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Entrepreneurial passion and organizational innovation: The moderating effects of events and the competence to exploit events

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Abstract

How do events, especially rare external events such as financial crises, wars, natural disasters, and the COVID-19 pandemic, affect the efficacy of entrepreneurial passion to drive organizational innovation? This study investigates the moderating role of events and entrepreneurs' competence to exploit the events (opportunity competence) in the relationship between entrepreneurial passion and organizational innovation. Drawing insights from event system theory, we identified two critical event characteristics (i.e., event novelty and event criticality). Integrating the affect infusion model and the self-verification process in the identity literature, we argue that the two event characteristics and opportunity competence are crucial for entrepreneurs to exploit the benefits of entrepreneurial passion in promoting organizational innovation. After analyzing a survey sample of 435 entrepreneurs in Qinhuai Silicon Alley in China and an online survey of 202 entrepreneurs worldwide, we found that entrepreneurial passion exerts a stronger effect on organizational innovation when events are more novel and more critical to entrepreneurs, and when entrepreneurs have greater opportunity competence. We discuss these findings' theoretical and practical implications later in this paper.

Keywords Entrepreneurial passion · Organizational innovation · Event novelty · Event criticality · Opportunity competence

Introduction

Entrepreneurial passion is a prominent topic in both entrepreneurial research and practice. Passion can boost creativity in problem-solving (Bierly et al., 2000), persistence in the entrepreneurial process (Cardon & Kirk, 2015), employee engagement

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(Cardon, 2008), and venture growth (Baum & Locke, 2004; Baum et al., 2001), as well as attract potential investors (Hsu, Haynie, Simmons, & McKelvie, 2014; Mitteness et al., 2012). Recent studies have indicated that entrepreneurial passion is also effective in promoting organizational outcomes, particularly organizational innovation (Kiani et al., 2020; Ma, Gu, & Liu, 2017; Patel, Thorgren, & Wincent., 2015; Strese et al., 2018), yet entrepreneurial passion's efficacy may vary under various circumstances. Contextual factors—such as entrepreneurs' regulatory focus (Ma et al., 2017) and thinking style (Kiani et al., 2020), shared organizational vision (Strese et al., 2018), and environmental dynamism and complexity (Baron & Tang, 2011; Patel et al., 2015)—can moderate passion's effects on organizational outcomes. However, these studies only considered feature-oriented factors (i.e., individual characteristics) or environmental characteristics (i.e., environmental dynamism or complexity) as major contextual factors. They overlooked the fact that entrepreneurs also experience various events that frequently force them to step out of their comfort zones. Events are a critical component of today's dynamic environment; thus, they differ from feature-oriented factors that are static in nature. Moreover, events are discrete and bounded in space and time (Morgeson, 2005); thus, they largely differ from the environmental dynamism or complexity that captures the continuous and incremental changes in an industry over time (Boyd, 1990; Rescher, 1996).

We argue that failing to incorporate events into an analysis of passion may elicit an incomplete understanding of the contextual theorizing of passion efficacy, as Johns (2017) points out: "If there has been a deficit in contextual theorizing, it is most apparent in a basic lack of theories that treat discrete events as contexts." More specifically, it is unclear whether events' characteristics and entrepreneurs' exploitation of such events influence entrepreneurial passion's efficacy in promoting organizational innovation. This research gap is critical because entrepreneurial passion's efficacy may differ when entrepreneurs face different events and because passion's role is highly salient in extreme conditions (i.e., novel or critical events in Morgeson 2005; threats in Staw et al., 1981; and punctuation in Tushman & Romanelli 1985).

To address this research gap, we investigated how events moderate entrepreneurial passion's efficacy in promoting organizational innovation. Scholars have reached the consensus that entrepreneurial passion comprises both *affect* (e.g., intensely positive feelings) and *identity* (the entrepreneurial identity's salience) elements (Cardon et al., 2013). We drew on event system theory (EST) to capture core event characteristics' implications on entrepreneurs' information processing and behaviors. We borrowed further insights from the affect infusion model (AIM) (Forgas, 1995) and the self-verification process in the identity literature to explain how core event characteristics influence the effects of passion's *affect* and *identity* elements on organizational innovation. For example, EST suggests that events induce substantive information processing when the events are more novel and critical to the entrepreneurs. Following AIM, we expected events to elicit greater passion infusion in entrepreneurs' cognitive processing when the events are more novel and critical, thereby amplifying the relationship between passion and organizational innovation. Furthermore, EST suggests that novel or critical events inspire changes or creations, consistent with the entrepreneurial identity's role expectations. According to the self-verification process in the identity literature (Heise, 1979; Stryker & Burke, 2000), we expect

entrepreneurs to be motivated to engage in event-eliciting entrepreneurial activities (i.e., innovation) to verify their entrepreneurial identity. Therefore, when events are more novel and critical, passion's identity element exerts a greater impact on organizational innovation.

Aside from events' characteristics, we also investigated the role of opportunity competence, which captures entrepreneurs' competence to identify and exploit opportunities from events as a critical boundary condition of passion efficacy. Drawing from the AIM and the identity literature, we argue that greater opportunity competence facilitates the infusion of passion into entrepreneurial activities (Forgas, 1995) and enhances entrepreneurs' confidence and motivation to confirm or enhance their entrepreneurial identity.

We tested our theory using a field survey of 435 ventures located in Qinhuai Silicon Alley in China, with an emphasis on a series of government-initiated events. We gauged the findings' robustness further by conducting an online survey of 202 entrepreneurs worldwide, with COVID-19 as the focal event. The findings generally demonstrated event characteristics' moderating effects on the relationship between entrepreneurial passion and organizational innovation.

Our study makes significant contributions to the entrepreneurial passion literature and the behavioral literature. First, we complemented extant research on entrepreneurial passion by delineating events as a critical boundary condition affecting passion's efficacy in promoting organizational innovation. Recent studies have begun to examine passion's varying effects under different individual and environmental contexts (Baron & Tang, 2011; Kiani et al., 2020; Ma et al., 2017; Patel et al., 2015; Strese et al., 2018). We built on this line of research by examining events as another highly different, yet critical context of passion efficacy. Furthermore, we contributed further insights into the entrepreneurial passion literature by investigating the interaction between passion and opportunity competence in promoting organizational innovation. Passion is treated as a key intangible asset in promoting organizational innovation (Makino et al., 2020). We built on this line of research by demonstrating that passion's power cannot be fully exploited when entrepreneurs do not have enough competence to exploit opportunities from events, thereby highlighting the importance of integrating emotional and capability perspectives when studying passion's efficacy. Finally, behavioral strategy scholars have suggested that to develop a more realistic theory of organizational decision-making, organizational studies should "merge cognitive and social psychology with strategic management theory and practice" (Powell et al., 2011: 1371). By examining passion and events' interaction effects, which shape the cognitive processing strategies that entrepreneurs adopt, we acted on this call for an integrative approach by merging cognitive and social psychology in management research.

Theoretical background and hypotheses

Entrepreneurial passion

Passion has been defined as "a strong inclination or desire toward an activity that one likes or loves, finds important, and in which one invests time and energy" (Vallerand et al., 2003: 757). Existing studies on entrepreneurial passion mainly have adopted two theoretical frameworks: the dualistic model of passion (Vallerand et al., 2003) and three types of entrepreneurial passion for specific role identities (Cardon et al., 2009). The former framework focuses on passion for the general identity of *entrepreneur* and identifies two types of passion based on the degree of internalization of the entrepreneurial identity (i.e., harmonious passion vs. obsessive passion). The latter framework focuses on passion for activities associated with different role identities (i.e., inventor, founder, and developer) and argues that passion for different role identities can elicit different effects (Cardon et al., 2009; Collewaert et al., 2016; Drnovsek et al., 2016). More importantly, entrepreneurs may experience different types of passion for activities associated with different role identities at different stages of the entrepreneurial process (Cardon et al., 2009). For example, passion for founding is most critical in the founding phase of a venture's lifecycle (Collewaert et al., 2016), while passion for inventing is highly influential in generating product innovation, and passion for developing is most essential in ventures' expansion decisions (Murnieks et al., 2020). Given our focus on innovation activities in the entrepreneurial process, we examined passion for inventing, which is linked to entrepreneurial efficacy in innovative idea development and opportunity exploration (Cardon et al., 2013; Katila & Ahuja, 2002). Thus, it is the type of passion most relevant to organizational innovation.

Following Cardon et al. (2009: 517), we define entrepreneurial passion as "consciously accessible intense positive feelings experienced by engagement in entrepreneurial activities associated with roles that are meaningful and salient to the self-identity of the entrepreneur." This definition indicates that entrepreneurial passion comprises two key elements. First, it has an *affective* aspect and involves experiencing intensely positive feelings. Second, it is *identity*-relevant, and the positive feelings are experienced for activities central to the individual's self-identity. Further empirical studies have provided evidence that these two aspects are distinct from each other (e.g., Cardon et al., 2013).

Entrepreneurial passion has been demonstrated to elicit several organizational benefits, e.g., venture growth (Baum & Locke, 2004; Baum et al., 2001) and attracting potential investors (Hsu et al., 2014; Mitteness et al., 2012). These effects mainly work through two mechanisms: Passion's affect element broadens entrepreneurs' cognitive repertoires (Cohn & Fredrickson, 2006), and passion's identity element motivates entrepreneurs to be committed to entrepreneurial activities (Cardon et al., 2009). In the following sections on hypothesis development, we will discuss how these two elements of entrepreneurial passion provide direct and contingent values for promoting organizational innovation.

Entrepreneurial passion and organizational innovation

Passion for inventing (henceforth: passion) concerns entrepreneurs' passion toward "activities associated with scanning the environment for new market opportunities, developing new products or services, and working with new prototypes" (Cardon et al., 2013: 379). We argue that passion's affect and identity elements could facilitate organizational innovation for the following reasons. First, entrepreneurial passion, as a form of intense and positive emotion, can help improve the entrepreneurs' perception on a wide range of information (Isen, 2002; Ashby & Isen, 1999), such as the market, technology and customer information (Delgado Carcía et al., 2015). Besides, passion also enhances the entrepreneurs' abilities to conceive of new combinations and formulate creative ideas, which serve as precursors of organizational innovation (Cardon et al., 2009). Studies also have indicated that "passion, as an intangible, hard-to-measure quality of those asking for resources, can be powerful and critical in many endeavors that are aimed at creating something new in the society" (Chen et al., 2009: 119). Given these reasons, we argue that the new creations motivated by passion are expected to result in organizational innovation in the end.

Second, entrepreneurs with positive emotions are likely to appraise risks positively and are willing to take risks. Multiple studies (e.g., Schwarz 1990; Schwarz & Clore, 1996) on individual-level phenomena have indicated that the risk-taking tendency is greater for individuals with positive emotions than those with negative emotions. At the organizational level, Huy (1999) also indicated that positive emotions created through playful activities could motivate organizational members' innovative behaviors. Given that organizational innovation is often the consequence of risk-taking, entrepreneurs with higher passion levels are more likely to take risks and produce innovation outcomes.

Furthermore, according to Cardon et al. (2013), passion emerges when the entrepreneurial identity is salient. Therefore, passion's identity element is arguably a strong motivator for entrepreneurs to engage in entrepreneurial activities, e.g., identifying new opportunities, coming up with innovative ideas, and tinkering with creative solutions to meet important needs and solve problems (Cardon et al., 2009). These activities themselves are of particular importance in promoting organizational innovation (Ward, 2004).

Finally, extant studies have demonstrated that passion can be transferred to other organizational members through both affect contagion and social identification processes (Barsade, 2002; Makino et al., 2020). When organizational members share their passion with each other, the shared passion will foster a "community of practice" that facilitates knowledge sharing and social exchange within the organization (Wenger & Snyder, 2000). This knowledge sharing and social exchange process will foster the emergence of new ideas, thereby promoting organizational innovation. Thus, we propose the following hypothesis:

Hypothesis 1 Entrepreneurial passion for inventing is positively related to organizational innovation.

Event characteristics as the context: event novelty and criticality

As previous research suggests, entrepreneurial passion's efficacy is subject to contextual factors, e.g., environmental complexity (Patel et al., 2015), organizational shared vision (Strese et al., 2018), entrepreneurs' thinking style (Kiani et al., 2020), and regulatory focus (Ma et al., 2017). Building on this line of research, we expect event-related characteristics to affect entrepreneurial passion's efficacy.

Events may force people to step out of their routines (Morgeson, 2005), and these events usually function as the means by which people come to reevaluate their established behaviors. Several extant studies have investigated events' influence on organizations (Hoffman & Ocasio, 2001) and on members within these organizations (Vuori & Huy, 2016). Events such as natural disasters, technological changes, or corporate scandals tend to exert varying degrees of influence on entrepreneurial decision making and behaviors (Salvato et al., 2020; Yiu et al., 2014).

Event system theory (EST) is a comprehensive model that depicts the characteristics of and potential consequences elicited by an event (Morgeson et al., 2015). According to EST, an event's strength is characterized by three aspects: novelty; disruption; and criticality. Event novelty reflects "the extent to which an event is different or varies from current and past behaviors, features, and events" (Morgeson et al., 2015: 520); thus, a novel event is usually a new or unexpected phenomenon (Morgeson, 2005). For example, introducing a new work procedure may be novel to the organization if it largely diverges from previous work processes. Event disruption reflects a discontinuity in the environment and breaks organizational routines (Morgeson et al., 2015). The term *disruption* usually is used interchangeably with *intervention* (Morgeson & DeRue, 2006) or *upheaval* (Gersick, 1991). Event criticality reflects "the degree to which an event is important, essential, or a priority" to an entity (Morgeson & DeRue, 2006: 273). The more critical the event, the more likely it is to attract unusual attention and responses (Morgeson et al., 2015). EST suggests that the three aspects of event strength are distinctive from each other, and that an event is likely to elicit the strongest emotional and behavioral reactions when it is novel, disruptive, and critical (Morgeson et al., 2015).

As we will demonstrate in the next section, event novelty and criticality are related directly to the working mechanism of passion's identity element, while event disruption is not. For example, entrepreneurs facing novel events are expected by key stakeholders to behave more creatively. These expectations under high event novelty are consistent with their entrepreneurial identity. Moreover, a critical event usually is deemed closely associated with the entrepreneurial identity, that is, the attribute of event criticality itself describes the association between the event and the entrepreneurial identity. Therefore, entrepreneurs may enhance their valued identity by engaging in dealing with critical events. However, a disruptive event does not carry clear implications on behavioral expectations associated with entrepreneurial identity. As suggested by EST (Morgeson et al., 2015), a disruptive event usually reflects the threat experienced from major disruptions. Existing studies suggest that individuals may respond differently to external threats. While some scholars argue that entrepreneurs tend to respond to perceived threats in the environment with risk-averse behavior because they perceive such actions to be associated with greater

control (Staw et al., 1981; Sitkin & Pablo, 1992), others suggest that entrepreneurs are expected to seek risks in unfavorable circumstances because they feel that they have little to lose (Kahneman & Tversky, 1979). The above analysis suggests that a disruptive event may not necessarily lead to creative solutions; instead, entrepreneurs may resolve challenges by following existing protocols and procedures (Chen et al., 2021). Therefore, the behavioral expectations following disruptive events may or may not relate to the role expectations of an entrepreneur identity, i.e., innovation. Furthermore, as we show below, we drew from the AIM to argue for the moderating role of event characteristics between the affect aspect of passion and organizational innovation. While event novelty and criticality are core components included in the AIM, event disruption is not. Therefore, we did not include event disruption in our framework.

In our analysis of events as the boundary condition, we drew insights from the AIM and identity literature (Burke & Reitze, 1991; Goffman 1959), corresponding to passion's affect and identity elements. One of the main tenets of the AIM is that affect will be more likely to be infused in decision making when the events require a substantive processing strategy with a high degree of constructive processing, rather than a direct access strategy that adopts a preexisting evaluation (Forgas, 1995). A substantive processing strategy is most likely to be adopted when the event is novel and of high personal relevance, and when the subjects have a great need for cognition and adequate cognitive capacity (Morgeson et al., 2015; Petty & Cacipoppo, 1986). Therefore, we expect events to strengthen passion's positive effects on organizational innovation by inspiring substantive processing. We also drew arguments from the identity literature to address events' influence on the relationship between passion's identity element and organizational innovation. Among the myriad theoretical approaches to identity, we focused on the self-verification process, which directs behaviors toward matching meanings associated with the situation (i.e., event) and the meanings associated with identity (Burke, 1991). We treated events as a context that raises various role expectations. Following Petriglieri (2011), an event's relevance to entrepreneurs depends on the following primary appraisals: (1) whether it preserves or benefits the entrepreneur's identity; (2) whether it harms the entrepreneur's identity; (3) whether it holds potential for entrepreneurial identity growth; and (4) whether it holds potential to harm the entrepreneur's identity. As we will demonstrate below, when an event is viewed as having high relevance, it is likely to enhance the entrepreneur's tendency to confirm, enhance, or defend their valued identity (Heise, 1979; Stryker & Burke, 2000; Gecas & Burke, 1995), thereby amplifying the relationship between passion (identity element) and organizational innovation.

Event novelty

An organization may experience different events at different developmental stages, and different organizations likely will have divergent interpretations of the same event (Dutton & Jackson, 1987). When an event diverges from expectations, it is likely to be perceived as "novel." Thus, a novel event usually represents a new or unfamiliar phenomenon.

AIM (Forgas, 1995) suggests that novel events (the opposite of familiar events or targets in AIM) require substantive cognitive processing. Individuals may employ quick shortcuts or direct access strategies that rely on existing routines when faced with familiar events, but are less likely to do so when faced with novel events, as they are usually forced to step out of established routines (Morgeson et al., 2015). Thus, the more novel the event, the more likely people are to activate substantive cognitive processing and modify routine-based behavior. For example, the COVID-19 pandemic is an extremely rare and novel event for most firms, and a firm's existing rules and procedures may not work effectively to deal with this event. Therefore, firms faced with a novel event need to seek new rules and procedures. Thus, our results suggest that entrepreneurs tend to adopt substantive processing strategies when faced with novel events.

In addition, AIM has shown that affect tends to be infused into judgments when individuals are dealing with more atypical and novel events (Forgas, 1993, 1994). As mentioned earlier, novel events prompt substantive processing strategies, i.e., search. Considering that organizational innovation occurs through extensive search activities, we can conclude that the passion (specifically, the affect element) tends to have a greater impact on organizational innovation as the novelty of the event increases.

Moreover, the occurrence of a novel event usually requires a creative response, such as the invention of a new product, and hence event novelty creates a social context that justifies entrepreneurial activity (Sine & David, 2003). Thus, novel events have the potential to reinforce entrepreneurial identity (Petriglieri, 2011). According to the self-verification process of the identity literature (Burke, 1991), if external role expectations (e.g., from stakeholders, etc.) in a given situation (i.e., event) enhance entrepreneurial identity, entrepreneurs will have a strong motivation to meet those role expectations. On the other hand, when external role expectations are inconsistent with the entrepreneurial identity, entrepreneurs will lose motivation to meet those role expectations (Shepherd & Haynie, 2009; Stryker & Burke, 2000). Following this logic, we argue that when entrepreneurial activity is consistent with the expectations of key stakeholders under novel events, entrepreneurs will have a strong motivation to confirm or reinforce their entrepreneurial identity. Thus, we propose:

Hypothesis 2 The positive relationship between entrepreneurial passion for inventing and organizational innovation is stronger when entrepreneurs face events with greater novelty.

Event criticality

Different events may not attract entrepreneurs' attention equally, and those of greater relevance are more likely to be viewed as more salient and attract a greater amount of attention and action. For example, Hoffman and Ocasio (2001) suggested that firms pay a great deal of attention to events that are crafted in a way that threatens their organizational identity. Entrepreneurship studies also have indicated that entrepreneurs tend to be emotionally and cognitively involved in certain activities (e.g., inventions) when they hold corresponding identities (e.g., an inventor identity;

Breugst et al., 2012). These studies, when combined, suggest that entrepreneurs are more likely to respond proactively and intensively when an event is treated as more critical.

The AIM suggests that, all things being equal, more critical events are likely to be processed substantively (Forgas, 1995), while less critical events will lead to direct access processing that adopts a preexisting evaluation. Ample evidence has indicated that even a slight variation in personal relevance, namely the level of criticality, may result in profound changes in information processing strategies (Brewer, 1988). For example, Mao et al. (2018) suggested that affect is more likely to influence individuals' justice perceptions in high personal relevance conditions than in low ones. Therefore, we expect that when entrepreneurs treat an event as more critical to their entrepreneurial identity, they will be more likely to engage in substantive information processing, which invokes a high degree of constructive processing. As a result, their passion will be more likely to be infused into cognition and decision making, thereby exerting a greater influence on organizational innovation.

Moreover, event criticality also provides a context in which entrepreneurs can enhance or defend their entrepreneurial identity, thereby promoting the conversion of passion into organizational innovation. As Morgeson et al. (2015) suggested, a critical event usually plays an important role in an entrepreneur's long-term success. In our context, we argue that a critical event carries important implications for the survival and development of new ventures (Hermann, 1963). When a critical event is perceived as an opportunity, it may improve the likelihood of a venture's success by providing entrepreneurs with critical resources and hence hold potential for entrepreneurial identity growth (Petriglieri, 2011). For example, meetings that the government organizes may provide entrepreneurs with potential collaborative opportunities. Government-initiated reward application events provide entrepreneurs with the possibility of attaining government support or preferential policy treatment. According to the self-verification process in the identity literature (Burke, 1991), when the meanings or role expectations associated with an event are consistent with the meanings of the entrepreneur identity, entrepreneurs will have stronger motivation to verify their identity by engaging in entrepreneurial activities, such as innovation.

However, when an event is perceived as a threat, it may influence a firm's survival and performance negatively. For example, external threats—e.g., technological transformation, financial crises, and the COVID-19 pandemic—likely "threaten the fundamental goals of an organization" (Weick, 1988: 305). We argue that these critical events may harm the entrepreneurial identity due to potential losses from such events (Petriglieri, 2011). As the self-verification process in the identity literature suggests, when external events change the situation such that "individuals perceive situated self-meanings and expectations of themselves as different from their identity standard, they act to counteract the disturbance" (Stets & Burke, 2000: 233). Indeed, extant studies have suggested that, faced with threats to their valued identity, entrepreneurs usually take proactive actions to defend their identities, rather than surrender (Powell & Baker, 2014; Jain et al., 2009). Therefore, these negative critical events also motivate entrepreneurs to engage in innovation as a way to defend their entrepreneurial identity. Thus, we propose:

Hypothesis 3 The positive relationship between entrepreneurial passion for inventing and organizational innovation is stronger when entrepreneurs face events with higher criticality.

Capability to exploit opportunities from events: opportunity competence

According to the literature on appraisal of events (Lazarus, 1991), individuals' response to events also depends on their appraisal of the competence to cope with events aside from the events' relevance. Therefore, we also considered entrepreneurs' competence to identify and exploit opportunities from events. In particular, we focused on opportunity competence, which is defined as entrepreneurs' competence related to "recognizing and developing market opportunities through various means" (Man et al., 2002: 132).

Following the AIM, we expected high opportunity competence to motivate exploratory learning, which, in turn, facilitates the use of a substantive processing strategy. Exploratory learning requires decision makers to attend to and learn from a broad set of alternative possibilities and usually is depicted as forward-looking actions that invoke substantial cognitive processes (Gavetti & Levinthal, 2000). However, when individuals do not have enough competence to process information from multiple sources, or when their processing competence is impaired, they tend to adopt a simplified heuristic processing strategy (Bodenhausen, 1993; Bodenhausen & Lichtenstein, 1987). Multiple studies have provided evidence that entrepreneurs may use simple heuristics to make decisions under high environmental complexity because of their limited cognitive capabilities to deal with information overload (Artinger et al., 2015; Busenitz & Barney, 1997). The above arguments based on the AIM suggest that a greater affect infusion occurs when entrepreneurs have greater opportunity competence. As discussed previously, this greater affect infusion will promote the conversion of entrepreneurial passion into organizational innovation.

Furthermore, we argue that opportunity competence also enables entrepreneurs to express their entrepreneurial identity and, thus, promote organizational innovation. Entrepreneurs are better-equipped to deal with events when they have greater opportunity competence. Extant studies have found that individuals enjoy engaging in activities in which they have a strong belief in their ability to succeed (Baum & Locke, 2004), or when their interests align with their abilities (i.e., what they want to do is what they can do). Following this logic, entrepreneurs with greater competence to exploit opportunities are more likely to enhance their entrepreneurial identity by engaging in entrepreneurial activities, e.g., generating new ideas and promoting innovation. Thus, we propose:

Hypothesis 4 The positive relationship between entrepreneurial passion for inventing and organizational innovation is stronger when entrepreneurs have greater opportunity competence.

STUDY 1: Method

Sample and data

The data used in this study were collected in December 2019 via a survey of ventures in Qinhuai Silicon Alley, located in Jiangsu Province, China. Qinhuai Silicon Alley provides an ideal research setting in which to investigate passion for inventing and organizational innovation for three reasons. First, learning from Silicon Valley in Northern California, the Nanjing government designed Qinhuai Silicon Alley to promote firm innovation in Jiangsu Province's Qinhuai District. The local government provides infrastructural support and facilitates collaborations between local firms and research institutes. Many ventures have moved to this area to take advantage of local government support and to build close business connections. Moreover, these ventures are relatively small in size,[1] and entrepreneurs exert substantial influence on organizational decision-making and the innovation process. Therefore, entrepreneurs' emotional aspects are highly relevant to organizational innovation.

Three research assistants developed the survey in English, and then translated it into Chinese. We also commissioned back-translations from two independent translators to ensure conceptual equivalence. Considering that one of the authors engaged in a research collaboration project with government officials in Qinhuai District, we had a chance to involve local government officials in the data collection process. In this way, a high response rate to our survey was ensured. The survey was sent to 583 entrepreneurs involved with Qinhuai Silicon Alley ventures, and 545 responses were received, a response rate of 93.5%. After deleting surveys with missing information, we reached a final sample size of 435.

Variables

We adopted measurements of the variables in our study from the existing literature and measured each item using a five-point Likert scale. Appendix 1 provides the items for our key variables, along with the Cronbach's alpha values and the percentage of variance explained for each variable.

Dependent variable. Our dependent variable was *organizational innovation*. We derived our measurement scale for organizational innovation from existing research on corporate entrepreneurship (Guth & Ginsberg, 1990; Zahra, 1996), which comprises three aspects: innovation; venturing; and strategic renewal. Zahra (1996) developed 14 items to measure these three distinct aspects of corporate entrepreneurship, but innovation—i.e., introducing new products, services, and production processes—was the most relevant to the focus on organizational innovation in our study, while the other two factors,venturing and strategic renewal, was not relevant to organizational innovation. Therefore, we adopted Zahra's (1996) scale. In particular, we extracted five items that cover the innovation aspects of Zahra's measurement scale for corporate entrepreneurship (Zahra, 1996) to measure organizational inno-

[1] Of the ventures in our sample, 60% have fewer than 100 employees, and 88% have fewer than 300 employees.

vation. The five innovation-related items explained 81.94% of the variance, with a Cronbach's alpha of 0.91.

Independent variables. We used the scale adapted from Cardon et al. (2013) to measure *entrepreneurial passion*. The scale incorporates two dimensions: (1) positive intense feelings for inventing activities and (2) the inventor identity's centrality. The scale's feeling dimension is a reflective measure comprising four items, whereas the identity dimension is a one-item measure of the inventor identity's centrality. The feeling items are averaged, then multiplied by the identity item (Cardon et al., 2013). The four affect items explained 82.71% of the variance of the affect dimension of entrepreneurial passion, with a Cronbach's alpha of 0.93.

Event characteristics. Since its establishment, Qinhuai Silicon Alley has focused on stimulating regional innovation as its first priority. To facilitate regional innovation, the Qinhuai government initiated several events. We categorized these events under the overarching event of "building Qinhuai Silicon Alley," given that these events were purported to facilitate regional innovation in Qinhuai Silicon Alley. We followed a two-step procedure by Morgeson (2005) and Morgeson and DeRue (2006) to collect and evaluate data regarding these events. First, we asked the entrepreneurs: "What are the major government-initiated events that have a great stake in the innovation of your firm since your entry into Qinhuai Silicon Alley?" The respondents were asked to write descriptions of the events. We also conducted interviews with two government officials to obtain a more comprehensive list of the events purported to facilitate regional innovation (event examples are presented in Table 1). We checked the consistency between the major events that the entrepreneurs proposed and those that the government proposed, and found that different entrepreneurs mentioned all the events that the two government officials proposed. Second, we asked the entrepreneurs to rate the novelty and criticality of the series of events based on established scales. To measure *event novelty*, we adopted a scale developed by Morgeson (2005). Considering that the measurement items reflect an event's typicality (the opposite of novelty), we reversed the rating scores. The four items in the scale explained 89.28% of the variance, with a Cronbach's alpha of 0.96. To measure *event criticality*, we used three items adapted from Morgeson and DeRue's (2006) work. The three items are loaded on one factor and explain 80.25% of the variance, with a Cronbach's alpha of 0.87.

We argue that these events provide a desirable context in which to test our model. First, considering that the government initiated these events, they are exogenous to the entrepreneurs. Moreover, extant studies have indicated that different entities may interpret the same event differently (Hoffman & Ocasio, 2001). Focusing on common events that entrepreneurs face enables us to control for possible extraneous variation without significantly losing variations among entrepreneurs' perceptions of event characteristics.

Opportunity competence. We used three items derived from the previous study to measure opportunity competence (Man et al., 2002). These items capture the entrepreneurs' ability to recognize potential markets, as well as evaluate and utilize business opportunities. The items explained 92.27% of the variance, with a Cronbach's alpha of 0.96.

Table 1 Example events from the interviews

Interpreting new policies The Qinhuai Government officials are very sensitive the new policies. They organized events to interpret these new policies, especially some preferential policies. For example, they made a brochure including all the recent new policies. Through their interpretation of these policies, I can get a clear understanding of which new policies most fit the current situation of our firm.
Organizing training programs Sometimes the training is too much. For example, they are holding the Third Corporate Executive Training these days. However, as I have no financing needs, I am not interested in it. Despite of this, I know some other firms are in desperate need of this training.
Product exhibition Silicon Alley frequently held product exhibitions. They asked each company to showcase their new products and invited the government officials at the city or provincial level to visit the exhibition. Although most of us are quite busy, we squeeze time to involve in this because we want to impress the municipal leaders. Last time, the leaders provided some help in our brand promotion.
Organizing Conferences/meetings They will organize some international or national conferences on leading edge technologies. They recently organized one conference on artificial intelligence. I got to know my current business partner and got access to supply chain resources in this conference.
Organizing talent projects They are promoting a "Zijinshan" talent project which aims to select promising innovation project. They selected me this time. This project requires a number of preparations. However, the final reward is attractive: besides the honor, they also provide financial support for the award winners, from 500,000 RMB to 1,000,000 RMB.

Control variables. We included several variables to control for possible confounding effects of entrepreneurs' demographic characteristics (i.e., *gender*, *age*, *education level*, *tenure at current firm*, and *tenure in current position*), firm characteristics (i.e., *firm type* and *firm size*), and industry characteristics. We measured entrepreneurs' gender using a dummy variable, coded 1 for males and 0 for females. We classified the entrepreneurs' ages into four groups and assigned corresponding values to each one (1 = ages 21–30, 2 = ages 31–40, 3 = ages 41–50, and 4 = ages > 50). We categorized education level into three groups (1 = college graduate,[2] 2 = university graduate, and 3 = postgraduate or above). Entrepreneurs' tenure at their current firms was measured by the number of months since they joined the firm, and tenure in their current positions was measured by the number of months they held their current positions. Firm type was measured using a dummy variable that indicates whether or not a firm is state-owned (1 indicates state-owned and 0 not state-owned). Given that Qinhuai Silicon Alley was established to "revitalize regional innovation," many conventional state-owned firms set up new businesses as subsidiaries, and some top managers in the original state-owned firms were selected as entrepreneurs in the newly established subsidiaries. About 53% of the firms in our sample were state-owned. Firm size was measured based on total number of employees. Industry was measured using a binary variable with a value of 1 if the industry is high-tech and 0 otherwise, given our focus on organizational innovation.

Analysis and results

Table 2 presents the means, standard deviations, and correlations for the variables. We evaluated the variance inflation factor (VIF) values in our analysis, and the results indicated a maximum VIF of 2.59 across all regression models, far below the commonly accepted VIF threshold of 10 (Cohen et al., 2003). Therefore, we believe that multicollinearity did not significantly distort our analyses.

To reduce possible selection bias, we performed a t-test that compared the following characteristics between participating and non-participating firms: (1) Four items reflected the entrepreneurs' gender, age, education level, tenure in current position, and tenure at current firm; and (2) three items reflected the ventures' firm ownership type, size, and industry (high-tech or low-tech). The results indicated no statistically significant differences for any of these items, indicating that selection bias, if present, exerts no significant effect on our subsequent analyses' generalizability.

We also conducted Harman's single-factor test to measure common method variance in our data (Podsakoff & Organ, 1986). A principal components factor analysis with an unrotated solution generated seven factors with eigenvalues greater than 1.0. The largest variance explained by a single factor was below 40% (less than 50%), suggesting that no single factor explained most of the covariance in all variables.

To check further whether significant common variance exists among our key variables— including organizational innovation, the feeing aspect of entrepreneurial passion for inventing, event novelty, event criticality, and opportunity compe-

[2] In China, colleges recruit students who did not meet the minimum admission score required for university admission on the National College Entrance Examination.

Table 2 Descriptive statistics and correlation matrix in Study 1

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Organizational innovation	0.91												
2. Entrepreneurial passion for inventing	0.56*	0.93											
3. Event novelty	0.61*	0.55*	0.96										
4. Event criticality	0.61*	0.61*	0.67*	0.87									
5. Opportunity competence	0.65*	0.64*	0.50*	0.62*	0.96								
6. Gender	-0.01	0.00	-0.08	-0.08	0.01	-							
7. Age	-0.17*	-0.04	-0.21*	-0.09	-0.13*	0.27*	-						
8. Education	-0.18*	-0.01	-0.07	-0.15*	-0.08	0.14*	0.11*	-					
9. Tenure in current firm	-0.29*	-0.09*	-0.29*	-0.24*	-0.21*	0.18*	0.61*	0.16*	-				
10. Tenure in current position	-0.07	-0.03	-0.14*	-0.16*	-0.10*	0.16*	0.47*	0.06	0.59*	-			
11. Firm type	0.11*	0.00	0.12*	-0.05	0.09*	-0.01	-0.14*	-0.21*	-0.38*	-0.12*	-		
12. Firm size	-0.25*	-0.02	-0.19*	-0.06	-0.16*	-0.01	0.22*	0.20*	0.54*	0.14*	-0.55*	-	
13. Industry	0.12*	0.02	0.01	0.08	0.06	0.12*	0.01	0.15*	0.00	0.13*	-0.07	-0.05	-
Mean	3.65	3.86	3.83	3.30	3.57	0.53	1.96	1.95	80.13	44.56	0.53	1.61	0.33
SD	2.13	0.82	0.88	1.18	1.00	0.52	0.90	0.62	84.28	44.86	0.50	0.92	0.47

Notes: N=435; * $p<0.05$. The variables including organizational innovation, entrepreneurial passion for inventing, event novelty, event criticality, and opportunity competence are standardized with a mean of 0 and a standard deviation of 1. The means and standard deviations in this table show those of the items that compose each of main variables. Variables reliabilities are shown on the diagonal

tence—we followed a procedure that Breugst et al. (2012) suggested and ran multiple confirmatory factor analyses. In the first model, we loaded all indicators on their respective latent constructs. The fit indices indicated a generally acceptable model fit ($\chi^2[180]=1843.04$; CFI = 0.95; RMSEA = 0.08; SRMR = 0.02). All the indicators loaded significantly ($p<0.001$) on their respective constructs. To check whether the indicators could be subsumed under one construct, we loaded all the indicators on one latent factor in the second model, and the fit indices indicated a much worse model fit ($\chi^2[180]=5313.16$; CFI = 0.45; RMSEA = 0.18; SRMR = 0.30). Comparing these two models suggests that no strong underlying component explains the variance in our main variables. To provide an additional check for any possible influence from common method variance (Podsakoff et al., 2003), we specified the third model by loading all the indicators on their respective latent factors, while also including an additional latent variable in the model. This latent variable represented the common variance extracted from all items and is allowed to influence all indicators. The model still did not converge after 3,000 iterations, providing further evidence that common method variance was not a major concern in our study.

To test the hypotheses, we performed multiple ordinary least square (OLS) regression analyses, and the results were reported in Table 3. Model 1 is the baseline model and includes only control variables. Model 2 examines the main effect of passion for inventing on organizational innovation. In support of Hypothesis 1, the results indicated that passion for inventing is related positively to organizational innovation ($b=0.55$, $p<0.001$).

The moderating effects predicted in Hypotheses 2–4 were tested with Models 3–6. In Model 3, we added the interaction between passion for inventing and event novelty. The result ($b=0.06$, $p<0.10$) indicated marginal support for Hypothesis 2. We also found marginal support for Hypothesis 3 based on Model 4, as indicated by the weak significance of the positive coefficient of the interaction between passion for inventing and event criticality ($b=0.06$, $p<0.10$). In Model 5, we added the interaction between passion for inventing and opportunity competence. Consistent with Hypothesis 4, Model 5 indicated that opportunity competence strengthens the positive effect of passion for inventing on organizational innovation ($b=0.08$, $p<0.001$). To visualize four contextual factors' moderating effects, we plotted the relationships between passion for inventing and organizational innovation under high (two standard deviations above the mean) and low (two standard deviations below the mean) levels of the four boundary conditions in Fig. 1. The plots clearly indicated that passion for inventing is more effective in promoting organizational innovation under higher levels of event novelty, event criticality, and opportunity competence.

Given the marginal moderating effects of event novelty and event criticality when they were analyzed separately, we examined and analyzed their combined moderating effect on the relationship between passion for inventing and organizational innovation. The results are reported in Model 7 of Table 3. In Model 7, we created a three-way interaction term comprising passion for inventing, event novelty, and event criticality. The results indicated that this three-way interaction term is statistically significant ($b=0.06$, $p<0.01$). This finding suggests that the positive effect of passion for inventing on organizational innovation is much stronger when event novelty and event criticality are higher simultaneously. Practically, this result suggests

Table 3 Regression models on entrepreneurial passion for inventing and organizational innovation in Study 1

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Gender	0.09	0.06	0.07	0.09	0.03	0.05	0.08
	(0.09)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Age	-0.04	-0.03	-0.00	-0.08	-0.03	-0.01	-0.03
	(0.07)	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Education	-0.27***	-0.23***	-0.23***	-0.15**	-0.16***	-0.14***	-0.18***
	(0.08)	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)	(0.06)
Tenure in current firm	-0.00***	-0.00***	-0.00*	-0.00	-0.00**	-0.00†	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tenure in current position	0.00†	0.00†	0.00	0.00*	0.00*	0.00	0.00*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm type	-0.03	0.01	0.00	0.05	-0.04	-0.03	0.04
	(0.11)	(0.09)	(0.09)	(0.09)	(0.08)	(0.08)	(0.09)
Firm size	-0.12†	-0.13*	-0.11*	-0.16**	-0.10*	-0.12**	-0.14***
	(0.07)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Industry	0.19†	0.19*	0.24***	0.16*	0.18**	0.21***	0.21***
	(0.10)	(0.08)	(0.08)	(0.08)	(0.07)	(0.07)	(0.07)
Entrepreneurial passion for inventing		0.55***	0.37***	0.36***	0.28***	0.11**	0.27***
		(0.04)	(0.04)	(0.05)	(0.04)	(0.05)	(0.05)
Event novelty			0.33***			0.18***	0.18***
			(0.05)			(0.05)	(0.05)
Event criticality				0.32***		0.12**	0.21***
				(0.05)		(0.05)	(0.05)
Opportunity competence					0.43***	0.36***	
					(0.05)	(0.05)	
Entrepreneurial passion for inventing × Event novelty			0.06†			-0.03	0.03
			(0.03)			(0.04)	(0.04)
Entrepreneurial passion for inventing × Event criticality				0.06†		-0.06	0.07†
				(0.04)		(0.05)	(0.04)
Entrepreneurial passion for inventing × Opportunity competence					0.08***	0.11***	
					(0.03)	(0.04)	
Entrepreneurial passion for inventing × Event novelty × Event criticality							0.06**
							(0.03)
Constant	0.87***	0.70***	0.53**	0.50**	0.45**	0.30*	0.41**
	(0.22)	(0.18)	(0.18)	(0.18)	(0.17)	(0.17)	(0.18)
Adjusted R^2	0.14	0.44	0.50	0.50	0.55	0.59	0.55

Notes: N=435; *** p<0.001, ** p<0.01, * p<0.05, † p<0.1. We included the interaction term between Event novelty and Event criticality in the three-way interaction analysis, but did not report the result here as it is irrelevant to our hypothesis testing

that the passion effect is strongest when the event is relevant to the entrepreneur and viewed as having a high degree of novelty. To further test this result, we divided our sample into four groups based on two dimensions (event novelty and event criticality) at two levels (low and high).[3] We analyzed the effects of passion for inventing on organizational innovation in these four groups. The results indicated that the cor-

[3] We used the means of event novelty and personal relevance as the cut-off points between high and low levels of event novelty and personal relevance, respectively,. The four groups include the following com-

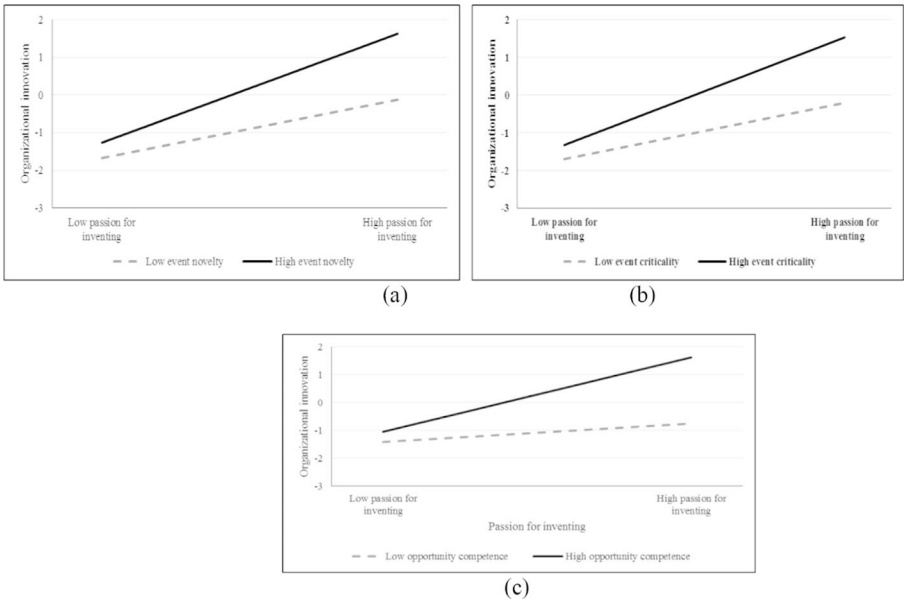

Fig. 1 The moderating effects

relation between passion for inventing and organizational innovation ($p < 0.001$) was highest in the group of high event novelty and high event criticality, confirming our previous finding.

Robustness check

To gauge our findings' robustness further, we conducted a few additional tests. First, one of the key premises in our arguments is that event novelty, event criticality, and opportunity competence motivate the use of a substantive processing strategy, thereby facilitating affect infusion into judgments and amplifying passion efficacy. To test this proposition, we examined these three factors' direct influences on entrepreneurial cognitive processes. More specifically, we used exploratory learning as the dependent variable and included the three factors as the independent variables, as well as the control variables mentioned in the previous section. Exploratory learning was measured using four items based on existing research (He & Wong, 2004; Li et al., 2014). Our results indicated that all three factors exhibit a significant influence on exploratory learning ($p < 0.001$), suggesting that the three factors promote substantive processing.

Second, we used exploratory innovation as an alternative measure of organizational innovation to test our hypotheses. Our measurement of exploratory innovation was derived from existing studies (Benner & Tushman, 2003; March, 1991). The

binations: high event novelty and high event criticality; high event novelty and low event criticality; low event novelty and high event criticality; and low event novelty and low event criticality.

Table 4 Regression models with exploratory innovation as an alternative dependent variable in Study 1

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Gender	-0.04	-0.04	-0.02	-0.07	-0.04
	(0.08)	(0.08)	(0.08)	(0.07)	(0.08)
Age	-0.06	-0.07	-0.11†	-0.07	-0.13*
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Education	-0.26***	-0.26***	-0.18**	-0.19***	-0.18***
	(0.07)	(0.07)	(0.07)	(0.06)	(0.07)
Tenure in current firm	-0.00	-0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tenure in current position	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm type	0.13	0.17†	0.19*	0.08	0.24**
	(0.10)	(0.10)	(0.10)	(0.09)	(0.10)
Firm size	0.04	0.04	0.01	0.07	-0.01
	(0.06)	(0.06)	(0.06)	(0.05)	(0.06)
Industry	0.01	0.03	-0.03	0.00	-0.01
	(0.09)	(0.09)	(0.09)	(0.08)	(0.08)
Entrepreneurial passion for inventing	0.50***	0.44***	0.27***	0.18***	0.25***
	(0.04)	(0.05)	(0.05)	(0.05)	(0.06)
Event novelty		0.14**			0.10†
		(0.06)			(0.06)
Event criticality			0.37***		0.37***
			(0.06)		(0.06)
Opportunity competence				0.49***	
				(0.05)	
Entrepreneurial passion for inventing× Event novelty		0.09**			0.09*
		(0.04)			(0.05)
Entrepreneurial passion for inventing× Event criticality			0.05		0.06
			(0.04)		(0.05)
Entrepreneurial passion for inventing× Opportunity competence				0.12***	
				(0.04)	
Entrepreneurial passion for inventing× Event novelty × Event criticality					0.09***
					(0.03)
Constant	0.56***	0.46**	0.37*	0.26	0.33†
	(0.20)	(0.20)	(0.20)	(0.19)	(0.20)
Adjusted R^2	0.31	0.33	0.38	0.45	0.40

Notes: N=435; *** p<0.001, ** p<0.01, * p<0.05, † p<0.1. We included the interaction term between Event novelty and Event criticality in the three-way interaction analysis, but did not report the result here as it is irrelevant to our hypothesis testing

results are provided in Table 4. Models 1–4 repeated our previous hypothesis testing, and Model 5 tested the combined moderating effect of event novelty and event criticality on the relationship between passion for inventing and exploratory innovation. The results were similar to those of the main test.

Third, as shown in Table 2, the correlations between passion for inventing and contextual factors (i.e., event novelty, event criticality, and opportunity competence) are relatively high. To determine whether passion for inventing may mediate the relationship between the contextual factors and organizational innovation, we estimated a structural equation model in which we treated the contextual fac-

tors as independent variables, passion for inventing as the mediator, and organizational innovation as the dependent variable. The results indicated poor model fit ($\chi^2[204] = 1980.38$; CFI = 0.84; RMSEA = 0.13; SRMR = 0.32). We also ran separate mediating models with each of these contextual factors as the independent variable, passion for inventing as the mediator, and organizational innovation as the dependent variable. All the models demonstrated poor model fit. The above evidence, to a certain degree, indicated that our data did not support the mediating effect of passion for inventing on the relationship between the contextual factors and organizational innovation.

Finally, although existing literature treats passion as a driver of organizational innovation and performance (Baum & Locke, 2004; Drnovsek et al., 2016; Makino et al., 2020), recent research has indicated that venture progress exerts a positive influence on entrepreneurial passion (Gielnik et al., 2015). To attenuate the influence from the potential reverse causality problem, thereby mitigating passion's possible endogeneity, we conducted a two-stage least squares (2SLS) regression. One critical issue in 2SLS was choosing valid instrument variables for passion (Wooldridge, 2012).[4] Considering that existing studies have not suggested any instrument variables for passion explicitly, we drew on related research to create one instrument.

According to a comprehensive review of literature on entrepreneurial passion, Cardon and Murnieks (2020) suggested that the roles of social environment and valued others should receive more attention in future research on the development of passion. Stenholm and Nielsen (2019) also empirically demonstrated that perceived social support from critical stakeholders, e.g., the government, is associated positively with entrepreneurial passion. First, perceived social support ignites positive emotions or affect, which is a critical element of entrepreneurial passion. Moreover, the experience of positive emotions will increase entrepreneurs' engagement in entrepreneurial activities, which will promote their passion over time (Gielnik et al., 2015). Therefore, we chose social support, particularly perceived community support from the Silicon Alley government, as an instrument of passion. We derived this measure from Theodori (2001), which mainly encompasses the aspects of living environment, medical services, schools, shopping facilities, entertainment facilities, and Silicon Alley's physical appearance. Conceptually, these aspects were not related directly to organizational innovation because they did not provide resources closely associated with organizational innovation, e.g., technology, finance et al. Moreover, they are unlikely to be affected by the government-initiated events purported to inspire regional innovation. In this way, using perceived community support as an instrument helps alleviate covariance among passion, organizational innovation, and events.

Following Flammer (2018), we regressed entrepreneurial passion on the instrumental and control variables during the first stage and used passion's fitted value as the predictor of organizational innovation during the second stage. The first-stage model's results indicated that perceived community support significantly predicts

[4] According to Wooldridge (2012), valid instruments should meet two requirements. First, the instrument variable z should correlate with the explanatory variable x, i.e., Cov (z, x) = 0. Second, the instrumental variable z should not correlate with the error term u, i.e., Cov (z, u) = 0.

entrepreneurial passion, and all the models' minimum F value (33.10) exceeded the cutoff value of 9.08 suggested by Bascle (2008). The results provide empirical support for treating perceived community support as a valid instrument of entrepreneurial passion. As shown in Appendix 2, the 2SLS regression results generally were consistent with our previous findings, confirming our results' reliability.

Study 2: method

Sample and data

In Study 2, we tested our model using another sample, in which we focused on a different external event, the COVID-19 pandemic, to gauge our model's generalizability. We believe that event novelty and criticality are representative characteristics of COVID-19 to most entrepreneurs, as it is highly novel and of great importance to the entrepreneurs.

Following existing research using online surveys (e.g., Su et al., 2022), we collected data through Prolific, a web-based research institute that provides professional services for data collection, in April 2022. Our survey comprised full-time entrepreneurs of established firms. We distributed 281 questionnaires to entrepreneurs and excluded 79 from the analyses either because these entrepreneurs provided incorrect answers to the identifier questions or because of missing values, leaving us with 202 usable responses.

To check for potential sampling bias, we performed a t-test to compare several entrepreneur- and venture-related characteristics between the remaining 202 responses and 79 rejected responses. The results indicated no significant differences in entrepreneurs' gender, age, education level, tenure in current position, and tenure at current firm, as well as the ventures' ownership type, firm size, firm age, and industry.

We also conducted Harman's single-factor test to measure common method variance in our data (Podsakoff & Organ, 1986). A principal component factor analysis with an unrotated solution generated six factors with eigenvalues greater than 1.0. The largest variance explained by a single factor was 20.41%; therefore, no single factor could explain most of the covariance in all the variables.

Measures

We adopted the same measurements and control variables used in Study 1. In measuring event characteristics, we changed the event from "building Qinhuai Silicon Alley" to "dealing with the COVID-19 pandemic since its outbreak in 2020."

Analysis and results

Appendix 3 presents the variables' descriptive statistics and correlations. The variables' reliabilities can be found on the diagonal. We performed OLS analyses to test the hypotheses, and the results are provided in Table 5.

Table 5 Regression models on entrepreneurial passion for inventing and organizational innovation in Study 2

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Gender	-0.32**	-0.27	-0.24†	-0.25	-0.19	-0.18
	(0.13)	(0.12)	(0.12)	(0.12)	(0.12)	(0.11)
Age	-0.08	-0.10	-0.11†	-0.07	-0.09	-0.08
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.06)
Education	-0.00	-0.03	-0.01	-0.07	-0.02	-0.01
	(0.09)	(0.09)	(0.08)	(0.08)	(0.08)	(0.08)
Tenure in current firm	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tenure in current position	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm type	0. 30	0.31	0.36	0.31	0.27	0.35
	(0.42)	(0.40)	(0.39)	(0.38)	(0.39)	(0.37)
Firm size	0.42***	0.42***	0.38***	0.38***	0.41***	0.34***
	(0.10)	(0.10)	(0.09)	(0.09)	(0.09)	(0.09)
Industry	0.33*	0.24†	0.18	0.23†	0.20	0.17
	(0.14)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)
Entrepreneurial passion for inventing		0.05***	0.05***	0.04***	0.03**	0.02†
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Event novelty			-0.50**			-0.41**
			(0.17)			(0.16)
Event criticality				-0.07		0.01
				(0.17)		(0.18)
Opportunity competence					-0.20	-0.08
					(0.17)	(0.18)
Entrepreneurial passion for inventing × Event novelty			0.02*			0.02†
			(0.01)			(0.01)
Entrepreneurial passion for inventing × Event criticality				0.02*		0.01
				(0.01)		(0.01)
Entrepreneurial passion for inventing × Opportunity competence					0.02**	0.02*
					(0.01)	(0.01)
Constant	-0.33	-1.19***	-1.15***	-0.97**	-0.91**	-0.67*
	(0.25)	(0.30)	(0.29)	(0.30)	(0.32)	(0.30)
Adjusted R^2	0.21	0.29	0.34	0.35	0.33	0.42

Notes: N = 202; *** p < 0.001, **> p < 0.01, * p < 0.05, † p < 0.1

As Model 2 revealed, entrepreneurial passion significantly influences organizational innovation ($p < 0.001$), thereby supporting Hypothesis 1. For Model 3, the interaction between entrepreneurial passion and event novelty was significant ($p < 0.05$), thereby supporting Hypothesis 2. Furthermore, Model 4's results demonstrated a significant moderating effect from event criticality on the relationship between entrepreneurial passion and organizational innovation ($p < 0.05$), providing consistent support for Hypothesis 3. Finally, for Model 5, the interaction between entrepreneurial passion and opportunity competence was significant ($p < 0.01$), thereby supporting Hypothesis 4. To sum up, these findings provided consistent support for our hypotheses.

Discussion

In the present study, we discovered the moderating effects of events and entrepreneurs' competence to exploit opportunities from events (opportunity competence) on the relationship between entrepreneurial passion and organizational innovation. Our findings indicated that entrepreneurial passion for inventing is likely to exert greater influence on organizational innovation when the events are both novel and critical, and when entrepreneurs have greater opportunity competence. These findings hold meaningful implications for theory and practice.

Theoretical implications

This study makes several contributions to the literature. First, we shed light on events' role in examining the boundary conditions that affect entrepreneurial passion's efficacy. Extant research suggests that events are at the heart of entrepreneurship and indicates that "the experienced event should be a principal focus in attempts to understand entrepreneurship" (Morris, 2015: 3). However, up until now, events' significance in entrepreneurship has not been examined (Gartner, 1993; Morris, 2015). By examining the joint moderating role of event novelty and event criticality in the relationship between entrepreneurial passion and organizational innovation, we complement existing literature on entrepreneurial passion, which mainly has focused on the contingent influences of feature-based personal traits and environmental characteristics (Baron & Tang, 2011; Kiani et al., 2020; Ma, Gu, & Liu, 2017; Patel et al., 2015; Strese et al., 2018). Furthermore, by delineating events' moderating effects on passion, we provide viable avenues for future research to investigate the interaction between events and passion. We encourage future researchers to adopt an event-oriented perspective to develop a more comprehensive understanding of entrepreneurial passion's efficacy.

Second, our study contributes to the research on the relationship between passion and innovation by integrating the emotional perspective with the cognitive and resource-based perspectives. Conventional research into the drivers of organizational innovation takes a (bounded) rational perspective by investigating the influences from external environment (Porter, 1981), and internal resources or capabilities (Barney, 1991). Different from these studies, research on passion takes an emotional perspective and treats passion as the critical driver of organizational innovation. Our findings showed that while passion is the strong internal force that facilitates innovation, its efficacy is bound by the external environment (i.e., events) and internal capabilities (opportunity competence). In this regard, we complement passion research by incorporating the cognitive and resource-based perspectives. We encourage future research to further integrate the emotional and rational perspectives when studying the efficacy of passion. For example, they may examine what entrepreneurs will do when the behavioral expectations from the external environment conflict with the entrepreneurial identity. Will they follow the behavioral expectations from key stakeholders, or insist on their identity, or will they choose a compromise?

Third, our study contributes to the emotion literature by demonstrating the importance of incorporating both the affect infusion and self-verification mechanisms when studying the efficacy of passion. While the AIM focuses on how the attributes of the target, judge, or situation influence the selection of different information processing strategies and hence the degree of affect infusion (Forgas, 1995), the self-verification process in the identity literature focuses on how the behavioral expectations in a certain situation align with the identity (Burke, 1991). Our results demonstrate that both mechanisms work simultaneously when the focal emotion is identity-relevant like passion. Future research might explore the moderating role of other attributes in the AIM such as social desirability by also incorporating the self-verification process analysis. They may also make a nuanced analysis of the self-verification process by investigating entrepreneurs' differential responses when behavioral expectations from the external environments provide opportunities or threats to their entrepreneurial identity.

Fourth, our study also highlights the importance of integrating events' differing characteristics. While existing event studies mainly have focused on investigating event characteristics' main effects on individual or organizational consequences (e.g., Ilies et al., 2011; Zellmer-Bruhn, 2003), recent research has called for an interactionist perspective on various event characteristics (Chen et al., 2021). We complemented this new research stream by demonstrating the significant synergetic effect of event novelty and event criticality in enhancing entrepreneurial passion's efficacy. While EST provides a comprehensive description of event characteristics, each dimension's uniqueness and their interactions merit further investigation. For example, event criticality demonstrates an event's relevance to the focal entity, i.e., it influences *whether* entrepreneurs will respond, while event novelty demonstrates the discontinuity in organizational routines that an event has elicited, i.e., it influences *how* entrepreneurs will respond. Furthermore, EST provides guidelines for what entrepreneurs are *expected* to do, while emotions determine what entrepreneurs are *willing* to do. By demonstrating the significant interaction effects of event characteristics and passion on organizational innovation, our work motivates future researchers to integrate EST with emotional theories to investigate their joint individual or organizational consequences.

Furthermore, we provide further insights on the role of entrepreneurs' cognitive capabilities in converting entrepreneurial passion into organizational innovation. Many studies have recognized passion's importance in organizations, and recent research (e.g., Makino et al., 2020) has suggested that treating passion as a key intangible organizational asset holds parallel implications for knowledge-based assets (Nonaka, 1994). However, the power unleashed from passion cannot be converted fully into organizational benefits if entrepreneurs do not have enough opportunity-exploiting capabilities as part of opportunity competence. This finding indicates the importance of integrating the emotional and capability perspectives in studying passion's effects.

Finally, by drawing from the AIM and the identity literature, which were developed at the individual level to explain the relationship between entrepreneurial passion and innovation at the organizational level, this study provides a feasible avenue for investigating emotional elements' effect on organizational innovation.

Individuals have emotions just as they have cognitions. Behavioral scholars (e.g., Powell et al., 2011) have long called for a more "realistic" assumption about organizational decision-makers by incorporating psychological factors into the analysis of strategic issues. However, extant studies that aim to answer this call remain limited. One critical issue is the problem of "ecological fallacy" (Robinson, 1950) or "aggregation bias" (Rousseau, 1985), which is encountered when making parallel arguments across different levels of analysis. We believe that this problem should not hinder research progress in investigating cross-level phenomena. We advocate for more exploratory research to examine the effect of emotions, e.g., passion, on organizational outcomes by borrowing insights from theories developed at different levels.

Practical implications

Our studies also hold important implications for ventures that could increase their organizational innovation. First, a new venture's founding teams usually comprise different individuals with varying characteristics and personalities. For example, entrepreneurs may have different identity orientations, i.e., some may emphasize the founder identity, while others may emphasize the inventor or developer identity. Considering that our findings indicated that passion for inventing plays a significant role in the innovation process, we suggest that when creating an entrepreneurial team, entrepreneurs' passion for inventing should be considered. At the founding stage, entrepreneurs who view the founder identity as more important than other identities may play essential roles. However, as a venture moves to the development stage and pursues further improvement through innovation, entrepreneurs who emphasize the inventor identity may take greater responsibility than those with other identities.

Second, new ventures also need to realize the boundary conditions that affect entrepreneurial passion's efficacy. To better utilize entrepreneurs' passion for inventing and improve organizational innovation, ventures could adapt events that may influence entrepreneurs' perceptions of event novelty or event criticality. For example, facing novel events, entrepreneurs may realize that their passion for inventing will be extremely effective in improving their new ventures' innovation performance. Although our study focuses on entrepreneurs' passion, we argue that adapting these contextual factors also could improve other organizational members' innovation performance when they share entrepreneurs' passion.

Third, we suggest that the government in Silicon Alley needs to consider the characteristics of the events they plan to initiate carefully. In particular, when the government plans to inspire innovation at regional firms, they should consider not only whether the events are critical to the entrepreneurs, but also whether the events are novel enough. In this regard, we encourage local governments to design events for regional ventures thoughtfully so that entrepreneurs can better exploit the benefits from these events.

Limitations and future research

Our study has several limitations that may provide opportunities for future research. First, we did not test the mediating mechanism that links passion for inventing and organizational innovation, although we performed robustness tests on cognitive information processing's working mechanism, which undergirded the relationship. Considering that we focused mainly on examining boundary conditions of entrepreneurial passion's effects, to maintain theoretical parsimony, we did not examine potential mediators. Further research might examine different mediating mechanisms and investigate how different moderators affect different mediating routes.

Second, our survey data were cross-sectional, which may limit our ability to test causal relationships and track these relationships' dynamics. We encourage future researchers to validate our findings using other samples.

Third, we used a subjective measure of our dependent variable—organizational innovation—which may be subject to entrepreneurs' individual bias. Although previous studies have validated this measure, we have tried to obtain more objective measurements of organizational innovation, e.g., the new product sales ratio or number of patents. However, as most ventures in our survey were unlisted firms, they were unwilling to report these data in the survey. We call for further research to test this model using more objective innovation measures.

Fourth, entrepreneurs' passion and organizational innovation are viewed frequently as existing on different levels. The mechanism that ties passion to organizational innovation may be more complex than we argued in our study. Future research could examine the more nuanced mechanisms between the key figures' passion and organizational outcomes. For example, researchers could examine how key figures' passion is shared among other organizational members, as well as how collective passion facilitates or impedes organizational outcomes.

Fifth, following entrepreneurship research (Cardon et al., 2009), our model treats passion as the primary driver of innovation, and event characteristics as the moderators. However, interaction between passion and event characteristics may be more complicated than we proposed. Future researchers should conduct a more nuanced analysis of the different combinations of passion and event characteristics, e.g., divide combinations into four different types based on degree of entrepreneurial passion and event novelty (low vs. high), and compare the relative organizational innovation in these different scenarios.

Finally, while our analysis of the moderating roles of event characteristics in the relationship between entrepreneurial passion and organizational innovation consists of two mechanisms, i.e., information processing and self-verification, we did not hypothesize these two mediating mechanisms for theoretical parsimony. Future research might select appropriate proxies for the information processing strategies and the self-verification processes, respectively, and examine a mediated moderation model to incorporate these two mechanisms.

Appendix 1

Scale items

Items
Organizational innovation
Over the past three years, this company…
Has spent heavily (well above your industry average) on research and development.
Has maintained world-class research and development.
Has introduced a large number of new products to the market.
Has acquired significantly more patents than its major competitors.
Has pioneered the development of breakthrough innovations in its industry.
Entrepreneurial passion for inventing
It is exciting to figure out new ways to solve unmet market needs that can be commercialized.
Searching for new ideas for products/services to offer is enjoyable to me.
I am motivated to figure out how to make existing products/services better.
Scanning the environment for new opportunities really excites me.
Inventing new solutions to problems is an important part of who I am.
Event novelty
In building innovation in Qinhuai Silicon Alley, to what extent do you agree that:
There is a clear, known way to respond to the event.
There is an understandable sequence of steps that can be followed by the firm in responding to this event.
The firm can rely on established procedures and practices in responding to this event.
The firm had rules, procedures, or guidelines to follow when this event occurred.
Event criticality
In building innovation in Qinhuai Silicon Alley, to what extent do you agree that:
This event was critical for my long-term success
This event was important for me
This event was a primary task for me
Opportunity competence
I can recognize potential markets;
I can evaluate the advantages and disadvantages of potential business opportunities
I can capture and implement the high-quality business opportunities

Appendix 2

2SLS regression models on the relationship between entrepreneurial passion and organizational innovation

Variables	Model 1	Model 2	Model 3	Model 4
Gender	0.03	0.04	0.05	0.02
	(0.08)	(0.07)	(0.07)	(0.07)
Age	-0.02	0.01	-0.05	-0.02
	(0.06)	(0.06)	(0.06)	(0.05)
Education	-0.22***	-0.22***	-0.16**	-0.17***
	(0.06)	(0.06)	(0.06)	(0.06)
Tenure in current firm	-0.00***	-0.00*	-0.00*	-0.00**
	(0.00)	(0.00)	(0.00)	(0.00)
Tenure in current position	0.00	0.00	0.00*	0.00*
	(0.00)	(0.00)	(0.00)	(0.00)
Firm type	0.02	0.03	0.05	-0.04
	(0.09)	(0.09)	(0.09)	(0.08)
Firm size	-0.13*	-0.12**	-0.15**	-0.10*
	(0.05)	(0.05)	(0.05)	(0.05)
Industry	0.20*	0.24***	0.19**	0.20**
	(0.08)	(0.08)	(0.08)	(0.07)
Instrumented passion for inventing	0.68***	0.49***	0.54***	0.38***
	(0.05)	(0.07)	(0.08)	(0.08)
Event novelty		0.25***		
		(0.06)		
Event criticality			0.21***	
			(0.06)	
Opportunity competence				0.36***
				(0.06)
Instrumented passion for inventing× Event novelty		0.06†		
		(0.04)		
Instrumented passion for inventing× Event criticality			0.08†	
			(0.05)	
Instrumented passion for inventing× Opportunity competence				0.09***
				(0.03)
Constant	0.63***	0.51**	0.47**	0.45**
	(0.19)	(0.18)	(0.19)	(0.17)
Adjusted R-squared	0.41	0.48	0.49	0.55

Note: N=435; *** p<0.001, ** p<0.01, * p<0.05, † p<0.1

Appendix 3

Descriptive statistics and correlation matrix in Study 2

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Organizational innovation	0.91												
2. Entrepreneurial passion for inventing	0.37*	0.83											
3. Event novelty	-0.27*	-0.03	0.89										
4. Event criticality	0.25*	0.20*	-0.13*	0.78									
5. Opportunity competence	0.41*	0.61*	-0.08	0.11	0.81								
6. Gender	-0.01	-0.04	-0.06	0.03	-0.11	-							
7. Age	-0.24*	-0.12	-0.03	-0.09	-0.16*	0.02	-						
8. Education	0.08	0.08	0.05	0.11	0.01	0.06	-0.02	-					
9. Tenure in current firm	-0.20*	-0.12	-0.05	-0.11	-0.15*	0.02	0.55*	-0.03	-				
10. Tenure in current position	-0.24*	-0.16*	-0.03	-0.10	-0.17*	0.01	0.56*	-0.06	0.94*	-			
11. Firm type	0.16*	-0.01	-0.07	0.05	-0.04	0.10	0.01	0.10	-0.08*	-0.12*	-		
12. Firm size	0.18*	0.08	0.08	-0.00	0.09	0.08	0.04	0.03	-0.08	0.14*	0.42*	-	
13. Industry	0.08	0.06	-0.12*	0.08	-0.02	0.25*	0.04	0.18*	0.03	0.13*	0.02	-0.02	-
Mean	2.62	4.24	3.16	3.21	4.06	0.52	2.11	1.90	75.59	65.02	0.03	1.67	0.29
SD	1.11	0.68	1.19	1.02	0.68	0.50	1.02	0.67	67.89	62.04	0.15	5.07	0.45

Notes: N=202; * $p<0.05$. The variables including organizational innovation, entrepreneurial passion for inventing, event novelty, event criticality, and opportunity competence are standardized with a mean of 0 and a standard deviation of 1. The means and standard deviations in this table show those of the items that compose each of main variables. Variables reliabilities are shown on the diagonal

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