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WHICH MATTERS MORE? GROUP FEAR VERSUS HOPE IN ENTRPRENEURIAL ESCALATION OF COMMITMENT

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RESEARCH SUMMARY

We examine the influence of two conflicting emotions—group fear and group hope—in entrepreneurial team decision making. We are interested in which emotion will be more strongly related to whether entrepreneurial teams escalate their commitment to a currently failing venture versus terminating that venture. Using a longitudinal start-up simulation and based on data from 66 teams across 569 decision making rounds, we find that group "hope trumps fear." That is, the relationship between group hope and escalating commitment to a failing venture is stronger than the relationship between group fear and terminating that venture. We predict and find that team engagement mediates these relationships. We find partial support for a predicted moderation effect of group friendship strength. Theoretical implications are discussed.

MANAGERIAL SUMMARY

Emotions are a critical but often unacknowledged part of entrepreneurial decision-making. We tested whether group fear or group hope will most strongly influence teams' decisions to escalate their commitment, versus terminating a currently failing venture. Using a longitudinal entrepreneurial simulation, based on data from 66 teams across 569 decision-making rounds, we find that "hope trumps fear." That is, the relationship between group hope and escalating commitment to a failing venture is stronger than the relationship between group fear and terminating that venture. Group engagement versus disengagement helps to explain this finding. Our results indicate the importance of entrepreneurs understanding and managing their team emotions for best decision-making. It also helps explain the continued engagement of entrepreneurial teams who even when fearful, have hope.

Entrepreneurship is an inherently uncertain process (Knight, 1921; Koudstaal, Sloof, and van Praag, 2016; McMullen and Shepherd, 2006). A quarter of new entrepreneurial ventures in the United States survive no longer than one year after founding, 44 percent fail by the end of the third year, and 55 percent fail by the end of the fifth year (Shane, 2008). In this context, how do entrepreneurial teams react when their financial situations turn for the worse? Do they terminate a venture that is losing money to cut their financial losses, or do they continue despite increasing financial risk? To understand this decision, we employ the theory of escalation of commitment to a failing course of action (Brockner, 1992; Sleesman *et al.*, 2012; Staw, 1981, 2005) because venture termination decisions typically occur under conditions of increasing loss. The dynamic nature of escalation theory is also useful as founding teams typically face the decision to escalate their commitment to a failing venture multiple times before deciding to terminate the venture (Shepherd *et al.*, 2014).

We are specifically interested in the *emotional* dynamics involved in teams' decision to escalate their commitment rather than terminate a currently failing venture. The growing field of affect in entrepreneurship has shown that emotions are important in entrepreneurial decision-making (Baron, 2008; Cardon *et al.*, 2012; Foo, 2011). Given the robust evidence that emotions are strongly felt as a consequence of venture termination (Shepherd, 2003; Shepherd and Cardon, 2009; Ucbasaran *et al.*, 2013), we predict that emotions are a critical antecedent to the decision to escalate commitment rather than terminate a currently failing venture.

We focus on the influence of group fear and group hope because, compared to other emotions, fear and hope are more associated with uncertainty (Chew and Ho, 1994; Loewenstein *et al.*, 2001; Lopes, 1987), which is inherent to the decision to escalate commitment to a venture. We compare a founding team's fear that a currently failing venture will ultimately increase financial losses to their hope that the venture can be turned around, recover the losses, and ultimately make money. We set the founding *team* as the unit of analysis because teams often establish and run new ventures (Schjoedt *et al.*, 2013) and make many major escalation decisions

(Staw, 2005). With few notable exceptions (Bazerman, Giuliano, and Appelman, 1984; Kameda and Sugimori, 1993; Moon *et al.*, 2003; Whyte, 1993), current research has focused on individual-level rather than group-level drivers of escalation of commitment.

Our key question involves an understanding of the concurrent effects of group fear and hope. Research has shown that contrasting emotions can be felt simultaneously (Larsen and McGraw, 2011; Rothman and Wiesenfeld, 2007) and lead to different behavioral outcomes (Averill, Catlin, and Chon, 1990; Lerner and Keltner, 2000). The influences of fear and hope have been actively pitted against each other in popular culture and rhetoric in contexts such as nuclear power (Biello, 2013), medical innovations (Lamont and Andrikopoulos, 2014), political campaigns (Heilemann, 2012), and technological ventures (Singh, 2015). However, until now, little academic research has examined their concurrent effects in managerial contexts. Therefore, we ask, *what happens when entrepreneurial teams feel both hope and fear at the same time*? We theorize and test competing hypotheses regarding which emotion is more related to a group's decision to escalate their commitment rather than terminate a currently failing venture.

Since entrepreneurs invest not only money but also time, effort, and attention in their ventures (Cardon and Kirk, 2015; Uy, Foo, and Ilies, 2015), we examine teams' behavioral engagement as a mediator between group fear and hope and escalation of commitment versus termination. Also, since friendship influences affective processes (Wagner and Smith, 1991) and entrepreneurial venture team dynamics (Francis and Sandberg, 2000), we examine team members' friendship strength as a potential moderator of the relationship between group fear and hope and escalation of commitment.

We employed an immersive laboratory methodology to realistically simulate and observe escalation of commitment as a longitudinal process. Teams of three business students served as co-founders of a computer-simulated start-up. Each team could terminate the venture at any time (and pay the debt accrued until that point, for which they believed they would be personally responsible) or escalate their commitment by investing even more time and money in the

venture. To examine the dynamic nature of these decisions, we longitudinally tracked each team's joint levels of fear, hope, and behavioral engagement across the multiple rounds of the simulation.

This study contributes to the literature on venture termination (Shepherd and Cardon, 2009; Shepherd, Wiklund, and Haynie, 2009; Ucbasaran *et al.*, 2013) and entrepreneurial affect (Baron, 2008; Cardon *et al.*, 2009; Foo, 2011) by offering new insights into the *emotional antecedents* of this important decision and demonstrating the effect of two simultaneously felt emotions—fear and hope—at the rarely examined team decision-making level. Moreover, we contribute to the escalation of commitment literature (e.g., Ku, 2008; Tsai and Young, 2010; Wong and Kwong, 2007) by examining two previously unexamined but relevant anticipatory emotions (Lerner and Keltner, 2001; Snyder, 2002). We present a prospective and agentic approach to escalation of commitment ("we persist in hope of a better future") as an alternative to the common retrospective approach ("we persist to justify our past actions") (Brockner *et al.*, 1986; Staw, 1976). Further, we contribute to the literature on affect in organizations and entrepreneurship (Baron, 2008; Cardon *et al.*, 2012; Elfenbein, 2007) as well as research about emotional ambivalence (Rothman and Melwani, 2017) by examining the interplay and outcomes of mixed emotions in the group and entrepreneurial contexts. Finally, answering the call of affect scholars (Barsade and Knight, 2015; Cardon *et al.*, 2012), we demonstrate a novel method to longitudinally capture emotions and compare the magnitude of influence of competing emotions over time.

THEORETICAL BACKGROUND

Emotions and venture termination

Research has examined the consequences of venture termination, namely, the financial, social, and psychological costs of failure, learning, and recovery from failure in the context of venture termination (Shepherd and Cardon, 2009; Ucbasaran *et al.*, 2013). Post- termination, entrepreneurs feel emotions as strong as grief (Shepherd, 2003). Anticipation of negative

emotions (i.e., anticipative grief) delays termination decisions (Shepherd *et al.*, 2009), and entrepreneurial passion supports entrepreneurs facing difficult times before a termination decision (Cardon and Kirk, 2015). Thus, we expand this by examining the emotional patterns that *precede* the venture termination decision.

Escalation of commitment to a failing course of action and its emotional antecedents

Over the past 30 years, scholars have established why individuals continue to invest time, money, or other resources to apparently failing courses of action (Staw, 1981): personal responsibility and refusal to admit past mistakes (Staw, 1976), attribution of failure to external factors (Staw and Ross, 1978), the belief that additional resources will improve the situation regardless of negative feedback (Staw and Fox, 1977), the need to save face (Brockner, Rubin, and Lang, 1981), and self-identity protection (Brockner *et al.*, 1986). Some explanations for this process of escalation, including sunk cost bias—the mistaken belief that one has invested too much to quit (Arkes and Blumer, 1985; Garland, 1990)—and loss framing—the choice between the current sure loss or possible future gains (Whyte, 1986),[1] involve risk-seeking behavior.

A vast amount of literature shows that emotions and decision-making are intertwined, including in the context of failing ventures (Guler, 2007; Schwarz, 2000; Winkielman *et al.*, 2007). Anger (Tsai and Young, 2010) and anticipated regret (Hoelzl and Loewenstein, 2005; Ku, 2008; Wong and Kwong, 2007) can lead to greater escalation of commitment, while negative affectivity (Wong, Yik, and Kwong, 2006) and experienced regret (Ku, 2008) inhibit escalation of commitment.

Mixed emotions in organizations and entrepreneurship

Affect research has primarily focused on the influence of single emotions on individual, team, or organizational outcomes (Barsade and Gibson, 2007). There is a need for research on the

[1] The construct of escalation of commitment differs from simple persistence. While escalation of commitment involves persistence, it does so within a specific contextual background. That is, it involves persistence in the face of (a) mounting sunk costs, (b) negative feedback, (c) a continuous decision-making process (decision, feedback, decision, etc.), and (d) the opportunity to withdraw at set decision points (Brockner *et al.*, 1986; Staw, 2005; Wong *et al.*, 2006).

interaction of multiple, concurrent, and sometimes conflicting emotions (Larsen and McGraw, 2011), including the construct of emotional ambivalence (Rothman and Melwani, 2017), and "the nuances of multiple emotions and their impact during the entrepreneurial experience" (Cardon *et al.*, 2012: 6).

WHICH IS MORE POWERFUL – GROUP FEAR OR GROUP HOPE IN ESCALATION OF COMMITMENT TO A CURRENTLY FAILING VENTURE?

Conceptual model

We propose a conceptual model in which the group emotions of fear and hope are mediated by group engagement leading to the decision to terminate or escalate commitment to a currently failing venture, which in turn is moderated by group friendship (please see Figure 1). We focus on the comparative influence of fear and hope because uncertainty, which is inherent to the termination decision, causes fear and hope (Baumgartner, Pieters, and Bagozzi, 2008), and the experience of these emotions influences one's perception of risk (Foo, 2011; Loewenstein *et al.*, 2001). Based on theories of discrete emotions, including emotion appraisal theory (Smith, Ellsworth, and Hall, 1985) and prototype emotions theory (Shaver *et al.*, 1987), we predict that group hope will promote escalation of commitment, while group fear will increase the likelihood of venture termination.

People can and do feel emotions simultaneously (Berrios, Totterdell, and Kellett, 2015; Larsen and McGraw, 2011). Our key research question, therefore, is as follows: Which emotion will have a stronger influence on a team's decision to escalate commitment to a currently failing venture or terminate the venture, group fear or group hope? While there is a compelling theoretical argument that both emotions have a strong influence, there is little empirical evidence comparing their effects. Thus, we offer two competing hypotheses.

We also propose that group engagement will operate as a mechanism through which a team's emotional dynamics of fear and hope transform into action and, ultimately, escalation of commitment to or termination of a currently failing venture. Group engagement is a state in

which group members jointly invest personal energy, emotionally connect with their work, and commit their psychological presence through attention and absorption in a task (Christian, Garza, and Slaughter, 2011; Rothbard, 2001).[2] Engagement is particularly important for entrepreneurial teams because entrepreneurial endeavors require much daily effort (Uy *et al.*, 2015) to achieve high sales and profits (Bitler, Moskowitz, and Vissing-JØrgensen, 2005).

Finally, we predict that the closeness of the friendships among a team's members will influence the strength of the association between group fear and group hope and escalation of commitment to a currently failing venture. We examine friendship as a moderator rather than broader social constructs such as strong ties and group cohesion because friendship is more inherently affective (Pillemer and Rothbard, 2018).

<Insert Figure 1 about here>

Group fear and the inhibition of escalation of commitment to a currently failing venture

We capture a specific dimension of fear of failure:[3] fear of the financial consequences of failure (i.e., increasing monetary sum entrepreneurial teams risk by escalating their commitment). We propose that a group's fear of losing more money will reduce their escalation of commitment to a failing venture based on the psychological theory that fear is an anticipatory emotion related to the behavioral inhibition system, which is linked to avoidance behaviors (Carver, 2006). Fear is activated by an uncertain future and continuous negative feedback, eliciting a search for information that supports rejection of an opportunity (Cohen-Chen *et al.*, 2014), rumination

[2] Escalation of commitment to a failing course of action is a different construct than group engagement. Engagement involves concentrating on a task and putting physical and mental effort into completing it. Escalation of commitment does not necessarily require engagement with a task; actors could function in "auto-pilot" mode. That is, they could be disengaged with the venture due to disappointment, disinterest, or shame but continue to invest more time and money because they feel trapped in the situation (Brockner *et al.*, 1986; Staw, 1976).

[3] Within an entrepreneurial context, Mitchell and Shepherd (2011) argued that fear of failure can be multidimensional (e.g., fear of devaluing one's self-esteem, fear of upsetting important others, fear of an uncertain future), and the outcomes of fear can be contradictory depending on what the fear concerns. For example, fear of failure in entrepreneurship has been linked with both approach and avoidance behaviors (Mitchell and Shepherd, 2011). Additionally, fear can motivate entrepreneurial action when actors attempt to delay or avoid failure or to exit the failing situation (Cacciotti and Hayton, 2015).

about worse outcomes (Ortony, Clore, and Collins, 1988; Roseman, 1996), and the belief that additional effort is futile (Elliot and Church, 1997).

From the perspective of emotion appraisal theory (Smith *et al.*, 1985), fear involves the perception that the situation (i.e., external factors) has a greater influence than an individual (i.e., internal factors) on outcomes (Lerner and Keltner, 2001). Fear evokes feelings of weakness and helplessness about a future event (Shaver *et al.*, 1987) and overestimation of the likelihood of a bad outcome (Bar-Tal, 2013) or the amount of risk in a situation (Lerner and Keltner, 2001). For example, in two empirical studies of entrepreneurial action, greater fear of failure was associated with less favorable evaluations of entrepreneurial opportunities and a lower tendency to exploit those opportunities (Grichnik, Smeja, and Welpe, 2010; Welpe *et al.*, 2012). This supports the idea that fear of losing more money increases one's risk perception and consequently reduces escalation of commitment (Tsai and Young, 2010).

In summary, we expect fear to influence the processes involved in escalating commitment or terminating a venture by means of avoidance appraisals; when people believe an upcoming event will cause physical or emotional pain, they will avoid or withdraw from it (Russell, 2003). Because fear increases alertness to danger (Roseman, 2001) and the readiness to protect oneself by averting or avoiding bad situations (Frijda, Kuipers, and Ter Schure, 1989), teams that are more fearful of losing money are predicted to be more likely to terminate a currently failing venture than to escalate their commitment to the venture.

Group hope and increased escalation of commitment to a currently failing venture

Hope is an explicitly anticipatory emotion involving the feeling that an unfavorable situation can be improved in the future (Roseman, 1996; Shaver *et al.*, 1987; Smith *et al.*, 1985; Snyder, 2002). We focus upon hope for the ultimate success of a venture, specifically for the positive financial consequences associated with overcoming a negative financial situation, including recuperating losses and ultimately making a profit. This mirrors our conceptualization of fear of failure of a venture, which entails negative financial consequences. As an anticipatory emotion, hope is

typically experienced in negative situations, such as a failing venture, when it is most needed to fuel action, engagement, and persistence (Averill *et al.*, 1990; Bryant and Cvengros, 2004; Roseman, Spindel, and Jose, 1990).

Discrete emotion theorists have shown that hope influences the evaluation of the likelihood and desirability of future events and can drive behavior (Ortony *et al.*, 1988). Specifically, hope can cause negative feedback to be interpreted more positively and improve the perception of project economics (Bowen, 1987). In a business venture context, hope is related to lower perceived entrepreneurial risk (Podoynitsyna, Van der Bij, and Song, 2012).

Applying emotion appraisal theory, scholars argue that hope arises in response to perceived lack of personal control over an environment or situation (Roseman, 1996; Roseman *et al.*, 1990), which leads to feelings of external uncertainty. If things are certain and in one's control, there is not much need to hope, but if one does not have control and there is great uncertainty, hope becomes very relevant. Snyder's (2002) discrete emotion theory of hope also incorporates appraisal, focusing on the hopeful person's internal appraisal in the face of external uncertainty. He finds that people who are more hopeful engage in greater agency thinking ("I feel I can do it") and pathway thinking ("I feel I know how to get there"), two key elements in the formation of hope. By integrating emotional appraisal theory with Snyder's theory, we gain insight into how hope can influence escalation of commitment processes: when people feel more hopeful, they experience a greater sense of subjective internal certainty despite objective external uncertainty.[4]

The greater internal agency produced by hope can lead to escalation of commitment through

[4] We note that hope has been shown to be theoretically and empirically different than optimism (Bryant and Cvengros, 2004), a universal attitude or belief that people are less likely than others to suffer bad outcomes and more likely to enjoy good outcomes (Scheier *et al.*, 1994). Hope is a state-specific feeling that one can overcome a negative situation with one's own agency, whereas optimism is a broad belief in the positivity of future outcomes. The belief in one's own agency also distinguishes hope from two related constructs examined in entrepreneurial settings: overconfidence—an inflated sense of confidence in the accuracy of one's knowledge and cognitive estimates (Forbes, 2005)—and hubris—an extreme level of over-confidence that involves unrealistic self-evaluations that are unsupported by objective data (Hayward, Shepherd, and Griffin, 2006). Hope is the feeling that a problematic situation can improve through one's efforts under perceived external uncertainty, but unlike hubris and over-confidence, it does not involve over-estimation of one's knowledge and ability to do so.

increased motivation and anticipation of good performance. Hopefulness has been found to be related to approach appraisal rather than avoidance appraisal (Roseman, 2001), which leads to positive motivation to achieve goals (Peterson and Byron, 2008; Snyder, 2002) and working harder (Averill *et al.*, 1990). This motivation boost is reinforced by the belief that hope itself will lead to better work performance (Peterson and Byron, 2008; Reichard *et al.*, 2013). As such, we predict that more hope will lead to greater escalation of commitment to a currently failing venture compared to venture termination.

Next, we examine our key research question, which concerns the combined comparative effect of fear and hope felt simultaneously.

Group fear *versus* group hope in escalation of commitment to a currently failing venture

We first discuss the hypothesis that the relationship between group fear and terminating a currently failing venture will be stronger than the relationship between group hope and escalating commitment to that venture. This hypothesis is based on an evolutionary view that people are more attuned to negative than positive stimuli, including emotions, because this tendency offers a better chance for survival (Baumeister *et al.*, 2001). This is because fear facilitates survival through greater awareness of threats and quicker responses (Rolls, 1999). Because people are more attuned to fear and act on it automatically (Öhman, 2005), it may have a stronger influence in a stressful escalation situation than hope, which is less automatic and requires more complex processing as it is a higher-order, more deliberate emotion that depends on the ability to imagine a better future (Jarymowicz and Bar-Tal, 2006).

Fear also increases arousal, which can increase the intensity of emotion, leading to new, even stronger fear responses (Lang, 1995). Shared arousal can be particularly powerful in groups, as fear can be learned vicariously (Olsson and Phelps, 2004) and spread within the group via emotional contagion (Barsade, 2002). Prospect theory (Kahneman and Tversky, 1979) would indicate that, compared to group hope, group fear has a stronger relationship with escalation of commitment to a currently failing venture. This is because fear generates a focus on losses

(Camerer, 2005) and the psychological cost of losses is higher than the psychological benefit of equivalent gains (Kahneman and Tversky, 1979).

While no direct empirical studies have shown that fear has a stronger effect than hope in the organizational domain, this phenomenon has been observed in other fields. For example, in the field of political science, fear had a greater influence than hope on society's collective views and actions in a continuously negative political environment (Bar-Tal, 2001).

Hypothesis 1a: The relationship between group fear and terminating a currently failing venture will be stronger than the relationship between group hope and escalating commitment to that venture.

The opposite theoretical argument is that group hope that the situation can be turned around will have a stronger relationship to escalation of commitment to a currently failing venture than group fear of losing more money by terminating that venture. This hypothesis relies on emotion appraisal theory, according to which hope is associated with greater feelings of self-responsibility and personal control compared to fear (Smith *et al.*, 1985). First, we know that hope can lead people to interpret negative information in a positive light (Bowen, 1987), perceive fewer risks (Podoynitsyna *et al.*, 2012), think that a currently unsatisfactory situation will improve (Roseman *et al.*, 1990), and believe that they can achieve their goals (Snyder, 2002). In other words, hope enables greater subjective internal certainty despite objective external uncertainty, increasing motivation to act in the face of adversity.

Prior research offers some evidence supporting this hypothesis. For example, in the health domain, hope for a desired future motivated people to perform beneficial health-related activities, while fear of an undesired future resulted in no action (Hoppmann *et al.*, 2007). In a more directly relevant study, Podoynitsyna *et al.* (2012) examined conflicting emotions and their effect on risk perception using a one-decision, paper-and-pencil entrepreneurial scenario test. The researchers found that when the levels of the individual emotions of fear, hope, happiness, and anger were simultaneously examined in terms of their ability to predict serial entrepreneurs' risk perceptions, hope remained negatively related to risk perception, while fear remained non-

significant. These results were similar to those of a different one-decision paper-and-pencil entrepreneurial study that examined the strength of individual hope compared to frustration (Brundin and Gustafsson, 2013). While these studies conducted at the individual level did not directly compare fear and hope or track escalation of commitment over time, they offer initial support for the idea that hope has more influence on the decision to commit than does fear. Based on the stronger motivational and agency tendencies associated with hope (Snyder, 2002) and the general finding that positive affect positively influences perceptions of expectancy and positive rewards (Isen *et al.*, 1985), one can predict that there will be a stronger relationship between group hope and escalation of commitment to a currently failing venture than between group fear and venture termination.

Hypothesis 1b: The relationship between group hope and escalating commitment to a currently failing venture is stronger than the relationship between group fear and terminating that venture.

Group engagement as a mediator of group fear and hope and escalation of commitment to a currently failing venture

We propose that group engagement will operate as a mechanism through which a team's emotional dynamics of fear and hope transform into action and, ultimately, escalation of commitment to, or termination of, a currently failing venture. We examine group engagement based on Metiu and Rothbard's (2013) model, which emphasizes the role of shared emotions among team members and a mutual focus of attention as an integral part of work–team engagement. This model helps explain why the shared emotions of a group will create a stronger shared reality that strengthens membership and identity in the group and, likely, influence behavior. Because group hope leads to positive motivation and agency, teams that are hopeful in an unfavorable situation will not passively wait for the situation to improve. Instead, they will actively engage in the task, focus their attention, and exert energy to turn the situation around (Snyder, 2002). As employee engagement research shows, when engagement is high, people are less likely to consider exit (i.e., quitting a job) as an option, even when explicitly presented with

outside opportunities (Saks, 2006).

Fear, in contrast, generally motivates withdrawal (Russell, 2003) and leads to decreased engagement with both the team and task and, eventually, to abandonment of the current course of action (Davidson *et al.*, 1994). In the organizational context, it has been proposed that fear of negative professional and personal consequences drives employee silence (i.e., unintentional or intentional withholding of information and silence about important issues in the workplace) (Kish-Gephart *et al.*, 2009). In the educational context, fear of failure has been linked to reduced effort and disengagement (De Castella, Byrne, and Covington, 2013). Thus, we posit that group engagement will mediate the negative influence of group fear and the positive influence of group hope on escalation of commitment to a currently failing venture.

Hypothesis 2a: Group engagement will mediate the relationship between group fear and terminating a currently failing venture versus escalating commitment to that venture.

Hypothesis 2b: Group engagement will mediate the relationship between group hope and escalating commitment to a currently failing venture versus terminating that venture.

Group friendship strength as a moderator of group fear and hope and escalation of commitment to a currently failing venture

We propose that the closeness of the friendships among a team's members will influence the strength of the association between group fear and group hope and escalation of commitment to a currently failing venture because the construct of friendship has an important role in determining group processes in entrepreneurial teams (D'hont, Doern, and Delgado García, 2016; Francis and Sandberg, 2000). We focus on this construct because it is inherently affective and friendship has a significant influence on interpersonal attentional processes. People identify more with friends than with acquaintances or strangers (Allan, 1979); for example, CEOs are significantly more likely to seek advice from executives in other organizations who are their friends than from acquaintances (McDonald and Westphal, 2007). In the affective realm, friendship has been related to greater expression of emotions in social settings (Wagner and

Smith, 1991); and friends, as compared to acquaintances, are able to read each other's expressions more quickly and accurately (Parmley and Zhang, 2015). Also, friends have been shown to have greater empathy for one another (Güroğlu *et al.*, 2008) and to experience greater emotional contagion in groups (Barsade, 1995). Friendship manifests as a perception that one is strongly identified with a group (Brown *et al.*, 1986), and in-group identification is related to greater accuracy in reading emotional expressions (Thibault, Bourgeois, and Hess, 2006). Because friends are more accurately aware of, interested in and empathetic of each other's emotions, and experience greater emotional contagion, the relationship between group fear of losing money and venture termination and the relationship between group hope of turning the situation around and escalating commitment will be intensified.

Hypothesis 3: Group friendship strength will intensify the relationship of group fear and group hope to terminating a currently failing venture versus further escalating commitment to that venture.

METHOD

We employed a multi-round, interactive, computer-based simulation design similar to that used by Seo and Barrett (2007) and modeled it directly based on Brockner *et al.*'s (1986) criteria for escalation of commitment settings to best capture escalation of commitment that occurs prior to venture termination. Using this behavioral simulation design, we had teams of three business students serve as co-founders of a computer-simulated start-up (*SimVenture*), developing new computer hardware. Each round of the simulation represented a calendar month of running the business. During each round, teams of three participants made a wide array of business decisions regarding the daily operations and business strategy of their start-up venture. Each decision had consequences that influenced the venture's performance. To continue building and growing the venture, participants believed that they needed to put in a personal financial investment (i.e., their own money) to obtain credit to continue the simulated venture. The simulation algorithm calculated the market outcomes of each round—customer inquiries, orders placed, and actual product sales—and produced the revenue and operating cost of the venture.

In our study design, the operating cost in the simulation became the debt that teams needed to pay with their own money to continue the simulation. The participants knew that it was possible to succeed in the simulation by arriving at a predetermined high amount of cumulative profit and that, if they achieved this level of profit, they would receive a substantial cash prize of £300 (approximately $450). The participants had to actively engage with each other as well as with their computers, and we captured all of these interactions via video recordings, which were later used to measure group engagement.

We followed Brockner *et al.*'s (1986) criteria of escalation of commitment settings. First, each team incurred mounting debt by staying in the simulation (with debt representing the investment required to cover the venture's operating cost). Teams' debt typically rose at an increasing speed as the simulation progressed and the venture scaled up. Second, each team received feedback about their debt at the end of every round and their venture's cumulative profit or loss. The situation constantly worsened (i.e., debt and cumulative loss rose). Third, each team engaged in a continuous decision process (decision, feedback, decision, etc.) that allowed the team to collectively decide whether to exit in each round. We present empirical evidence that participants indeed escalated their commitment to a currently failing venture until they decided to terminate the venture in our Online Appendix 1.

We merged this realistic and absorbing entrepreneurial escalation of commitment simulation with an experience sampling methodology, in which participants rated their feelings in real time as they engaged in a task. Experience sampling is widely used to measure emotions and other psychological constructs over time (Hektner, Schmidt, and Csikszentmihalyi, 2007), and it has been posited to be helpful for addressing critical questions in entrepreneurship research (Uy, Foo, and Aguinis, 2010). In our design, after receiving financial feedback for the current round, each team member completed a brief survey about group level fear and hope. Team members then had to reach a consensus regarding whether to quit or further commit to the venture.

Participants, design and procedure

The sample consisted of 66 teams, each including three business school students (198 participants).[5] In total, 36 teams were comprised of master's students (MSc in Management with an entrepreneurship focus and MSc in Investment Management) and 30 teams were comprised of undergraduate students (BA in Business Studies and BA in Informatics) at a British university. Eighty-one percent of the master's students were pursuing an MSc in Management, specifically with an entrepreneurship focus, and 87 percent of the undergraduate students were pursuing a business degree. The mean age was 22.09 years (s.d. = 1.84), and 55 percent of the participants were female.

Participants formed their own teams of a fixed size of three people when they signed up to participate in the study. At least one day before the session, recruited participants completed a questionnaire assessing the individual difference measures that served as the control variables in the analyses. On the day of the study, upon arrival at the lab, the teams first engaged in one hour of practice led by a researcher and then began the simulation session. Each team received a small amount of money (£6, approximately $9) at the end of the practice session as compensation for their time, regardless of whether they chose to continue in the study. Teams were allowed to proceed at their own pace in each round of decision-making during the simulation. They were also allowed to quit the simulated venture whenever they wished.

Each team's goal was to grow the venture and reach a predetermined amount of virtual profit, which would earn the team a sizeable financial reward of £300 (approximately $450) to be shared among the team members. Based on the pilot tests, we set the required profit at a level that was highly challenging, but achievable, for inexperienced participants. Our design simulated the real-

[5] Of the 88 teams that participated in our study, three were used to pilot the design; one reached the predetermined amount of profit and won the prize, and therefore did not satisfy the criterion of a failing course of action; and 12 teams opted out after the training session. This resulted in a usable sample of 72 teams. For a more conservative test, we excluded six additional teams who participated but decided not to continue once their own money was at stake (i.e., they stayed within the spending allowance of the simulation). Thus, the final sample was 66 teams. The results remain unchanged when the six additional teams are re-included in the analyses.

world phenomenon of high-growth entrepreneurship, in which most ventures fail at a mounting cost but success, although rare, yields a large reward (Godfery, 2015).[6]

After the first few rounds, during which their initial free allowance was 3,000 units of currency in the simulation, staying in the venture required paying real money to the researcher (1,000 units of currency = £1). Quitting at any point after that, therefore, meant that team members had to personally bear the debt the team had incurred up to that point beyond the initial allowance. Having payment be a consequence of team members' decisions produced greater psychological realism in the simulation.[7]

Dependent variable

Escalation of commitment to a currently failing venture versus termination of the venture was captured by a dummy variable ("quit") with a value of 1 for the round at the end of which the team terminated the virtual venture and 0 for all preceding rounds. The 66 teams participated in different numbers of rounds, ranging from 3–21, with a mean of 8.7 rounds (s.d. = 3.5 rounds). There was neither left-censoring, as data were collected from the start for all teams, nor right-censoring, since all 66 teams quit the simulation at the end. The final sample included 569 team-round observations of 66 teams.

Predictor variables

Group fear was measured at the end of each round after the financial results were announced and before teams decided to continue or terminate the venture.[8] Because the time interval between measurements varied across rounds and could be very brief (ranging from 1–45

[6] As we note above, one team received the reward. The fact that success was possible, although rare, means that the simulation accurately captures entrepreneurial reality (Godfery, 2015).

[7] In reality, during the debriefing at the end of the study, we explained that participants did not have to pay actual money. To reinforce the belief that participants would have to pay their debt with their own real money, the researcher presented the amount of debt to the team at the end of every round and reminded the participants that they had to pay it back. Repayment was ensured by two copies of an IOU note signed and kept by the team and the researcher until the end of the study (not at the end of the specific session, but when all teams had completed the study).

[8] In a typical round of the simulation, the team made decisions, received the simulated financial results for that round, answered questionnaires about group fear and hope, and then decided whether to continue or terminate the venture. Emotions were always measured before the escalation or termination decision.

minutes; mean = 9.7 minutes, s.d. = 5.43 minutes), it was necessary to minimize the number of items so that the questionnaire would not be overly intrusive or cognitively demanding (Krosnick, 1991). Furthermore, because one of the characteristics of discrete emotions is that they generally have a direct referent (Barsade and Gibson, 2007), our scales focused on the discrete emotions of group fear and group hope within the specific context of the simulation. For group fear, we conducted a pilot study, taking the words describing the fear prototype from Shaver *et al.*'s (1987) prototype emotion model (fearful, anxious, nervous, scared, and worried) and putting them in sentences related to the simulated venture. From that set, we chose the three sentences comprised of the fear scale words with the highest factor loadings, measured on a five-point scale (1: not at all, 5: very much): "We fear for the future of our venture," "My team is scared of losing a lot of money at the end," and "My team is worried that we will not reach our goal in the game" (Cronbach's $\alpha = 0.79$). We collected data in the form of individual responses to items that asked individuals to state "how the team as a whole felt," which enabled us to measure fear as a group-level emotion. We measured all of our variables and processes from this group referential perspective (Klein and Kozlowski, 2000). We then aggregated the fear data for each of the 569 rounds in the simulation at the team level for the 66 teams. The intra-class correlation coefficient ICC(1) between team members was acceptable (0.74).

Group hope was also measured at the end of each round and before the decision to escalate or terminate. We chose the most widely used hope scale in the field, Snyder *et al.*'s (1996) State Hope scale. We adapted the following three items to the specific context of the simulation and measured them on a five-point scale (1: not at all, through 5: very much) using the same informant group referent approach we described above for the fear scale: "My team feels hopeful that we will succeed in the game," "At the present time, we are energetically pursuing our goals in the game," and "Right now my team sees ourselves as being pretty successful in the game" (Cronbach's $\alpha = 0.80$). We chose Snyder's scale because it is the most frequently cited state hope scale in emotion literature and because it is a multiple-item scale. However, despite

the acceptable Cronbach's α, which indicates that the three items were related, we performed a robustness check to ensure that we were indeed capturing the most affective part of "hope" and conducted all of our analyses using the single item "My team feels hopeful that we will succeed in the game." The results of our models remained the same. Last, for analysis, we aggregated the hope data from 66 teams in 569 total rounds of the simulation at the team level. As noted above, the items were all collective and referred to the team level. The ICC(1) among the team members was acceptable (0.72).

Mediator: Group engagement

All team interactions were videotaped throughout the simulation for later coding. Video coded ratings of emotion have been found to be effective and reliable (Barsade, 2002; Côté, Gyurak, and Levenson, 2010). Three trained video coders were instructed to code the facial expressions and bodily movements that operationalized group engagement. The video was silenced to avoid coder bias regarding language. Because of the international make-up of our sample, team conversations often occurred in languages or accents that our coders could not understand.[9] Coders rated each team's group engagement on a five-point scale (1: bored, 3: neutral, 5: engaged) based on their perception of each team's nonverbal engagement (paying attention to teammates, leaning toward the laptop, focusing on the laptop) or lack of engagement (not paying attention to teammates, leaning backward, looking away from the laptop). The distinct activities that naturally occurred during each simulation round were classified a priori for the coders by the authors as "coding segments." These included decision-making in the simulation, analyzing and reacting to the simulation results, and discussing whether to continue with the simulation or terminate the venture. The minimum duration of these coding segments was 30 seconds and the maximum was five minutes. Because the duration varied, the number of coding segments varied

[9] Group engagement is largely an affective phenomenon (Metiu and Rothbard, 2013), and a majority of affect is understood through facial expressions and nonverbal behavior (Mehrabian, 1972). To empirically confirm that we were not losing important information by removing speech, we had three different coders rate ten videos with sound in which the only language was English with minimal accent differences. We found a significant correlation (0.604, $p < 0.001$) with our original ratings (ICC = 0.687).

for each round (mean = 2.95, s.d. = 1.15, min = 1, max = 9). The group engagement data consisted of 1,852 total coding segments from 66 teams and 569 total rounds. We calculated group engagement for each simulated round by averaging the engagement scores of the coding segments during the focal round. We then aggregated the by-round scores for group engagement across the three coders. There was an acceptable degree of inter-rater reliability between the three coders (ICC(2) = 0.559).[10]

Moderator: Group friendship strength

Team members responded to a question measuring their perceived relationship with the other two team members: "How would you describe the relationship between you and your teammates, for teammate A and teammate B, on a five-point scale (1: acquaintance, 3: somewhat close friends, 5: very close friends)."[11] This measure is consistent with the operationalization of friendship intensity in network analyses (Francis and Sandberg, 2000). The two scores correlated at 0.33 and were averaged to form a friendship score between each participant and the other two team members. The individual-level friendship strength data were then aggregated at the team level. The average group-level friendship strength was 3.58 (s.d. = 1.03).

Control variables

To offer the most rigorous test possible, we controlled for a wide range of variables that have been shown to relate to emotions or escalation of commitment. Importantly, we controlled for the actual amount of money teams owed to the researcher prior to each decision to escalate or quit (that is, their *debt at each end-of-round decision point*). Teams put in a minimum of £1 (approximately $1.50) and a maximum of £175 (approximately $263), with a mean of £22.5 (approximately $34) (s.d. = £33.3, approximately $50), until they quit the simulation. Second, we controlled for demographic and personality-related factors including *age*, *gender*, *Big 5 personality*

[10] Besides coding group-level engagement (one score for the whole team), the coders also coded engagement for each individual in the team. As a robustness check, we operationalized group-level engagement as the aggregation of the individual-level engagement data, with the same regression results.
[11] We have fewer (56) teams with friendship data, as friendship measures were added after the first wave of data collection. The number of team-round observations was 470.

variables (John & Srivastava, 1999; Cronbach's α = 0.69–0.82 with an average of 0.74), *trait positive affect* (PA) (MPQ wellbeing scale, Tellegen, 1982; Cronbach's α = 0.74), *trait negative affect* (NA) (MPQ stress reaction scale, Tellegen, 1982; Cronbach's α = 0.86) and *general self-efficacy* (Chen, Gully, & Eden, 2001; Cronbach's α = 0.85). Last, we controlled for factors that were potentially relevant to escalation decision making and performance in the business simulation, including *perceived worth of money* (e.g., "In general, how much is £6 (approx. $9) worth to you?"), *years of entrepreneurial experience*, *English as the participants' first language*, *previous business degree*, *entrepreneurial family background* (i.e., parents who were entrepreneurs), and *level of experience in strategy PC games* (1: none or close to none, 4: quite a lot).[12] Table 1 reports the correlations between the study variables and descriptive statistics.

<Insert Table 1 about here>

Model specification and estimation

We used event history analysis to capitalize on the longitudinal nature of our data. The event we observed was termination of the simulated venture. Our dependent variable in the model was "hazard to quit," a function of the probability that the event of terminating the venture (the inverse of escalation of commitment to the venture) will happen after a specific number of rounds. As the data were organized by round, we chose to use a discrete time model—Cox regression, also known as Proportional Hazards Model—for the event history analyses. The size of the longitudinal dataset (569 team-round observations) was appropriate for our models. To correct for values of 0, we log-transformed the current debt control variable by log(x+1) before entering it into the regression models. This approach to logarithmic transformation is common for data that are skewed right (positively) and, as in our case, have values of 0.

[12] We unfortunately were not able to include controls for other emotions that have been associated with escalation of commitment. While adding extra emotions would have been useful, measuring more emotions would require multi-item scales for each round, and we found in pilot tests that participants were not able to successfully complete that many scales. These pilot tests indicated that a greater number of scales and items employed in every round delayed the natural progress of the task, reduced focus, and often annoyed participants. This also led to use of the shorter fear and hope scales in the study.

Because event history analysis is not appropriate for mediation tests, we tested our mediation hypotheses by fitting the predictors and the binary "quit" dependent variable to *logistic regression* models; we used Hayes's (2013) bootstrapping methods—specifically, the PROCESS macro for SPSS—to estimate direct and indirect effects.

RESULTS

Descriptive analyses show that, on average, the teams experienced some fear and hope simultaneously. Specifically, for 567 of 569 rounds (99.7%), teams experienced some fear. In only two rounds across all teams and rounds did all three members of the team report 1 ("not at all") on the fear scale. In 560 of the 569 rounds (98.4%), teams experienced some hope. In only nine rounds across all teams and rounds did all three members of the team respond 1 ("not at all") on the hope scale. Thus, with very few exceptions, the teams experienced, to some degree, hope and fear simultaneously in every round. No team experienced only hope or fear during the simulation. Figure 2 illustrates the dynamic levels of average group fear and group hope across rounds for teams who escalated their commitment and had not yet terminated the venture.

<Insert Figure 2 about here>

To test the primary hypotheses of interest, the relative strength of the relationship between group fear and termination of a currently failing venture versus the relationship between group hope and escalation of commitment to that venture (Hypothesis 1a versus 1b), we simultaneously entered group fear and group hope into the model (Table 2, Model 2). We found that both group fear and group hope related in the predicted (opposite) ways to venture termination and escalation of commitment. However, group hope had a significantly stronger relationship to escalation of commitment versus venture termination than did group fear, supporting Hypothesis 1b. Specifically, group hope was significantly and negatively related to venture termination (and positively related to escalating commitment) (b = -0.08, $p < 0.001$, hazard ratio = 0.92), and group fear was positively related to venture termination (and negatively related to escalating commitment), but the effect was not significant (b = 0.02, p = 0.216, hazard

ratio = 1.02). We also observed that one standard deviation above the mean of group hope was associated with a 6% decrease in the probability of venture termination and one standard deviation above the mean of group fear was associated with only a 1% increase in the probability of venture termination.

To achieve final confirmation that the positive relationship between group hope and escalating commitment to a currently failing venture was indeed stronger than the positive relationship between group fear and terminating the venture, we conducted a Wald test. Specifically, because the effects of group hope and group fear occur in opposite directions, we tested $\beta_{\text{group hope}} + \beta_{\text{group fear}} = 0$. The chi-squared statistic was (χ^2) = 5.18 (p = 0.023), and based on the results, we rejected the null hypothesis that the effects of group hope and group fear are equally strong. Thus, Hypothesis 1b was supported: when group fear and group hope co-exist, group hope has a stronger relationship with the team's decision to escalate commitment and not terminate a currently failing venture than does group fear. While we did not hypothesize an interaction between group fear and group hope, an exploratory analysis found no significant results.

<Insert Table 2 about here>

In support of Hypothesis 2, group engagement was found to mediate the relationship between group fear and group hope and escalation of commitment to a currently failing venture. We started from an event history model, which showed that group engagement was significantly and negatively related to venture termination (hence positively related to escalating commitment) (b = -0.09, p = 0.002, hazard ratio = 0.91, Table 2, Model 3). Subsequently, to test for the mediation effect of group engagement, we fitted two separate logistic-regression models of group fear and group hope as predictors, controlling for the other emotion in both cases, and conducted analyses using 5,000 bootstrap samples with bias-corrected confidence estimates. In the relationship between group fear and terminating the venture, the mean indirect effect of group engagement is positive and significant (a × b = 0.142) with a 95% confidence interval

excluding zero [0.016, 0.312]. In the indirect path, a unit increase in group fear decreases engagement by 0.080 on a scale of 1 to 5 (path a); holding constant group fear, a unit increase in engagement reduces the log odds of terminating the venture by 1.789, representing an 83% decrease in the odds of termination (path b).[13] Since the direct effect (path c) is not significant (-0.298, $p = 0.235$), only indirect mediation occurs (Zhao, Lynch Jr., and Chen, 2010). Thus, Hypothesis 2a is supported.

In the relationship between group hope and escalation of commitment versus terminating the venture, the mean indirect effect of group engagement is negative and significant (a × b = -0.367) with a 95% confidence interval excluding zero [-0.604, -0.129]. In the indirect path, a unit increase in group hope increases engagement by 0.205 (path a); holding constant group hope, a unit increase in engagement reduces the log odds of termination by 1.789, representing an 83% decrease in the odds of termination (path b). The direct effect (path c) is significant (-1.152, $p < 0.001$), holding constant engagement, a unit increase in group hope reduces the odds of terminating the venture by 68%.[14] As a × b × c (0.423) is positive, it indicates a complementary mediation (Zhao *et al.*, 2010), supporting Hypothesis 2b (please see Figure 3).

<Insert Figure 3 about here>

Subsequently, to examine the moderating effect of friendship, we started again from event history analysis. The event model tested for moderation of group friendship strength on the direct effect of emotions to escalation. We first standardized the variables group fear, group hope, engagement, and friendship strength, created interaction terms, and entered them into the event history model. Using a subsample of 56 teams (n=470) from which friendship strength data were collected, we found a marginally significant interaction between group fear and

[13] Equivalently, one standard deviation above the mean in group fear decreases engagement by 0.110 (path a); holding constant group fear, one standard deviation above the mean in engagement reduces the log odds of quitting by 0.894, representing an 59% decrease in the odds of termination (path b).
[14] Equivalently, one standard deviation above the mean in group hope increases engagement by 0.313 (path a). The direct effect (path c) is significant (-0.879, $p < 0.001$), holding constant engagement, one standard deviation above the mean in group hope reduces the odds of terminating the venture by 58%.

friendship strength (b = 0.02, p = 0.094, hazard ratio = 1.02, Table 2, Model 4) but no significant relationship between group hope and friendship strength or between group engagement and friendship strength. In both cases, we also found that friendship strength was a significant direct positive predictor of escalation of commitment (b = -0.48, p = 0.008, hazard ratio = 0.62 in Table 2, Model 4; b = -0.50, p = 0.002, hazard ratio = 0.61 in Table 2, Model 5). That is, the stronger the friendship among group members, the more likely they were to escalate their commitment than to terminate a currently failing venture.

Last, to test whether friendship moderated not only the direct effect of emotions to escalation, but also the mediated path between emotions and engagement, we used again logistic regressions. We conducted moderated mediation analyses with friendship as the moderator and group engagement as the mediator. Specifically we tested Model 59 in the PROCESS macro (Hayes, 2013) where friendship is hypothesized to moderate both the indirect paths (a and b) as well as the direct path (c) between group fear and group hope and venture termination. We used unstandardized variables and fitted two separate models of group fear and group hope as predictors, controlling for the other emotion in both cases, and conducted analyses using 5,000 bootstrap samples with bias-corrected confidence estimates. Results indicated there was no significant moderated mediation of friendship and group engagement for either group fear or group hope. In other words, we find that the moderating effect of friendship does not go through the mediated path, i.e. via engagement. However, a significant moderation effect of friendship for group fear (conditional direct effect) was found (1.008, p = 0.049) with a 95% confidence interval excluding zero [0.009, 2.007]. Consistent with the event history analyses, the interaction effect between group fear and friendship strength indicates that teams with closer friendship were more likely to be influenced by the fear of their teammates.

Robustness checks and additional analysis

We also examined different specifications of the event history models. First, we tested a (more conservative) sub-sample of 46 teams who paid more than £6 (approximately $9), that is, teams

who risked more money than they earned in the practice session. Second, to confirm that hope predicted differentially from the construct of optimism, we examined a sub-sample of 46 teams that included the variable of dispositional optimism (LOT-R, Cronbach's $\alpha = 0.61$; Scheier, Carver, and Bridges, 1994) as a control. Dispositional optimism was not a significant direct predictor of escalation of commitment. Third, we added two additional control variables to measure diversity in the degree to which group members perceived group-level affect (Barsade *et al.*, 2000).[15] To do so, we first compiled the composite score of fear and hope for each team member and then calculated the standard deviation of the composite fear and hope scores of the three group members and included them as two additional control variables. Fourth, we tested cumulative profits/losses, not operating costs, as a performance control variable in the regression.[16] The results of all four robustness checks were unchanged from those we report.

To further examine the dynamic effects of group fear and group hope, we conducted an exploratory analysis to test the effect of round-by-round changes in the levels of group fear and group hope on escalation of commitment versus venture termination. Specifically, we calculated the changes between time t and time t-1 for group fear (delta_fear = $fear_t - fear_{t-1}$) and group hope (delta_hope = $hope_t - hope_{t-1}$). These delta variables were used as predictors of hazard to quit in longitudinal event history models. We found a significant negative relationship ($b = -0.10$, $p = 0.001$, hazard ratio = 0.91) between delta_hope and hazard to quit; a round-by-round drop in group hope was positively related to venture termination. The relationship between delta_fear and hazard to quit was not statistically significant ($b = -0.02$, $p = 0.403$, hazard ratio = 0.98); a

[15] We did not use individual-level measures of hope and fear ("How I personally feel"), but individual perceptions about how the group feels as a whole ("How do I think the group feels"). When designing the study, we considered measuring individual-level emotions as well so we could conduct robustness tests. However, after the pilot, we abandoned this idea; given the frequency of surveys in the experiment, it would have been too cognitively demanding for participants to describe how they personally felt and how they thought the group was feeling, for every round.

[16] As we predicted increasing cumulative losses, we could have tied the teams' real debt to the profit/loss figure. Instead, we tied debt to operating costs because we could not be sure ex ante that the losses would indeed increase. This did not affect the study outcomes; the result for profit/loss was similar to that for operating costs, indicating that both were related to escalation of commitment versus termination.

round-by-round rise in group fear had no significant effect on venture termination. These results indicate that escalation of commitment is not only related to the absolute amount of group fear and group hope, as indicated by our main models, but also to round-to-round changes in group hope (not group fear).

We also conducted a series of additional exploratory analyses, which we present in our Online Appendices. We examined a) the relationship between the Big 5 personality variables and their interaction with group fear and hope (Online Appendix 2), b) the presence of team leaders (Kalmanovich-Cohen, Pearsall, and Christian, 2018) and the relationship between leaders' perception of group fear and hope and escalation of commitment (Online Appendix 2), and c) patterns in the dynamic evolution of group fear and hope over time across teams (Online Appendix 3).

DISCUSSION

Our primary goal was to understand which emotion—group fear or group hope—has a greater dynamic effect on escalation of commitment to a currently failing venture versus termination of that venture. We found that group hope "trumped" group fear. The teams' level of hope—more than their fear—determined whether they escalated their commitment and kept investing resources into a currently failing venture rather than terminating that venture. This was the case even after controlling for the influence of actual debt owed by the team at the time of the decision. In other words, the team members' feelings about the project's prospects drove their decision to escalate commitment rather than terminate the venture, over and above the influence of debt already incurred.

The teams' behavioral engagement with the task was found to mediate the relationship between group fear and hope and termination of the venture. Moreover, group friendship strength positively moderated (i.e., enhanced) the relationship between group fear and the choice to terminate a currently failing venture but had no effect on the relationship between group hope and escalation of commitment. In line with our hypothesis, teams that were closer friends

considered each other's emotions—in this case, their level of fear (not hope)—more seriously during decision-making.

Interestingly, while not hypothesized, we also observed that group friendship strength had a direct, positive relationship to the currently failing venture. One explanation is that stronger friendships could lead team members to want to continue to spend time together. As proposed by Francis and Sandberg (2000), in underperforming ventures, strong friendship among team members contributes to the "psychic income" of entrepreneurship, which compensates for the lack of economic income and leads to greater escalation of commitment.

Theoretical contributions

We contribute to the literature on venture termination (Shepherd and Cardon, 2009; Shepherd *et al.*, 2009; Ucbasaran *et al.*, 2013) and emotions in entrepreneurship (Baron, 2008; Cardon *et al.*, 2009; Delgado-García, De Quevedo-Puente, and Blanco-Mazagatos, 2015) by expanding the understanding of the emotional antecedents of venture termination and escalation of commitment to a currently failing venture. First, we introduce two conflicting emotions that are very likely to arise in adverse situations but are understudied in a venture termination context: fear that the financial situation will worsen and hope that it will improve. Second, through the dynamic lens of escalation of commitment, we illustrate the tension of experiencing these two emotions at the same time. In a comparative test, we show that the association between hope and escalating commitment trumps the association between fear and venture termination. In simple terms, our novel message to the venture termination literature is that, when considering termination of a currently failing venture, the hope an entrepreneurial team feels about the possibility of turning around a venture will outweigh their fear of losing additional money. However, our finding that friendship moderates the influence of group-level fear (not hope) on the decision to escalate commitment or terminate a venture indicates that the level of group fear is important in the context of teams with strong friendships. Third, answering the call to examine emotions in entrepreneurial teams (Cardon *et al.*, 2012), we show that group-level emotions can

influence the decision-making of an entrepreneurial team, specifically in the context of venture termination versus escalation of commitment. Fourth, we identify a mechanism through which group emotions influence the venture termination decision: group engagement, a state of heightened attention and emotional and psychological investment in other group members and the task (Christian *et al.*, 2011; Metiu and Rothbard, 2013).

We also contribute to the escalation of commitment literature. Given that both fear and hope are important motivators of escalating commitment and have conflicting natures, understanding which emotion is stronger advances the understanding of affect's influence on escalation of commitment (e.g., Ku, 2008; Tsai and Young, 2010; Wong and Kwong, 2007). In addition, we introduce a prospective, more agentic approach to escalation of commitment to a currently failing venture. When escalation of commitment is explained retrospectively, it is often implicitly viewed as a passive and irrational behavior of psychological entrapment ("we persist to justify our past actions") (Brockner *et al.*, 1986; Staw, 1976). While research has shown that this is the case, our findings offer an additional perspective on this view. Escalation of commitment to a currently failing venture can also be a prospective act ("we persist in hope of a better future"), one in which the assessment of future success is fueled by hope and inhibited by fear.

We contribute to emotion research in entrepreneurship (Baron, 2008; Cardon *et al.*, 2012) and other types of organizations (Barsade and Gibson, 2007; Elfenbein, 2007). First, we extend the knowledge of how multiple conflicting emotions—in our case, fear and hope—collectively influence important strategic decisions, such as terminating versus escalating commitment to failing ventures. As we illustrate, groups do not necessarily feel one emotion at a time; they can feel multiple, often conflicting, emotions. The simultaneous effect of multiple distinct emotions is an important area for further investigation in the literature on emotions in organizations (Larsen and McGraw, 2011) and entrepreneurship (Cardon *et al.*, 2012: 6). Our study increases the understanding of this area. While we do not focus on the general feeling of ambivalence (Rothman *et al.*, 2017), but rather on the behavioral and psychological outcomes that arise from

each of the two different emotions, our research has implications for the emotional ambivalence literature. For example, Rothman and Melwani (2017), in a conceptual article, proposed that leaders' experience of emotional ambivalence would make them more cognitively and behaviorally flexible and open to changes, and as a result, prevent them from escalating commitment to a failing course of action. In our case, by breaking down the generalized psychological construct of emotional ambivalence into specific component parts of which specific emotions people feel ambivalent about, and then examining how each emotion operated in the presence of the other, we contribute to the theorizing about emotional ambivalence in a different way. We find that people are pulled in opposite directions as a result of these opposing emotions and our study offers insight into which of the two specific ambivalent emotions have the most sway on escalation of commitment and in which direction.

Last, we demonstrate a creative method to longitudinally capture emotions and compare the magnitude of influence of competing emotions on actors over time. Researchers of entrepreneurial emotions (Cardon *et al.*, 2012) and group emotions (Barsade and Knight, 2015) have called for longitudinal data on emotion dynamics. Our simulation does so, offering a novel methodology to dynamically capture emotions.

Strengths, limitations, and opportunities for further research

A strength of our study is the naturalism of the research design. A major critique of past escalation research is that most of our understanding of the phenomenon is based on laboratory studies using single scenarios in which previous investment is imagined rather than actually experienced by participants (Kirby and Davis, 1998). Our design allowed us to observe multiple decision points over time and participants who escalated their commitment to a course of action for which they were financially responsible. The cost of escalating commitment to the simulated venture depended on the team's performance in the simulation and was material. Most importantly, our design was longitudinal, answering the call for more precise examination of the escalation versus venture termination phenomenon as a continuous process rather than simple,

isolated choices (Moon, 2001; Staw, 1996, 2005). It allowed us to longitudinally track the natural co-occurrence of conflicting emotions (fear and hope) that would take place in the field, offering the additional benefits of standardized lab conditions.

Although the naturalism of the multi-round behavioral simulation is a key strength of our study, it is not the same as running an actual venture in terms of the resources involved and the timing of decisions. A natural next step is to measure group fear and hope in actual venture teams. To avoid the pitfalls of a retrospective approach, it is important to capture these ventures from the beginning, including using incubator settings or short-term ventures. Also, we intentionally allowed emotions to vary naturally to capture these processes realistically, but designing a study that induces differing levels of group fear and hope would allow for more direct examination of their causal implications.

Regarding the boundary conditions of our theory, we suggest that our model applies broadly to situations of entrepreneurial escalation of commitment. As mentioned earlier, the design of the simulation approximates high-growth entrepreneurship, in which most ventures fail at a mounting cost, while success is rare but yields very large rewards. However, we argue that the escalation processes are similar for most business ventures, even if their growth might be slower and on a smaller scale; the feelings of fear and hope are always central in entrepreneurship, as the financial stakes are generally high for the founders. Further research could empirically validate this claim, as well as explore more potential moderators, in the same manner as our test regarding friendship-strength. For example, interesting potential moderators could be the size of the founding team (as compared to the fixed-size teams of three members in this study) and the team's hierarchy and power dynamics (as compared to the teams of equals we examined here). Last, while we focused on the entrepreneurial team as a whole, teams often have leaders. It would be interesting to examine the interactive role of the emotions of leaders and their teams on escalation processes. We present some early exploratory analyses of team leaders in Online Appendix 2.

CONCLUSION

We examined the relationship between two future-oriented emotions, group fear and group hope, and escalating commitment to (versus terminating) a currently failing simulated entrepreneurial venture. Our work bridges research on venture termination, escalation of commitment, and affect in entrepreneurship and organizational behavior and makes multiple distinct contributions to these streams of literature. Our key finding is that hope trumps fear, echoing treatises from the humanities suggesting that the struggle between hope and fear is a key characteristic of humans and determinant of their actions (Hobbes, 1651), including in business settings (Singh, 2015).

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Table 1. Group-level descriptive statistics of study variables and correlations

Variable		Mean	s.d.	1	2	3	4	5	6
1	Age	22.09	1.84						
2	Female group members (%)	0.55	0.34	-0.20					
3	BIG5 – Extraversion[1]	3.51	0.44	-0.08	-0.19				
4	BIG5 – Agreeableness	3.37	0.32	0.26	0.12	-0.22			
5	BIG5 – Conscientiousness	3.76	0.33	0.18	-0.16	0.10	0.34		
6	BIG5 – Emotional Stability	3.40	0.42	0.20	-0.34	0.24	0.37	0.36	
7	BIG5 – Openness	3.29	0.30	-0.22	-0.15	0.50	-0.23	-0.02	0.02
8	Trait Positive Affectivity	3.59	0.32	-0.07	-0.08	0.48	0.06	0.11	0.34
9	Trait Negative Affectivity	2.78	0.41	0.04	0.24	-0.28	-0.06	-0.11	-0.69
10	General self-efficacy	3.96	0.26	-0.29	-0.06	0.35	-0.13	0.30	0.06
11	Perceived worth of money	3.30	0.48	-0.23	0.19	-0.04	0.14	-0.06	-0.03
12	Entrepreneurship experience[2]	0.23	0.51	-0.01	-0.18	0.25	0.10	0.16	0.16
13	English as mother tongue (%)	0.21	0.30	-0.20	-0.28	0.02	0.08	0.03	0.12
14	Business degree (%)	0.41	0.37	0.52	-0.14	0.01	0.18	0.33	0.21
15	Entrepreneurial family (%)	0.59	0.31	-0.13	0.03	0.21	-0.01	-0.01	0.08
16	Strategy game experience[2]	1.99	0.60	-0.22	-0.23	0.03	-0.18	-0.15	0.04
17	Group friendship strength	3.58	1.03	-0.25	-0.08	0.06	-0.29	-0.06	-0.06
18	Debt at the time of decision (£)	9.87	23.84	0.02	-0.35	0.06	0.19	0.18	0.31
19	Group fear	2.71	0.69	-0.06	-0.04	-0.23	0.06	0.11	-0.16
20	Group hope	3.05	0.76	0.01	-0.12	0.11	0.07	0.09	0.15
21	Group engagement	3.81	0.50	0.13	-0.08	0.02	-0.03	-0.15	0.05

Variable		7	8	9	10	11	12	13	14
8	Trait Positive Affectivity	0.11							
9	Trait Negative Affectivity	-0.11	-0.19						
10	General self-efficacy	0.37	0.44	-0.15					
11	Perceived worth of money	-0.12	0.06	0.05	0.10				
12	Entrepreneurship experience	0.31	0.15	0.02	0.22	0.09			
13	English as mother tongue (%)	0.14	0.01	-0.19	0.08	0.32	0.06		
14	Business degree (%)	-0.36	0.10	-0.03	-0.16	-0.18	-0.01	-0.14	
15	Entrepreneurial family (%)	0.15	0.19	-0.01	0.01	0.01	0.13	-0.19	0.05
16	Strategy game experience[2]	0.24	0.32	-0.20	0.32	0.18	0.03	0.21	-0.18
17	Group friendship strength	0.06	0.16	-0.01	0.17	0.16	-0.08	0.03	-0.05
18	Debt at the time of decision (£)	0.19	0.16	-0.22	0.20	-0.05	0.23	0.08	0.08
19	Group fear	-0.17	-0.28	0.06	-0.07	0.04	0.11	0.13	-0.02
20	Group hope	0.12	0.17	-0.15	0.23	0.05	0.07	0.09	0.01
21	Group engagement	-0.16	0.06	0.01	-0.06	0.21	0.08	-0.04	0.08

Variable		15	16	17	18	19	20
16	Strategy game experience	-0.07					
17	Group friendship strength	0.14	0.27				
18	Debt at the time of decision	0.24	0.19	0.26			
19	Group fear	-0.22	0.01	-0.05	0.10		
20	Group hope	0.01	0.16	0.06	-0.02	-0.35	
21	Group engagement	0.09	0.01	0.08	-0.20	-0.25	0.39

Note: n = 66 teams. For variables debt at the time of the decision, group fear, group hope and group engagement, n= 569. Correlations greater than 0.08 or smaller than -0.08 are significant at $p < 0.05$
[1]Unless indicated otherwise, all scales are 1-5 scales (1=Not at All to 5=Very Much). [2]In years.

Table 2. Event history models of teams quitting the simulated venture (ceasing escalation of commitment) (n=569[1])

Predictor variable	(1)	(2)	(3)	(4)	(5)
Age	0.22	0.24	0.27	0.14	0.17
	(0.10) [0.027]	(0.11) [0.023]	(0.10) [0.010]	(0.12) [0.220]	(0.12) [0.160]
Female group members (%)	1.87	1.52	1.30	1.19	1.17
	(0.59) [0.002]	(0.48) [0.001]	(0.52) [0.012]	(0.60) [0.048]	(0.60) [0.051]
BIG5 – Emotional Stability	-0.64	-0.36	-0.48	-1.63	-1.51
	(0.60) [0.282]	(0.69) [0.596]	(0.67) [0.470]	(0.74) [0.028]	(0.71) [0.032]
BIG5 – Openness to Experience	-1.08	-0.91	-1.26	-1.06	-1.26
	(0.59) [0.066]	(0.55) [0.099]	(0.54) [0.019]	(0.73) [0.148]	(0.77) [0.103]
BIG5 – Extraversion	0.86	0.68	0.74	0.89	0.93
	(0.46) [0.062]	(0.36) [0.061]	(0.35) [0.033]	(0.48) [0.061]	(0.46) [0.043]
BIG5 – Agreeableness	-0.62	-0.41	-0.36	-0.30	-0.46
	(0.51) [0.220]	(0.52) [0.430]	(0.53) [0.495]	(0.54) [0.572]	(0.49) [0.345]
BIG5 – Conscientiousness	0.49	0.03	-0.18	0.34	0.58
	(0.46) [0.288]	(0.44) [0.938]	(0.42) [0.665]	(0.60) [0.572]	(0.61) [0.344]
Trait Positive Affectivity	-0.06	0.14	-0.06	0.55	0.57
	(0.45) [0.890]	(0.42) [0.739]	(0.39) [0.880]	(0.49) [0.261]	(0.53) [0.283]
Trait Negative Affectivity	0.30	0.48	0.49	0.22	0.33
	(0.46) [0.512]	(0.49) [0.328]	(0.48) [0.306]	(0.62) [0.718]	(0.60) [0.585]
General self-efficacy	-0.94	-0.54	-0.43	-1.28	-1.26
	(0.62) [0.126]	(0.58) [0.353]	(0.54) [0.423]	(0.84) [0.129]	(0.79) [0.111]
Perceived worth of money	-0.23	0.09	0.30	-0.14	-0.15
	(0.34) [0.492]	(0.33) [0.780]	(0.33) [0.363]	(0.42) [0.736]	(0.43) [0.721]
Entrepreneurship experience (yrs)	-0.14	0.09	0.13	-0.03	-0.02
	(0.45) [0.750]	(0.24) [0.707]	(0.23) [0.587]	(0.26) [0.900]	(0.23) [0.919]
English as mother tongue (%)	0.44	0.10	0.06	-0.98	-0.90
	(0.64) [0.490]	(0.59) [0.868]	(0.57) [0.923]	(0.83) [0.236]	(0.80) [0.263]
Entrepreneurial family (%)	-0.60	-0.58	-0.31	-0.52	-0.46
	(0.44) [0.175]	(0.35) [0.095]	(0.36) [0.377]	(0.43) [0.228]	(0.43) [0.289]
Strategy game experience	0.22	0.06	0.14	0.45	0.47
	(0.30) [0.463]	(0.25) [0.804]	(0.25) [0.566]	(0.28) [0.115]	(0.27) [0.087]
Business degree (%)	-0.93	-0.90	-0.74	-0.57	-0.56
	(0.46) [0.045]	(0.54) [0.100]	(0.53) [0.163]	(0.69) [0.409]	(0.67) [0.409]
Debt at the time of the decision[2]	0.09	0.09	0.08	0.10	0.19
	(0.02) [<.001]	(0.02) [<.001]	(0.02) [<.001]	(0.02) [<.001]	(0.02) [<.001]
Group fear[3]		0.02	0.01	0.01	0.01
		(0.01) [0.216]	(0.01) [0.617]	(0.02) [0.751]	(0.02) [0.791]
Group hope[3]		-0.08	-0.06	-0.04	-0.04
		(0.02) [<.001]	(0.02) [0.001]	(0.02) [0.029]	(0.02) [0.041]
Group engagement[3]			-0.09	-0.03	-0.03
			(0.03) [0.002]	(0.02) [0.092]	(0.02) [0.098]
Group friendship strength[3]				-0.48	-0.50
				(0.18) [0.008]	(0.17) [0.002]
Group fear x friendship strength				0.02	
				(0.01) [0.094]	
Group hope x friendship strength					0.01
					(0.02) [0.736]
Group engagement x friendship strength				0.01	-0.01
				(0.02) [0.572]	(0.02) [0.901]
Log-likelihood	-204.4	-193.1	-190.1	-148.9	-149.5
Wald Chi-squared test	100.1	180.4	177.1	234	243.6
Overall model fit:					
Akaike information criterion (AIC)	429.03	407.67	404.6	343.8	344.9

Robust standard errors in parentheses; p-values in brackets. [1]n=470 in Models 4 and 5. [2]Debt at the time of the decision variable is log-transformed by log(x+1). [3]Standardized in Models 4 and 5.

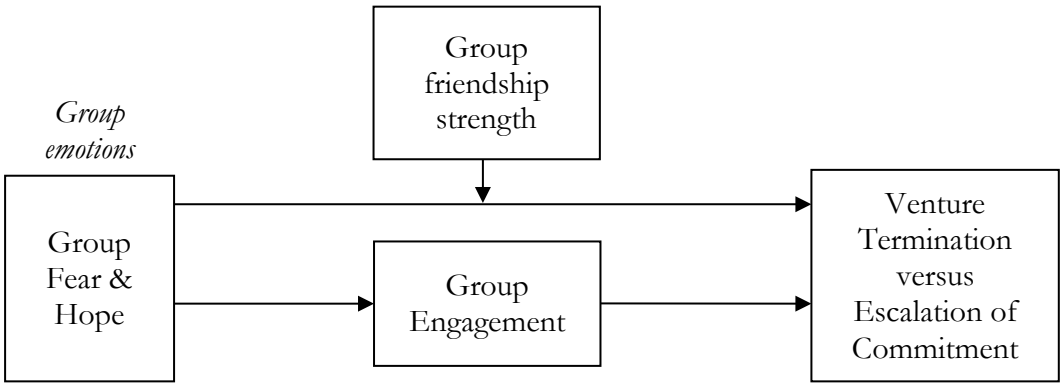


Figure 1. The conceptual model

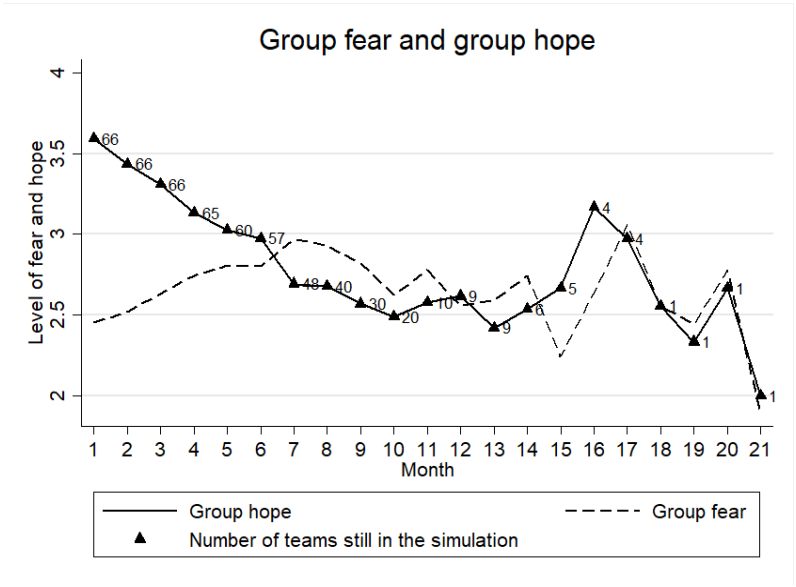
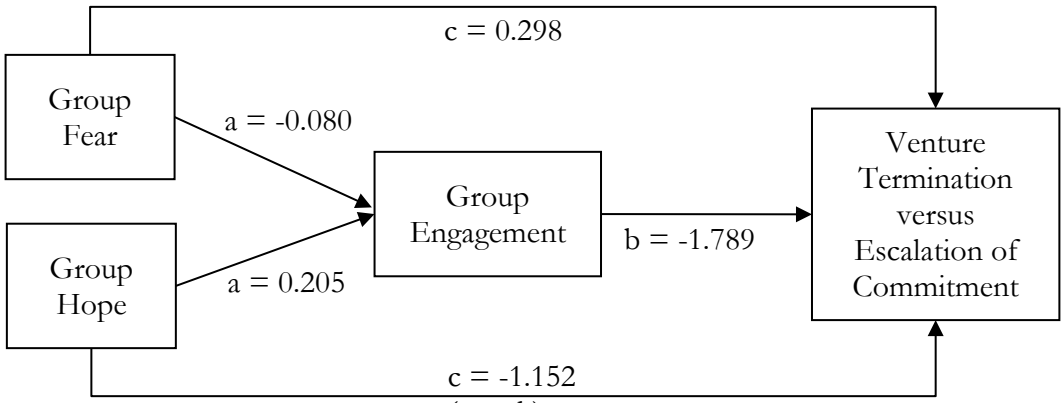


Figure 2. Average level of group fear and hope per round, for teams who had not yet terminated their venture



Unstandardized regression coefficients for the relationship between group fear and group hope and venture termination (ceasing escalation of commitment) as mediated by group engagement. The values 0.298 and -1.152 represent the direct effect of group fear and group hope, respectively, on venture termination (ceasing escalation of commitment) after the inclusion of group engagement.

Figure 3. The mediating role of group engagement between group fear and hope and venture termination versus escalation of commitment to the currently failing venture

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