

# How Do Feelings Influence Effort? An Empirical Study of Entrepreneurs' Affect and Venture Effort

Maw-Der Foo  
University of Colorado, Boulder

Marilyn A. Uy  
University of Colorado, Boulder, and University of Victoria

Robert A. Baron  
Rensselaer Polytechnic Institute

How do feelings influence the effort of entrepreneurs? To obtain data on this issue, the authors implemented experience sampling methodology in which 46 entrepreneurs used cell phones to provide reports on their affect, future temporal focus, and venture effort twice daily for 24 days. Drawing on the affect-as-information theory, the study found that entrepreneurs' negative affect directly predicts entrepreneurs' effort toward tasks that are required immediately. Results were consistent for within-day and next-day time lags. Extending the theory, the study found that positive affect predicts venture effort beyond what is immediately required and that this relationship is mediated by future temporal focus. The mediating effects were significant only for next-day outcomes. Implications of findings on the nature of the affect–effort relationship for different time lags are discussed.

*Keywords:* entrepreneurial affect, affect, venture effort, temporal focus, affect-as-information

Scholars investigating work motivation seek to understand what encourages people to expend effort on tasks. This is an important issue for the management field because efforts influence work outcomes (Latham & Pinder, 2005; Locke & Latham, 1990, 2002; Staw & Barsade, 1993). A vast body of evidence shows that affect impacts behaviors through cognitive processes that influence how individuals prefer to act (e.g., Forgas, 1995; Gendolla, 2000; Isen & Labroo, 2003; Schwarz & Clore, 1996). Yet, despite the potential impact of affect on work behaviors, this factor plays only a marginal role in work motivation theories (cf. George & Brief, 1996; Seo, Barrett, & Bartunek, 2004). The affect–effort link has not been clearly established, even though scholars have long recognized the importance of effort in the work motivation literature (Latham & Pinder, 2005).

In this article, we use the affect-as-information perspective as a theoretical foundation for understanding how affect influences entrepreneurial effort. The start-up process is rich with affective ups and downs (Cook, 1986), and entrepreneurs are often portrayed as passionate, enthusiastic, and persistent even in the face of challenge and adversity (e.g., Cardon, Zietsma, Saporito, Mathern, & Davis, 2005). Baron (2008) noted two reasons why entrepreneurs who create new ventures experience strong affective reactions. First, the new venture environment is highly unpredictable, because the entrepreneurial process is chaotic, complex, and compressed in time (Aldrich & Martinez, 2001). Second, entrepreneurs make major investments in time, energy, and effort in their ventures and often stake their personal fortunes and even their self-esteem on the success of their ventures. Given these basic facts, it is important to investigate the role of affect with respect to new ventures. High effort levels often pay off for entrepreneurs and help them attain the success they desire, such as increased sales and profits (Bitler, Moskowitz, & Vissing-Jorgensen, 2005). And especially for early-stage ventures, Foo, Sin, and Yiong (2006) have underscored the need for an entrepreneur to persevere so that the venture has a reasonable chance of success.

Our study concerning the relationship between the entrepreneur's affect and effort is important in several ways. First, we provide insights into how affect propels effort. Although there are some exceptions (e.g., Erez & Isen, 2002; Forgas & George, 2001), existing literature on this topic generally—and somewhat surprisingly—shows very little actual empirical research in work motivation that includes affect. We draw on the affect-as-information model (Schwarz & Clore, 1983) to clarify the nature and direction of the affect–effort relationship, which we summarize in Figure 1. We find that negative affect predicts new venture effort. This finding is consistent with the theory that negative affect signals that things are not going well (Carver, 2003) and

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Maw-Der Foo, Management and Entrepreneurship Division, Leeds School of Business, University of Colorado at Boulder; Marilyn A. Uy, Management and Entrepreneurship Division, Leeds School of Business, University of Colorado at Boulder, and Faculty of Business, University of Victoria, Victoria, British Columbia, Canada; Robert A. Baron, Lally School of Management and Technology, Rensselaer Polytechnic Institute.

Marilyn A. Uy is now at the Faculty of Business, University of Victoria, Victoria, British Columbia, Canada.

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Correspondence concerning this article should be addressed to Maw-Der Foo, Management and Entrepreneurship Division, Leeds School of Business, University of Colorado, 419 UCB, Boulder, CO 80309. E-mail: foom@colorado.edu

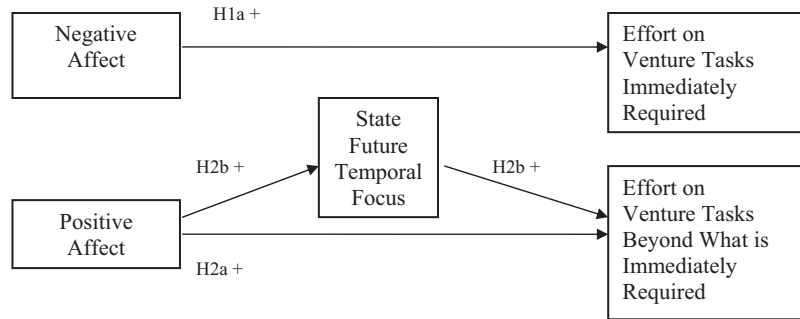


Figure 1. General research model for the hypothesized relationships of affect and effort. H = hypothesis.

thereby initiates a response to try harder and increase one's effort. However, we also find that positive affect predicts new venture effort. We extend the affect-as-information perspective by suggesting that although positive affect signals that all is going well, it does not necessarily reduce effort. Instead, we clarify the mechanism behind the affect–effort relationship by showing that positive affect is linked to increased effort through a future temporal focus.

Second, we answer the call to explore the relationship of affect to proactivity. It has been argued that proactive behaviors, defined as anticipatory actions that individuals do to impact themselves and their surrounding (Grant & Ashford, 2008), are influenced by affective experiences. Positive affect fuels proactive behaviors because it promotes an envisioning into the future (Grant & Ashford, 2008). We explicitly tested this idea by demonstrating the mediating effect of future temporal focus on the relationship between positive affect and venture efforts.

Third, this is one of the first studies to show that affect matters in the domain of entrepreneurship. In a theory paper, Baron (2008) highlighted various ways in which affect influences the entrepreneurial process. However, these suggestions were based on extensions from research in other contexts rather than on directly relevant empirical findings. Because affect fluctuates even within short periods of time (Judge & Ilies, 2004; Watson, 1988), we investigated within-individual variations of affect and effort, which are dynamic constructs that vary over time.

Fourth, we improved upon current use of experience sampling methodology (ESM) by developing a cell phone-based ESM. We adopted the wireless application protocol (WAP) function and created a system whereby participants could complete their surveys through their cell phones twice daily for 24 days. This novel use of WAP technology allowed us to scrutinize, in real time, how the within-entrepreneur affective fluctuations are linked to variations in future temporal focus and venture efforts.

### Affective Influences on Venture Efforts

When people experience positive or negative affect, they implicitly ask themselves, “How do I feel about this situation?” (Frijda, 1986; Schwarz & Clore, 1983). It is well documented that affect influences information processing, even when the cause of the affect is irrelevant to the current situation (e.g., Albarracín & Wyer, 2001; Robins & Denisi, 1994). However, the impact of this information component of affect on behavior is unclear. Drawing on the affect-as-information perspective, Carver (2003) offered

insights into the affect–behavior link and suggested that people self-regulate their behaviors to reduce discrepancies between actual states and desired states and to compare current progress with the desired rate of progress (Carver & Scheier, 1990). Negative affect indicates that progress toward goals is inadequate and increased efforts are needed to reduce this discrepancy (Carver, 2003). When applied to entrepreneurs, negative affect might signal that progress toward current tasks is slower than desired and that they should exert more effort working on these tasks. On the basis of the arguments above, we offer the following hypothesis:

*Hypothesis 1:* For individual entrepreneurs, negative affect is positively related to increased subsequent effort on venture tasks that require immediate attention.

Because positive affect signals that things are going well, individuals do not need to exert more effort on immediate tasks (Carver, 2003). Therefore, we have not hypothesized any relationship between positive affect and venture tasks that are immediately required. Using the affect-as-information perspective, one might expect positive affect to reduce effort, as positive affect signals all is going well at the moment. However, we expected that positive affect would still promote further actions, because entrepreneurs could use this information as a signal that they can engage in proactive behaviors. Proactive behaviors are anticipatory behaviors that individuals take to impact themselves or their environments (Grant & Ashford, 2008). As Carver and Scheier (1990) and Carver (2003) stated, people have multiple goals and when one goal is satisfied, they turn their attention to other goals. We propose that positive affect influences effort toward tasks beyond those immediately required and base this on the reasoning that positive affect heightens a future temporal focus. Such temporal focus then drives proactive efforts.

Future temporal focus is the extent to which individuals allocate their attention to the future (Bluedorn, 2002). Positive affect influences a future temporal focus for two reasons. First, because positive affect signals that things are going well and that the present environment is safe (Fredrickson, 2001; Schwarz & Clore, 1983), it allows the individual to move beyond current concerns to engage in more future-oriented thinking (Raghunathan & Trope, 2002; Trope & Neter, 1994). Second, positive affect widens the scope of attention (Fredrickson & Branigan, 2005), and this wide scope of attention allows individuals to attend to possible future states beyond the here and now (Karniol & Ross, 1996).

A future temporal focus should in turn induce proactive behaviors and, for this study, venture tasks that are beyond what is immediately required. Grant and Ashford (2008) conceptualized proactive behaviors as “future-focused,” “mindful,” and “acting in advance with foresight about future events before they occur” (p. 9). They noted that to engage in proactive behavior, individuals need to anticipate future outcomes (e.g., to mentally represent a vision that could exist at some future point). Such imagining boosts motivation by increasing people’s confidence that these outcomes will occur (Koehler, 1991) and “increases the probability that one will act to promote or prevent these states (Ajzen, 1991); in other words, anticipation can fuel self-fulfilling prophecies” (Grant & Ashford, 2008, p. 10).

Hence, positive affect should influence a future temporal focus, and a future temporal focus could then lead entrepreneurs to engage in venture tasks beyond what is immediately required.

*Hypothesis 2a:* For individual entrepreneurs, positive affect is positively related to increased subsequent effort on venture tasks beyond what is immediately required.

*Hypothesis 2b:* For individual entrepreneurs, future temporal focus mediates the relationship between positive affect and increased subsequent effort on venture tasks beyond what is immediately required.

Last, trait affect should strengthen the relationships between state affect and venture efforts. Trait activation theory suggests that traits are expressed in behaviors only when trait-relevant cues are present (Tett & Guterman, 2000). Individuals high in a given affective trait should be more behaviorally responsive to the corresponding affective state (Ilies, Scott, & Judge, 2006; Tett & Burnett). Moreover, Larsen and Ketelaar (1991) suggested that people high in extraversion (which is highly correlated with trait positive affect) are more sensitive to stimuli that induce positive affect, whereas people high in neuroticism (which is highly correlated with trait negative affect) are more sensitive to stimuli that induce negative affect. Thus, we hypothesized as follows:

*Hypothesis 3:* Trait affect will moderate the relationship between entrepreneurs’ state affect and venture efforts, such that (a) trait negative affect will strengthen the relationship between state negative affect and venture efforts and (b) trait positive affect will strengthen the relationship between state positive affect and venture efforts.

The next section describes the ESM with which the affect, temporal focus, and efforts of 46 entrepreneurs were tracked over 24 days.

## Method

### Sample and Procedures

Participants were recruited from a business incubator attached to a university in Manila, Philippines. Fifty-six entrepreneurs from 22 start-up ventures had been admitted into the incubator.<sup>1</sup> Of these entrepreneurs, 49 agreed to participate. Three entrepreneurs dropped out a week after the study started, which left 46 participants in the final sample. The sample comprised 15 women and 31 men (as we explain, our analyses are based on 1,668 data points).

The industry categories represented were manufacturing (52%), wholesale and retail (23%), professional and technical services (15%), and food services (10%). Some 57% of the participants were of Malay ancestry; the rest were Chinese (39%) and Hispanics (4%). All participants had a bachelor’s degree and had been in the incubator for about 6 months.

We examined entrepreneurs’ positive and negative affect and venture efforts using ESM, which is a type of repeated data collection method in which participants provide in situ reports of their experiences over a period of time (Beal & Weiss, 2003). We used the cell phone’s WAP to conduct the survey. WAP is a standardized protocol enabling mobile devices, such as cell phones, to access Internet and other Web-based applications (Vos & de Klein, 2002). Through wireless networks, the WAP survey (programmed in Java language) can be downloaded and stored in the cell phones. The survey responses are sent to a server as a text message (short message service; SMS). The system records the time when the participants’ responses were received.

Participants received 15–20 minutes of individualized coaching on how to download and complete the survey using their cell phones. During the orientation, participants completed a baseline paper-and-pencil survey on demographic information, trait affectivity, and general future temporal focus. They were instructed to carry their cell phones during the period of the study and to complete the survey upon receipt of the SMS prompt. Six rounds of ESM studies were administered every other week, with each round consisting of two SMS prompts for 4 consecutive days. Rounds 1, 3, and 5 were administered from Monday to Thursday, and rounds 2, 4, and 6 were administered from Tuesday to Friday. The schedule of the SMS prompts was randomized between 10:00 am and 10:00 pm to avoid being too intrusive. Participants received the first SMS prompt between 10:00 am and 4:00 pm and the second SMS prompt between 4:00 pm and 10:00 pm. This time frame was selected after interviews with participants on their normal work schedules. The cell phone survey was designed to be short enough to be completed within 2 minutes. Each participant was compensated in Philippine pesos to the equivalent of US \$45.

In total, 2,232 SMS prompts were sent and 1,668 valid reports were received, yielding a response rate of 74.73%. Following previous ESM studies (e.g., Judge & Ilies, 2004), valid reports are those received within 2 hours after the SMS prompt was sent.

### ESM Measures

*Positive and negative affect.* State positive affect (PA) and state negative affect (NA) were assessed with the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). A 10-item shortened version was used: 5 items for PA (“enthusiastic,” “attentive,” “proud,” “interested,” “inspired”) and

<sup>1</sup> We should note that we conducted an initial study to gather data on the hypotheses outlined above. However, as noted by the anonymous reviewers, the dependent measures employed in that initial study were not adequately specific in their reference to current and future-oriented efforts. The research reported here sought to address that important issue by developing and employing improved dependent measures. Because the methods and procedures used in the initial study and the follow-up investigation were generally similar except for this crucial change, we focus here only on the follow-up (improved) data set.

5 items for NA (“upset,” “irritable,” “nervous,” “distressed,” “jittery”). Shortened versions are routinely used in ESM studies to ease participant burden (e.g., Zohar, Tzischinski, & Epstein, 2003). Because each question was only a word, the effort required of participants was relatively low. Participants rated the extent to which each item described their momentary affect (i.e., affect experienced at that moment) on a scale of 1 (*not at all*) to 5 (*extremely*). The alpha reliability coefficients for PA and NA were .87 and .85, respectively.

**Future temporal focus.** Future temporal focus items were adapted from the Temporal Focus Scale (Shipp, Edwards, & Lambert, 2006). Participants were asked to indicate how well each of the following describes them at the current moment using a 5-point scale ranging from 1 (*not at all*) to 5 (*extremely*). The two items are “I focus on my future” and “I think about what my future has in store.” The alpha reliability coefficient for state future temporal focus was .83.

**Venture effort.** Venture effort measures were adapted from the Work Effort Scale (Bielby & Bielby, 1988). Participants were asked to assess (since the last time they completed the cell phone survey) the following: “How much effort did you put into venture tasks that are required immediately?” and “How much effort did you put into venture tasks beyond what is immediately required?” The responses were anchored from 1 (*very little*) to 5 (*a lot*). The use of single-item scales is common in experience sampling studies (e.g., Ong, Bergeman, Bisconti, & Wallace, 2006; Williams & Alliger, 1994) because of the efforts required of participants to respond to each survey item at multiple times.

### Baseline (Time 1) Measures

Baseline measures were assessed during the orientation prior to the ESM survey. These dispositional variables were controlled for in the analyses to partial out between-individual effects on the ESM variables.

**Trait PA and trait NA.** These traits were assessed with the full 20-item Positive and Negative Affect Schedule (Watson et al., 1988) with general instructions (e.g., “Please indicate to what extent you *generally* feel this way”). Each trait affect had 10 items. The alpha reliability coefficients for trait PA and trait NA were both .88.

**Future temporal focus.** Future temporal focus was assessed with all four items that measure future-oriented attention from the scale developed by Shipp et al. (2006). Participants were asked to rate the extent to which the items generally describe them using a scale from 1 (*definitely false*) to 5 (*definitely true*). Examples include “I think about the times to come” and “I think about what my future has in store.” The alpha reliability coefficient was .80.

**Self-efficacy.** We controlled for self-efficacy because it influences effort levels (Wood & Bandura, 1989). We used the 8-item general self-efficacy measure (Chen, Gully, & Eden, 2001), because venture creation requires capabilities in various fields (Markman, Baron, & Balkin, 2005). Participants evaluated statements such as “I am confident that I can perform effectively on many different tasks” and “Compared to other people, I can do most tasks very well” on a scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The alpha reliability coefficient was .91.

### Results

Table 1 presents the means, standard deviations, and correlations of the study variables. The intraclass correlation values of the ESM variables (Variables 6–10) ranged from .38 to .56. These values denote a nontrivial degree of nonindependence and justify the use of mixed models.

Because the data comprised multiple observations of individuals over time, we used a mixed model (also known as the hierarchical linear model or multilevel random coefficient model) to test all hypotheses. Mixed models take into account the correlated structure of the data, as multiple reports are obtained from each person. For all mixed models, all predictors assessed via ESM were individual-mean centered to partial out individual-mean effects from the momentary assessment (Hofmann & Gavin, 1998). The *xtmixed* command in Stata Version 9 was used to run mixed regression models (cf. Rabe-Hesketh & Skrondal, 2005).

Tables 2 to 4 show the results of the hypothesis testing based on 1,668 ESM reports from 46 participants. In all models, we controlled for gender, trait affectivity, self-efficacy, general future temporal focus, and firm effects. To determine the stability of the results over time, we incorporated time effects by creating lags for within-day and next-day outcomes. On each study day, each entrepreneur provided two sets of responses (Occasion 1 and Occa-

Table 1  
Means, Standard Deviations, and Correlations of the Study Variables

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
1. Gender	0.33	0.47	—								
2. Self-efficacy	4.02	0.61	-.16	—							
3. Trait positive affect	3.80	0.58	-.26	.59	—						
4. Trait negative affect	2.33	0.78	.12	-.34	-.31	—					
5. General future temporal focus	4.19	0.50	.05	.62	.35	-.05	—				
6. State positive affect	3.04	0.97	-.13	-.01	.15	-.06	-.03	—			
7. State negative affect	2.14	0.96	-.05	-.17	-.04	.23	-.06	-.01	—		
8. State future temporal focus	3.72	0.97	.04	.24	.20	-.05	.25	.26	-.13	—	
9. Venture effort (immediately required)	3.38	1.31	-.18	.15	.07	-.15	.08	.21	.02	.18	—
10. Venture effort (beyond immediately required)	2.95	1.25	-.23	.25	.23	-.20	.13	.19	.11	.16	.68

Note. *N* = 46. Variables 6 to 10 are averaged momentary assessments across 1,668 ESM data points. Gender is coded 0 = male, 1 = female.  $|r_s| \geq .049$  are significant at the 0.05 level (two-tailed).  $|r_s| \geq 0.07$  are significant at the 0.01 level (two-tailed).

Table 2  
 Multilevel Regressions Results: Affect on Venture Effort

Variable	Model 1		Model 2		Model 3		Model 4	
	Within-day venture effort (immediately required)		Within-day venture effort (beyond immediately required)		Next-day venture effort (immediately required)		Next-day venture effort (beyond immediately required)	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Gender	0.12	0.36	-0.21	0.38	-0.13	0.36	-0.18	0.38
Self-efficacy	0.12	0.36	0.09	0.39	0.07	0.37	-0.03	0.39
Trait positive affect	0.05	0.38	0.21	0.40	-0.05	0.38	0.38	0.40
Trait negative affect	-0.24	0.26	-0.45	0.28	-0.24	0.26	-0.29	0.28
State positive affect	0.20**	0.05	0.13**	0.05	0.14**	0.04	0.08*	0.04
State negative affect	0.11*	0.05	0.02	0.05	0.17**	0.04	0.08*	0.04
Log-likelihood	-969.64		-890.15		-1,391.46		-1,298.36	
<i>N</i>	682		682		989		989	

Note. The regression coefficients are unstandardized. State positive and negative affect were individual-mean centered and lagged to analyze within-day and next-day effects, respectively. The models also controlled for firm effects by including dummy variables for firm.

\*  $p < .05$ . \*\*  $p < .01$ .

sion 2), and these responses were between 8 and 12 hours apart. Within-day analyses were done by pairing the predictor variables in Occasion 1 with the criterion variables in Occasion 2 of the same day. For the next-day analyses, in which the gap between the predictor and criterion variables was approximately 20–24 hours, the predictor variables in Occasion 1 (or 2) of the previous day were paired with the criterion variables of Occasion 1 (or 2) the following day.

Hypothesis 1 describes the relationship between the entrepreneur's negative affect and venture effort on tasks immediately required. We tested this hypothesis for both within-day and next-day outcomes. Model 1 of Table 2 shows positive relationship between negative affect and within-day effort in venture tasks immediately required ( $\beta = .11, p < .05$ ), and Model 3 of Table 2 also shows a positive relationship between negative affect and next-day effort in venture tasks immediately required ( $\beta = .17, p < .01$ ). Hence, Hypothesis 1 was supported for both within-day and next-day lagged outcomes. Surprisingly, we also found negative affect to relate positively to next-day effort in venture tasks beyond what is immediately required, and we provide possible explanations for this in the Discussion section.

Hypothesis 2a involves the relationship between the entrepreneur's positive affect and effort on venture tasks beyond what is immediately required. Models 2 and 4 of Table 2 show that positive affect and effort beyond what is immediately required were positively and significantly related for both within-day ( $\beta = .13, p < .01$ ) and next-day outcomes ( $\beta = .08, p < .05$ ). Although they were not hypothesized, we also found positive relationships between positive affect and venture efforts required immediately for both within-day and next-day outcomes, and we provide potential explanations for this in the Discussion section.

Hypothesis 2b describes future temporal focus as a mediator between positive affect and venture effort beyond what is immediately required. The steps recommended by Shrout and Bolger (2002) were used to verify whether mediation occurred. The first step is to establish that a significant regression path exists between the independent variable and the mediator, in this case, positive affect and future temporal focus. Table 3 shows a significant

positive relationship between positive affect and future temporal focus ( $\beta = .15, p < .01$ ). The relationship of negative affect on future temporal focus is not significant ( $\beta = -.03$ ). In the next steps, we demonstrate that the mediator, future temporal focus, influences the dependent variable, venture effort beyond what is immediately required with the independent variable controlled. We incorporated both within-day and next-day lags in our analyses. Full mediation is indicated by a nonsignificant relationship between the independent variable and dependent variable, and partial mediation is indicated by a significant reduction in the regression coefficient of the relationship between the independent variable and the dependent variable.

Model 1 of Table 4 shows that future temporal focus was significantly related to within-day venture effort beyond what is immediately required ( $\beta = .15, p < .01$ ), and Model 2 of Table 4 shows that this relationship remains significant with positive affect in the analysis ( $\beta = .13, p < .01$ ). In addition, positive affect was a significant predictor of within-day venture effort beyond what is

Table 3  
 Multilevel Regression Results: Affect on Future Temporal Focus

Variable	Future temporal focus	
	<i>B</i>	<i>SE</i>
Gender	0.28	0.36
Self-efficacy	0.03	0.41
Trait positive affect	0.17	0.38
Trait negative affect	0.15	0.28
General future temporal focus	0.27	0.43
State positive affect	0.15**	0.02
State negative affect	-0.03	0.02
Log-likelihood	-1,868.81	

Note. The model is based on 1,668 observations from 46 participants. The regression coefficients are unstandardized. Positive and negative affect were individual-mean centered. The models controlled for firm effects by including dummy variables for firm.

\*\*  $p < .01$ .

Table 4  
 Mediating Effects of Future Temporal Focus on the Relationship Between Positive Affect and Venture Effort Beyond What Is Immediately Required

Variable	Model 1		Model 2		Model 3		Model 4	
	Within-day venture effort (beyond immediately required)		Within-day venture effort (beyond immediately required)		Next-day venture effort (beyond immediately required)		Next-day venture effort (beyond immediately required)	
	B	SE	B	SE	B	SE	B	SE
Gender	-0.09	0.42	-0.09	0.42	-0.12	0.42	-0.12	0.42
Self-efficacy	0.07	0.45	0.07	0.45	0.07	0.46	0.07	0.46
Trait positive affect	0.28	0.42	0.28	0.42	0.42	0.42	0.42	0.42
Trait negative affect	-0.37	0.30	-0.37	0.30	-0.24	0.30	-0.24	0.30
General future temporal focus	-0.34	0.47	-0.34	0.47	-0.20	0.48	-0.20	0.48
State future temporal focus	0.15**	0.05	0.13**	0.05	0.09*	0.04	0.08*	0.04
State positive affect			0.10*	0.04			0.06	0.04
Log-likelihood	-886.55		-886.32		-1,297.12		-1,298.37	
N	682		682		989		989	

Note. The regression coefficients are unstandardized. State future temporal focus and positive affect were individual-mean centered and lagged to analyze within- and next-day effects, respectively. The models controlled for firm effects by including dummy variables for firm.

\*  $p < .05$ . \*\*  $p < .01$ .

immediately required when future temporal focus was included in the model ( $\beta = .10, p < .05$ ). Results for the Sobel test with bootstrap procedures (5,000 bootstrap samples) indicate that 95% of the bootstrap estimates were between the values of  $-0.003$  and  $0.07$  (with bias correction incorporated) and a  $z$  value of  $1.71$  (*ns*). Models 3 of Table 4 show that future temporal focus was significantly related to next-day venture effort beyond what is immediately required ( $\beta = .09, p < .05$ ), and Model 4 of Table 4 shows that this relationship remains significant with positive affect in the analysis ( $\beta = .08, p < .05$ ). As Table 4 of Model 4 shows, positive affect was not a significant predictor of next-day venture effort beyond what is immediately required when future temporal focus was entered into the model ( $\beta = .06, ns$ ). This suggests full mediation. The Sobel test with bootstrap procedures (5,000 bootstrap samples) indicates that 95% of the bootstrap estimates were between the values of  $0.003$  and  $0.04$  (with bias correction incorporated) and a  $z$  value of  $2.07$  ( $p < .05$ ). These findings suggest that state future temporal focus fully mediated the relationship between positive affect and venture effort beyond what is immediately required only for next-day lagged effort. Hence, the mediation hypothesis is supported only for the next-day outcome.

We also found some support for the trait activation theory (cf. Ilies et al., 2006), which suggests that individuals high on a given affective trait should be more behaviorally responsive to the corresponding affective state (Tett & Burnett, 2003). When next-day outcomes were used, trait negative affect strengthened the positive relationship between state negative affect and venture efforts beyond what is immediately required ( $\beta = .12, p < .01$ ). When within-day outcomes were used, trait positive affect strengthened the positive relationship between state positive affect and venture efforts immediately required ( $\beta = .18, p < .05$ ) and beyond what is immediately required ( $\beta = .18, p < .01$ ).

In addition, we tested for reverse relationships (i.e., how venture efforts impact state affect for both within-day and next-day lags). Results suggest that exerting effort on venture tasks immediately

required did not impact within-day and next-day negative affect ( $\beta = .04, ns$ , and  $\beta = .03, ns$ , respectively). Results also indicate that exerting effort on venture tasks beyond what is immediately required was significant only for within-day positive affect ( $\beta = .11, p < .01$ ) and not for next-day positive affect ( $\beta = .04, ns$ ). In general, the findings were more consistent with the direction we hypothesized than with the reverse relationships.

Because the two effort measures were highly correlated ( $r = .68$ ), we conducted additional analyses by using one effort type as the dependent variable while controlling for the effect of the other effort type. Controlling for effort on venture tasks immediately required, results indicate that positive and negative affect are not significant predictors of within-day efforts ( $\beta = .04, ns$  for PA and  $\beta = -.03, ns$  for NA) and next-day efforts ( $\beta = .02, ns$  for PA and  $\beta = .01, ns$  for NA) beyond what is immediately required. However, controlling for effort on venture tasks beyond what is immediately required, results suggest that positive affect and negative affect are significant predictors of venture efforts immediately required for within-day outcomes ( $\beta = .12, p < .01$  for PA and  $\beta = .10, p < .05$  for NA) and next-day outcomes ( $\beta = .10, p < .01$  for PA and  $\beta = .13, p < .01$  for NA). Thus, despite the high correlations among PA and NA, the analyses provide some additional support that affect valence predicts efforts.

## Discussion

The results of this study indicate that the entrepreneur's affect does indeed play a significant role in the process of new venture creation. Consistent with the affect-as-information perspective, support was found for Hypothesis 1a that negative affect increases venture efforts on tasks that are immediately required. Extending this theory by drawing on the proactivity literature, we also found support for Hypothesis 2a, that positive affect increases venture efforts on tasks beyond what is immediately required. Both hypotheses were supported for within-day and next-day outcomes.

Last, Hypothesis 2b proposed that future temporal focus mediates the relationship between positive affect and venture effort on tasks beyond what is required. This hypothesis was supported but only for next-day outcome.

Our findings suggest that affect serves as a source of information for entrepreneurs. As argued in the affect-as-information theory, negative affect signals that things are not going well in the venture and may lead entrepreneurs to expend more effort on venture tasks requiring immediate attention. An unexpected finding was that negative affect also increased venture efforts beyond what is immediately required. Because negative affect signals that something is wrong in the venture situation, it could lead entrepreneurs to engage in precautionary behaviors to prevent future damage to the venture.

Positive affect signals that things are going well in the venture, and, using affect-as-information theory, one might expect the entrepreneur to reduce effort because all is well at the moment. In the present study of entrepreneurs, we argued that positive affect should increase venture efforts. It is precisely because positive affect signals that things are going well at the moment that the entrepreneur's focus can shift to the future, and such focus motivates the entrepreneur to work harder because it promotes behaviors to achieve desired future outcomes (Karniol & Ross 1996). This argument was supported, because our findings showed that future temporal focus mediated the link between positive affect and venture efforts beyond what is immediately required (next-day lagged outcome). Although not hypothesized, positive affect was also found to increase effort on tasks immediately required, and a future temporal focus also mediated the link between positive affect and venture tasks immediately required (with a next-day lag). Striving toward desired future states involves bridging the present and the future (Karniol & Ross, 1996). When entrepreneurs focus on the future, they may not neglect the present, as knowledge of the present may be required to determine how one can reach the desired outcome. To become successful in their venture pursuits, entrepreneurs should be able to integrate the present and future time horizons (Bird & West, 1997). They must be able to make sense of the here and now and the what will be and establish a coherent link between them.

### *Theoretical Implications*

Our study helps to clarify the mechanisms that underlie the link between affect and task-directed effort. Drawing on the affect-as-information perspective, we show that the entrepreneurs' affect has an informational function that could influence the entrepreneurs' venture efforts. Consistent with the arguments of affect as information, we find that negative affect, which signals that things are not going well in the current situation, induces entrepreneurs to invest more effort in the venture. We contribute to this theory by showing how positive affect, which informs the entrepreneur that all is well with the current state of affairs, also increases venture efforts. Our study does not contradict the affect-as-information perspective with regard to the informational value of positive affect. Instead, it serves to extend this theory by showing that positive affect heightened the entrepreneurs' future temporal focus, and such temporal focus related positively to venture effort beyond what is immediately required. This finding demonstrates that positive affect promotes future-oriented thinking (Fredrickson,

2001) and that future-oriented thinking drives proactive behaviors (Grant & Ashford, 2008). A future temporal focus was also linked to effort on tasks that are required immediately. This finding bolsters the argument that a future temporal focus may not necessarily result in neglect of the present, as knowledge of the present and putting effort into tasks immediately required are also necessary for the attainment of desired future outcomes.

Beyond our contribution to affect-as-information theory, we contribute to the proactivity literature by testing the link between affect and proactive behavior. Because proactive behaviors are anticipatory and future focused (Frese & Fay, 2001), we show how the entrepreneur's positive affect enhanced venture efforts through future temporal focus. Proactivity can be considered an emotional process because it often involves "taking ego and image risks" (Grant & Ashford, 2008, p. 22), yet the precise relationship between affect and proactivity is relatively unknown. Our study is one of the first to provide empirical evidence concerning how affective influences, particularly positive affect, enhance proactive behaviors. It is also important to study proactivity longitudinally, because proactivity is a process that does not occur at one point in time but unfolds over time (Grant & Ashford, 2008). Our findings indicate that affect and effort fluctuations are, at least in the case of positive affect, linked to fluctuations in future temporal focus.

Recently, in examining the affect-behavior link, Baumeister, Vohs, DeWall, and Zhang (2007) challenged the view that emotion directly causes behavior. They argued instead that individuals evaluate how behaviors induce emotions and engage in behaviors to experience positive feelings and repair negative emotions. They proposed a direct impact of affect, in contrast to discrete emotions, on behavior. Our study suggests a modification to Baumeister et al.'s (2007) theory. In particular, even for affect, cognition (represented by a future temporal focus in this study) plays a critical role in influencing behaviors.

Because affect can change even over short periods of time, the ESM approach is an ideal way to assess the influence of affect. We improved on current ESM use by developing a cell-phone-based ESM. Though not without limitations, such as the small screen size that necessitated short surveys, the cell phone ESM we developed has advantages over existing ESM, as it enables time stamping, allows researchers to interact with participants and monitor their responses in real time, offers increased convenience, and improves cost effectiveness. More important, ESM allows us to probe issues that would otherwise be difficult to study. For instance, a key issue in entrepreneurship research is "How are opportunities identified?" (Baron, 2006; Shane & Venkataraman, 2000). ESM enables information on opportunity discovery at the point in time when it occurs; thus, it can offer insights into this process, which other research methods may not capture.

### *Limitations*

Several limitations should be noted. First, our measure of affect (the PANAS) did not tap the different levels of activation/arousal of positive and negative affect. Notwithstanding this shortcoming, we decided to use the PANAS because most ESM studies on positive affect and negative affect have used Watson et al.'s (1988) scale (e.g., Judge & Ilies, 2004; Song, Foo, & Uy, 2008; Zohar et al., 2003). We opted for a commonly used measure, so that our findings could be compared with those of existing studies. Future

studies can use less restricted measures that incorporate low-activation positive and negative affect and even discrete emotions to examine more nuanced relationships between affect and effort.

Second, participants self-reported their effort levels, and it can be argued that these levels were not objectively measured. In future, researchers can use objective or observer-rated measures of effort to overcome self-reporting biases. Despite this limitation, this measure of effort is justified, given 35 years of motivation research demonstrating that attention drives effort (Locke & Latham, 2002). A related concern for self-reports is common method variance (Campbell & Fiske, 1959). Nonetheless, repeated-measure studies involving within-individual analyses may reduce this concern, “because research demand characteristics are likely to weaken with repeated measurement over time” (Williams & Alliger, 1994, p. 863). Moreover, we lagged the dependent variables for within-day and next-day outcomes. We also conducted a Harman’s single factor test (Harman, 1967); this test yielded four factors (not just one), with the first accounting for 26.21% of the variance in the data. Thus, common method variance was unlikely to be a serious problem in this study.

Third, we should generalize the findings only to short-term entrepreneurial efforts, because the entrepreneurs participated for only 24 days. Over the longer term, there can be relationships different from those found in this study. For example, for negative affect, a curvilinear relationship might be found. Initial negative affect may relate positively to effort, but if the negative affect persists, it may signal that things will not improve despite greater efforts and the entrepreneurs can choose to “cut their losses” and disengage from their ventures.

In conclusion, the findings of our research indicate that affect does indeed play a role in the entrepreneurial process. In fact, it appears to influence significantly the effort entrepreneurs direct to tasks important to the survival and growth of their new businesses. Given the volatile, uncertain, and rapidly changing environments in which entrepreneurs (and new ventures) operate, affective influences may well be of considerable importance. As many entrepreneurs note, they have no well-developed norms, “scripts,” or rules to follow when they create a new venture; rather, they must “make it up as they go along.” And decades of careful research indicate that it is precisely in such situations that affect tends to exert its strongest and most far-reaching effects.

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