

**I PUT IN EFFORT, THEREFORE I AM PASSIONATE: INVESTIGATING THE
PATH FROM EFFORT TO PASSION IN ENTREPRENEURSHIP**

Michael M. Gielnik, Matthias Spitzmuller, Antje Schmitt, D. Katharina Klemann, and
Michael Frese

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Michael M. Gielnik (Corresponding Author)
Leuphana University of Lüneburg
Institute of Strategic HR Management
Scharnhorststr. 1
21335 Lüneburg, Germany
michael.gielnik@leuphana.de

Matthias Spitzmuller
Queen's University and
National University of Singapore
Queen's School of Business
Kingston, Ontario, Canada
matthias.spitzmuller@queensu.ca

Antje Schmitt
University of Kassel
Department of Business Psychology
Nora-Platiel St. 5
34109 Kassel, Germany
aschmitt@uni-kassel.de

D. Katharina Klemann
Justus Liebig University Giessen
Department of Work and Organizational
Psychology
Otto-Behaghel-Str. 10F
35394 Giessen, Germany
Katharina.Klemann@psychol.uni-giessen.de

Michael Frese
National University of Singapore and
Leuphana University of Lüneburg
NUS Business School
Department of Management & Organisation
15 Kent Ridge Drive
Singapore 119245
bizmf@nus.edu.sg

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ABSTRACT

Most theoretical frameworks in entrepreneurship emphasize that entrepreneurial passion drives entrepreneurial effort. We hypothesize that the reverse effect is also true and investigate changes in passion as an outcome of effort. Based on theories of self-regulation and self-perception, we hypothesize that making new venture progress and free choice are two factors that help to explain why and under which conditions entrepreneurial effort affects entrepreneurial passion. We conducted two studies to investigate our hypotheses. We conducted a weekly field study with 54 entrepreneurs who reported entrepreneurial effort and passion over eight weeks (341 observations). The results showed that entrepreneurial effort predicted changes in entrepreneurial passion. We conducted an experiment (N = 136) to investigate the effect of effort on passion and the underlying psychological processes in a laboratory setting. The results revealed that new venture progress mediated the effect of entrepreneurial effort on passion and that free choice moderated the mediated effect. Overall, our findings provide a new theoretical perspective on the relationship between entrepreneurial effort and passion.

INTRODUCTION

Passion is an important and fascinating construct because it is often characterized as a “hot” feeling or, metaphorically, “the fire of desire” (Cardon, Wincent, Singh, & Drnovsek, 2009, p. 515). Passion should be particularly important in entrepreneurship. Starting a new business is a lengthy and challenging process requiring continuous action by the entrepreneur (Frese, 2009; Gartner, 1985). Research has shown that it usually takes several years to launch a new firm during which the entrepreneur has to invest countless hours (Reynolds & Curtin, 2008). Entrepreneurs need to expend considerable effort to successfully start a new venture (Foo, Uy, & Baron, 2009). Scholars have proposed that, beyond other characteristics such as need for achievement (Rauch & Frese, 2007), entrepreneurial passion is an important personal characteristic fueling entrepreneurial efforts (Baum, Locke, & Smith, 2001; Cardon et al., 2009). Cardon et al. (2009) conceptualize entrepreneurial passion as an intense positive emotion towards entrepreneurial tasks and activities important to the entrepreneur’s self-identity. In this study, we focus on the emotional element of entrepreneurial passion. Scholars have argued that the intense positive emotion associated with entrepreneurial passion has a motivational function to engage in entrepreneurial activity and that it manifests itself in working hard on entrepreneurial tasks (Baum & Locke, 2004; Cardon, Zietsma, Saporito, Matherne, & Davis, 2005). Indeed, there is some empirical evidence that entrepreneurial passion has a positive effect on entrepreneurial behavior and performance (Baum et al., 2001; Baum & Locke, 2004; Murnieks, Mosakowski, & Cardon, in press).

The view that emotions have a direct causal influence on people’s behavior is intuitively appealing and is widely assumed by emotion researchers (e.g., Russell, 2003). More recently, scholars have questioned the adequacy of this view. Specifically, Baumeister, Vohs, DeWall, and Zhang (2007) suggested in their theory of emotion as a feedback system that emotions can also be the outcome of people’s behavior rather than a direct causal antecedent thereof. With regard to entrepreneurial passion, this means that entrepreneurial passion may not only

drive entrepreneurial behavior, but that there may also be a reverse effect of entrepreneurial effort on entrepreneurial passion. In this study, we follow this line of reasoning and present a theoretical framework which states that an increase or decrease in entrepreneurial passion results from entrepreneurs' efforts. We conduct a field study with weekly measurements over eight weeks to investigate our hypothesis that entrepreneurial effort predicts changes in entrepreneurial passion (Study 1). To explain the mechanisms underlying this relationship, we draw on theories of self-regulation (Bandura, 1997; Carver & Scheier, 1982; Locke & Latham, 2002) and self-perception (Bem, 1972). We draw on self-regulation theories to argue that effort leads to making progress which results in positive affect (Carver, 2006; Locke & Latham, 2002). We draw on self-perception theory which states that people infer their emotions from observations of their own overt behavior (Bem, 1972). According to Bem (1972), people make this inference only if they show the behavior out of their free choice. Thus, only in case of free choice should high effort lead to an increase in passion. We use an experimental design manipulating entrepreneurial effort, new venture progress, and free choice to investigate the mechanisms linking entrepreneurial effort and passion (Study 2).

This article seeks to contribute to the literature in several ways. First, the literature has discussed entrepreneurial passion mainly as a causal antecedent fueling entrepreneurial effort (Baum & Locke, 2004; Cardon et al., 2009). We extend the existing theorizing in the entrepreneurship literature by suggesting that there is an additional causal direction flowing from entrepreneurial effort to entrepreneurial passion. Second, we follow entrepreneurship researchers' call to investigate factors stimulating entrepreneurial passion (Cardon, Foo, Shepherd, & Wiklund, 2012; Murnieks et al., in press). Investigating antecedents of entrepreneurial passion is important because entrepreneurial passion may influence entrepreneurs' creativity, information processing, and decision making (R. A. Baron, 2008; Cardon et al., 2009). Our study shows entrepreneurial effort to be a factor that changes entrepreneurial passion. Furthermore, we develop a theoretical model with new venture

progress and free choice as two important factors that help to explain why and under which conditions entrepreneurial effort affects entrepreneurial passion (see Figure 1). Our study thus adds to emerging research developing theoretical models of antecedents of entrepreneurial passion (Murnieks et al., in press). Third, an important question is how entrepreneurial passion develops over time (Murnieks et al., in press). To address this question, Cardon et al. (2012) suggested to collect data at multiple points in time and investigate the nonstatic nature of passion. We adopt a dynamic perspective on entrepreneurial passion to investigate how entrepreneurial passion co-varies with entrepreneurial effort over time. Previous research has mostly concentrated on stable trait-based approaches towards entrepreneurial passion (Baum et al., 2001; Baum & Locke, 2004; Murnieks et al., in press). However, research has shown that much of the variability in motivational and emotional variables is within individuals which calls for theoretical models focusing on within-person variance (Ilies & Judge, 2005; Lord, Diefendorff, Schmidt, & Hall, 2010). Adopting such a dynamic perspective appears to be particularly important in entrepreneurship because starting a new business is not a steady chain of events but a dynamic process in which entrepreneurs experience repeated cycles of successes and setbacks (Lichtenstein, Carter, Dooley, & Gartner, 2007). Thus, it is unlikely that entrepreneurs' level of entrepreneurial passion remains stable over time.

The Relationship between Entrepreneurial Effort and Entrepreneurial Passion

Entrepreneurial effort is the intensity of work on entrepreneurial tasks (Foo et al., 2009). Entrepreneurial passion has been conceptualized as love of one's entrepreneurial work (Baum & Locke, 2004) or as an intense positive emotion, similar to excitement and elation, that is linked to entrepreneurial tasks and activities (Cardon et al., 2009). In the entrepreneurship literature, definitions of passion share an emphasis on the emotional dimension (Chen, Yao, & Kotha, 2009). The main characteristic of entrepreneurial passion is an activated positive feeling that is directed at activities specifically relevant to entrepreneurship (Breugst,

Domurath, Patzelt, & Klaukien, 2012; Cardon, 2008). In the current study, we follow these definitions and focus on the intense positive emotions associated with entrepreneurial passion.

Previous research has focused on the effect of entrepreneurial passion on effort (Cardon et al., 2009). However, scholars have recently emphasized that although emotions may lead to behavior, emotions are also often the consequences rather than antecedents of behavior (Baumeister et al., 2007). Specifically, the theory of emotions as a feedback system suggests that emotions provide feedback about the adequacy of behavior (Baumeister et al., 2007). According to this theory, behavior results in outcomes and subsequent appraisal processes of the outcomes lead to emotional experiences. We apply this general notion to the constructs of entrepreneurial effort and entrepreneurial passion. We hypothesize that changes in entrepreneurial passion are a result of entrepreneurial effort.

Hypothesis 1: Entrepreneurial effort has a positive effect on changes in the positive emotion of entrepreneurial passion.

We draw on two theoretical lines of reasoning to explain why and under which conditions entrepreneurial effort positively affects entrepreneurial passion. First, self-regulation theories (Bandura, 1997; Carver & Scheier, 1990; Locke & Latham, 2002) assume that effort leads to progress which results in positive emotions. For example, control theory states that increased effort leads to making significant progress toward a goal which results in positive affect (Carver & Scheier, 1982; Carver, 2006). The rationale is that the more effort people show, the faster they reduce the discrepancy between the current state and their desired goal. Reducing the discrepancy at a faster rate is related to experiencing positive emotions, such as happiness, excitement, or elation (Carver & Scheier, 1982; Carver, 2006). Similarly, goal setting theory and social cognitive theory suggest that achieving a goal is a direct antecedent of a positive attitude towards the task (Locke & Latham, 2002). People create a disequilibrium by setting goals and then mobilize effort to reduce the disequilibrium (Bandura, 1997). Reaching a goal leads to a response in the form of self-incentives and

satisfaction (Bandura, 2001). It is important to note that not only achieving the ultimate goal leads to positive feelings (e.g., starting a business) but also the accomplishment of sub-goals has similar positive effects. Weick (1984) has noted that achieving “small wins”, which are concrete outcomes in the process to the ultimate goal, have positive effects on people’s emotions. Similarly, Amabile and Kramer (2011) suggest that these small wins are indicators of progress with powerful effects on people’s emotions. With regard to our study, this means that entrepreneurs who invest more effort should be more likely to make faster progress and achieve small wins in the venture creation process which should uplift their positive emotions.

Hypothesis 2: New venture progress mediates the effect of entrepreneurial effort on changes in the positive emotion of entrepreneurial passion.

Second, we draw on self-perception theory (Bem, 1972) to argue under which conditions entrepreneurial effort affects entrepreneurial passion. Self-perception theory holds that people’s emotions and attitudes are partially determined by “inferring them from observations of their own overt behavior and/or the circumstances in which this behavior occurs” (Bem, 1972, p. 5). Bem (1972) has argued that people come to know their emotions and attitudes from their own overt behavior rather than inferring their internal states through introspection of weak or ambiguous cues. The process is that people observe themselves performing an activity and then make inferences about how they feel about performing this activity. The process is thus similar to how an outside observer would make inferences about a person’s emotions and attitudes. According to self-perception theory (Bem, 1972), the process of inferring one’s own emotions and attitudes depends on the attribution whether or not the behavior was voluntary. If people have a free choice over their behavior, they will make an inference about their emotions and attitudes. If people do not have a free choice, for example if they are assigned to a task, they are less likely to attribute their behavior to their emotions and attitudes but rather to the external assignment (Bem, 1972).

Previous research in the entrepreneurship domain has built on self-perception theory and found that entrepreneurs' self-perception is an outcome of their entrepreneurial efforts and, in particular, of their entrepreneurial achievements in the venture creation process (Verheul, Uhlaner, & Thurik, 2005). Entrepreneurs who accomplished entrepreneurial tasks had a more positive entrepreneurial self-image (Verheul et al., 2005). Similarly, we argued that new venture progress has a positive function for entrepreneurial passion mediating the effect of entrepreneurial effort on passion. However, following Bem's (1972) notions regarding the importance of free choice, the effect only holds in case of free choice. This means that entrepreneurs' efforts that are less driven by their free will are less likely to positively affect entrepreneurial passion. Research has shown that 21% of the entrepreneurs in the USA and 22% of the entrepreneurs in Germany engage in entrepreneurship because they have no better choice for work (Xavier et al., 2013). Their entrepreneurial efforts are thus driven to a larger extent by external constraints. In this case, the effect of entrepreneurial effort on entrepreneurial passion through new venture progress should be smaller because it is less attributed to the own person. We thus hypothesize that free choice moderates the mediated effect of entrepreneurial effort on passion through new venture progress.

Hypothesis 3: Free choice moderates the mediated effect of entrepreneurial effort on the positive emotion of entrepreneurial passion through new venture progress. Specifically, free choice moderates the mediating effect of new venture progress on the positive emotion of entrepreneurial passion, such that entrepreneurial effort only affects the positive emotion of entrepreneurial passion through new venture progress in case of free choice but not in case of no free choice.

We conducted two studies to test our hypotheses. In Study 1, we tested Hypothesis 1 in a field study with 54 entrepreneurs using a study design with repeated weekly measurements over eight weeks. In Study 2, we tested Hypotheses 2 and 3 in a laboratory experiment with 136 students to examine the mechanisms that explain the effect of entrepreneurial effort on

passion. The experiment allows us to establish a causal chain from entrepreneurial effort to entrepreneurial passion through the mechanisms of new venture progress and free choice.

STUDY 1: METHOD

Sample

The sample consisted of 54 German entrepreneurs. We focused on entrepreneurs in the pre-launch phase in which they develop their business idea into a viable business concept and assemble the necessary resources to start the business (R. A. Baron, 2007). To include a range of different entrepreneurs, we decided not to limit our recruiting approach to one source, such as business incubators (e.g., Foo et al., 2009). We contacted the participants through different channels, such as the chamber of commerce, employment agencies, new venture fairs, and mailing lists of a German university. The prerequisite for participating in our study was that the person was currently pursuing a business opportunity. A sample size of 54 is consistent with other studies employing a weekly measurement design (Bakker & Bal, 2010). In our sample, the entrepreneurs were on average 36 years old and 51% of the entrepreneurs were female. The majority held a high school degree (62%) followed by a university degree (28%). About a third of the entrepreneurs (35%) had been previously involved in the start-up process of a new venture. They had an average of 13 years of work experience. Furthermore, 80% of our sample reported that they had relatives or friends who were entrepreneurs. The entrepreneurs pursued opportunities in different industries, such as retail, manufacturing (e.g., production of liqueur), services (e.g., marketing, security) and counseling/consulting.

Procedure

To collect data on entrepreneurial effort and entrepreneurial passion, we used a repeated measurement design to analyze within-person differences. The 54 entrepreneurs of our study were contacted on a weekly basis. A weekly-study design covers a suitable time-frame to give the entrepreneurs sufficient time to develop their business and to investigate dynamic changes in the relationship between entrepreneurial effort and entrepreneurial passion. Previous

research has indicated that people are accurate in their evaluations of emotional states over the course of a week (Parkinson, Briner, Reynolds, & Totterdell, 1995). We sent an invitation email to the entrepreneurs containing a link that led to an online questionnaire containing items on entrepreneurial effort and entrepreneurial passion derived from English instruments (Cardon, Gregoire, Stevens, & Patel, 2013; Foo et al., 2009). We translated English items into German and a bilingual native English speaker back translated the items. We checked for consistency with the original items to ensure that the meaning of the items was identical.

In total, we invited all entrepreneurs eight times to complete our online questionnaire. On average, the entrepreneurs responded 7.35 times resulting in 397 data points (response rate of 92%). We asked our questions regarding entrepreneurial effort and entrepreneurial passion each time to have a fully cross-lagged design. The questions referred to the participants' entrepreneurial effort and passion during the last week. We used values from one week to predict values of the subsequent week. The values collected in week 1 were used as independent variables but not as dependent variables, reducing the number of usable data points to 347. We excluded six additional data points because the participants did not complete the questionnaire in the assigned week resulting in a final data set of 341 data points.

Measures

Entrepreneurial effort. We measured entrepreneurial effort eight consecutive times during our weekly study. We based our measure of entrepreneurial effort on two items developed by Foo et al. (2009). The two items were "In the last week, how much effort did you put into venture tasks that were required immediately" and "In the last week, how much effort did you put into venture tasks beyond what was immediately required". The participants answered the items on a 5-point Likert scale anchored from "little effort" to "much effort". The Cronbach's Alpha ($\alpha = .83$) indicated that the internal consistency of the scale was good.

Entrepreneurial passion. We measured entrepreneurial passion eight consecutive times during our weekly study. We based our measure of entrepreneurial passion on two items

developed by Cardon et al. (2013). The items focus on the emotional component of passion which is considered to be the key characteristic of entrepreneurial passion (Breugst et al., 2012; Cardon et al., 2009; Cardon, 2008). The two items were “In the last week, searching for new ideas for products / services to offer was enjoyable to me” and “In the last week, establishing a new company excited me”. We adapted the first item from the passion for inventing scale and the second item from the passion for founding scale (Cardon et al., 2013). Cardon et al. (2013) developed three different scales to capture the different phases of the entrepreneurial process (inventing, founding, and developing). We used items from the passion for inventing and passion for founding scales because of our focus on the pre-launch phase. To select the two items for our weekly study, we applied the full scales of passion for inventing and passion for founding to our sample of entrepreneurs before the start of our weekly study. We selected the items with the highest item-total correlation. Moreover, the two items showed a correlation of $r = .90$ with the total scale suggesting that the items were good indicators of the scale. Participants answered both items on a 5-point Likert scale ranging from “strongly disagree” to “strongly agree”. We combined the two items to form our scale of entrepreneurial passion (Cronbach’s Alpha = .89). We used only two items because of the time consuming method of a weekly study. Using only a reduced number of items for a scale is in line with previous research using such a study design to reduce participant burden and to ensure a good response rate (e.g., Bakker & Bal, 2010; Foo et al., 2009).

Controls. In our analyses, we controlled for participants’ age, gender, and entrepreneurial experience. We assessed entrepreneurial experience by asking the participants whether they had previously started a business and whether they had been previously involved in the start-up process of a new business. They received a score of 0 if they answered “No” to both questions and a score of 1 if they answered “Yes” to at least one of the questions. We also included the week number in our model to control for possible learning or trend effects.

Method of Analysis

We used a fully cross-lagged design with multiple observations of our participants. We obtained multiple observations from our participants and we therefore used hierarchical linear modeling to account for the dependence in the data. In our study, we are interested in the question whether entrepreneurial effort predicts changes in entrepreneurial passion. We therefore conducted within-person analyses. We centered the values for our independent variables of entrepreneurial effort and entrepreneurial passion around the mean of each person (person-centered). The method of person-centering ensures that all effects are independent of any differences between the participants (e.g., stable individual or contextual characteristics, such as gender or industry) (Enders & Tofghi, 2007; Hofmann & Gavin, 1998).

STUDY 1: RESULTS AND DISCUSSION

To test the factor structure of our two main variables of entrepreneurial effort and entrepreneurial passion, we conducted a multi-level confirmatory factor analysis (MCFA) using Mplus (Muthén & Muthén, 1998-2010) which accounts for the nested structure of our data. By using MCFA in Mplus the factor structure is analyzed both at the within-person and the between-person level. Also, Mplus uses full information maximum likelihood estimation that allows for missing data under the missing at random assumption. The two-factor solution showed an excellent fit ($\chi^2 [2] = 0.412$, CFI = 1.0, RMSEA = .00, SRMR[within] = .004, SRMR[between] = .001). We compared this model with a one-factor solution. The one-factor solution did not show acceptable fit ($\chi^2 [4] = 109.003$, CFI = .75, RMSEA = .26, SRMR[within] = .089, SRMR[between] = .135). A Satorra-Bentler scaled χ^2 -difference test (Satorra & Bentler, 1994) confirmed that the two-factor solution showed a significant better model fit than the one-factor solution (χ^2 -difference (2) = 96.01, $p < .001$). This shows that entrepreneurial effort and entrepreneurial passion were two distinct factors.

Before testing our hypotheses, we investigated whether there was systematic between- and within-person variance in entrepreneurial effort and entrepreneurial passion. We computed a null model to estimate the between- and within-person variance. We found that

45% of the total variance in entrepreneurial effort was between-person variance and 55% was within-person variance. With regard to entrepreneurial passion, 48% of the total variance was between-person variance and 52% was within-person variance. The results indicate that there is substantial variance within and between persons.

Hypothesis 1 states that entrepreneurial effort leads to an increase in entrepreneurial passion. We calculated hierarchical linear models and used values of entrepreneurial effort and entrepreneurial passion from one week to predict entrepreneurial passion in the subsequent week. We thus investigated time-lagged effects of entrepreneurial effort on changes in entrepreneurial passion. We used the person-centered values to investigate changes within persons. The results are presented in Table 1. We found that entrepreneurial effort had a positive effect on within-person changes in entrepreneurial passion ($b = 0.16$, $SE = 0.07$, $p < .05$). This finding provides support for Hypothesis 1.

As add-on analyses, we used values of entrepreneurial effort and entrepreneurial passion from one week to predict entrepreneurial effort in the subsequent week to test the reverse effect of entrepreneurial passion on entrepreneurial effort (Table 2). The coefficient for entrepreneurial passion was not significant ($b = 0.01$, $SE = 0.08$, ns). The finding suggests that entrepreneurial passion does not explain variance in entrepreneurial effort within persons. Furthermore, we conducted the same analyses on the between-person level. The pattern of results was similar. Entrepreneurial effort predicted entrepreneurial passion ($b = 0.16$, $SE = 0.06$, $p < .01$). The reverse effect was not significant. Entrepreneurial passion did not predict entrepreneurial effort ($b = 0.06$, $SE = 0.07$, ns).

Finally, we examined the cross-lagged paths of within-person entrepreneurial effort and entrepreneurial passion across subsequent weeks using multi-level structural equation modeling (Muthén & Muthén, 1998-2010) (see Figure 2). We used Kenny's (1975) notions of the cross-lagged panel test to label the paths. Both synchronous paths were positive and significant (path between effort in week_t and passion in week_t = .51, $p < .01$; path between

effort in week_{t+1} and passion in week_{t+1} = .50, $p < .01$). The cross-lagged path of entrepreneurial effort to entrepreneurial passion was positive and significant (path from effort in week_t to passion in week_{t+1} = .17, $p < .05$). The cross-lagged path of entrepreneurial passion to entrepreneurial effort was not significant (path from passion in week_t to effort in week_{t+1} = .00, *n.s.*). We also tested whether the cross-lagged paths were statistically different using Kenny's (1975) cross-lagged differential. Following Heise (1970), we used the path coefficients in the analyses. The cross-lagged differential was significant ($z = 2.62$, $p < .01$) indicating that there is a causal flow in the direction from entrepreneurial effort to entrepreneurial passion in a design with a time lag of one week.

The findings from the hierarchical linear regression models and from the cross-lagged differential provide evidence that entrepreneurial effort has a time-lagged effect on changes in entrepreneurial passion. However, our field study provides only preliminary support for a causal relationship and it does not examine the mechanisms that lead to an increase or decrease in entrepreneurial passion. We therefore conducted a laboratory experiment to investigate the causal processes underlying the relationship in a controlled setting.

STUDY 2: STUDY RATIONALE AND METHOD

We conducted an experiment manipulating entrepreneurial effort, new venture progress, and free choice in a fully crossed 2x2x2 experimental design. Manipulating entrepreneurial effort allows us to investigate a causal effect of entrepreneurial effort on passion (Hypothesis 1). We combined two approaches to investigate whether new venture progress mediates the relationship between entrepreneurial effort and passion (Hypothesis 2). First, we used an experimental-causal-chain design (Spencer, Zanna, & Fong, 2005) following the steps by Baron and Kenny (1986) to establish mediation. Second, we used a blockage design (MacKinnon & Fairchild, 2009). In a blockage design, the manipulation of the mediating variable is designed in such a way that effects can be observed in one experimental condition and are blocked in others. In our case, we manipulated new venture progress to show that new

venture progress has a causal effect on entrepreneurial passion and that new venture progress blocks or enhances the effect of entrepreneurial effort on passion. This pattern of blocking and enhancing provides evidence for a mediating effect (MacKinnon & Fairchild, 2009). Finally, we manipulated free choice to test the hypothesis that the mediated effect of entrepreneurial effort on passion through new venture progress depends on free choice (Hypothesis 3). The mediated effect should only occur in case of free choice.

Sample and Procedure

We conducted our experiment with 136 undergraduate students enrolled in business administration studies at a university in Singapore. We recruited the participants through the department subject pool. The participants were on average 20.62 years old. Thirty-seven percent of the participants were female. Upon arrival, the students completed a questionnaire which included measures of entrepreneurial passion, commitment to invest effort, and demographic variables. We measured entrepreneurial passion at the beginning of the experiment to have a baseline measure. We used the measure of commitment to invest effort to check for motivational differences across the experimental groups before the manipulation.

After the completion of the first questionnaire, the participants received a document which included the manipulations for entrepreneurial effort (high entrepreneurial effort versus low entrepreneurial effort) and free choice (free choice versus no free choice). The document informed the subjects that the experiment is about entrepreneurship and that their task is to develop a business idea into a more viable business concept. To this end, the participants were told to gather information and to answer the following five questions: (1) Who will be your customers, (2) What will be conditions and trends of the market that you will enter, (3) Who are your competitors, (4) What can you say about your suppliers, and (5) What are helpful or constraining regulations. We requested the participants to work on these five questions to simulate entrepreneurial tasks. We selected these questions because they are important topics in a business plan that entrepreneurs typically prepare in the course of creating a new venture.

The document also provided a list of potential actions the participants could take to gather information about the five topics, such as talking to family and friends, getting in touch with potential customers, suppliers, or investors, and collecting information about competitors and the market. We derived the list of activities from the entrepreneurship literature on start-up activities performed by entrepreneurs to develop a business concept and to start a business (Davidsson & Honig, 2003; Dimov, 2007). The participants had a computer with internet access and were allowed to use their mobile phones, the internet, and any social media. The participants noted down their responses to the five questions in an online document on the computer. The participants worked independently on the tasks. When the time for working on the tasks was over, the participants submitted the online document. The participants were told that their answers were automatically coded and evaluated by a computer-aided content-analysis software for entrepreneurial tasks to produce a feedback report for them. After the submission of the online document, the students completed a second questionnaire including scales to measure entrepreneurial effort and self-perception of causes for their behavior. We used these scales as manipulation checks. After the completion of the second questionnaire, the participants received their individual feedback report. The participants were told that the feedback report was produced on the basis of their responses to the five questions. The feedback report was the manipulation of new venture progress (significant new venture progress versus no significant new venture progress). The students then completed a third questionnaire which included measures of new venture progress and entrepreneurial passion. We used the measure of new venture progress for a manipulation check. We used the measure of entrepreneurial passion as our outcome variable in the statistical analyses. After the third questionnaire, we asked the participants in an open format to describe what they have thought and felt about working on the entrepreneurial tasks. We coded the participants' responses to the open question for entrepreneurial passion. We used this measure to validate the self-report measure of entrepreneurial passion. At the end of the experiment, the participants received a

thorough debriefing. We informed the participants about the manipulations and the purpose of the study. We explicitly told them that the feedback did not reflect their actual performance.

Manipulation of entrepreneurial effort. To manipulate entrepreneurial effort, we varied the amount of time for working on the entrepreneurial tasks. In the high entrepreneurial effort condition, the participants had 60 minutes time and 30 minutes in the low entrepreneurial effort condition. Furthermore, in the high entrepreneurial effort condition we also stated that the current study is a main study in a large scale research project and that it is important to work intensively and diligently on the tasks. We also mentioned that the three best performers will receive a gift card for a large internet retailer (approximately 65 USD, 40 USD, and 25 USD) (cf., Humphreys & Revelle, 1984; MacKinnon et al., 1985). In the low entrepreneurial effort condition, we stated that the current study is a pilot study and the main purpose is to check whether the technical procedure works. We did not mention that there is an incentive for the three best performers.

Manipulation of new venture progress. We provided the participants with different feedback reports to manipulate new venture progress. They received feedback that they have made significant new venture progress or that they have made no significant new venture progress. Specifically, the feedback report listed the five topics (customers, market, competitors, suppliers, and regulations) and indicated percentage scores and the grade the participants had achieved on each topic, an overall grade, and a conclusion. In the significant progress condition, the percentages ranged from 75% to 95%. The grade for each topic said either very good or excellent. The overall grade was excellent and the conclusion read that the report submitted by the participant would mean a significant advancement in the new venture development process. In the no significant progress condition, the percentages ranged from 11% to 39%. The grade for each topic said either fair or inadequate. The overall grade was inadequate and the conclusion read that the report submitted by the participant would mean no significant advancement in the new venture development process.

Manipulation of free choice. The two conditions to manipulate free choice were whether or not the participants could choose the business idea they wanted to work on. In the free choice condition, the participants could select one out of 12 business ideas or they could also come up with a completely new business idea. We derived the list of 12 business ideas from the entrepreneurs from Study 1. We described each business idea in one or two sentences. In the no free choice condition, the participants were assigned to one specific business idea. Out of the 12 business ideas, we selected five business ideas for the no free choice condition. The participants in the no free choice condition were randomly assigned to one of the five business ideas. We decided to have five different business ideas in the no free choice condition to ensure that our findings were not due to a specific business idea. The description of the business ideas was identical in both conditions.

Measures

Entrepreneurial passion. We measured entrepreneurial passion before and after the manipulations to be able to examine changes in entrepreneurial passion due to the manipulations. We used nine items developed by Cardon et al. (2013) to measure passion for inventing and passion for founding because of our focus on the pre-launch phase (see also Study 1). The participants provided their answers to the nine items on a 5-point Likert scale ranging from “strongly disagree” to “strongly agree”. We combined the nine items to form our scale of entrepreneurial passion before (Cronbach’s Alpha = .94) and after the manipulations (Cronbach’s Alpha = .95).

In addition to the self-report measure of entrepreneurial passion, we also asked the participants in an open question at the end of the experiment to describe their thoughts and feelings about working on the entrepreneurial tasks. The responses were coded for entrepreneurial passion by two independent raters who were blind to the experimental conditions of the participants. We developed a coding scheme based on the items developed by Cardon et al. (2013). The items refer to excitement, enjoyment, enthusiasm, motivation,

and feeling energized with regard to entrepreneurial tasks. Therefore, the raters coded statements referring to a positive or negative form of excitement, enjoyment, enthusiasm, motivation, and being energized. An example of positive statement of excitement is “it was exciting and thrilling to come up with an idea out of nothing”. An example of a negative statement is “I felt really bored and totally uninterested”. The positive statements counted +1 and the negative statements -1 for the score of coded entrepreneurial passion. The inter-rater reliability for the two raters was good (ICC = .95) (Shrout & Fleiss, 1979).

Entrepreneurial effort. We measured entrepreneurial effort after the participants had worked on the tasks. We used this measure as a manipulation check. We developed two items based on previous research on entrepreneurial effort (Bielby & Bielby, 1988; Foo et al., 2009). The first item was “I worked hard on venture tasks in this study”. The second item was “I was putting forth a good effort in working on the tasks assigned to me as part of this study”. The participants answered the two items on a 5-point Likert scale ranging from “not at all” to “to a very great extent”. We combined the two items to form our scale of entrepreneurial effort (Cronbach’s Alpha = .91). As an additional manipulation check for entrepreneurial effort, we counted the number of words of the participants’ report on the five questions (entrepreneurial tasks).

New venture progress. We measured new venture progress after the participants had received the feedback report. We used this measure as a manipulation check. We measured new venture progress using seven items based on van Gelderen and colleagues (2005). Six of the seven items asked the participants “To what extent do you think you have achieved the goal of a concrete description of” followed by the topics “your product/service”, “your potential customers”, “your competitors”, “your suppliers”, “relevant regulations”, and “your market”. The seventh item asked whether the participants thought that they had overall achieved the goals. The participants rated the seven items on a 5-point Likert scale ranging

from “not at all” to “to a very great extent”. We computed the mean to combine the seven items to our scale of new venture progress (Cronbach’s Alpha = .93).

Self-perceptions of internal causes of behavior. We measured self-perceptions of internal causes of behavior after the participants had worked on the entrepreneurial tasks. We used this measure as a manipulation check. We based our measure on items developed by Ryan and Connell (1989). This measure asks for different reasons why people show a certain behavior. We selected four items which capture the extent to which people perform a behavior because the behavior conforms to their own values or goals (Ryan & Connell, 1989). Our four items started with the statement “I have worked on the topics” followed by four different reasons. The four reasons were “because I want to understand the subject”, “because I want to learn new things”, “because I think the topic of entrepreneurship is important”, and “because I find it a personal challenge to do so”. The participants answered all items on a 5-point Likert scale ranging from “strongly disagree” to “strongly agree” (Cronbach’s Alpha = .84).

Commitment to invest entrepreneurial effort. We measured commitment to invest entrepreneurial effort at the beginning of the experiment to test whether there were motivational differences across the experimental conditions before the manipulations. We used two items based on Bielby and Bielby (1988) and Foo et al. (2009). The first item was “I am committed to work hard on venture tasks during this study”. The second item was “I am committed to go beyond what is immediately required when working on venture tasks during this study”. The participants answered both questions on a 5-point Likert scale ranging from “not at all” to “to a very great extent”. Cronbach’s Alpha of the scale was .86.

STUDY 2: RESULTS AND DISCUSSION

To test whether our randomization was successful, we conducted univariate ANOVAs with the experimental manipulations as independent variables and commitment to invest entrepreneurial effort and demographic variables as dependent variables. We did not find any significant main or interaction effects of the experimental manipulations on the variables. This

indicates that our randomization was successful. To test whether our manipulations were successful, we conducted t-tests with the manipulations as independent variables. First, the high entrepreneurial effort group reported higher levels of entrepreneurial effort ($M = 3.63$) than the low entrepreneurial effort group ($M = 3.31$; $t = 2.27$, $p < .05$). Also, the t-test for the number of words submitted by the two groups was significant ($t = 8.00$, $p < .01$; $M_{\text{high}} = 1028.65$ versus $M_{\text{low}} = 638.59$). Second, the manipulation of new venture progress was successful ($t = 5.96$, $p < .01$). The significant new venture progress group reported higher new venture progress ($M = 3.31$) than the no significant new venture progress group ($M = 2.58$). Third, we tested whether the free choice group differed from the no free choice group in self-perceptions of internal causes of behavior. The t-test was significant ($t = 2.03$, $p < .05$) with higher internal causes in the free choice condition ($M = 3.33$) than in the no free choice condition ($M = 2.99$). We conclude that all manipulations were successful. Finally, to validate the self-report measure of entrepreneurial passion, we correlated the self-report measure of entrepreneurial passion after the manipulations with the coded entrepreneurial passion based on the participants' response to the open question about their thoughts and feelings towards working on the entrepreneurial tasks. The correlation was positive and significant ($r = .42$, $p < .01$) providing support for the validity of the self-report measure.¹

To test the effects of the manipulations on changes in entrepreneurial passion, we conducted repeated measures ANOVAs. First, we tested whether the entrepreneurial effort manipulation had an effect on changes in entrepreneurial passion. The effect was significant ($F = 3.93$, $p < .05$). The result provides support for a causal effect of entrepreneurial effort on changes in entrepreneurial passion (Hypothesis 1). The result is also relevant for our second hypothesis. Our second hypothesis is that new venture progress mediates the relationship

¹ The magnitude of the correlation corresponds to correlations between self- and external/objective ratings and to correlations between multi-method measures of a construct (cf., Bledow & Frese, 2009; Bommer et al., 1995; Fox & Dinur, 1988). Multi-method measures and self-other ratings usually cover different subcomponents of a construct space leading to moderate correlations between the different measures (Lance et al., 2008). In our study, the coded responses are based only on the expressed emotions while the self-report measure also captures all internally accessible aspects of entrepreneurial passion.

between entrepreneurial effort and passion (Hypothesis 2). The significant effect of entrepreneurial effort on changes in entrepreneurial passion means that the first condition to establish mediation holds (i.e., the independent variable has an effect on the dependent variable) (R. M. Baron & Kenny, 1986). The second condition to establish mediation is that the independent variable affects the mediator. This cannot be tested in our experiment because we manipulated both, the independent variable (entrepreneurial effort) and the mediator (new venture progress), which means that the two variables were independent of each other. To demonstrate that the second condition holds, we conducted an additional experiment which provided support for a positive effect of entrepreneurial effort on new venture progress.² The third and fourth conditions are that the mediator has an effect on the dependent variable and that the effect of the independent variable becomes non-significant when the mediator is included. To show that these conditions hold, we included the manipulations of new venture progress and free choice in the repeated measures ANOVA. We found a significant effect of new venture progress on changes in entrepreneurial passion ($F = 10.35, p < .01$). This finding shows that there is a causal effect of new venture progress on changes in entrepreneurial passion providing support for the third condition. To demonstrate that the fourth condition holds, we used the blockage design by MacKinnon and Fairchild (2009).³ We have to provide evidence that the effect of entrepreneurial effort on passion is blocked in case of no significant new venture progress and that the effect is enhanced in case of significant new venture progress (MacKinnon & Fairchild, 2009). In statistical terms, this corresponds to an

² To provide support for the effect of entrepreneurial effort on new venture progress, we conducted a separate experiment with 42 undergraduate students enrolled at a German university. The experiment was similar to the experiment described in this paper. We manipulated effort and asked the participants to work on the five entrepreneurial tasks. The manipulation was successful. We measured our dependent variable of new venture progress in the same way as our manipulation check for new venture progress described in the Method section of Study 2 in this paper. We conducted a t-test to show that entrepreneurial effort had a positive effect on new venture progress. The t-test was significant ($t = 2.07, p < .05$) with a higher mean for new venture progress in the high entrepreneurial effort group ($M = 2.75$) than in the low entrepreneurial effort group ($M = 2.40$). The details of this study can be requested from the first author of this paper.

³ Note that we manipulated both, entrepreneurial effort and new venture progress which means that the two manipulations are independent of each other. Therefore, the usual approach to examine the effect of the independent variable on the dependent variable when the mediator is included does not apply in our design.

interaction effect between entrepreneurial effort and new venture progress on changes in entrepreneurial passion. Furthermore, Hypothesis 3 states that the mediating effect is moderated by free choice: there is only a mediating effect in case of free choice but not in case of no free choice. Overall, this means that we expect a significant three-way interaction between entrepreneurial effort, new venture progress, and free choice. This was supported by our data. The repeated measures ANOVA showed a significant three-way interaction between the manipulations of entrepreneurial effort, new venture progress, and free choice on changes in entrepreneurial passion ($F = 4.33, p < .05$). To investigate the significant three-way interaction, we ran separate repeated measures ANOVAs for the free choice and the no free choice conditions. We ran separate analyses for the free choice and no free choice conditions because we hypothesized that the mediation effect of new venture progress holds in the former but not in the latter. In the no free choice condition, we found a significant effect of new venture progress on changes in entrepreneurial passion ($F = 9.97, p < .01$) but no significant interaction between entrepreneurial effort and new venture progress ($F = 0.26, ns$). This suggests that new venture progress does not block or enhance the effect of entrepreneurial effort on passion in the no free choice condition (cf., MacKinnon & Fairchild, 2009). In contrast, the repeated measures ANOVA for the free choice condition showed a significant interaction between entrepreneurial effort and new venture progress ($F = 6.21, p < .05$). The significant interaction between entrepreneurial effort and new venture progress in the free choice condition is illustrated in Figure 3. To further examine the significant interaction between entrepreneurial effort and new venture progress in the free choice condition, we conducted paired t-tests for the four different conditions (see Table 3). The results showed that there was a significant increase in entrepreneurial passion in case of high effort and significant progress ($t = 3.34, p < .01$). In case of low effort and significant progress, there was no significant change in passion ($t = -0.66, ns$). In both cases of no significant progress, entrepreneurial passion decreased; there was a significant decrease in the

no significant progress and low effort condition ($t = -2.09, p < .05$) and a marginally significant decrease in the no significant progress and high effort condition ($t = -2.04, p < .10$). The significant interaction between entrepreneurial effort and new venture progress and the pattern of the paired t-tests provide evidence that new venture progress enhances and blocks (reverses) the effects of entrepreneurial effort on entrepreneurial passion. There is a positive effect of entrepreneurial effort in case of significant new venture progress. In case of no significant new venture progress, entrepreneurial passion decreases independent of entrepreneurial effort. This pattern provides support for Hypothesis 2 that new venture progress mediates the effect of entrepreneurial effort on changes in entrepreneurial passion (cf., MacKinnon & Fairchild, 2009). Furthermore, we found this mediating effect only in the free choice condition but not in the no free choice condition; we found a significant three-way interaction between the three manipulations which had the pattern that the interaction between entrepreneurial effort and new venture progress was only significant in the free choice condition but not in the no free choice condition. These findings support Hypothesis 3 that free choice moderates the mediating effect of new venture progress in the relationship between entrepreneurial effort and entrepreneurial passion.

Supplemental Analysis

There is an alternative explanation for the findings in our experiment. It is possible that reward contingency was driving the effect of effort on passion. A significant manipulation check of effort does not necessarily establish that the manipulation is responsible for a change in passion (Sigall & Mills, 1998). Thus, we conducted an additional experiment in which we isolated the effects attributable to effort and to reward contingency. We used a fully crossed 2x2 experimental design manipulating entrepreneurial effort and reward contingency. The manipulation for entrepreneurial effort was equivalent to the previous experiment except for the part regarding the reward in terms of a gift card. We created two conditions to manipulate reward contingency. In the high reward contingency condition, we stated that “the three study

participants who were most diligent in working on the tasks will receive a gift voucher. It is entirely up to you to win the gift voucher”. In the low reward contingency condition, we stated that “three study participants will be randomly chosen to receive a gift voucher. It is purely up to chance for each participant to win the reward”. We could thus test whether the effect of effort on changes in passion were driven by participants’ expectations to receive a reward based on their efforts. We sampled in total 111 students from a university in Singapore (N = 60) and Germany (N = 51). The students from the two universities were evenly distributed across the different conditions (Singapore: $Chi^2 = 0.22$, *ns.*; Germany: $Chi^2 = 0.18$, *ns.*). The procedure and measures were identical to the previous experiment.

We computed repeated measures ANOVAS to examine the effects of effort and reward contingency on changes in entrepreneurial passion. We controlled for the university in our analyses to account for the fact that we sampled participants from two different universities. The analyses showed a significant main effect of effort on change in entrepreneurial passion ($F = 4.05$, $p < .05$). Simple slope analyses revealed that there was a significant increase in entrepreneurial passion in the high effort condition ($t = 2.39$, $p < .05$) while there was no significant effect in the low effort condition ($t = -0.49$, *ns.*). We did not find a significant main effect of reward contingency ($F = 0.43$, *ns.*) nor a significant interaction between effort and reward contingency ($F = 0.10$, *ns.*).⁴ The results provided additional support for the hypothesized effect of effort on changes in entrepreneurial passion (Hypothesis 1). Furthermore, we can rule out the alternative explanation that the effect was driven by participants’ expectations to receive a reward contingent on their effort.

⁴ To test whether our sampling approach (sampling students from two different universities) had an effect on the results, we tested whether the variable for university (Singapore vs. Germany) interacted with the main and interaction effects of effort and reward contingency on changes in entrepreneurial passion. There were no significant effects (all F 's < 0.40, all p 's > .53). Furthermore, we tested whether the effect size for effort was similar for both subsamples. The size of the effect of effort on changes in entrepreneurial passion in the overall sample was $\eta^2 = .04$. The effect size in the Singapore subsample was $\eta^2 = .03$. The effect size in the German subsample was $\eta^2 = .04$. Given that there were no significant interaction effects with university and that the effect sizes of the effect of effort on changes in entrepreneurial passion were similar in both subsamples, we conclude that the effect is robust across subsamples and that our significant findings were not influenced by our sampling approach.

GENERAL DISCUSSION

We conducted two studies to examine the relationship between entrepreneurial effort and entrepreneurial passion. Overall, the findings indicate that changes in entrepreneurial passion are a consequence of entrepreneurial effort and that the interplay of new venture progress and free choice provide a causal link underlying the effect of entrepreneurial effort on passion. Our findings have several important theoretical implications for the literatures on entrepreneurship, emotion, and motivation.

Theoretical Implications

Our finding that entrepreneurial effort predicted entrepreneurial passion differs from the dominant perspective in the entrepreneurship literature. So far, the focus has been on entrepreneurial passion as a driver that fuels entrepreneurs' efforts (Baum & Locke, 2004; Cardon et al., 2009). Our study indicates that the opposite is also true and that there is a causal effect flowing from entrepreneurial effort to entrepreneurial passion. Thus, our results suggest that theoretical frameworks on entrepreneurial passion need to consider entrepreneurial passion to be an outcome of entrepreneurial effort.

Our study answers calls in the entrepreneurship literature to investigate factors stimulating entrepreneurial passion (Cardon et al., 2012; Murnieks et al., in press). This is important because entrepreneurial passion is proposed to influence entrepreneurs' creativity, information processing, and decision making (Cardon et al., 2009) with positive effects on entrepreneurs' behavior and performance (Busenitz & Barney, 1997; Gielnik, Frese, Graf, & Kampschulte, 2012; Gielnik, Kramer, Kappel, & Frese, 2014; Simon, Houghton, & Aquino, 2000). Scholars have begun to develop such models identifying entrepreneurial identity centrality to be a predictor of entrepreneurial passion (Murnieks et al., in press). Our study contributes to this line of research on antecedents of entrepreneurial passion by suggesting additional pathways through which entrepreneurs experience higher or lower levels of entrepreneurial passion. By building on theories of self-regulation (Carver & Scheier, 1982;

Locke & Latham, 2002) and self-perception (Bem, 1972), we demonstrate that new venture progress and free choice are mechanisms leading to changes in entrepreneurial passion.

Our study also contributes to the literature on emotion. Our study shows that emotions can be a function of behavior – the effort that entrepreneurs dedicate to their tasks in. Research investigating the effects of personal projects on people's emotions found similar results, such that people who completed projects experienced higher levels of happiness (McGregor & Little, 1998). However, our findings also suggest that the effect is dependent on free choice as suggested by the theory of self-perception (Bem, 1972). People infer their emotions from their behavior only if that behavior appears to be free from external controlling factors (Bem, 1972). This is similar to the psychological processes described by self-determination theory (Ryan & Deci, 2000): people who receive external rewards for working on an interesting task discount their interest in that task because they attribute their behavior to the external reward (i.e., an external cause for their behavior). Our study thus adds to recent theoretical developments on the behavior-emotion link (Baumeister et al., 2007) insofar as our study integrates propositions from self-perception theory to explain under which conditions positive outcomes lead to positive emotions.

Finally, our study contributes to the literature on motivation and self-regulation. We adopted a dynamic perspective and investigated changes in entrepreneurial effort and entrepreneurial passion over time. Our findings show that for both entrepreneurial effort and entrepreneurial passion, almost half of the variance was within-person variance. This means that entrepreneurs' passion and effort fluctuate over time. This study thus supports recent theoretical developments in the literature on motivation and self-regulation which suggest that considering dynamic changes in human motivation in general and in self-regulatory processes in particular is important because much of the variability in these variables is within-person variance (Lord et al., 2010). Furthermore, we show that entrepreneurial passion co-varies over time with entrepreneurs' different levels of entrepreneurial effort. Our study thus adds to the

self-regulation literature on emotion control (e.g., Kanfer, Ackerman, & Heggestad, 1996). So far, the literature has mainly focused on self-regulatory processes to keep negative emotional reactions at bay during task engagement (Kanfer et al., 1996; Keith & Frese, 2005). Our study extends this perspective by demonstrating how people can regulate positive emotions in terms of entrepreneurial passion. The positive emotions themselves may then help people to improve their self-regulation (cf., Tice, Baumeister, Shmueli, & Muraven, 2007).

Study Limitations and Future Research Directions

A strength of our paper is that our mix of studies ensured external validity in Study 1 and internal validity in Studies 2. A potential limitation of Study 1 is the time lag during the weekly study. We selected a time lag of one week to give the entrepreneurs sufficient time to develop their business in the course of the weekly observations and at the same time, not to overburden them with too many measurement waves. Because of the retrospective reports of entrepreneurial effort and passion memory biases may have occurred (Bolger, Davis, & Rafaeli, 2003). Although we acknowledge that memory biases may occur, previous research indicates reasonable agreement between ratings of currently reported momentary emotional states and summary reports over weekly time frames (Parkinson et al., 1995). Future studies could consider using an experience sampling method which reduces memory biases (Uy, Foo, & Aguinis, 2010). An experience sampling method also allows researchers to conduct a more fine-grained analysis of the relationship between entrepreneurial effort and entrepreneurial passion. Specifically, passion at one point in time may have a positive effect on effort at the same point in time. The significant synchronous correlations of effort and passion in our Study 1 point into that direction indicating that a causal flow in both directions is possible.

We used a different time lag in the laboratory experiment where we captured short-term entrepreneurial passion. Cardon (2008) has noted that short-term emotions may influence the entrepreneurs' current state but less so the entrepreneurs' general entrepreneurial passion. However, there may be a relationship between short- and long-term emotions if there is a high

frequency: Frequently experienced negative or positive emotions over a longer time are likely to influence enduring emotional experiences related to one's work (Judge, Higgins, Thoresen, & Barrick, 1999; Taylor, 1991). A similar relationship to long-term passion may occur for frequently bouts of short-term passion.

Another issue involving time is our manipulation of entrepreneurial effort in the laboratory experiment which contained aspects of time (60 vs. 30 minutes), importance (main vs. pilot study), and incentives (gift card for best performers vs. no gift card). One could argue that the manipulation of effort could focus on time only. Several studies have used time as a measure of effort (Sitzmann & Ely, 2011). However, Fisher and Ford (1998) have argued and empirically shown that time alone is a deficient indicator of effort. Effort represents people's mental or physical workload or the intensity with which people work on a task (Kanfer, 1987). Time alone is unrelated to people's intensity of working on a task because people's attentional focus might be on or off the task (Fisher & Ford, 1998; Kanfer & Ackerman, 1989). Furthermore, our study builds on control theory which argues that investing more effort in less time means making faster progress towards goal achievement with positive emotional consequences (Carver & Scheier, 1990). Thus, a manipulation of effort which focuses on the aspect of time alone would not capture the psychological processes underlying our theoretical model.⁵ It is also important to note that we conducted an additional experiment to rule out the alternative explanation that the expected reward contingent on one's effort was driving the change in entrepreneurial passion instead of effort itself. The additional

⁵ In fact, we tried out the time alone manipulation in a laboratory experiment with 158 students at a Singaporean university. The experiment was identical to the experiment reported in Study 2 in this paper except for the manipulation of entrepreneurial effort. We manipulated entrepreneurial effort by varying the aspect of time only (60 vs. 30 minutes for working on the tasks) and keeping the aspects of importance and incentives constant. In line with the findings by Fisher and Ford (1998), we did not find that manipulating time only led to a difference in entrepreneurial effort reported by students in the high and low effort conditions ($M_{\text{high}} = 3.34$, $M_{\text{low}} = 3.35$, $t = -0.08$, $p = .94$). This finding suggests that a manipulation of the aspect of time alone was not effective and that it is also necessary to direct participants' attentional focus to on-tasks activities in order to successfully manipulate effort. Theoretically, the combination of time and intensity works well, because given high intensity, increasing time does not suggest to participants to compensate for the longer time with decreased effort – an effect that seems to occur when time alone is manipulated (Horning, Gerhard, & Michailow, 1990).

experiment did not support the alternative explanation: effort independent of reward contingency explained why people experienced an increase in entrepreneurial passion.

With regard to our samples, it is possible to argue that the sample size of 54 entrepreneurs in Study 1 was small. However, we followed the 54 entrepreneurs over a period of eight weeks leading to 341 observations for our analyses. With regard to Study 2, we note that our participants were undergraduate students. This may question the external validity of our findings. However, given that Study 1 was conducted in a field setting with real entrepreneurs, we believe that this should be less of a concern for the given study.

Our study offers some interesting starting points for future research. Consistent with recent work on the function of emotions for behavior, our findings suggest that emotions follow from behavior (Baumeister et al., 2007). Nevertheless, emotions may influence behavior insofar as the anticipation of emotions may drive behavior. This means that with regard to entrepreneurial passion, anticipated entrepreneurial passion may be more important than actually experienced entrepreneurial passion for stimulating entrepreneurial effort and behavior (Baumeister et al., 2007). Future research could distinguish between the anticipation of the intensive positive emotion and experiencing the emotion itself.

Furthermore, previous research mostly concentrated on entrepreneurial passion as a stable personality characteristic (e.g., Baum & Locke, 2004; Baum, Locke, & Smith, 2001). Our study shows that entrepreneurial passion is more flexible. Future research could adopt a more fine-grained perspective on the flexible patterns of entrepreneurial effort and passion over time. For example, future research could use growth curve modeling to identify different patterns in the growth or decay of entrepreneurial effort and passion across individuals (cf., Bliese & Ployhart, 2002). Such research on fluctuations of entrepreneurial effort and passion would also add to our understanding of the temporal dynamics inherent in motivational and emotional states (Sonnentag & Frese, 2012; Watson, 2000; Weiss & Cropanzano, 1996).

Conclusions

Overall, our findings suggest that there is substantial variance in entrepreneurial passion over time and changes in entrepreneurial passion are a consequence of entrepreneurs' efforts. Entrepreneurs increase their passion when they make significant progress in their venture and when they invest effort out of their own free choice.

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Figure 1. The theoretical model: New venture progress and free choice explaining why and under which condition entrepreneurial effort affects entrepreneurial passion.

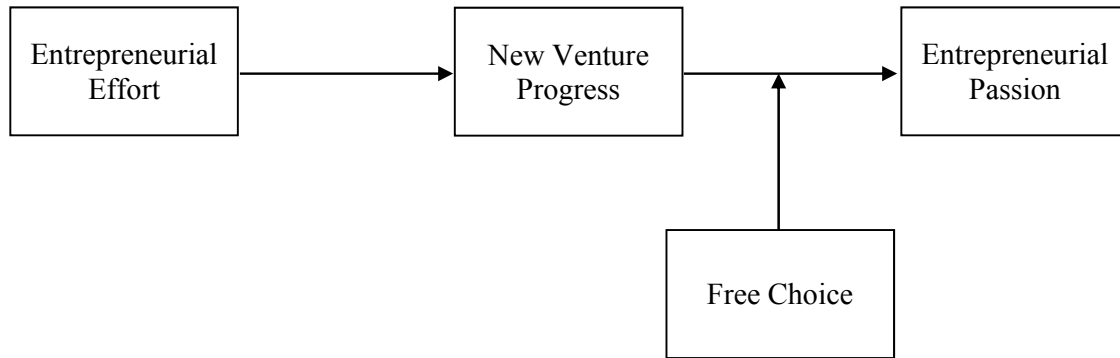
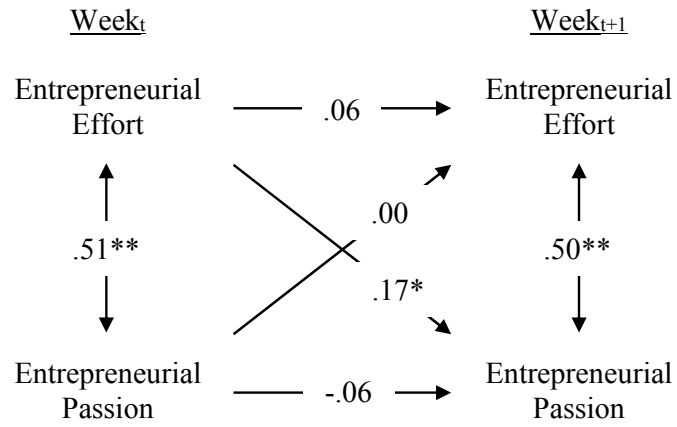
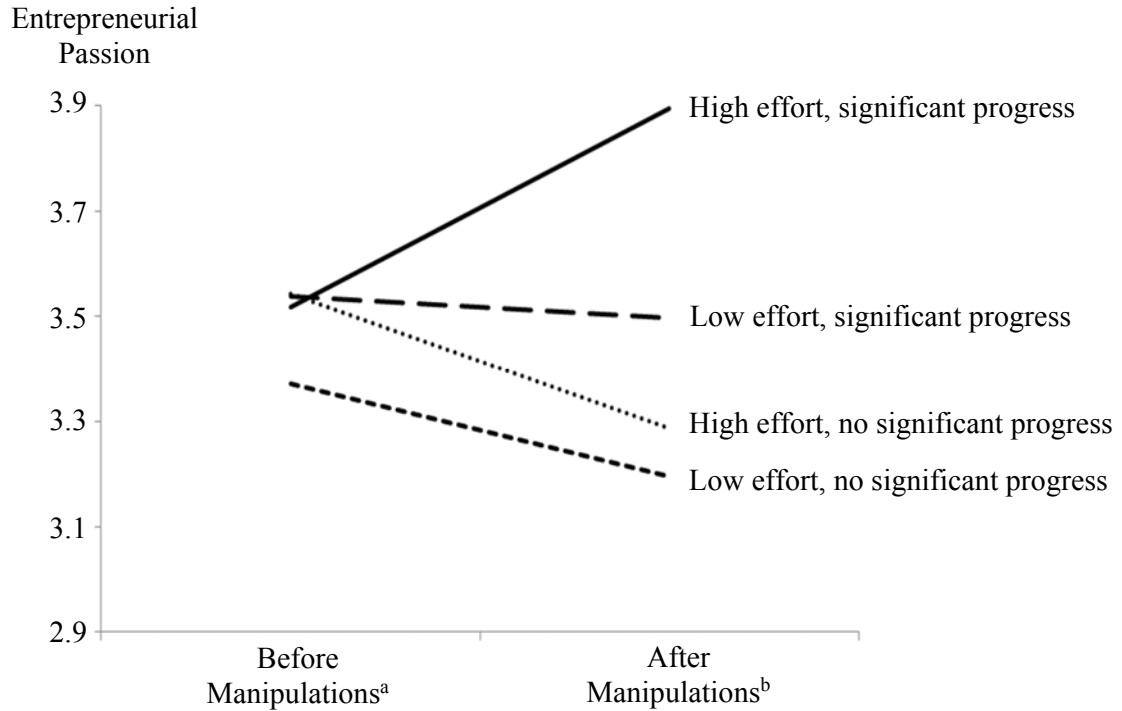


Figure 2. Study 1: Cross-lagged multi-level structural equation modeling of within-person entrepreneurial effort and entrepreneurial passion.



Note: * $p < .05$; ** $p < .01$.

Figure 3. Study 2: Significant interaction between entrepreneurial effort and new venture progress on changes in entrepreneurial passion in case of free choice.



Note: ^a Before the manipulations of entrepreneurial effort, new venture progress, and free choice; ^b After the manipulations of entrepreneurial effort, new venture progress, and free choice.

Table 1. Study 1: Hierarchical Linear Modeling of entrepreneurial passion predicted by entrepreneurial effort (person-centered values).

Variables	Model 1		Model 2	
	Within Persons (person-centered)			
	Entrepreneurial Passion		Entrepreneurial Passion	
	(subsequent week)		(subsequent week)	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Intercept	2.75	0.49	2.75	0.49
Week Number (Time)	-0.02	0.03	-0.02	0.03
Age	0.02	0.01	0.02	0.01
Gender ^a	0.10	0.26	0.10	0.26
Entrepreneurial Experience	0.57*	0.28	0.57*	0.28
Entrepreneurial Passion	0.03	0.07	-0.05	0.07
Entrepreneurial Effort			0.16*	0.07
Deviance	848.80		846.77	
Variance explained by model	0%		2%	
Change in variance explained			2%	

Note: *N* of observations = 341; ^a 1 = female, 0 = male; * *p* < .05; ** *p* < .01.

Table 2. Study 1: Hierarchical Linear Modeling of entrepreneurial effort predicted by entrepreneurial passion (person-centered values).

Variables	Model 1		Model 2	
	Within Persons (person-centered)			
	Entrepreneurial Effort		Entrepreneurial Effort	
	(subsequent week)		(subsequent week)	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Intercept	2.73	0.52	2.73	0.52
Week Number (Time)	-0.01	0.02	-0.01	0.03
Age	0.01	0.01	0.01	0.01
Gender ^a	0.01	0.28	0.01	0.28
Entrepreneurial Experience	0.49	0.30	0.49	0.30
Entrepreneurial Effort	0.05	0.06	0.04	0.07
Entrepreneurial Passion			0.01	0.08
Deviance	870.09		873.37	
Variance explained by model	0%		0%	
Change in variance explained			0%	

Note: *N* of observations = 341; ^a 1 = female, 0 = male; * *p* < .05; ** *p* < .01.

Table 3. Study 2: The joint effects of entrepreneurial effort and new venture progress on changes in entrepreneurial passion before and after manipulations split by the free choice condition.

	Entrepreneurial Passion							
	<i>N</i>	Before manipulations ^a		After manipulations ^b		Difference before and after manipulations	Paired t-test	
		<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>		<i>t</i>	<i>p</i>
<i>Free choice</i>								
High effort, significant progress	20	3.52	0.75	3.89	0.91	0.38	3.14	.01
Low effort, significant progress	19	3.54	0.62	3.50	0.62	-0.04	-0.66	.52
High effort, no significant progress	17	3.54	0.82	3.29	0.80	-0.25	-2.04	.06
Low effort, no significant progress	21	3.37	0.86	3.20	0.90	-0.17	-2.09	.05
<i>No free choice</i>								
High effort, significant progress	14	3.15	0.89	3.35	1.00	0.20	1.55	.14
Low effort, significant progress	13	3.09	0.72	3.21	1.08	0.12	0.84	.42
High effort, no significant progress	17	3.52	0.77	3.29	0.87	-0.22	-2.29	.04
Low effort, no significant progress	15	3.42	0.73	3.00	0.80	-0.42	-3.81	.01

Note: $N = 136$. ^a Before the manipulations of entrepreneurial effort, new venture progress, and free choice; ^b After the manipulations of entrepreneurial effort, new venture progress, and free choice.

BIO SKETCHES

Michael M. Gielnik (michael.gielnik@leuphana.de) is a Junior Professor for HR Development at the Leuphana University of Lüneburg, Germany. He received his Ph.D. from the Leuphana University of Lüneburg. His research interests are entrepreneurship, in particular action-based entrepreneurship trainings and the entrepreneurial process. He has taken a special interest in entrepreneurship in developing countries.

Matthias Spitzmuller (matthias.spitzmuller@queensu.ca) is an Assistant Professor at Queen's School of Business. He received his Ph.D. in Organizational Behavior from Michigan State University. His research explores how individuals and teams engage in actions as a means of self-regulation.

Antje Schmitt (aschmitt@uni-kassel.de) is postdoctoral researcher at the Department of Business Psychology, University of Kassel, Germany. She received a Ph.D. from the University of Lüneburg. Her research focuses on self-regulation, affect at work, and proactive work behavior.

D. Katharina Klemann (Katharina.Klemann@psychol.uni-giessen.de) is a doctoral student of industrial and organizational psychology at the University of Giessen. Her research interests include entrepreneurial processes, career transitions, career adaptability, and career identity.

Michael Frese (michfrese@gmail.com) has a joint appointment at NUS Business School and at University of Lueneburg. He received his Ph.D. from the Technical University of Berlin. His research includes the psychology of entrepreneurship; factors that influence innovation and creativity in people, teams, and organizations; active performance concepts, such as personal initiative, training (e.g., for entrepreneurship in developing countries); and learning from errors and experience. Guiding concepts are evidence-based management and action regulation theory.