) our study emphasizes the role of emotional and cognitive elements, which
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41 may also be important.
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50 **ENTREPRENEURIAL EMOTIONS AND PASSION**

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52 Entrepreneurship practitioners and academics agree that entrepreneurial emotion is
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54 instrumental in influencing entrepreneurial cognitions, behaviors and outcomes (e.g. Baron,
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56 2008; Cardon *et al.*, 2012; Foo, 2011). Entrepreneurial emotion refers to ‘the affect, emotions,
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3 moods, and/or feelings—of individuals or a collective—that are antecedent to, concurrent
4 with, and/or a consequence of the entrepreneurial process, meaning the recognition/creation,
5 evaluation, reformulation, and/or the exploitation of a possible opportunity' (Cardon *et al.*,
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10 2012: 1). Understanding entrepreneur's emotions and incorporating information from those
11 emotions into cognitive processes seems specifically important in demanding contexts, such
12 as technology entrepreneurship.
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16 Recently, there has been an increasing interest in a specific emotional experience,
17 entrepreneurial passion, that has a significant impact on entrepreneurial behaviors (Murnieks
18 *et al.*, 2014). Entrepreneurial passion is important because it increases entrepreneurs' beliefs
19 that their work is meaningful, leads to greater levels of persistence in venture activities
20 (Cardon & Kirk, 2015), improves creativity in problem-solving (e.g. Bierly *et al.*, 2000), and
21 increases ownership of experiences related to venture successes and failures (Bird, 1989).
22 Entrepreneurial passion increases exhibition of transformational leadership and emotional
23 display, which may influence employee passion and engagement (Cardon, 2008), and in
24 general increases investor interest in the firm (Mitteness, Sudek & Cardon, 2012).
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37 There are divergent conceptual perspectives on what entrepreneurial passion is and
38 how it influences venture outcomes in the current literature. An early passion-as-trait
39 approach (e.g. Baum & Locke, 2004; Baum *et al.*, 2001) sees passion as a relatively stable
40 trait across the life-cycles of entrepreneurs. A large body of work in psychology done by
41 Vallerand and colleagues (Vallerand, 2008; Vallerand & Houliort, 2003; Vallerand *et al.*,
42 2010), views passion a bit differently, treating it as an emotional experience one has for a
43 specific activity in their life, such as their profession (nursing) or a hobby (coin collecting).
44 This stream of work focuses on the extent to which one's passion for this particular set of
45 activities is in balance with the rest of one's life (harmonious passion) or whether this passion
46 overpowers the other aspects of one's life (obsessive passion). In entrepreneurship, scholars
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3 have shown that harmonious passion for the career of entrepreneur can have a functional
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5 impact on the amount of time one spends working on the venture (Murnieks *et al.*, 2014), but
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7 that many entrepreneurs are in fact, obsessive about their ventures (Fisher, Maritz & Lobo,
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9 2013). Scholars have also emphasized potentially negative effects of obsessively passionate
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11 entrepreneurs in attaining financial performance (Ho & Pollack, 2014).
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14 Recently, a definition of entrepreneurial passion has emerged that argues that positive
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16 and intense feelings of passion are focused upon specific roles within entrepreneurship, rather
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18 than for the overall role of entrepreneur (Murnieks, 2007) or for work as a whole (Baum *et*
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20 *al.*, 2001). In this perspective, entrepreneurial passion exists for one or more meaningful roles
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22 that are salient to the self-identity of the entrepreneur and correspond to intense positive
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24 feelings that are focused on the specific entrepreneurial roles. In this definition
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26 entrepreneurial passion involves both 1) intense positive feelings for something specific, and
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28 2) strong identity centrality of the object of those feelings. This perspective suggests that
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30 entrepreneurial passion can remain stable or can fluctuate over the life-cycle of the
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32 entrepreneur or venture depending on differing levels of passion entrepreneurs have for
33
34 different role identities. Both dimensions of passion are important for understanding what
35
36 passion is and how it is associated with entrepreneurial efforts (Cardon *et al.*, 2013). Since
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38 feelings of passion are focused on a specific object (passion for something), passion is distinct
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40 from one's core affect or generalized emotional state that has a certain level of valence
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42 (pleasant/unpleasant) and level of intensity (strong/weak) in accord with the circumplex
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44 model of emotions (Watson & Tellegen, 1999). This suggests that entrepreneurial passion as
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46 defined in our study is not a trait because the amount of passion a person experiences is
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48 dependent on the specific object invoking that passion, rather than a generalized attitude or
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50 disposition.
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3 A key part of the recent conceptualization of passion is the identity-centrality of the
4 object of an entrepreneur's passion (Cardon *et al.*, 2009b; Murnieks *et al.*, 2014). Identity
5 theory (Stryker & Burke, 2000) views the self as a collection of identities that are based on a
6 particular role. Identities answer the question of 'who am I?' (Stryker & Serpe, 1982) by
7 making a connection to the role an individual engages in. Role identities put individuals in
8 social categories, such as 'I am a company founder' and influence behavior through the
9 expectations that a specific role has for the self (Burke & Reitzes, 1981). Recently, in
10 elaborating the link between entrepreneurial passion and identity, Murnieks and colleagues
11 (2014) found that the centrality of the entrepreneurial role identity impacted the level of
12 entrepreneurial passion experienced and the subsequent extent of entrepreneurial behavior
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25 Meaningful role identities that have been associated with entrepreneurial passion in
26 the literature are: (1) an inventor identity that involves activities related to seeking out new
27 ideas, tinkering with new product development, and scanning the environment for new
28 opportunities; (2) a founder identity that involves activities of assembling the resources
29 necessary to create a firm, and the actual founding of the firm; and (3) a developer identity
30 that concerns activities related to firm and market development (e.g., finding new customers)
31 and firm growth (Cardon *et al.*, 2009b). In this study we focus on entrepreneurial passion for
32 developing a business, which stems from activities related to growing and expanding a firm
33 after its founding that are associated with the role identity of developer. Many entrepreneurs
34 are motivated to grow and expand their ventures (Cliff, 1998) by finding new markets and
35 customers, developing new business models, planning financial growth and harvesting,
36 thereby suggesting that passion for developing is of central interest to researchers and
37 practitioners.
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54 Challenges related to achieving sustainable returns and financial profitability are even
55 more present in high technology ventures because the venture needs to overcome distinct
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3 developmental conjunctures-research phase, opportunity-framing phase, pre-organization
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5 phase, and re-orientation phase (Vohora, Wright & Lockett, 2004) to become a viable
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7 growing venture. Extant literature suggests that high technology firms suffer from financial
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9 and non-financial constraints that hinder their survival and growth (for review see Colombo,
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11 Croce & Murtinu, 2014) hence the developer identity in such firms is of central importance.
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14 15 16 **THEORY AND HYPOTHESES DEVELOPMENT**

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18 In Figure 1 we suggest that the experience of entrepreneurial passion for developing activates
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20 entrepreneurial action, primarily through goal-setting motivational mechanisms that are
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22 associated with venture growth. This model is developed based on goal-setting theory (Locke
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24 & Latham, 1990), theory of the nature and experience of entrepreneurial passion (Cardon *et*
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26 *al.*, 2009b), and empirical evidence from psychology and entrepreneurship (Cardon & Kirk,
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28 2015; Uy *et al.*, 2014). The processes in the model are triggered when entrepreneurial passion
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30 is activated. When entrepreneurial passion is activated, it engages full-blown emotional,
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32 cognitive and physical responses (Cardon *et al.*, 2009b; Russell, 2003) that are coherent and
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34 coordinated. The experience of entrepreneurial passion for developing thus regulates efforts
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36 of high-tech entrepreneurs in coping with environmental challenges when developing their
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38 ventures. We suggest that the experience of entrepreneurial passion is associated with venture
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40 growth, both directly (path A) and indirectly (path B/C and path D/E) through goal-setting
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42 mechanisms. Consistent with work by Uy and colleagues (2014), we include goal challenge
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44 and goal commitment in our model since the two variables are recognized as the key elements
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46 of motivation (Lewin, 1943). Below we develop theory concerning each of the proposed path
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48 in the model.
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54 ***Insert Figure 1***
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Direct effects of passion on venture growth

We hypothesize that the experience of entrepreneurial passion is positively associated with venture growth (path A in Figure 1). There are two distinct arguments supporting the hypothesized relationship, based on the two dimensions of entrepreneurial passion (Cardon *et al.*, 2013; Cardon & Kirk, 2015; Cardon *et al.*, 2005, 2009b). First, positive feelings associated with entrepreneurial passion for developing provide high-tech entrepreneurs with information that communicates positive assessment of the current status and gives a green light to engage in further entrepreneurial activities (Schwarz & Clore, 1996). Because feelings can be retrieved as cohesive mental constructions long after the stimuli has ended (Schwarz & Clore, 1983) entrepreneurs may consciously experience (positive) feelings of entrepreneurial passion for developing retrieved from past experiences or future desires for their ventures. Because of the positive information conveyed through positive feelings of entrepreneurial passion for developing, the scope of thought-action repertoires broadens and enhances the entrepreneur's personal resources, ranging from physical and intellectual to social and psychological resources (Fredrickson, 1998). These expanded and more heterogeneous resources of a high-tech entrepreneur that occur from the positive feelings of passion are associated with venture growth (e.g. Wiklund & Shepherd, 2003).

Second, positive feelings of entrepreneurial passion for developing are related to enhance venture growth because of the identity centrality of such feelings. Identity theory (Burke & Reitzes, 1981) and prior work on role identities in entrepreneurship suggests that entrepreneurs think about their role identities (Cardon *et al.*, 2013; Fauchart & Gruber, 2011), act in ways to realize their identity as an entrepreneur (Shepherd, Wiklund & Haynie, 2009), and seek to protect that identity as it reinforces their self-concept (Murnieks *et al.*, 2014).

When entrepreneurs experience strong feelings such as entrepreneurial passion for activities associated with role identities that are important to them (such as those associated with

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2
3 developing the venture), they work hard to preserve and reinforce those identities, and often
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5 engage in more creative problem-solving and exhibit persistence towards their goals (Albert,
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7 Ashforth & Dutton, 2000). Entrepreneurs clearly experience an entrepreneurial role identity
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9 (Murnieks, 2007) and they act in ways to reinforce and promote that identity (Fauchart &
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11 Gruber, 2011; Murnieks *et al.*, 2014). Despite this evidence (Fauchart & Gruber, 2011;
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13 Murnieks *et al.*, 2014), none of the theoretical or empirical work to date has directly examined
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15 the link between passion (a form of entrepreneurial identity) and venture growth.
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19 More general research on emotions suggests that emotional reactions will be
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21 particularly motivating when the stimulus or event being experienced is a personally
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23 significant one (Izard, 2009), as it is when an entrepreneur experiences passion for a particular
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25 role identity. In addition, Albert and colleagues (2000: 14) argue that ‘theories of identity and
26
27 identification are infused with motivation and feeling, which helps explain the direction and
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29 persistence of individual and more collective behaviors’. If a high-tech entrepreneur is
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31 particularly passionate about developing a venture, this suggests they will be especially driven
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33 to grow and develop their firm, rather than just accepting its current performance levels.
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35 Passion for developing would therefore lead to greater motivation to engage in behaviors
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37 associated with venture growth, such as increasing performance on different goals, such as
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39 venture size, sales, market share, or profitability. These arguments lead to the following
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41 hypothesis:
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45 **Hypothesis 1:** Entrepreneurial passion for developing is positively related to venture
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47 growth.
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49 **The mediation effects of motivation mechanisms**

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51 Entrepreneurial passion may also be associated with venture growth because it enhances
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53 motivation through goal-setting processes of entrepreneurs. Goal-setting theory argues that an
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55 individual’s conscious goals impact their performance by directing personal attention to the
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3 task, by increasing effort and persistence and by encouraging the development and use of
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5 action plans and strategies to attain one's goals (Locke & Latham, 1990). Following Austin
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7 and Vancouver (1996), we define goals as internal representations of desired outcomes,
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9 events and processes that work together in provoking behavioral and affective responses. For
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11 example, wealth attainment related goals of entrepreneurs have been shown to impact
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13 initiation of growth oriented technology ventures (Amit, MacCrimmon & Zietsma, 2001)
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17 The central role of goals in entrepreneurship is well acknowledged (Baum, 2013 for a
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19 review; Dunkelberg *et al.*, 2013). Goals are important to entrepreneurs (Kuratko, Hornsby &
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21 Naffziger, 1997) as they direct attention, effort, and action in pursuit of desired outcomes
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23 (Locke & Latham, 2006). Entrepreneurs use goals 'to exploit their opportunities through
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25 activities such as human and financial resource gathering, business start-up planning and
26
27 organizing, and market entry' (Baum, 2013: 2). The mediating role of goals has been
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29 supported in prior entrepreneurship research. For example, Baum and Locke (2004) found
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31 that growth goals significantly predicted future growth of a venture and fully mediated the
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33 effects of passion for work on venture growth. While this study explored effects of static
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35 quantitative goals that entrepreneurs set for a venture's sales performance and employment,
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37 the focus of our study is on a potentially broader set of goals and goal related motivation from
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39 the challenge and commitment to such goals.
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44 In line with the goal-setting theory (Locke & Latham, 1990; Locke & Latham, 2006)
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46 and theoretical framework concerning the nature and experience of entrepreneurial passion
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48 (Cardon *et al.*, 2009b) we hypothesize that the relationship between entrepreneurial passion
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50 and venture growth is mediated by setting challenging goals (path B/C) and through goal
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52 commitment (path D/E in Figure 1). Below we develop theory concerning the specific
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54 mechanisms for these relationships.
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The mediation effect of goal challenge

Entrepreneurial passion impacts venture growth because it facilitates setting challenging goals (Plemmons, 2013). *Goal challenge* is defined as a level of difficulty in a set goal (Locke & Latham, 1990). The productive role of positive emotions in setting challenging goals is advanced by the broaden-and-build theory (Fredrickson, 1998). According to this theory positive emotions such as entrepreneurial passion broaden one's awareness and encourage exploratory thoughts and actions. Over time these broadened cognitive and behavioral activities build one's skills and resources, which positively impact the level of challenge in set goals. Positive emotions also serve as a source of feedback on progress towards attainment of goals (Emmons & Kaiser, 1996) because according to the 'feeling-as-information' theory (Schwarz & Clore, 1996) people make decisions and direct behavior based on the information conveyed through what they feel. Entrepreneurs that experience strong positive feelings of entrepreneurial passion for developing interpret those positive feelings as positive diagnostic information about the target of judgment, such as the challenging goal of increasing market share, believing their positive feelings indicate that they are making satisfactory progress toward their challenging goal.

In turn, offsetting challenging goals typically result in better performance (Seijts *et al.*, 2004). More specific and more difficult goals lead to higher performance than do vague or abstract goals because challenging goals motivate one to attain more rather than to remain satisfied with achieving easier goals (Locke & Latham, 2002). Support for this relationship has been found in entrepreneurship. For example, Baum and Locke (2004) found that entrepreneurs with passion for work invested more resources, effort and time towards attainment of their venture's goals. Our theoretical reasoning also has support in the role identity literature, in which role centrality has been linked to individuals' voluntary activities. Burke and Reitzes (1981) suggest that the subjective importance of a specific role (e.g. role

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2
3 centrality) leads individuals to spend more time in that role. When entrepreneurs set goals for
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5 their ventures, these goals are voluntarily set and undertaken, pursuit of such goals serves to
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7 reinforce their role identity (Hoang and Gimeno, 2010). Thus, prior literature suggests that
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9 since the positive feelings and role centrality components of passion for developing lead to
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11 the setting of more challenging goals, and that setting challenging goals leads to higher
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13 venture growth, we propose:

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16 **Hypothesis 2:** Setting challenging goals partially mediates the positive relationship
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18 between entrepreneurial passion for developing and venture growth.
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20 21 **The mediation effect of goal commitment**

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23 Furthermore, entrepreneurial passion can stimulate venture growth by promoting an
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25 entrepreneur's commitment to set goals. *Goal commitment* means 'one's determination to
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27 reach a goal' (Locke & Latham, 1990: 125), or how willing they are to tenaciously pursue
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29 goals in the face of setbacks and obstacles (Hollenbeck & Klein, 1987). Because self-set goals
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31 reflect the entrepreneurs' values and/or long range objectives that they want to attain (Locke,
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33 1996: 119) it is expected that entrepreneurs will be strongly committed to these goals.
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36 Entrepreneurs' commitment to the set goals in the domain of developing a venture is further
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38 stimulated because of the intrinsic value of such goals. Goals associated with developing a
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40 high-tech venture affirm the role identity of a developer (Cardon *et al.*, 2009b). In addition,
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42 intrinsically motivated entrepreneurs, such as those experiencing passion, more effortfully
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44 engage in pursuit of goals (Baron & Ward, 2004) and are more committed to those goals,
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46 because intrinsic rewards have a higher value than extrinsic ones (Klinger, 1977) and increase
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48 commitment to such goals (Ryan & Deci, 2000). This suggests a positive relationship
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50 between passion for developing and goal commitment, due to both the identity centrality and
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52 positive feelings dimensions of passion for developing.
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3 Goal commitment, in turn, is associated with better venture growth. A meta analytic
4 review of empirical studies that examined relationships between goal commitment and other
5 variables (Klein *et al.*, 1999) demonstrated a positive direct relationship between goal
6 commitment and performance. By being committed to a specific goal, an entrepreneur persists
7 in the planned course of actions leading to that goal and/or adapts these actions when needed,
8 ultimately leading to better performance outcomes (Klein, Cooper & Monahan, 2013).
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10 Because evidence suggests that positive feelings and identity-centrality associated with
11 passion lead to higher goal commitment, and that goal commitment leads to better venture
12 growth, we propose:
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23 **Hypothesis 3:** Goal commitment partially mediates the positive relationship between
24 entrepreneurial passion for developing and venture growth.
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28 **METHOD**

29 **Sample description**

30 We tested our hypotheses using a two-wave survey and archival venture performance data
31 from US high-tech firms. The first wave of data collection was conducted between October
32 2009 and January 2010 to collect information on entrepreneurial passion, and the second
33 wave was conducted about 15 months later in April of 2011 to collect information on goal
34 commitment and goal challenge.
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43 We draw on high-tech companies for two reasons. First, a majority of high-growth
44 ventures in the US are founded in the high-technology sector. Entrepreneurs in such firms are
45 less likely to be life-style entrepreneurs and more likely to exhibit passion for developing.
46 Furthermore, successful launch of high-tech business requires passion for inventing and
47 founding; thus allowing us to control for these types of passion to more conservatively predict
48 the relationship between passion for developing and venture growth. Second, several past
49 studies have drawn on the Corptech directory (e.g. Lee, 2007; Lee & Lieberman, 2010; Sine,
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3 Mitsuhashi & Kirsch, 2006), and the information could be triangulated with the Dun and
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5 Bradstreet Directory. As there are no formal requirements for private firms in the U.S. to
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7 make their performance information public, relying on two different databases to derive
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9 performance information on sales and number of employees allows for more reliable
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11 estimates.
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13 14 **Wave 1 data collection**

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16 From the 2009 Corptech directory, we drew 719 high-technology manufacturing ventures
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18 who were ten years or younger, had founder CEOs, were located in Mid-western US states
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20 (Illinois, Indiana, Kentucky, Ohio, and Missouri), and that had between 10 and 250
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22 employees. These ventures represented 30 different six-digit North American Industry
23
24 Classification System (NAICS) industry codes¹. Corptech directory is a reliable source of
25
26 venture listings and has been used widely in studies related to small ventures (e.g. Baron,
27
28 Hannan & Burton, 1999; Freear & Wetzel, 1990; Lee, Peng & Barney, 2007). A packet
29
30 containing our survey, along with a cover letter and pre-paid business reply envelope was sent
31
32 to CEOs who were founders. After the first mailed survey, three follow-up reminders were
33
34 sent between October 2009 and January 2010. We received responses from 164 CEOs, for a
35
36 response rate of 22.80 percentage, which is in line with average response rates cited for
37
38 mailed surveys to top executives (e.g. Bartholomew & Smith, 2006; Hmieleski & Baron,
39
40 2009). In the final data set for wave 1, we excluded one firm with incomplete data. This
41
42 yielded a final sample of 163 firms and their founders.
43
44
45
46

47 We tested non-response bias for early vs. late respondents and respondents vs. non-
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51
52 ¹ 334111 Electronic Computers; 334112 Computer Storage Devices; 334113 Computer Terminals; 334119 Other Computer Peripheral
53
54 Equipment; 334210 Telephone Apparatus; 334220 Radio & TV Broadcasting & Wireless Communications Equipment; 334290 Other
55
56 Communications Equipment; 335921 Fiber Optic Cables; 334310 Audio & Video Equipment; 334411 Electron Tubes; 334412 Bare Printed
57
58 Circuit Boards; 334414 Electronic Capacitors; 334415 Electronic Resistors; 334416 Electronic Coils, Transformers, & other Inductors;
59
60 334417 Electronic Connectors; 334418 Printed Circuit Assembly; 334419 Other Electronic Components; 334413 Semiconductor & Related
Devices; 333295 Semiconductor Machinery; 334511 Search, Detection, Navigation, Guidance, Aeronautical, and Nautical Systems and
Instruments; 334512 Automatic Environmental Controls; 334513 Industrial Process Control Instruments; 334514 Totalizing Fluid Meter &
Counting Devices; 334515 Electricity Measuring & Testing Equipment; 334516 Analytical Laboratory Instruments; 334519 Other
Measuring & Controlling Instruments ; 334510 Electromedical & Electrotherapeutic Apparatus ; 334517 Irradiation Apparatus; 333314
Optical Instrument & Lens; 333315 Photographic & Photocopying Equipment

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2
3 respondents based on firm age, sales revenues, firm size (number of employees), industry,
4
5 CEO age, CEO gender, and CEO industry experience. We found no significant differences,
6
7 leading us to conclude that non-response bias was not a likely threat to validity. We also
8
9 calculated sampling error based on the population of ventures in the high-tech manufacturing
10
11 sector listed in Corptech during 2009. Assuming a sampling proportion of 10 percentage and
12
13 a confidence interval of 95 percentage our sampling error was 5.13 percentage, which is
14
15 within the acceptable range (Sarndal, Swenson & Wretman, 1992). Heckman's two-step
16
17 residual estimation confirmed that our sample did not suffer from selection bias based on
18
19 number of employees, age, and firm sales ($\rho: 0.19, p = 0.48$).
20
21

22 **Wave 2 data collection**

23
24 We measured goal mechanisms in Wave 2. In April 2011, a survey along with a cover letter
25
26 and pre-paid business reply envelope was sent to each CEO who had completed the survey in
27
28 Wave 1. To enhance response rates we informed the CEOs that we would donate USD \$10
29
30 for every completed survey to a charity of their choice. After the first mailed survey and one
31
32 follow-up reminder, we received responses from 122 CEOs, indicating a retention rate of
33
34 74.39 percentage. We found no significant differences between participating vs. non-
35
36 participating firms based on firm age, sales revenue, firm size (number of employees),
37
38 industry, CEO age, CEO gender, and CEO industry experience. We also found no self-
39
40 selection bias for participating versus non-participating respondents between Wave 1 and
41
42 Wave 2 on these variables ($\rho: 0.16, p = 0.54$) (Heckman, 1979). There was no significant
43
44 difference in passion for developing between 122 entrepreneurs who continued to participate
45
46 in Wave 2 and 41 entrepreneurs from Wave 1 who did not participate in Wave 2 (mean
47
48 difference = 0.86, t -test = 1.212, $p > 0.10$).
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54 Although our measures were collected at three different points in time, this is not a
55
56 longitudinal study of passion or goal setting, as we are not conceptually interested in changes
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1
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3 in passion, goals, or performance. Instead, we utilize a multi-wave approach to data collection
4
5 to assess the stability of passion over time, ensure that goal related variables are reported after
6
7 the passion is reported in Wave 1, and that the performance outcomes are after Wave 2.
8

9 10 **Measures**

11 **Passion for developing [t].** To measure entrepreneurial passion for developing we use
12
13 one of the three entrepreneurial passion scales developed by Cardon and colleagues (2013).
14
15 Each entrepreneurial passion scale was validated to measure passion in one of three domains:
16
17 opportunity recognition (inventing), venture creation (founding) and venture growth
18
19 (developing). Each scale incorporates two dimensions: 1) positive intense feelings for
20
21 activities associated with the role and 2) the identity-centrality of the role. The feelings
22
23 dimension of each scale is a reflective measure consisting of multiple items, whereas the
24
25 identity dimension is a one-item measure of the identity centrality of each entrepreneurial
26
27 role. For example, passion for developing is measured by multiplying identity centrality item:
28
29 ‘Nurturing and growing my company (or companies) is an important part of who I am.’ The
30
31 measure of intensity of positive feelings for activities associated with the role of a developer
32
33 is measured using five items (i.e. Assembling the right people to work for my business is
34
35 exciting; Trying to convince others to invest in my business motivates me; I really like
36
37 finding the right people to market my product/service to; I really enjoy commercializing new
38
39 products/services; and Pushing my employees and myself to make our company better
40
41 motivates me). The feelings items are averaged and multiplied by the identity item, per the
42
43 scale development and validation guidelines (Cardon *et al.*, 2013). Alphas for the feelings
44
45 component of the measure is $\alpha_{\text{developing}}=0.84$.
46
47
48
49
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51 **Goals [t+2].** Drawing from the goal-setting theory (Locke & Latham, 1990; Locke &
52
53 Latham, 2006) we aimed to make our goal measures specific to the respondents therefore we
54
55 first asked respondents to list eight venture related goals they had in the past three years.
56
57
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60

Based on the goals that they listed for themselves we measured goal challenge and goal commitment to those goals. Furthermore, in order to increase respondents' cognitive involvement in the goal statement process we asked them to assess the relevance of each goal in five functional areas (i) marketing; (ii) manufacturing; (iii) R&D; (iv) finance; and (v) human resources. Next, we asked the respondents to assess the financial impact on company sales for not meeting each particular goal. Finally, we ask respondents to rank each goal in terms of its importance relative to the remaining seven goals. Sample goals listed by the respondents were 'increasing market share to 30 percentage,' where the assessed effect of not meeting this goal was '[\$] 2 million decline in sales,' and this goal was ranked second in importance. Other examples of goals were 'developing retail distribution channels,' 'developing new products in collaboration with a local university,' and 'establishing organizational recruitment and control systems.' When having specific goals listed and their intrinsic importance assessed we proceeded by measuring goal challenge and goal commitment associated with the goals.

Goal challenge [t+2]. Goal challenge is related to the degree of difficulty in realizing the stated goals. Goal challenge was measured using the inventory developed by Sheldon and Elliot (1999), where:

$$Goal\ Challenge = \frac{\sum_{g=1}^G N_{functional\ Areas,g} \times \ln(Sales\ Impact)_g}{G}$$

Goal challenge for each goal consists of the impact of the goal on different functional areas and the resulting impact on a decline in sales if the goal was not met. Respondents reported up to eight goals ranging from g to G . Each goal, g , affects one or more of the five functional areas. The value of $N_{functional\ Areas}$ ranged from 1 to 5 (1 – marketing; 2 – manufacturing; 3 – R&D; 4 – finance; and 5 – human resources). Degree of goal challenge was summed for up to eight total goals listed by the respondent. The final sum was standardized by dividing the

1
2
3 sum with the total number of listed goals, G . The final goal challenge measure ranged from
4
5 9.05 to 56.24 with a mean of 21.72 (s.d. = 10.46).
6

7 **Goal commitment [t+2].** Goal Commitment is measured using a seven-item scale
8 based on Klein *et al.* (1999). Respondents were asked to assess the level of goal commitment
9 towards the goals listed, rated on a 5-point (1-completely disagree to 5-completely agree)
10 rating scale. Sample scale items were 'It wouldn't take me much to abandon these goals'
11 (reverse-coded), and 'I think these goals are good goals to shoot for', 'It's hard to take this
12 goal seriously', 'It is unrealistic for me to expect to reach this goal', 'It is quite likely that this
13 goal may need to be revised, depending on how things go', 'I am strongly committed to
14 pursuing this goal', 'Quite frankly, I do not care if I achieve this goal or not'. The scale
15 reliability was 0.82.
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27 **Venture growth [t+3].** We triangulate information on ventures sales and employees
28 in 2011 and 2012 from Corptech and Dun and Bradstreet Million Dollar Directory. Past
29 studies in entrepreneurship have used sales and employee growth as a measure of firm
30 performance (Chandler, McKelvie & Davidsson, 2009). Our measure of growth is based on
31 Hmieleski, Corbett, and Baron (2013: 142). Goal challenge and goal commitment measured at
32 t+2 use the reference point of goals in the past three years, and goal challenge and goal
33 commitment are expected to have a short-term impact on growth. Excluding the past three-
34 years during which goal challenge and goal commitment were reported, we measure change
35 in performance for two years after measurement of goal challenge and goal commitment. We
36 calculated percentage change in sales (employee) from 2011 to 2012, and from this
37 percentage change we subtract industry median percentage change in sales (employee) from
38 2011 to 2012. We then take a mean of industry-adjusted changes in sales and employee as the
39 measure of venture growth.
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3 **Control variables.** As liabilities of newness (related to firm age) and liabilities of
4
5 smallness (related to firm size) could affect venture sales, we include *firm age* as the number
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7 of years since establishment to 2010, as reported in the Corptech directory, and triangulated
8
9 with the Dun and Bradstreet Million Dollar Directory. *Firm size* is measured by the average
10
11 of the number of employees during 2008, 2009, and 2010 reported in the Dun and Bradstreet
12
13 Million Dollar and Corptech directories. Environmental conditions in an industry can also
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15 significantly affect firm growth. *Environmental dynamism*, following Dess and Beard (1984)
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17 was calculated as the anti-log of standard error of the regression slope for the natural log of
18
19 net sales on time (2007-2011). Higher values of standard errors indicate greater instability in
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21 sales over time. We also control for *past venture growth*, using the same operationalization as
22
23 for the outcome variable but for years 2008, 2009, and 2010. Finally, we control for passion
24
25 in two other domains, *passion for inventing* and *passion for founding* (details of scale items in
26
27 Appendix), since they can be correlated with *passion for developing* (Cardon *et al.*, 2013) and
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29 we did not want this to conflate our results.
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32

33 34 **Construct Validity**

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36 Exploratory factor analysis reported in the Appendix shows that the scale items for the
37
38 passion and goal challenge measures load strongly onto their respective scales. All scale item
39
40 loaded significantly at $p < 0.01$ (Anderson & Gerbing, 1988). The highest modification index
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42 was below the recommended cut-off of 5.00 (Hair *et al.*, 2006). Furthermore, all the
43
44 composite reliability values were above the recommended value of 0.70. In our tests for
45
46 discriminant validity, no confidence intervals of the correlations for constructs included 0
47
48 (Anderson & Gerbing, 1988) and difference in chi-square between constrained-unconstrained
49
50 constructs were $p < 0.001$ (Fornell & Larcker, 1981). Overall, the measures are internally
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52 consistent and distinct from one another.
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57 ***Insert Table 1 about here***
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3 Table 1 shows the correlations among the variables. We observe low to moderate
4
5 levels of correlations. A variance inflation factor (VIF) > 10.0 indicates a multicollinearity
6
7 problem (Hair *et al.*, 2006). The highest VIF in our study was 6.030 which further suggested
8
9 that the effects of multicollinearity were not significant.
10

11 **Method of Analysis**

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13 We use path analysis in Mplus 5.21 (Muthén & Muthén, 1998-2010) to test the proposed
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15 mediation model. To maintain model stability due to a small sample of 122 firms, we use the
16
17 residual covariance matrix approach that allows for preserving degrees of freedom in small
18
19 samples (Bollen *et al.*, 2010; Haagen & Vittadini, 1991). The control variables are used to
20
21 predict covariances among *all* remaining variables in the model, and the resulting residual
22
23 covariance matrix is used as input in the final model. We test the proposed path analysis
24
25 model using Robust Weighted Least Squares (RWLS) with 1000 bootstrap samples. RWLS is
26
27 robust to non-normality and increases validity of findings in smaller sample sizes
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29 (Marcoulides & Saunders, 2006). Results for alternate model tests are reported in Table 2 and
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31 path analysis results are reported in Figure 2.
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36 The fit of the proposed model is acceptable ($\chi^2/df = 4.821$; CFI=0.934; TLI=0.913;
37
38 RMSEA=0.084 [95 percentage C.I.=0.072, 0.095]). According to Hu and Bentler (1999: 26-
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40 27), the threshold values for model fit are > .95 for CFI or TLI, and < .06 ($N \geq 250$) and < .08
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42 ($N < 250$) for RMSEA. As our sample has fewer than 250 firms, a RMSEA of 0.084 is close
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44 to acceptable. Furthermore, recent work by Heene, Hilbert, Draxler, Ziegler, and Bühner
45
46 (2011) has also cautioned against using strong cutoffs for fit indices.
47
48

49 In addition, compared to alternative models, the proposed model represents a better fit
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51 to the data. The null model with no relationships among the variables was significantly
52
53 different from the proposed model ($p < 0.001$). Next, we compared the proposed model with a
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55 direct effects model where all constructs were linked directly to sales ($\Delta\chi^2/\Delta df = 8.304$ (2), p
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3 < 0.001; CFI=0.861; TLI=0.842; RMSEA=0.142 [95 percentage C.I.=0.081, 0.202]) and with
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5 a full mediation model ($\Delta\chi^2/\Delta df = 5.627 (1), p < 0.05$; CFI=0.890; TLI=0.874;
6
7 RMSEA=0.107 [95 percentage C.I.=0.071, 0.145]). Both the direct effects model and full
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9 mediation model had worse model fit than the proposed model.
10

11 RESULTS

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13 Hypothesis 1 predicts a positive relationship between passion for developing and venture
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15 growth ($\beta = 0.220, p < 0.05$), and is supported. Hypothesis 2 proposed a mediation of goal
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17 challenge on the relationship between passion for developing and venture growth ($\beta = 0.080,$
18
19 $p = 0.126$; Sobel test = 1.529, Aroian test = 1.454, Goodman test = 1.616), and is not
20
21 supported. Finally, the mediation effect of goal commitment between passion for developing
22
23 and venture growth proposed in Hypothesis 3 is supported ($\beta = 0.175, p < 0.05$; Sobel test =
24
25 2.154, Aroian test = 2.106, Goodman test = 2.209). Indirect path between passion and venture
26
27 growth through goal commitment is significant and the direct path between passion for
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29 developing and firm growth is also significant, thus indicating partial rather than full
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31 mediation for Hypothesis 3.
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36 ***Insert Figure 2 ***
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39 DISCUSSION

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41 Although the body of literature on the role of passion in the entrepreneurship process has
42
43 grown substantially over the past few years and entrepreneurial passion has been validated as
44
45 a distinct individual level construct (Cardon *et al.*, 2013) there remain several unanswered
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47 theoretical and empirical questions concerning the role of passion in the entrepreneurial
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49 process. In this study, we theorized and empirically examined the association between
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51 experience of entrepreneurial passion for developing and goal-setting that in turn is related to
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53 growth of high-tech ventures. In particular, drawing from one of the influential theories of
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55 work related motivation, goal-setting theory (Locke & Latham, 1990), we examine how
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3 entrepreneurs' goal challenge and goal commitment are related to venture growth. We suggest
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5 that venture growth is associated with passion for developing firms, both directly and
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7 indirectly. The indirect relationship of entrepreneurial passion for developing with venture
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9 growth occurs through goals as goals direct attention, effort, and action, and this ultimately
10
11 positively relates to venture growth. While several studies in entrepreneurship have so far
12
13 emphasized the role of goals in improving venture performance (Locke & Latham, 2006;
14
15 Rauch & Frese, 2000), our study is one of a few that empirically analyzes the mediating role
16
17 of entrepreneurs' goals in achieving venture related outcomes. In addition, while Baum and
18
19 Locke (2004) previously found that passion for work has an impact on venture growth, and
20
21 this impact is fully mediated by growth goals of the entrepreneur, we expand this line of work
22
23 by focusing on passion specific to the entrepreneurship domain - passion for developing
24
25 firms; but, we find support for partial mediation effects. We also incorporate current
26
27 conceptualizations of passion as having two primary dimensions: intense positive feelings for
28
29 a specific role, and the identity-meaningfulness of that role (Cardon *et al.*, 2013; Cardon *et*
30
31 *al.*, 2009b; Vallerand & Houliort, 2003). In addition, we expand the nature of goals that
32
33 entrepreneurs may have beyond just growth goals and allow entrepreneurs to indicate the
34
35 level of goal challenge and goal commitment they have for different types of goals they have
36
37 for their firms. This is important because we recognize that even when entrepreneurs are
38
39 passionate for developing their firms they may have other goals in addition to their growth
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41 goals.
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48 Our findings suggest that entrepreneurial passion for developing firms is positively
49
50 associated with venture growth, and that this relationship is partially mediated by goal
51
52 commitment. Interestingly, we did not find support for mediation of goal challenge on the
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54 relationship between entrepreneurial passion and venture growth. In line with the theoretical
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56 reasoning advanced by the 'broaden and build' theory (Fredrickson, 1998), the direct
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3 relationship between entrepreneurial passion and goal challenge was supported. Similarly, the
4
5 direct positive relationship between goal challenge and venture growth suggested by identity
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7 literature (Burke & Reitzes, 1981) was also supported, likely because the voluntary setting of
8
9 challenging goals works as reinforcement towards the role identity of entrepreneurs (Hoang &
10
11 Gimeno, 2010). It appears that passion for developing firms, which is defined as experiencing
12
13 positive and intense feelings for growth-oriented activities along with identity-centrality of
14
15 being a developer, is particularly motivating for entrepreneurs to do whatever it takes to
16
17 ensure that the venture is indeed growing. While this clearly involves goal commitment, as
18
19 evidenced by the significant mediation effect, and in part by goal challenge, other activities
20
21 outside the scope of our study may also help explain this relationship. For example, Cardon
22
23 and Kirk (2015) found a significant relationship between passion for developing and
24
25 persistence, which we did not model in the present study.
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29 30 **Theoretical implications**

31
32 Our first contribution is to the growing body of empirical work exploring cognitive and
33
34 affective processes of entrepreneurs. Our finding that passion for developing is in fact
35
36 positively related to venture growth provides evidence of a relationship believed to be true but
37
38 not yet confirmed in an empirical setting. Further, prior work has suggested that
39
40 entrepreneurial passion is associated with goal challenge and goal commitment (Cardon et al.,
41
42 2009), but did not theorize how those associations might be related to venture growth. In
43
44 addition, Baum's work (2001) on the relationships among passion for work, goals, and
45
46 growth utilized a generalized perspective of passion for work, rather than passion specific to
47
48 entrepreneurship (e.g. Murnieks *et al.*, 2014) or for specific roles (Cardon et al., 2009).
49
50 Looking at specific types of entrepreneurial passion is important because different roles and
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52 activities that entrepreneurs engage in may elicit different types of passion that are uniquely
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54 associated with outcomes of interest. For example, while a venture's expansion is most often
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3 pursued by entrepreneurs who are also founders, there are many great examples of non-
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5 founding entrepreneurs who experienced passion for developing a venture by stepping into an
6
7 existing start-up and growing it into a more lasting, valuable, or sustainable venture (e.g. Ray
8
9 Kroc of McDonald's). While these pathways were alluded to in prior work in
10
11 entrepreneurship (Cardon *et al.*, 2009b) and more generally in the goals literature (e.g. Locke
12
13 & Latham, 2006), empirical confirmation in this context has been scant.
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15

16
17 Our second contribution concerns the relationship between entrepreneurial emotions
18
19 and venture outcomes. The model that we empirically test builds on prior findings of Baum
20
21 and Locke (2004) that the relationship between 'passion for work or love of one's work'
22
23 (Baum & Locke, 2004: 588) and venture growth was mediated by venture growth goals.
24
25 Finding support for mediating effects of entrepreneurs' goals on venture growth is important
26
27 because this provides more empirical evidence that understanding an entrepreneur's
28
29 personality, emotional experiences, and cognitions is key to understanding entrepreneurial
30
31 ventures. Our results indirectly suggest that one potential key for understanding the link
32
33 between individual and venture is identity. Specifically, the identity centrality of a particular
34
35 role, such as developer, within the overall entrepreneurial identity (Murnieks *et al.*, 2014) is a
36
37 key aspect of the experience of passion for that identity (Cardon *et al.*, 2013) and further
38
39 understanding of how the overall entrepreneurial identity works is needed (Fauchart &
40
41 Gruber, 2011; Hoang & Gimeno, 2010). Recent work also suggests that entrepreneurs may
42
43 hold multiple identities and understanding how they keep such identities in balance,
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45 especially if they are incongruent with one another, is critical (Powell & Baker, 2014). We
46
47 contribute to the growing body of work on identity in entrepreneurship by looking at the
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49 relationships among passion for a specific identity (firm developer), goal-setting, and venture
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51 growth. While not the focus of our theorizing, our empirical results also indicate that passion
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53 for developing has a different relationship with venture growth than does passion for founding
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3 or inventing, further supporting the idea that better understanding of specific role identities
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5 and emotions experienced for them, is a fruitful avenue of inquiry in the entrepreneurial
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7 domain.
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10 Finally, our study adds to the literature on the connection between founder and venture
11
12 in the context of high-technology ventures. The notion of a tight link between entrepreneur
13
14 and venture related outcomes is well ingrained in the entrepreneurship literature (e.g. Gartner,
15
16 1990). For example, Chandler and Hanks (1993) argue that the performance of a business
17
18 founder is measured by the performance of the organization, which is influenced by the
19
20 environment within which the organization emerges and operates. Similarly, in a longitudinal
21
22 study of Finnish entrepreneurs Arenius and Laitinen (2008) demonstrated that the connection
23
24 of entrepreneurs to their ventures is inherently different than the connection of employees to
25
26 traditional organizations. This is because entrepreneurs often experience deep identity
27
28 connections with their ventures, they feel profound psychological ownership (Murnieks,
29
30 2007), and they become intertwined with the firm such that the performance of one is
31
32 intertwined with the performance of the other (Pierce, Kostova & Kirks, 2001). Based on our
33
34 findings we can suggest that passion for a particular role identity may be one link between the
35
36 founder and the venture. Previous research on technology ventures has examined talent and
37
38 experience (Eesley and Roberts, 2012) and personal networks (Vissa & Bhagavatula, 2012) of
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40 founders but has not examined the potential affective or cognitive aspects of the relationship
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42 between individual and firm, and our study addresses this gap. Our results suggest that there
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44 is an important relationship between individual passion of the entrepreneur and growth of the
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46 venture in high technology contexts.
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51 **Practical implications**

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54 Our results suggest several practical implications for high-tech entrepreneurs that aspire to
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56 grow their ventures. First, if entrepreneurial passion facilitates venture growth directly and
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3 indirectly, then how can we encourage entrepreneurs to find and fully embrace their passion?
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5 Cardon and colleagues (2009b) suggest that one cannot teach an entrepreneur to be more
6
7 passionate, but instead the goal should be to teach them how to become aware of what gives
8
9 them positive feelings so that those feelings can be harnessed toward productive ends. Other
10
11 scholars have suggested that passion may be teachable, or at least increased through exposure
12
13 to entrepreneurship education or other experiences (Gielnik *et al.*, In Press). According to
14
15 research on experiences of emotions (Frijda, 1993), people experience emotions when they
16
17 conceptualize an instance of affective feeling and categorize it. In addition, the emotion
18
19 regulation framework suggests that individuals can control the experience of emotions
20
21 (anticipatory-focused regulation) as well as the expression of emotion (response-focused
22
23 regulation) to others (Barrett, 2004). Our study suggests that if entrepreneurs can be trained to
24
25 be attentive to the positive feelings of passion they experience this can then be positively
26
27 related to venture growth. Further, if entrepreneurs are taught to develop venture goals that
28
29 are consistent with their passion, they should be even more productive in achieving those
30
31 goals. In working with practicing entrepreneurs who are already inclined toward more
32
33 positive emotional experiences, our focus should be perhaps on helping such individuals
34
35 figure out what would make them most passionate. One could help entrepreneurs examine
36
37 their self-identity, particularly what aspects of their identity are most salient and central, and
38
39 then explore potential business ideas that capitalize on those identity components. This is akin
40
41 to the work of Haynie and Shepherd (2011) where wounded veterans are trained to explore
42
43 hidden aspects of their identity and then taught how to identify potential business
44
45 opportunities in line with that identity. This could also be done for existing entrepreneurs,
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47 helping them remember why they started their firms originally and the connection the firm
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49 has to their self-identity, and therefore rekindling their passion for developing the firm
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51 further.
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3 Second, numerous studies on goal-setting and individual performance (e.g.
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5 Hollenbeck & Brief, 1987; Locke & Latham, 2002) have underscored the importance of
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7 setting challenging goals because of positive performance appraisals that follow. Based on the
8
9 findings from our study we suggest that it is important for entrepreneurs to cognize their
10
11 personal goals and appraise their goal related performance. Setting challenging goals will
12
13 drive overall competitive strategies and enhance a venture's long term growth and
14
15 sustainability (Locke & Latham, 2002). In addition, in pursuing competitive strategies and
16
17 adapting them to environmental changes, personal goal-setting becomes an important self-
18
19 regulation mechanism. Consistent with social cognitive theory, individuals who engage in
20
21 self-regulation more effectively cope with personal and environmental obstacles in pursuit of
22
23 goals (Locke & Latham, 2002). This is specifically important in bouncing back from failure
24
25 experiences, which are unfortunately even more common in technology-based ventures than
26
27 in non-tech firms (Storey & Tether, 1998). Engaging entrepreneurs in explicit goal-setting
28
29 activities might help enhance venture growth, because the articulation of goals increases goal
30
31 commitment, especially when such goals are shared publicly rather than kept to oneself. The
32
33 public sharing of goals among a group of entrepreneurs might also encourage setting of more
34
35 challenging goals. An important activity for entrepreneurs is formation of implementation
36
37 intentions (Gollwitzer, 1999), including both setting a goal (e.g.: 'I intend to increase
38
39 company's market share by 30 percent') and forming implementation intentions (e.g. 'If we
40
41 encounter fierce response from competition in our domestic market, we will partner with our
42
43 major competitor abroad') to realize that goal.
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49 **Limitations and future research**

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51 As with all research, there are some limitations of our study. First, we utilized a fairly limited
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53 population of high-technology manufacturing ventures located in five states in the Mid-
54
55 western US from which data were collected. Our sample has survivor bias as we include
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3 surviving and stable ventures and it also has potential unobserved heterogeneity where among
4
5 surviving ventures, due to variations in age and number of samples, efficacy of passion for
6
7 developing could vary. For example, entrepreneurs with passion for developing in older
8
9 and/or larger ventures may have honed their passion for developing, whereas others in
10
11 younger and/or smaller ventures may be in the process of honing their passion for developing.
12
13 While honing passion for developing is a self-regulatory process, in older and/or larger
14
15 ventures motivation related to passion for developing may also reduce over time as a stable
16
17 and established venture may impede passion to further develop the venture. We call on future
18
19 studies to explore these intertemporal dynamics of entrepreneurial passion over the course of
20
21 venture development. Second, we examined the effects of CEO characteristics on goals and
22
23 venture growth. Future research could use multilevel data (including top management team
24
25 level data) focusing on the impact of passion for developing on employees and/or the strategic
26
27 direction of the firm. Other individual-level characteristics could also be examined. Third, we
28
29 measure firm growth using percentage change in sales and employees over two years. The
30
31 impact of goal challenge and goal commitment on performance is likely to be in the short-
32
33 term and immediate impact on growth is a more reliable measure as such growth is less
34
35 confounded by changing aspirations and goals of the entrepreneur. Long-term growth
36
37 outcomes ranging from 'steady sales growers' to 'super relative growers' (Delmar, Davidsson
38
39 & Gartner, 2003) are less directly applicable in the current context. Nevertheless, future
40
41 studies could focus on the relationships between different types of entrepreneurial passion and
42
43 different types of growth outcomes for ventures. Finally, based on the current research design,
44
45 causality cannot be inferred. Due to the episodic nature of entrepreneurial efforts, the
46
47 underlying nature of causality between entrepreneurial passion and venture outcomes, is
48
49 contingent on the strength of this relationship in different contexts. As passion drives effort,
50
51 motivation, and regulation before, during, and after venture formation in a potentially cyclical
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3 manner, additional studies are necessary to assess the underlying nature of relationship
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5 between entrepreneurial passion and venture outcomes.
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8 The above-mentioned limitations also open avenues for future research. First, the
9
10 proposed model and hypotheses need to be empirically tested on other samples of
11
12 entrepreneurs, across different industries and contexts, preferably through longitudinal
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14 designs. Second, growing knowledge on entrepreneurial emotion and entrepreneurial passion
15
16 suggests that it would be useful to consider the impact of multiple emotional experiences on
17
18 venture growth. Despite the practical experiences of entrepreneurs and the broader
19
20 management and psychology literatures on the experience of mixed emotions (Ersner-
21
22 Hershfield *et al.*, 2008), the simultaneous effect of different types of emotion has seldom been
23
24 empirically examined in the entrepreneurship literature (Foo, Uy & Baron, 2009). A clearer
25
26 understanding of contingently managing different emotional experiences would help us
27
28 understand how entrepreneurs can selectively leverage different types of entrepreneurial
29
30 emotion. Such empirical testing of the simultaneous occurrence of different types of emotions
31
32 might require careful and thorough qualitative research, where entrepreneurs can be regularly
33
34 shadowed and observed with a focus on the extent to which they simultaneously experience
35
36 different types of affect, and how they manage those situations. Third, anecdotal evidence
37
38 suggests that entrepreneurial teams often disband at some point during the early venture
39
40 growth stage, often attributed to disagreements over venture goals (re-invest profits to grow
41
42 more, or stabilize and pull funds out, for example). Exploration of how each team member's
43
44 passion (level and/or focus) (Drnovsek, Cardon & Murnieks, 2009) or the collective team's
45
46 passion diversity (Forster, Post & Cardon, 2012) impacts individual and firm goals, goal
47
48 conflict, and firm outcomes would be particularly interesting and relevant to pursue. We also
49
50 encourage additional research on the relationships between passion for inventing and passion
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52 for founding on venture outcomes. While research on each domain of entrepreneurial passion
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(inventing, founding, developing) is promising, examining the shared influence of these domains on the venture throughout its life cycle could also help uncover additional avenues and obstacles on the path toward venture success.

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TABLE 1
Means, Standard Deviations, and Correlations

	Mean	SD	1	2	3	4	5	6	7	8	9
1. Venture growth (2011-2012)	0.09	0.77	1								
2. Firm age	8.93	1.38	0.12*	1							
3. Firm size	27.86	17.62	0.27***	0.31***	1						
4. Environmental dynamism	0.84	0.12	-0.19*	0.05	0.03	1					
5. Past venture growth	0.11	0.91	0.72***	0.31***	0.36***	-0.41***	1				
6. Passion for inventing	7.73	5.26	0.03	0.01	0.04	0.04	0.02	1			
7. Passion for founding	6.99	4.83	0.09*	0.02	0.08*	0.02	0.11*	0.29***	1		
8. Passion for developing	7.19	3.40	0.19**	0.05	0.02	0.02	0.24**	0.28***	0.35***	1	
9. Goal commitment	2.26	0.84	0.22***	0.02	0.04	0.02	0.20**	0.30***	0.31***	0.34***	1
10. Goal challenge	21.72	10.46	0.21***	0.03	0.17**	0.24***	0.16*	0.03	0.13*	0.16**	0.29***

Notes.

- * $p < .05$
- ** $p < .01$
- *** $p < .001$

N=122 repeat measurements 15 months apart

TMT Size is the number of people in the top management team of the venture.

FIGURE 1
Conceptual model

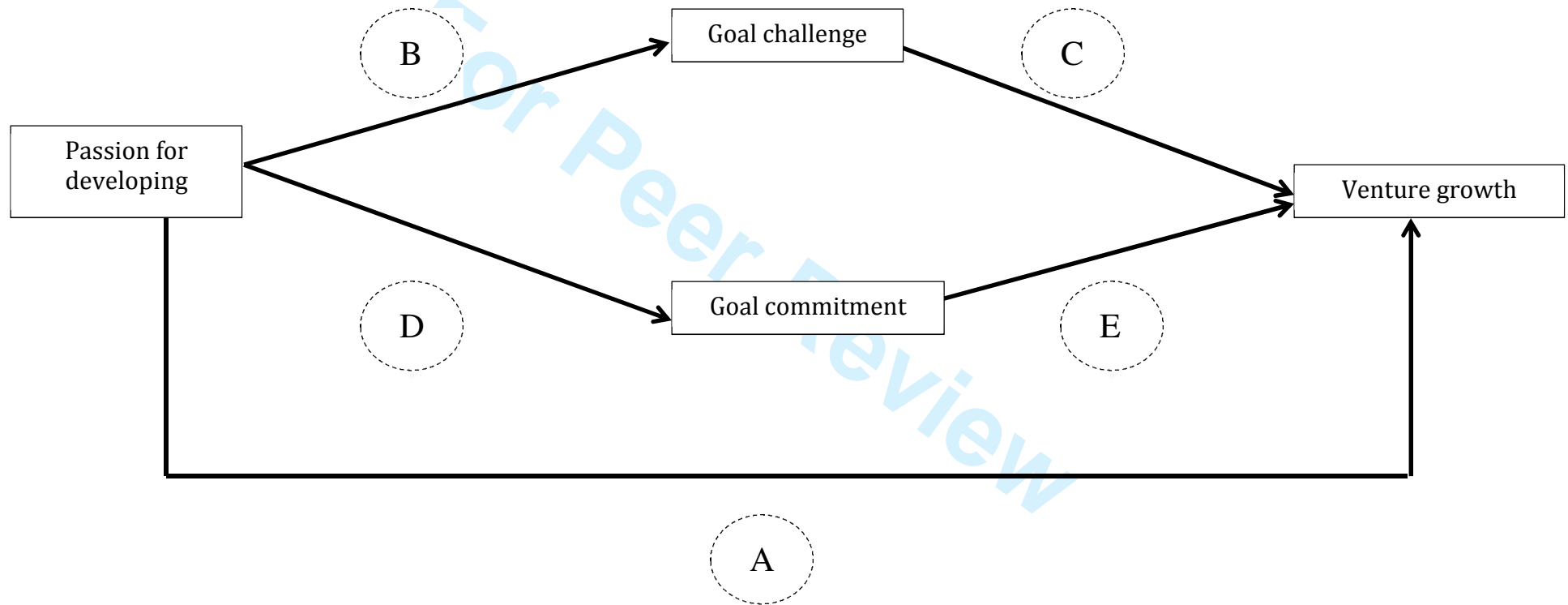
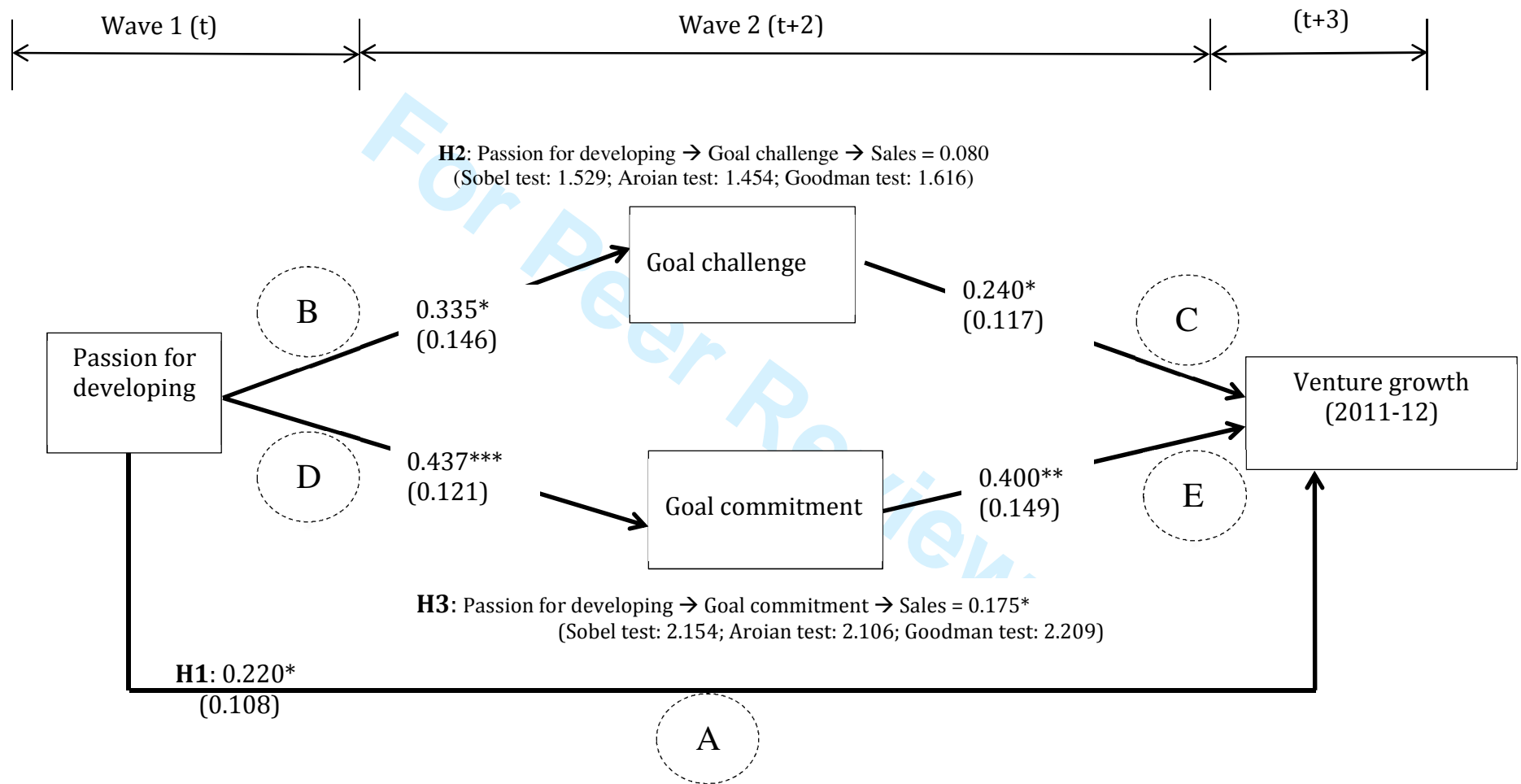


FIGURE 2
Path Analysis



$\chi^2/df = 4.821$; CFI=0.934; TLI=0.913; RMSEA=0.084 [95 percentage C.I.=0.072, 0.095]

Notes.
 N=122 ventures
 * $p < .05$
 ** $p < .01$
 *** $p < .001$

APPENDIX

Scale Description ²	Items	Exploratory Factor Analysis (Varimax rotation)				Item Loading
		Factor 1	Factor 2	Factor 3	Factor 4	
CFA for feelings subscales (controlled for covariance among three subscales): $\chi^2/df = 3.197$; CFI=0.936; TLI=0.915; RMSEA = 0.083						
Passion for Inventing						
Feelings						
	Finding new ways to solve unmet market needs that can be commercialized is exciting.	0.654	0.017	0.089	0.104	1
	Searching for new ideas for products/services is enjoyable.	0.404	0.245	0.135	0.179	0.733***
	I feel energized when I am developing product prototypes.	0.526	-0.105	0.134	0.129	0.855***
	I am motivated to figure out how to make existing products/services better.	0.502	0.028	0.107	0.238	0.820***
	Scanning the environment for new opportunities really excites me.	0.317	0.192	-0.030	0.084	0.637***
	Inventing new solutions to problems is an important part of who I am.	0.429	0.209	0.148	0.150	0.745***
Identity-Importance	Discovering new business ideas or opportunities is an important part of who I am.	0.574	0.090	-0.102	-0.230	
Passion for founding						
Feelings						
	Establishing a new company excites me.	0.326	0.460	0.096	0.097	1
	Owning my own company energizes me.	0.147	0.572	-0.006	-0.006	0.816***
	I did not enjoy creating my own firm.	0.234	0.633	0.028	0.122	0.847***
	Creating something out of nothing is exciting.	-0.048	0.434	0.121	0.221	0.682***
	Nurturing a new business through its emerging success is enjoyable.	0.145	0.505	0.250	0.145	0.793***
Identity-Importance	Being the founder of my business is an important part of who I am.	0.040	0.420	0.087	-0.244	
Passion for Developing						
Feelings						
	Trying to convince others to invest in my business motivates me.	0.048	0.346	0.435	0.092	1
	I really like finding the right people to market my product/service to.	0.004	0.099	0.404	0.408	0.667***
	Assembling the right people to work for my business is exciting.	0.016	0.217	0.511	0.135	0.815***
	I really enjoy commercializing new products/services	0.108	0.140	0.337	0.025	0.606***
	Pushing my employees and myself to make our company better motivate me.	0.091	-0.003	0.548	0.362	0.860***
Identity-Importance	Nurturing and growing my company (or companies) is an important part of who I am.	0.110	0.131	0.405	-0.018	
Goal Commitment						
	It's hard to take this goal seriously.	0.119	0.148	0.310	0.410	1
	It is unrealistic for me to expect to reach this goal.	0.274	0.103	-0.008	0.647	0.863***
	It is quite likely that this goal may need to be revised, depending on how things go.	0.021	0.132	0.330	0.319	0.616***
	I am strongly committed to pursuing this goal.	0.025	0.283	0.010	0.532	0.830***
	It wouldn't take me much to abandon this goal.	0.083	0.216	0.099	0.596	0.844***
	I think this goal is a good goal to shoot for.	0.006	0.063	0.305	0.433	0.772***
	Quite frankly, I do not care if I achieve this goal or not.	0.054	0.317	0.089	0.404	0.681***

Notes. N=122 responses ; *** p < 0.001

² (5-point Likert Scale; 1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree, 5-Strongly Agree)