Learning from Failure: The Making of Entrepreneurial Leaders

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George Solomon
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Dedication

To my mother, who loves me regardless of all my defects;

my father, who demands nothing but perfection from me;

and Martin, who supports me unconditionally to become my ideal self.
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Abstract of the Dissertation

Learning from Failure: The Making of Entrepreneurial Leaders

Failure is a built-in component of the entrepreneurial journey due to its high levels of uncertainty and risk. Despite being difficult and challenging, failure represents one of the most valuable experiences that entrepreneurial leaders will ever have the (mis)fortune to engage in. This dissertation investigated how and when failure contributes to an individual’s transformational leadership through learning. A moderated mediation model was proposed and then tested using multsource data from CEOs and managers of small and medium-sized information technology enterprises in the United States and Finland. Results revealed that the influence of failure experience on transformational leadership was fully mediated by learning. When failure related positively to learning, learning positively mediated the relationship between failure experience and transformational leadership. When the relationship between failure and learning was negative, the mediation turned negative. In other words, the value of failure experience for one’s transformational leadership was determined by whether or not, and to what extent, one exhibited learning behaviors. Further, while the relationship between the personal saliency of failure and learning was positive in general, individuals who had stronger emotion regulation ability were better able to manage the negative emotions and thus enjoyed a steeper learning slope than those with weaker emotion regulation. Both the strength and direction of the relationship between the number of terminated businesses was a function of learning goal orientation. That is, for individuals with a high learning goal orientation, the number of previously terminated businesses was positively associated with their current learning behaviors. In contrast, for entrepreneurs with a low
learning goal orientation, the number of terminated businesses related negatively to learning behaviors. Findings of this study can be applied in designing training, education, and mentoring programs for entrepreneurial leaders or in guiding venture capitalists’ investment selection decisions.
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CHAPTER 1:
INTRODUCTION

Statement of the Problem

For decades, entrepreneurial activities have been the catalyst for positive social change and a vital force in economic growth (Kirzner, 1973; Schumpeter, 1934, 1950). The World Development Report indicated that small and medium-size enterprises (SMEs) account for 65% to 75% of gross domestic product (GDP) for all countries (The World Bank Group, 2009). Based on these data, it is not unreasonable to claim that the future of the economy hangs on the informal sector and SMEs. In fact, SMEs have created 48% of employment opportunities and contributed to 46% of GDP in the United States (U.S. Small Business Administration, 2011). By generating 64% of net new jobs over the past two decades, SMEs have revitalized the United States following economic downturns in the 1990s and again in 2001 (Schramm, 2004; Small Business Committee, 2011).

However, with increasingly fierce global competition and a widespread financial crisis, SMEs are faced with a challenging situation. According to the U.S. Small Business Administration, more than half of SMEs fail within the first 5 years (Aldrich, 1999). Young firms do not only dominate job creation, but their likelihood of failure is also disproportionately high (Haltiwanger, Jarmin, & Miranda, 2010). In other words, the critical role that SMEs play in job creation and economic growth is contingent upon their continuous presence. Understanding failure and the implications of failure is key to being able to leverage entrepreneurial activities in fostering economic growth (Harrison & Leitch, 2005; R. G. McGrath, 1999).
Due to the amount of uncertainty and risk involved in entrepreneurial endeavors, failure is a built-in component of entrepreneurship (Lubatkin & Chatterjee, 1994). Entrepreneurs usually encounter numerous failures and mistakes before they succeed (Timmons, 1999). Even the greatest entrepreneurs of our era were not spared the agony of failure. For example, in 1985 Steve Jobs was ousted from the top management of Apple, Inc., the very company he cofounded with Steve Wozniak in his own garage. When reflecting upon this experience, Steve Jobs called it an “awful-tasting” but “much needed” medicine (Jobs, 2005); he even considered it the most valuable lesson in his entrepreneurial journey. “The heaviness of being successful was replaced by the lightness of being a beginner again,” as Jobs described it. “I was less sure about everything. It freed me to enter one of the most creative periods of my life” (Jobs, 2005).

The story of Steve Jobs and many other successful entrepreneurs has presented intriguing questions for entrepreneurship researchers: What lessons does failure provide? How do entrepreneurs develop leadership skills in the process of making mistakes, failing, and learning from their mistakes and failure? Why do some entrepreneurs learn from this experience and become better leaders, while others do not? However, perhaps because of the bitter nature of failure, the quest for such a transformational process has been scarce (Edmondson, 2011). While entrepreneurship scholars have investigated the causes of failure and ways to avoid failure (e.g., Gaskill, Van Auken, & Manning, 1993), the fundamentally negative view of failure has led to a pervasive bias in the field of entrepreneurship (R. G. McGrath, 1999). As a result, the precious learning opportunities the experience of failure affords have been long understudied (see McGrath, 1999, for an exception), even though for more than a decade, scholars have been urging
entrepreneurship research to move from a preoccupation with achieving success and avoiding failure to an integrated view that links these two phenomena (Aldrich & Fiol, 1994).

It is almost incontrovertible wisdom that failure is the fire that tempers the steel of an entrepreneur’s learning and street savvy (Timmons, 1999). It is paradoxical that the implication of failure has not been given sufficient scholarly attention within the entrepreneurship tradition (R. G. McGrath, 1999). While the intriguing process of transforming failure into success remains obscure (Cannon & Edmondson, 2001), it is becoming increasingly clear that there is a need to steer research away from picking winners to identifying key issues in the learning and developmental process of entrepreneurs (Sullivan, 2000).

Entrepreneurship is a process (R. A. Baron, 2007), and learning is at the very core of that process (Harrison & Leitch, 2005; Minniti & Bygrave, 2001). The assertive, forward-moving, and proactive nature of learning (Kolb, 1984) captures the essence of entrepreneurship and further provides valuable insight for the question of why some entrepreneurs become better leaders after experiencing failure. The entrepreneurial process is more than the mere creation of a business (Kuratko, 2007; Shane & Venkataraman, 2000; Swiercz & Lydon, 2002); just as entrepreneurial leaders found their ventures to adapt and flourish, they also accumulate relevant know-how and develop themselves as leaders. In order to become effective leaders, entrepreneurs need to continuously build their competency through learning. However, because most existing research regarding learning from failure has relied on historical data, the mechanisms involved in achieving this advantage have not yet been specified (Edmondson &
Moingeon, 1996). Within the entrepreneurial context, in particular, many aspects of the learning process remain poorly understood (Cope, 2005).

“Learning from failure is not automatic or instantaneous” (Shepherd, 2003, p. 319); rather, it is complicated by a myriad of interpersonal and intrapersonal factors. To start with, since entrepreneurs are deeply attached to their ventures, business failure is likely to trigger negative emotions such as grief. Negative emotions inhibit deep reflection (Cannon & Edmondson, 2001), hinder cognitive processes (R. A. Baron, 2008), and limit the number of alternatives considered. According to cognitive resource theory (Fiedler & Garcia, 1987), when faced with failure, individuals divert their cognitive resources to negative emotions, rather than focusing on problem solving and learning-related processes. If negative emotions such as anxiety or grief consume most cognitive resources, individuals will exhibit a lack of perspective and an inability to select relevant information, both of which interfere with learning (Sutcliffe & Weick, 2008). Given the impact of emotions, it is important to understand why some entrepreneurs are able to conquer negative emotions associated with failure and seize learning opportunities where others find only despair. In addition, entrepreneurs possess different personal goals and varied emotional abilities. These personal dispositions individually and collectively determine the extent an individual can exploit a learning opportunity. No existing research in entrepreneurship, to my knowledge, has incorporated goal orientation or emotional intelligence as potentially important “boundary conditions” for learning from failure.

Another limitation in the existing literature relates to the making of entrepreneurial leaders. In the entrepreneurial process, entrepreneurs must perform
different activities and accomplish various tasks. To successfully meet the demands imposed by all three phases of a venture, the entrepreneur not only needs to paint a vision that is convincing and resonating for various stakeholders, but also must use this vision to inspire internal and external followers (R. A. Baron, 2007). In other words, effective leadership is critical to venture success. Transformational leadership, a particular form of effective leadership, has been linked to a number of organizational and individual-level outcomes pertinent to entrepreneurship. For instance, transformational leadership has been shown to relate positively to employee creativity and innovation (Mumford, Scott, Gaddis, & Strange, 2002), research and development project performance (Keller, 1992), and overall innovation at the organizational level (Jung, Chow, & Wu, 2003).

Understanding the genesis of transformational leadership will greatly improve our knowledge regarding how to better prepare entrepreneurs for future challenges and develop them as effective leaders. Whereas existing management research has uncovered a great range of positive organizational outcomes of transformational leadership, relatively little is known about its antecedents (Bommer, Rubin, & Baldwin, 2004), especially in the entrepreneurial context.

**Purpose of the Study and Research Questions**

Addressing the gaps in the existing literature, the primary objective of my dissertation was to uncover the process of how entrepreneurs learn from failure and become transformational leaders. I did so by drawing upon three important streams of literature—entrepreneurship, leadership, and management learning—to develop a theoretical model (as depicted in Figure 1.1) to guide my exploration of the following research questions:
1. Does failure experience predict an entrepreneur’s transformational leadership?
2. How does failure experience influence an entrepreneur’s transformational leadership?
3. When does the relationship between failure experience and transformational leadership hold?

I answered these questions by first examining the relationship between failure experience and transformational leadership. Next, I investigated learning behaviors and the mediating role of learning in the relationship between failure experience and transformational leadership. Finally, I identified the boundary conditions of learning from failure by investigating the personal characteristics of entrepreneurs that influence the learning process. These research questions were examined through the theoretical establishment of a series of hypotheses and the statistical analysis of survey-based data.

![Diagram](image)

*Figure 1.1. A moderated mediation model of learning from failure and transformational leadership.*
Significance of the Study

By exploring the aforementioned research questions, the present research contributes to the existing literature in three aspects. First, the study represents the evolutionary trend in entrepreneurship research: the crux of inquiry has migrated from “who the successful entrepreneurs are” or “what successful entrepreneurs do” to “how successful entrepreneurs come to be” (Deakins & Freel, 1998). In delineating the entrepreneurs’ learning mechanism triggered by failure, this research has put forward a conceptual model depicting how entrepreneurs develop effective leadership that is instrumental for entrepreneurial activities. It empirically tested the relationships linking important variables such as experience, learning, and leadership, which should greatly improve our understanding of the evolutionary nature of entrepreneurship.

Second, in introducing the individual-level moderators of goal orientation and emotional intelligence, the study sheds light on why some individuals learn from failure and become effective leaders while others do not. Since fear and anxiety are common emotions involved in learning (Vince, 1998), the study constitutes a valuable addition to existing rationality-focused management theories by explicating the critical role emotions play in the learning process.

Finally, in exploring the relationship between learning and transformational leadership, the present study addresses a key concern for entrepreneurship scholars who have called for greater understanding of and evidence on how learning translates into effective leadership that fosters competitive advantages (Edmondson & Moingeon, 1996).
Definition of Terms

Transformational leadership. An influence process in which the leader elevates followers beyond self-interests through idealized influence or charisma, inspiration, individualized consideration, or intellectual stimulation (Bass, 1999).

Failure. Deviation from expected and desired results, including both avoidable errors and unavoidable negative outcomes of entrepreneurial activities (Cannon & Edmondson, 2001).

Learning. A set of learning behaviors characterized by reflection, experimentation, as well as the detection, discussion, and correction of failure in an entrepreneurial setting (Argyris & Schön, 1978; Edmondson, 1999; Kolb, 1984).

Learning goal orientation. The effort to understand something new or to improve one’s level of competence in a given activity (Button, Mathieu, & Zajac, 1996; Elliott & Dweck, 1988).

Emotional intelligence. The ability to recognize and regulate emotions in oneself and in others so as to promote personal growth (Goleman, 2006; Mayer, Salovey, & Caruso, 2004).

Conclusion

This chapter has established the legitimacy and significance of the present study. Chapter 2 provides the theoretical foundation for the research model, outlining a series of hypotheses. Chapter 3 details the methodology employed in this study, including the sample, measures, and analytical strategy. Chapter 4 provides results of the data analysis. Finally, chapter 5 discusses the implications and limitations of the results and proposes directions for future research.
CHAPTER 2: LITERATURE REVIEW

This chapter begins with an overview of the entrepreneurship and leadership literature, with a focus on transformational leadership theory. This is followed by a review of major perspectives on entrepreneurial learning. Together, these reviews provide the theoretical foundation for studying the phenomenon of entrepreneurs’ learning from failure and establish the relationship between learning and transformational leadership. The chapter then focuses on failure, reviewing organizational-level and individual-level research, defining failure, and discussing learning from failure. Throughout the review, hypotheses are developed to test the relationships in the model introduced in chapter 1.

Entrepreneurship

Entrepreneurship research has grown dramatically over the past 30 years, and the field is still expanding (Kuratko, 2007). As a field of study, entrepreneurship encompasses the processes of discovery, evaluation, and exploitation of opportunities and the set of individuals who discover, evaluate, and exploit these opportunities (Shane & Venkataraman, 2000). Scholars have adopted different focuses towards studying the entrepreneurial phenomenon: the entrepreneurial firms and entrepreneurs (Krackhardt, 1995).

Research on entrepreneurial firms has produced a vast body of literature (e.g., Covin & Miles, 1999; Dess et al., 2003; Ireland et al., 2002; Kuratko, Ireland, & Hornshy, 2001; Morris & Kuratko, 2002), and the review of it would entail a separate study. The present research, however, focuses on entrepreneurs for three important reasons. First,
“entrepreneurship is fundamentally personal” (Baum, Frese, Baron, & Katz, 2007, p. 1).

In the simplest theoretical form, entrepreneurship (E) is a function of the entrepreneurs (e), or, E = f (e) (Kuratko, 2007). Put differently, it takes personal vision, passion, knowledge, and resources to eventuate a conducive environment or promising business opportunity into a successful venture. Next, evidence from the practitioners (e.g., venture capitalists) shows that entrepreneurs’ personal characteristics are as important as, if not more important than, the business idea or industry environment for making an investment decision (Chen, Yao, & Kotha, 2009; Shepherd, 1999). Finally, although the current entrepreneurship literature has devoted considerable attention to the role entrepreneurs play within their business and the general economy (Fernald, Solomon, & Tarabishy, 2005), the psychology of entrepreneurship is a less studied area than the economics of entrepreneurship (Antonakis & Autio, 2007) and thereby presents immense research opportunities (Baum et al., 2007).

Entrepreneurs are described as “aggressive catalysts for change in the world of business; individuals who recognize opportunities where others see chaos, contradiction, or confusion” (Kuratko, 2007, p. 1). With a personal lens, entrepreneurship is viewed as a dynamic process of vision, change, and creation driven by entrepreneurs (Kuratko & Hodgetts, 2007). Entrepreneurship scholars have attempted to describe entrepreneurs in terms of traits (Begly & Boyd, 1987; Carland, Carland, Carland, & Pearce, 1995; Stewart, Watson, Carland, & Carland, 1999), cognitive styles (Busenitz & Barney, 1997; Mitchell et al., 2007; Mitchell, Smith, Morse, Peredo, & Mckenzie, 2002), and behaviors (Miller, 1983; Schumpeter, 1934).
The trait or personality approach is one of the classic and earliest approaches to entrepreneurship (Rauch & Frese, 2007). Schumpeter’s (1934) initial theorizing of entrepreneurship included concepts similar to innovativeness, achievement orientation, dominance, and other personality traits. Subsequently, McClelland (1961) discussed wealth creation from a motivational perspective and associated entrepreneurs with high achievement motivation. These early entrepreneurship theories spurred a proliferation of research trying to identify particular personality traits that characterize entrepreneurs. Vecchio (2003) summarized the “Big Five” traits in the entrepreneurship literature as risk-taking propensity (Carland et al., 1995; Stewart, Watson, Carland, & Carland, 1999), need for achievement (McClelland, 1961; Stewart et al., 1999), need for autonomy (Harrell & Alpert, 1979; McClelland, 1961), self-efficacy (Boyd & Vozikis, 1994; Chen, Greene, & Crick, 1998), and locus of control (Brockhaus, 1975; Gilad, 1982).

Empirical studies testing trait theories often produced mixed results. For example, whereas some studies found that entrepreneurs had a higher risk-taking propensity than managers (Carland et al., 1995; Stewart, Watson, Carland, & Carland, 1999) or the general population (Stewart et al., 1999), others found no such differences (Brockhaus, 1980). Similarly, despite a compelling theoretical argument for the role of locus of control in entrepreneurship (Gilad, 1982), subsequent empirical studies (i.e., Engle, Mah, & Sadri, 1997) failed to distinguish between entrepreneurs and their employees based on locus of control. Moreover, although certain entrepreneurs were shown to have a higher need for achievement (Stewart et al., 1999) or autonomy (Harrell & Alpert, 1979; McClelland, 1961), it is not clear whether certain combinations of needs would be consistently linked to entrepreneurial activity or venture success. Consequently, scholars
have questioned the value of the trait approach to entrepreneurship and claimed that entrepreneurship requires behaviors that are too varied to be consistently related to specific traits (Gartner, 1989; Low & MacMillan, 1988).

From a behavioral perspective, entrepreneurship is described as a set of actions: pursuing self-interest (Smith, 1776), using an innovative combination of available resources (Schumpeter, 1934), bearing with uncertainty (Kets de Vries, 1977), and proactively seeking opportunities (Miller, 1983). Among these entrepreneurial behaviors, the notions of innovation and opportunity discovery have received the most attention (Shane & Venkataraman, 2000). To answer questions such as “why some persons but not others recognize opportunities for new products or services that can be profitably exploited” (Mitchell et al., 2007), a stream of research has emerged exploring the link between entrepreneurs’ thinking and doing.

The entrepreneurial cognition literature of the past decade has suggested three major characteristics of the entrepreneurial cognitive pattern. First, entrepreneurs tend to rely on heuristics-based logic for decision-making. Busenitz and Barney’s (1997) seminal work was among the first to report a notable difference in decision-making between entrepreneurs and nonentrepreneurs. One reason behind this difference might be that entrepreneurs are situated in environments that maximize the benefit of heuristics-based logic (R. A. Baron, 1998). For instance, heuristic-based logic reduces individuals’ susceptibility to certain common fallacies (e.g., avoidance of sunk costs) that particularly hinder venture performance (R. A. Baron, 2004). Even though heuristic-based logic, such as drawing conclusions based on representativeness, effectuation, and illusion of control and renders entrepreneurial decision-making subjective and sometimes even biased
(Simon & Houghton, 2002), it functions as a cognitive shortcut that enables entrepreneurs to make sense of uncertainty and complexity quickly.

Next, entrepreneurs seem particularly alert to new opportunities. A plausible explanation is that entrepreneurs possess certain cognitive frameworks that readily match consumer demands and market trends with their own strengths and resources (R. A. Baron, 2006) and facilitate logical leaps that assist in the recognition of opportunities (Busenitz & Arthurs, 2007). It is also speculated that entrepreneurs employ certain ways of perceiving and interpreting information that allow them to reach unique conclusions about new opportunities (Nixdorff & Solomon, 2007).

Finally, entrepreneurs often deviate from a rational decision-making model. Since entrepreneurs seldom have ample time to consider all the alternatives and then determine an optimal decision, they often strive to exploit the limited opportunities available to them (Shane & Stuart, 2002). Entrepreneurs are also known for having expertise in making sense of an evolving situation and thus better adapting to changing environmental demands (Mitchell et al., 2007). Mitchell and colleagues (2000) suggested that entrepreneurs develop unique knowledge structures by transforming, storing, recovering, and employing information differently than non-entrepreneurs. Unfortunately, the processes for forming “entrepreneurial expertise” are largely unknown. An increasing number of scholars have argued that this expertise is embedded in a more comprehensive “entrepreneurial mindset” (McGrath & MacMillan, 2000) or “entrepreneurial leadership” (Fernald et al., 2005; Gupta, MacMillan, & Surie, 2004; Swiercz & Lydon, 2002).

Research on entrepreneurial cognition has greatly improved our understanding of entrepreneurship. However, the challenges facing entrepreneurs are more than just
opportunity recognition or risk taking (R. A. Baron, 2007). Baron (2007) suggested that the entrepreneurial process consists of three major phases: prelaunch, encompassing activities preparing for the start of a new venture; launch, when actual startup activities take place; and post-launch, including all activities occurring after the startup. Entrepreneurs must perform different activities at different points of this process (Gartner, 1989). While identifying and evaluating opportunities comprise the major tasks in the prelaunch phase, once entrepreneurs move into the post-launch stage, their focus shifts to performing all the functions of a business leader. For the later stages of a venture, entrepreneurs need to not only paint a vision that is uplifting, convincing, and resonating for various stakeholders, but also use this vision to inspire internal and external followers, promote innovation, and steer paradigm shifts (Winslow & Solomon, 1993). To run a functioning company, entrepreneurs must deal with an increasingly diverse range of people inside and outside the company, handle conflicts, conduct negotiations, and influence others. Growing the business also requires entrepreneurs to be able to recruit, motivate, and retain talent (R. A. Baron, 2007). Finally, entrepreneurs need to lead the process of organizational emergence in such a way as to create an effective organization (Antonakis & Autio, 2007). All of these tasks are highly challenging and require more than certain personality traits or cognitive styles. Rather, they entail substantial leadership competencies from articulating vision to influencing people. Perhaps Antonakis and Autio (2007) said it best:

> These objectives cannot easily be attained by relying solely on the force of one’s own personality traits, one’s desire for achievement, or one’s tendency to overestimate one’s own strengths and underestimate risks, or low vulnerability. Something more is required—qualities that are projected through behaviors in daily encounters: leadership. (p. 189)
Leadership

The previous review has revealed that leadership is of critical importance in the entrepreneurial process. Moreover, as a field of study, leadership has developed great theoretical and methodological sophistication that can provide a rich source of inspiration for entrepreneurship research (Antonakis & Autio, 2007). With this in mind, I proceed to review the evolution of leadership theories. Table 2.1 presents the major theories and studies representing four primary approaches to the study of leadership.

Table 2.1
Summary of the Major Theories and Studies of Leadership

<table>
<thead>
<tr>
<th>Theoretical approaches</th>
<th>Theory/study</th>
<th>Authors</th>
<th>Focal variables</th>
<th>Situational factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trait approach to leadership</td>
<td>Managerial motivation theory</td>
<td>McClelland &amp; Boyatzis, 1982</td>
<td>Leader’s need for power, achievement, and affiliation</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Center for Creative Leadership studies</td>
<td>McCall &amp; Lombardo, 1983</td>
<td>Leader’s emotional stability, personal integrity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Meta-analysis</td>
<td>Judge et al., 2002</td>
<td>Leader’s personality dimensions: extraversion and conscientiousness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Meta-analysis</td>
<td>Judge, Colbert, &amp; Ilies, 2004</td>
<td>Leader’s cognitive ability/intelligence</td>
<td></td>
</tr>
<tr>
<td>Behavioral approach to leadership</td>
<td>Ohio State leadership studies</td>
<td>Fleishman, 1953; Halpin &amp; Winer, 1957; Hemphill &amp; Coons, 1957</td>
<td>Leader’s behaviors: consideration, concerning people and relationships; and initiating structure, concerning task accomplishment</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Michigan leadership studies</td>
<td>Katz et al., 1950; Katz &amp; Kahn, 1952</td>
<td>Leader’s behaviors: task-oriented, relations-oriented, and participative leadership</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Meta-analysis</td>
<td>Judge et al., 2009</td>
<td>Leader’s behaviors: getting along, getting ahead, and providing meaning</td>
<td></td>
</tr>
<tr>
<td>Theoretical approaches</td>
<td>Theory/study</td>
<td>Authors</td>
<td>Focal variables</td>
<td>Situational factors</td>
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<tr>
<td>------------------------</td>
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</tr>
<tr>
<td>Situational approach to leadership</td>
<td>The least preferred coworker contingency model</td>
<td>Fiedler, 1967</td>
<td>The Least Preferred Coworker Score, which indicates a leader’s motive hierarchy</td>
<td>Effectiveness contingent on leader-member relations, leader’s position power, and task structure</td>
</tr>
<tr>
<td>Path-goal theory</td>
<td>House, 1971</td>
<td>Leader’s behaviors: supportive, directive, participative, and achievement-oriented leadership</td>
<td>Effectiveness contingent on task and subordinate characteristics</td>
<td></td>
</tr>
<tr>
<td>Situational leadership theory</td>
<td>Hersey &amp; Blanchard, 1977</td>
<td>Leader’s behaviors: relations-oriented behavior, task-oriented behavior</td>
<td>Effectiveness contingent on different levels of subordinate maturity</td>
<td></td>
</tr>
<tr>
<td>Leader-member exchange theory</td>
<td>Liden &amp; Graen, 1980; Graen &amp; Uhl-Bien, 1995</td>
<td>The mutual influence between leader and member</td>
<td>Effectiveness contingent on exchange relationship between leader and member</td>
<td></td>
</tr>
<tr>
<td>Integrative approach to leadership</td>
<td>Charismatic leadership theory</td>
<td>House, 1977; Conger &amp; Kanungo, 1987</td>
<td>Leader’s personal trait of charisma; leader’s behaviors of articulate vision, leading by example, and empowering followers</td>
<td>Effectiveness contingent on the combination of the leaders’ characteristics and behaviors, followers’ attributions, and the situation in which the influence occurs</td>
</tr>
<tr>
<td>Transactional leadership</td>
<td>Bass, 1985, 1996</td>
<td>Leader’s behaviors: rewards followers’ effective performance and punishes undesired performance</td>
<td>Universally effective, especially in dynamic, unstable situations (e.g., entrepreneurial environment)</td>
<td></td>
</tr>
<tr>
<td>Transformational leadership</td>
<td></td>
<td>Leader’s behaviors: idealized influence; inspirational motivation; individualized consideration; intellectual stimulation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Early Leadership Theories**

**Trait approach.** Early leadership theories emphasized attributes of leaders, such as personality, motives, values, and skills. Underlying this approach is the assumption
that some people are natural leaders, endowed with certain traits not possessed by other people. In contrast to this belief, Stogdill’s (1948, 1974) influential reviews showed that a person does not become a leader by virtue of the combination of certain traits. These findings led scholars to conclude that the trait approach had little explanatory power (Zaccaro, Foti, & Kenny, 1991).

More recent leadership trait studies have better explained how leader attributes relate to leadership emergence and effectiveness. In general, the following traits have been found to influence leadership effectiveness: general mental ability (Judge, Colbert, & Ilies, 2004); extraversion and conscientiousness (Judge, Bono, Ilies, & Gerhardt, 2002); socialized power motivation combined with moderately high achievement orientation and low need of affiliation; high energy level and stress tolerance; self-confidence; and personal integrity (Kirkpatrick & Locke, 1991).

**Behavioral approach.** Personal dispositions endow people only with leadership potential; to emerge as a leader, one must take further actions (Kirkpatrick & Locke, 1991). Following this logic, the behavioral approach to leadership focuses on identifying effective leadership behaviors. Leadership is defined as the behavior of an individual that directs the activities of a group toward a shared goal (Hemphill & Coons, 1957).

Building on their previous meta-analysis, Judge and colleagues (2009) developed a leader trait emergence effectiveness model to incorporate leader behaviors explaining the variance in leadership that could not be accounted for by traits. They found that behaviors such as getting along, getting ahead, and providing meaning mediate the relationship between traits and leadership emergence (Judge, Piccolo, & Kosalka, 2009).
**Situational approach.** In studying leaders’ traits and behaviors, scholars discovered that in different situations, leaders employed different behaviors. The situational/contingency approach of leadership argues that the effectiveness of different leadership attributes (e.g., traits, skills, behaviors) is contingent on situations. Early situational leadership theories, such as the least preferred coworker contingency model (Fiedler, 1967), path-goal theory (House, 1971), and situational leadership theory (Hersey & Blanchard, 1977), attempted to specify the appropriate types of leadership behavior depending on various aspects of the situation.

Results from empirical research generally supported the least preferred coworker contingency theory (Strube & Garcia, 1981), but the methods used to test this theory were not robust enough to warrant a positive conclusion (Vecchio, 1983). On the other hand, despite a large number of empirical studies devoted to testing path-goal theory and situational leadership theory, the results have been inconclusive (Podsakoff, MacKenzie, Ahearne, & Bommer, 1995; Wofford & Liska, 1993). These early contingency theories suffered from conceptual ambiguity, over-complexity, and inadequate account of human motivation (Yukl, 2010). As a result, the process by which leader traits or behaviors influence followers’ performance is not clearly explained.

A subsequent situational approach, as represented by leader-member exchange theory (Graen & Uhl-Bien, 1995), highlights the role of followers and the process of leadership influences and advocates that the effectiveness of leadership style is contingent on the interaction between leader and follower. Within this approach, leadership is defined as mobilizing instructional and psychological resources so as to arouse, engage, and satisfy the motives of followers (Burns, 1978).
Transformational Leadership Theory

Building on the approaches described above, contemporary leadership theories involve more than one type of leadership variable. The integrative approach thus represents an important step toward greater integration of theories (Yukl, 1989) and has gained a dominant presence in the leadership literature (Brown & Moshavi, 2005). The definition of leadership from this approach presents a synthesized view that accounts for the influencing process between a leader and followers and its resultant outcomes. This influencing process is explained by the combination of the leaders’ characteristics and behaviors, followers’ attributions, and the context in which the influence occurs (Antonakis, Cianciolo, & Sternberg, 2004).

Transformational leadership theory (Bass, 1985; Burns, 1978) is among the most influential theories within the integrative approach. Central to transformational leadership theory is a notion of charisma. Once believed to be a “divinely inspired gift,” charisma was characterized by Weber (1947) as a form of influence based on follower perceptions that the leader is endowed with exceptional qualities. Such perceptions usually occur during a social crisis when a leader emerges with a radical vision that offers a solution to the crisis and attracts followers who believe in that vision. House (1977) proposed a theory about how charismatic leaders behave, how they differ from other people, and the conditions under which they are most likely to flourish. For instance, a set of traits was identified to increase the likelihood of being perceived as charismatic: a strong need for power, high self-confidence, and strong convictions (Yukl, 1989). In terms of behaviors, charismatic leaders are able to articulate a vision that embodies social values appealing to followers of all levels; they also employ impression management to maintain followers’
confidence in them, and they actively communicate their high expectations for followers and express their confidence in followers’ ability. When these effective leadership behaviors are exercised to an appropriate extent, charismatic leaders can create an achievement-oriented culture (Harrison, 1987), high-performing system (Vaill, 1978), and value-driven organization (Peters & Waterman, 1982). Additionally, Conger and Kanungo (1987) pointed out that charisma is an attribution phenomenon. That is, based on the outcomes associated with certain leadership behaviors, followers attribute charismatic traits to a leader. Consequently, followers form an indispensable element in the creation of the charismatic leadership phenomenon (Howell & Shamir, 2005).

Beyond House’s (1977) charismatic leadership theory, Burns (1978) claimed that transformational leadership is not limited to a few charismatic political leaders. Instead, transformational leadership exists at every level of the organization. For Burns (1978), transformational leaders are those who seek to raise the consciousness of followers by appealing to higher-level needs such as self-actualization and elevate followers from their everyday selves to their better selves.

Building upon the theories of Burns (1978) and House (1977), Bass (1985) coined two constructs: transactional leadership and transformational leadership. Transactional leadership refers to the exchange relationship between leader and follower which is characterized by contingent reward for the followers’ effective performance and punishment for undesired performance (Avolio, 1999). Transactional leadership can take three forms: *active management-by-exception*, in which the leader monitors the follower’s performance and takes corrective action if necessary; *passive management-by-exception*, in which the leader waits for problems to arise before taking corrective action;
or *laissez-faire leadership*, in which the leader simply avoids taking any action (Bass, 1999). In essence, transactional leaders motivate followers by appealing to their self-interest. Although transactional leadership builds the foundation for relationships between leaders and their followers because it specifies expectations and responsibilities, it is a pragmatic approach often employed by leaders to maintain the “status quo” (Bass, 1985, 1990). Transactional leaders’ highly corrective behaviors could lead to a pervasive risk-avoidant culture and limited opportunities for followers’ development (Avolio, 1999).

In contrast to transactional leaders, transformational leaders transform and motivate followers by making them more aware of the importance of the task outcomes, transcending their own self-interest for the sake of the organization or team, and activating their higher-order needs. With transformational leadership, followers develop trust, admiration, loyalty, and respect toward their leader and are motivated to go above and beyond their defined responsibilities. Specifically, Bass and colleagues identified four interrelated dimensions of transformational leadership influence (Bass, 1985, 1999; Bass & Avolio, 1994): *charisma/idealized influence*, arousing followers’ strong emotions and identification with the leader; *inspirational motivation*, communicating an appealing and evocative vision; *individualized consideration*, interacting with followers in a way that makes them feel valued, supported, and encouraged; *intellectual stimulation*, increasing followers’ awareness of problems and influencing followers to view problems from a new perspective.

A substantial amount of empirical work has demonstrated that transformational leadership is positively associated with individual followers’ and work group performance (Dvir, Eden, Avolio, & Shamir, 2002), followers’ job satisfaction
(Kirkpatrick & Locke, 1996), and various leadership effectiveness measures (Judge & Piccolo, 2004). The underlying mechanism supporting these empirical findings is that transformational leadership enhances the development of followers, inspires them to think in unconventional ways, and inspires them to accomplish challenging tasks (Jung, 2001). This mechanism also makes transformational leadership beneficial to entrepreneurial activities. Scholars have found that transformational leadership relates positively to employee creativity and innovation (Mumford et al., 2002), research and development project performance (Keller, 1992), and overall innovation at the organizational level (Jung et al., 2003). As Yukl (2010, p. 279) predicted, “transformational leadership is likely to be more important in a dynamic, unstable environment,” such as an entrepreneurial environment.

For these reasons, transformational leadership is of particular relevance in the entrepreneurial context, and I focus on transformational leadership as the outcome variable. In the current study, I adopt Bass’s (1999) definition, which views transformational leadership as an influence process in which the leader elevates followers beyond self-interests through idealized influence or charisma, inspiration, individualized consideration, or intellectual stimulation.

While transformational leadership has been linked to a wide range of positive individual and organizational outcomes, relatively little is known regarding its genesis (Bommer et al., 2004). At the organizational level, theoretical work has identified a number of contextual and facilitating conditions to transformational leadership. For example, Pawar and Eastman (1997) suggested that certain macro-level contexts (e.g., organizational, structural) are more conducive to transformational leadership than others.
Shamir and Howell (1999) identified some meso-level contexts (e.g., goals, tasks, and technology) as important to the emergence of charismatic leadership. Unfortunately, empirical evidence regarding work contexts for transformational leadership is lacking.

At the individual level, existing empirical literature has focused on personal characteristics that are relatively stable, such as personality (Atwater & Yammarinol, 1993; Judge & Bono, 2000; Rubin, Munz, & Bommer, 2005), motivation (Barbuto Jr, Fritz, & Marx, 2002), and achievement needs (Pillai, Williams, Lowe, & Jung, 2003). An exception was the study of Bommer and colleagues (2004), who investigated the interaction between social context and cynicism about organizational change, as an antecedent to transformational leadership. Although Bommer and colleagues (2004) pointed to a promising future research direction of examining individual variables that could be developed or are more malleable, cynicism about organizational change predicts behavioral intent, rather than specific leadership behaviors.

An increasing number of researchers have found that experiences (Atwater & Yammarinol, 1993; Bass & Avolio, 1994; McCall, 2004), especially developmental experiences (DeRue & Wellman, 2009; McCauley, Ruderman, Ohlott, & Morrow, 1994), can challenge individuals in a way that enables the development of effective leadership. For example, one’s leadership experiences in school and extracurricular activities, difficult challenges in childhood and adolescent forecast subsequent tendencies for leaders to be more transformational (Avolio & Bass, 1994; Avolio & Gibbons, 1988). Particularly, developmentally challenging work experiences facilitate the development of individuals’ cognitive and strategic leadership skills as well as their interpersonal leadership skills (DeRue & Wellman, 2009). These experiences prompt individuals to
collect and process new information, think critically about the situation, and identify the underlying causes and consequences of problems (Cox & Cooper, 1998). Further, they enhance cognitive and strategic leadership by urging individuals to identify critical drivers of and barriers to organizational adaptation and to consider better ways for allocating organizational resources to create competitive advantages (Barney, 1991). At the same time, these experiences enhance interpersonal leadership effectiveness by enabling individuals to experiment with new ways of influencing people with diverse interests, as well as encouraging individuals to exercise “power-with” rather than “power-over” (DeRue & Wellman, 2009). Since both strategic and interpersonal perspectives are inherent in transformational leadership, developmentally challenging experiences should be conducive to transformational leadership.

Developmental experiences take many forms, and business failure is one of the most traumatic and challenging. Yet, for some individuals, an experience with failure could serve as an incubator for transformational leadership. The possibility for positive change in the struggle with failure is present from the writings of early Christians to modern philosophers (Tedeschi & Calhoun, 1995). While there have been no systematic studies of failure and transformational leadership, similar concepts, such as hardship, adversity, and resilience, have been discussed by leadership scholars and practitioners (Bennis & Thomas, 2002; Kayes & Kayes, 2011; Reid, 2008).

Research on developmental experiences, hardship, and resilience provides several reasons why failure could relate positively to transformational leadership. First, failure provides opportunities to learn about oneself, including the strengths and weaknesses, skills and abilities, as well as identity and vision (Cope, 2011). In his in-depth interviews
with eight entrepreneurs from the United Kingdom and the United States, Cope (2011) demonstrated how failure engendered a transformative self-perception for the interviewees. One illustration came from Tom (anonymized by the original author):

“"I'm much more confident in myself and I'm very resilient I think now. I've been through so many difficult things and so many good things and bad things. I've got a much better sense of myself in terms of what I can do and what I can't, what I'm comfortable with, what I'm not comfortable with...I think my skills have broadened so much...I guess I was always on a steep learning curve, so it has just completely transformed my life from that point of view...I feel personally a much stronger person” (Cope, 2011, p.615).

Second, failure is a dramatic event that calls into question basic assumptions of the future of one’s business and how to move towards that future (Cope, 2011; Janoff-Bulman, 1992). Second, business failure provides stimuli for individuals to try new behaviors or reframe old ways of thinking and acting (Sitkin, 1992). Third, like other challenging work experiences, failure provides motivation for learning and development by highlighting the gap between individuals’ current skill set and the requirements of the leadership role (McCauley, 2001). Although failure experience is not the only input of transformational leadership, failure is an important source of developmentally challenging experiences that contributes to effective leadership. Accordingly, I advance the following hypothesis, as presented in Figure 2.1:

\[ H1. \text{The entrepreneur's failure experience is positively associated with his or her transformational leadership.} \]

\[ \begin{array}{c}
\text{Failure Experience} \\
\text{H1 (+)}
\end{array} \rightarrow \begin{array}{c}
\text{Transformational Leadership}
\end{array} \]

*Figure 2.1. Hypothesis 1 regarding the relationship between failure experience and transformational leadership.*
The above review revealed that most experience-based perspectives of leadership development have tapped into the essential process of learning from experience and transforming learning into leadership (Cox & Cooper, 1998; DeRue & Wellman, 2009; Kayes & Kayes, 2011; McCauley, 2001; McCauley et al., 1994). However, no research to date has explicitly established or empirically tested the mediating role of learning. What remains unclear is how and to what extent learning functions in the process of transforming experience into leadership competence. And even more fundamentally, one important question remains: “Can one learn to be a transformational leader?” (Vandenberghe, 1999). To address this gap, in the following section, I review major learning perspectives and examine the relationship between learning and leadership within the entrepreneurial context.

**Entrepreneurial Learning**

While entrepreneurial learning could be drawn from a wide range of learning theories, four dominant perspectives emerged over the last decades: the behaviorist, cognitivist, social learning, and constructivist worldviews. In this section, I review the theoretical arguments and empirical findings of these perspectives, discuss the implications of each, and then define entrepreneurial learning for the present study. Primary issues and major theorists of the four organizing perspectives are presented in Table 2.2.
Table 2.2
Four Major Theoretical Approaches to Entrepreneurial Learning

<table>
<thead>
<tr>
<th>Theoretical tradition</th>
<th>Definition of learning</th>
<th>Key features of learning</th>
<th>Major theorists</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behaviorist</td>
<td>Change in the entrepreneur’s behaviors and venture performance</td>
<td>Environmental stimuli and the consequences of previous actions</td>
<td>Jovanovic, 1998; Minniti &amp; Bygrave, 2001</td>
</tr>
<tr>
<td>Cognitivist</td>
<td>The cognitive mechanism or mental process that steers the process of creating and managing a venture</td>
<td>Cognitive capacities of the entrepreneur</td>
<td>Busenitz &amp; Barney, 1997; Brockner, Higgins, &amp; Low, 2004; Cope, 2005; Gaglio &amp; Katz, 2001; Politis, 2005</td>
</tr>
<tr>
<td>Social learning</td>
<td>The ongoing interactions and dialogues the entrepreneur has in a network of relationships</td>
<td>Personal networks and learning communities</td>
<td>Boyd &amp; Vozikis, 1994; Deakins &amp; Freel, 1998; Taylor &amp; Thorpe, 2004</td>
</tr>
<tr>
<td>Constructivist</td>
<td>The sensemaking process used as entrepreneurs interpret and reinterpret what has just happened to them and their venture</td>
<td>Significant learning events</td>
<td>Cope, 2003, 2005; Rae &amp; Carswell, 2000</td>
</tr>
</tbody>
</table>

Behaviorist Perspective of Entrepreneurial Learning

The behaviorist learning theory considers learning as a response to environmental stimuli that results in behavioral changes (Skinner, 1969, 1974). This perspective follows the post-Schumpeterian school in recognizing that the entrepreneur’s behaviors can be changed by the dynamics of entrepreneurship (Deakins & Freel, 1998). Behaviorists view entrepreneurial learning as a series of behavioral changes or a personal development from
prestart, nascent entrepreneurs to novice entrepreneurs and finally to mature

In their model of entrepreneurial learning, Minniti and Bygrave (2001) described
learning as a process of responding to success and failure. They postulated that the
knowledge distinguishing entrepreneurs as a special group could be acquired only via
learning-by-doing or by direct observation. This “learning-by-doing” involved choices
among alternatives whose payoffs were uncertain and risky. Over time, entrepreneurs
learned to repeat only behaviors that appeared successful and discard behaviors that
resulted in failure. Put differently, positive outcomes enhanced the decisional algorithm
that produced them. Because of the self-reinforcing nature of outcomes, this model posits
no requirement for analytical capacity in entrepreneurs to discern which algorithm is
superior (Minniti & Bygrave, 2001).

Jovanovic (1982) claimed that firm owners take different actions depending on
whether their firms are more or less efficient than others. Firms with higher efficiency
levels enjoyed lower costs and thus increased output, whereas those with lower levels of
efficiency were faced with higher costs and constrained output. When entrepreneurs
discover that their firms have higher costs than the break-even point, they eventually
cease production and exit the industry (Jovanovic, 1982). Essentially, learning occurs as
the discovery of and reaction to the true efficiency level of the entrepreneur’s venture.

Taken together, these economic models assume that when entrepreneurs start their
ventures, they are naïve about their managerial abilities and the profitability of their firms
(Deakins & Freel, 1998). Only through building up enterprises as a “learning experiment”
(Cressy, 1996, p. 1257) could entrepreneurs learn about their efficiency level compared
to the industry average. As a result, they alter their behaviors to reflect industrial fluctuations (Audretsch & Acs, 1990). However, these models fail to account for entrepreneurs’ prior experience, knowledge, learning ability, and motivation, which could help them gain a better picture of their “true” efficiency level. It is unlikely that most entrepreneurs regard themselves as a random draw from the population efficiency level (Cressy, 1996). In fact, prior experience will greatly influence entrepreneurs’ self-awareness of cost, ability, and efficiency level (Deakins & Freel, 1998).

In sum, behaviorism allows a limited role of entrepreneurs. Many potentially influential personal characteristics, such as needs, motivations, values, knowledge, skills, and competencies, are largely discounted. Nevertheless, by highlighting antecedents, behavioral changes, and consequences of behaviors (Pinder, 1998), the behaviorist analysis offers a valuable starting point in understanding entrepreneurial learning.

**Cognitivist Perspective of Entrepreneurial Learning**

Scholars who approach entrepreneurial learning from a cognitivist tradition place a much greater emphasis on the entrepreneur’s mental capabilities. The entrepreneur’s cognition is viewed as a vital independent variable that is related to many important outcomes in the entrepreneurial process (Mitchell et al., 2004, 2007). The entrepreneur is no longer an “environmental dupe” (Schwandt, 2005), but an individual with free will and capacity to process information and produce knowledge.

To date, researchers interested in the cognitive abilities of entrepreneurs have explored a wide range of intriguing questions. One of the first inquiries along this line was whether entrepreneurs learn differently than other business people (Busenitz & Barney, 1997). Busenitz and Barney (1997) claimed that due to the ever-changing
environment and swift opportunities, entrepreneurs rarely have the time to draw on large random samples to reliably estimate customer demand, production costs, and other key aspects of the market. Instead, they have to generalize from a small, nonrandom sample (i.e., their own experience) as a decision-making shortcut (Katz, 1992). As a result, when learning, entrepreneurs manifest representativeness more extensively than managers in large organizations (Busenitz & Barney, 1997).

When learning is discussed in the context of entrepreneurship, the spotlight has been on opportunity recognition and exploitation (Rae, 2000). As such, the next major inquiry in the cognitive tradition concerns factors leading entrepreneurs to recognize opportunities and take action (Brockner, Higgins, & Low, 2004; Gaglio & Katz, 2001; Shane, 2000, 2001; Shane & Venkataraman, 2000; Venkataraman, 1997). Information is so crucial that entrepreneurs will discover only those opportunities related to their prior knowledge (Venkataraman, 1997). Similarly, available information increases the likelihood that people will exploit found opportunities (Shane & Venkataraman, 2000). Useful information could be gained from previous employment (Cooper, Woo, & Dunkelberg, 1989) and/or transferred from a prior engagement with similar opportunities (Carroll & Mosakowski, 1987). Shane’s (2000) study of eight entrepreneurs who responded to an invention revealed that prior knowledge about the market influenced discovery of which market to enter (or which opportunity to act on), whereas experience about how to serve the market informed choices of how to utilize the new technology. Finally, entrepreneurs’ prior knowledge of customer needs guided their discovery of products and services to exploit a new technology opportunity (Shane, 2000).
Besides information and knowledge, the mental framework guiding entrepreneurs to process information plays an equally important role. Gaglio and Katz (2001) proposed that people who possess entrepreneurial alertness are sensitive to change and market disequilibrium. They tend to respond to information that does not match their current cognitive schema by adjusting existing schemas to accommodate newly acquired information. Entrepreneurs with high alertness seek objective accuracy and complex information concerning the nature of change, the nature of specific industries, and their social environment. As a result of the adaptive mental framework, alert entrepreneurs are better able to learn about market opportunities (Gaglio & Katz, 2001). Additionally, regulatory focus is likely to have an impact on how individuals approach opportunities. When people are promotion focused, growth and advancement needs heighten the salience of potential gains, whereas when they are prevention focused, security and safety needs increase the salience of potential losses (Higgins, 1998). Therefore, a promotion focus is conducive to the recognition of entrepreneurial opportunities, while a prevention focus is necessary for the actual implementation of opportunities (Brockner et al., 2004).

One of the most recent interests in the cognitive domain addresses the distinguishing features associated with the content (Cope, 2005) and procedure (Politis, 2005) of entrepreneurial learning. In terms of the content dimension, Cope (2005) summarized five distinct areas of entrepreneurial learning: (1) oneself, (2) the entrepreneurial venture, (3) the environment and entrepreneurial networks, (4) small business management, and (5) the nature and management of relationships. Politis (2005) proposed that the learning process has two distinctive courses, exploitation or exploration, depending on how entrepreneurs transform their experience into knowledge. With an
exploitation strategy, entrepreneurs choose actions that replicate or are closely related to the ones they have already taken. In contrast, entrepreneurs with an exploration strategy choose new actions that are different from the ones that they have already taken, thus creating variations in their cognitive schemas (Politis, 2005).

Cognitive theorists explain the mental processes entrepreneurs use to make judgments and process information. In so doing, they advance our understanding of entrepreneurial learning by connecting environmental stimuli with the internal mental process of the entrepreneur. While giving a central role to the entrepreneur’s cognitive ability, the cognitive approach is constrained by its view of the entrepreneur as an “intellectual Robinson Crusoe” (Pavlica, Holman, & Thorpe, 1998, p. 131). Indeed, the entrepreneurial process is embedded in a cosmic of social, political, and economic contextual variables (Bird, 1988). Without considering the interrelation between the entrepreneurial context and the learning process, it is hard to render fruitful entrepreneurial learning research.

**Social Learning Perspective of Entrepreneurial Learning**

Social learning theorists emphasize that individuals’ knowledge is dependent on interaction with and observation of other people (Bandura, 1997; Schwandt, 2005). Individuality is developed and reflected in the social context via the formation of self-efficacy (Bandura, 1997). For example, having an entrepreneurial role model positively influences entrepreneurs’ learning (Boyd & Vozikis, 1994), in that by relating themselves to the role model, entrepreneurs can enhance their self-efficacy through vicarious experience (Wood & Bandura, 1989). The effect of observational learning through role models is evident in the findings that many entrepreneurs have parents who were self-
employed (Bowen & Hisrich, 1986; Scherer, Brodzinski, & Wiebe, 1990). Mentor relationships are another effective source of social learning (Boyd & Vozikis, 1994). Various functions of mentoring, such as sponsorship, coaching, access to challenging work assignments, and access to informal social networks, contribute to increase entrepreneurs’ self-efficacy (Kram, 1983).

Entrepreneurs use social networks to get advice and resources to launch a business (Greve & Salaff, 2003). One way to study the social element is to consider a network as a resource of individual learning (Szarka, 1990). Deakins and Freel (1998) argued that the level and sophistication of networks, both formal and informal, affect the quality of learning. When entrepreneurial learning is viewed as a process of coparticipation (Taylor & Thorpe, 2004), the influence of entrepreneurs’ personal networks on learning becomes crucial. For example, by conducting a series of in-depth interviews with a focal entrepreneur (Simon Jones), Taylor and Thorpe (2004) recaptured the conversation and negotiation between the entrepreneur and his personal contacts. These interviews later served as the material for constructing a social conversational model of learning, where the process of decision-making was explicitly and implicitly influenced by co-participation.

Another way to study the social context focuses on the collective learning effect in the entrepreneurial learning community. Deeds and Hill (1996) revealed that entrepreneurs could enhance their competitive advantage by forming a business alliance. Such an alliance often boosts information sharing and technology transfer within the learning community (Hendry, 1996). The thriving of the learning community, in turn,
contributes to a growing rate of new product development and shareholder wealth for new ventures (Park & Kim, 1997).

Social learning theorists have contributed to the entrepreneurial learning literature by accounting for the sociocultural context where the entrepreneurial process takes place. The social experience is heterogeneous in nature and is likely to have varied impacts on entrepreneurial learning. What social learning theorists fail to address is the variance in experience and different implications associated with daily routines and critical learning events. For example, a study of social learning showed that individuals who observe a low-performance parental role model also expect to pursue an entrepreneurial career, although their self-efficacy is lower than that of individuals who observe a high-performance parental role model (Scherer et al., 1990). Apparently, self-efficacy alone cannot explain all of the dynamics involved in various social experiences.

**Constructivist Perspective of Entrepreneurial Learning**

While exploring the behaviorist, cognitive, and social nature of entrepreneurial learning, scholars have identified events and learning episodes that are of special significance to entrepreneurs in the learning process (Cope, 2005; Deakins & Freel, 1998; Minniti & Bygrave, 2001; Taylor & Thorpe, 2004). The notion that critical learning events constitute catalysts for entrepreneurial learning is gaining momentum (Cope, 2003, 2005). To illustrate, in a study of organizational growth, Deakins and Freel (1998) found that most strategic development occurred generically rather than being neatly planned. Put differently, changes in strategies resulted from a combination of knowledge and reaction to critical events. Learning as an essential part of organizational evolution was rarely planned as well. Instead, it was “the result of a series of reactions to critical events
in which individuals learn to process information, adjust strategy, and make decisions” (Deakins & Freel, 1998, p. 146). In light of this growing trend, the social constructivist approach was incorporated into the study of entrepreneurial learning.

Social constructivists believe that the way individuals interpret and reinterpret these incidents is central to sensemaking and hence learning (Mezirow, 1991). For them, reality and knowledge are socially constructed (Berger & Luckmann, 1966), and therefore the first step of learning is to take a reflexive stance. Following the fundamental philosophy of constructivism, the growth and development of entrepreneurs is realized through their ability to critically inquire into the meaning of environmental cues and their own assumptions.

Cope (2003) presented an excellent qualitative meta-case study reflecting the constructivist tradition. He interviewed six entrepreneurs who encountered critical learning events and tried to understand their personal reflections during and after these events. Two particular cases were discussed in detail explaining how entrepreneurs analyzed and challenged previously held perceptions and assumptions and consequently reconstructed views about their organizations and their own identities. The first case described how Andrew, the founder of a small communication consulting company, reflected upon the interpersonal conflict he had with his employees and realized that his “theory-in-use” was responsible for a lack of necessary structure in the company. Andrew’s reflection triggered what Argyris and Schön (1978) called “double-loop” learning, which resulted in a restructuring of organizational norms and procedures in Andrew’s company. The second case emphasized the personal aspect of critical reflection. The entrepreneur concerned was Simon, a manager who had built a career in corporate
finance but made a fatal mistake that led to the bankruptcy of his venture. Reflecting upon one’s mistakes can be extremely painful, and in this case, even frightening (Cope, 2003). However, it often generates renewed understanding of oneself and moves entrepreneurs to reassess their orientation to perceiving, knowing, believing, feeling, and acting (Mezirow, 1990), which could ultimately alter the way they learn.

To summarize, research on entrepreneurial learning is growing increasingly diverse and specialized. A rare consensus among scholars from various traditions lies in the understanding that entrepreneurial learning is experiential in nature (Cope, 2003, 2005; Cope & Watts, 2000; Minniti & Bygrave, 2001; Politis, 2005; Rae & Carswell, 2000; Shane, 2000; Shane & Venkataraman, 2000; Taylor & Thorpe, 2004). Although the four perspectives have each offered considerable insights on many facets of entrepreneurial conduct and wealth creation (Harrison & Leitch, 1994), much research has been undertaken in parallel traditions without “cross-fertilization” (Harrison & Leitch, 2005, p. 352). It is fair to say that the field has not yet seen an overarching theoretical framework that guides our understanding of the interaction of learning and the entrepreneurial process (Deakins, 1999). In light of this gap in the literature, I intend to synthesize the literature into a coherent theme using experiential learning theory as an underlying framework.

**Entrepreneurial Learning Defined**

Before I define entrepreneurial learning, it is important to address some caveats within the existing body of research. First, although the potential learning effect of various types of experience (e.g., industry experience, management experience) has been well documented (see, for example, Shepherd, Douglas, & Shanley, 2000), the distinction
between experience and the knowledge produced as a result of experience is unclear (Politis, 2005). Furthermore, the concept of experience and that of experiential learning are often tangled. Experience itself does not suffice for learning; experience only provides the raw material for knowledge. Learning is the crucible that transforms experience into knowledge. Due to confusion among concepts of experience, experiential learning, and knowledge, the critical process of how entrepreneurs transform experience into entrepreneurial knowledge that subsequently contributes to entrepreneurial success remains obscure (Politis, 2005).

My primary objective is to elucidate this learning process in an entrepreneurial context. Experiential learning theory (ELT; Kayes, 2002; Kolb, 1984) is particularly relevant, for ELT delineates two basic dimensions of learning: the acquisition of experience and the transformation of acquired experience into knowledge. According to ELT, learning involves the interplay between the two. The first dimension requires individuals to resolve the tension between apprehension (concrete experience) and comprehension (abstract conceptualization). When individuals make sense of the environment through tangible, felt qualities of immediate experience, apprehension occurs. In contrast, when individuals grasp experience by interpreting it as meaningful symbols and place them within an abstract structure, comprehension occurs. The second dimension, where experience is then turned into knowledge, involves tension between intension (reflective observation) and extension (active experimentation). In the course of intention, individuals look inward to reflect upon their experiences, whereas in the process of extension individuals look outward to execute their ideas and interact with the external world (Kolb, 1984).
Rooted in the work of pragmatist philosophers (i.e., John Dewey and Kurt Lewin), who deemed the integration of theory and practice vital (Kolb, 1984), ELT is a practical theory that describes how people learn in real contexts beyond the classroom setting. Entrepreneurs rarely confine their learning to a classroom. Rather, successful entrepreneurs learn as they progress in an extremely hands-on entrepreneurial journey. There is a consensus among scholars and practitioners alike that “learning by doing” constitutes a distinguishing feature of entrepreneurs (Cope & Watts, 2000; Minniti & Bygrave, 2001). As McCall (2004) pointed out, “The primary source of learning to lead, to the extent that leadership can be learned, is experience” (p. 127). On-the-job work experience, specifically, is the most effective way for individuals to develop leadership (DeRue & Wellman, 2009). Consequently, ELT is not only consistent with understanding the relationship between learning and leadership in an entrepreneurial context, but it also precisely captures the entrepreneurial spirit of “trial and error.” It is on these grounds that I consider ELT a suitable theoretical framework to guide my investigation.

Applying ELT to study entrepreneurial learning is not without limitations. First and foremost, ELT extracts learners from their social, cultural, and historical context (Holman, Pavlica, & Thorpe, 1997; Kayes, 2002; Reynolds, 1997; Vince, 1998). Second, ELT does not adequately address the magnitude of uncertainty embedded in the entrepreneurial process (Cope, 2005). Third, ELT has largely ignored the unconscious aspects of learning, particularly defense mechanisms triggered by negative emotions (Vince, 1998). Finally, ELT makes no distinction between learning induced by continuous experience (i.e., routines) and critical events like failure (Cope, 2003). I intend to integrate a range of experience-based theories (e.g., social learning theory,
Bandura, 1997; transformative learning theory, Mezirow, 1991) to alleviate the
drawbacks of ELT in the entrepreneurial context and thus to better understand
entrepreneurial learning. Building on this body of research, I define entrepreneurial
learning as a dynamic process in which entrepreneurs acquire experience and further
transform that experience into entrepreneurial knowledge, skills, and competences.

Entrepreneurs are constantly immersed in streams of immediate experiences
(Gartner, 1989; Morris, Kuratko, Schindehutte, & Spivack, 2012; Reuber & Fischer,
1999; Reuber, Dyke, & Fisher, 1990). The entrepreneurial environment is so turbulent
that entrepreneurs rarely have time to theorize (Busenitz & Barney, 1997). Hence, I argue
that the dominant mode for entrepreneurs to acquire experience is apprehension.

Two concrete sources provide raw materials for the apprehension of experience:
personal involvement with the venture and direct observation of creating and growing a
new venture (Minniti & Bygrave, 2001; Reuber et al., 1990). These two sources do not
exist in exclusion of each other. In reality, most entrepreneurs rely on both during
different stages of their ventures, although the degree to which a particular source is
relied on varies. For example, during prestart, entrepreneurs gain industry experience via
previous employment in relevant industries (Cooper et al., 1989) as well as prior
engagements with comparable opportunities (Carroll & Mosakowski, 1987).
Entrepreneurs could also have been exposed to direct experience by observing role
models such as parents (Scherer et al., 1990) and mentors (Kram, 1983). After launching
a new venture, entrepreneurs’ own practices become their major source of experience.
Entrepreneurs could continue to gain valuable experience by observing their business
partners as well as competitors; interacting with investors, board advisors, and clients;
and actively participating in their learning communities (i.e., local networks) (Szarka, 1990).

Once entrepreneurs have acquired a “stock of experience” (Minniti & Bygrave, 2001), a transformational process involving the conversion of experience into practical wisdom must take place for learning to occur. The transformation consists of reflecting upon one’s vision and mental framework, actively seeking performance feedback and gathering information, and adjusting business strategy accordingly (Cannon & Edmondson, 2001). Deviating from Kolb (1984), who argued that individual preferences determine the adoption of either intention (reflective observation) or extension (active experimentation) as the dominant mode of transforming experience, I maintain that both intention and extension are needed in the process of transforming experience into entrepreneurial knowledge that subsequently contributes to venture success. In the learning experiment of creating and managing a venture, entrepreneurs learn the meaning of their concrete experiences by internally reflecting on the implications of these experiences, both to themselves and their venture. With insights gained and schemas developed, entrepreneurs act on the external environment to further extend their experience. I should note that although acquisition and transformation of experience are described as if they assume a sequential order, these two aspects of learning happen simultaneously. Moreover, rather than having acquisition and transformation as two independent entities, experience is continuously being created and recreated (Holmqvist, 2004).

Consider an entrepreneur’s experience of launching a marketing campaign to promote a new product. Once the campaign was launched, the entrepreneur would
continuously monitor and evaluate its process and outcome. If the campaign failed to realize a predefined marketing goal, the entrepreneur may ruminate on the frustration such failure caused and examine the loss his or her venture suffered. These reflections would lead the entrepreneur to reassess key aspects of his or her assumptions (Cope, 2003; Mezirow, 1990). Simultaneously, the entrepreneur may gather information on how and why the campaign failed and obtain feedback from followers in the research and development, production, and marketing departments as well as clients and external mentors; such information would help the entrepreneur generate a new understanding of the market and the product. The entrepreneur could then test his or her new understanding by using different marketing techniques in future campaigns. Should these updated campaigns fail, another learning circle would be initiated.

**Entrepreneurial Learning and Transformational Leadership**

Given the experiential nature of learning, there is broad agreement that learning is the primary mechanism through which leaders develop (Derue & Wellman, 2009; Kolb, 1984; Petriglieri, Wood, & Petriglieri, 2011). An increasing number of scholars have highlighted the link between identity development and leadership (Carroll & Levey, 2010; Day & Harrison, 2007; Derue & Ashford, 2010; Lord & Hall, 2005; Shamir & Eilam, 2005), and some have even argued that leadership development is essentially personal development (Petriglieri et al., 2011).

A starting point of personal development is becoming more aware of one’s self (Hall, 2004). The intension dimension of entrepreneurial learning, in which the entrepreneur internally reflects upon implications of failure experiences for both his venture and himself, renders an opportunity to examine one’s core beliefs, assumptions,
and ways of making sense of the world and self. In doing so, the entrepreneur develops a clearer vision. When exercising the extension dimension of entrepreneurial learning, the entrepreneur verbally and nonverbally communicates vision to followers and lays down plans for achieving that vision. While a clear vision provides a necessary condition for transformational leadership, effective vision delivery results in followers’ perception of the leader’s charisma (Awamleh & Gardner, 1999; Howell & Frost, 1989).

The foundation for the entrepreneur’s deep reflection and active experimentation comes from the entrepreneur’s concrete and observational experience of failure. The entrepreneur actively gathers information related to failure from various stakeholders, including followers. This active engagement provides a means for the entrepreneur to involve followers’ self-concept in the venture, which enhances followers’ self-worth by making them feel a part of something important (Shamir, House, & Arthur, 1993). According to Berson, Shamir, Avolio, and Propper (2001), incorporating followers’ self-concept in the tasks to be undertaken and enhancing their identification with challenges facing the organization is the inspirational influence unique to transformational leaders.

The feedback-gathering process involves two-way communication. When trying to pinpoint why and how failure occurred, the entrepreneur not only discusses prior mistakes with followers, but also takes in their suggestions and concerns. Consequently, the entrepreneur customizes his or her leadership behaviors to reflect an individualized consideration. This interactive communication allows the entrepreneurial leader to encourage followers to think about reasons for and solutions to the problems and therefore provides a form of intellectual stimulation for followers.
Taken together, these learning behaviors of entrepreneurs can be translated into dimensions of transformational leadership, namely, charisma, inspiration, individualized consideration, and intellectual stimulation. Consequently, I expect a positive relationship between entrepreneurial learning and transformational leadership.

**Failure**

An emerging literature suggests that individuals as well as organizations learn from their failure experiences. In this section, I systematically review the theoretical arguments and empirical findings regarding failure and its learning implications. I compare research at different levels and identify potential barriers to learning from failure. Finally, I focus on the psychological mechanisms underlying individual-level learning and propose moderators in the relationship between failure and learning. Key characteristics of organizational and individual-level failure are summarized in Table 2.3.

**Organizational-Level Research**

**Learning from an organization’s own failure.** Organizations are history-dependent systems that adapt to past experience (March & Simon, 1958), and failure is central to this adaptation and organizational change (Baum & Dahlin, 2007; Chuang & Baum, 2003; Madsen & Desai, 2010). The adaptation of organizations involves two distinct methods of searching for alternatives: exploration and exploitation (March, 1991). Based on positions relevant to their aspiration level, organizational outcomes are considered either successes or failures (March & Simon, 1958), and the organization’s
## Table 2.3
*Organizational- and Individual-Level Research on Learning from Failure*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Level of analysis</th>
<th>Level of analysis</th>
</tr>
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<tbody>
<tr>
<td><strong>Definition of failure</strong></td>
<td>Performance that falls significantly below an aspiration level or expected desired results (Cannon &amp; Edmondson, 2001; Cyert &amp; March, 1963; March &amp; Simon, 1958)</td>
<td>Events that deviate from expectations or “right solutions” and have negative impacts on the individual (Ellis &amp; Davidi, 2005; Morris &amp; Moore, 2000)</td>
</tr>
<tr>
<td><strong>Operationalization of failure</strong></td>
<td>Discontinuance of components in a nursing chain (Chuang &amp; Baum, 2004); the number of prior crashed space orbital launches (Madsen &amp; Desai, 2010); higher than historical average accident rate in a focal railroad (Baum &amp; Dahlin, 2007)</td>
<td>Business discontinuance due to legal problems, partnership dispute, death of initial funding member(s), or shift in interest (Bruno et al., 1992); bankruptcy of a business (Zacharakis et al., 1999); Discontinuance to operate under the current ownership or management (Shepherd, 2003).</td>
</tr>
<tr>
<td><strong>Impact of failure</strong></td>
<td>Improved performance (Chuang &amp; Baum, 2003); lower error rate (Baum &amp; Dahlin, 2007; Haunschild &amp; Rhee, 2004; Haunschild &amp; Sullivan, 2002); decreased possibility for future failure (Madsen &amp; Desai, 2010)</td>
<td>Improved performance (Morris &amp; Moore, 2000); expanded problem-solving repertoire (Ellis &amp; Davidi, 2005; Wong &amp; Weiner, 1981)</td>
</tr>
<tr>
<td><strong>Learning mechanism</strong></td>
<td>Learning from own organization: nonlocal or problematic search (Baum &amp; Dahlin, 2007; Madsen &amp; Desai, 2010); learning from other organizations: vicarious learning (Chuang &amp; Baum, 2003; Kim &amp; Miner, 2007)</td>
<td>Attribution search (Wong &amp; Weiner, 1981); self-focused upward counterfactual thinking (Morris &amp; Moore, 2000); enriching mental maps (Ellis &amp; Davidi, 2005)</td>
</tr>
<tr>
<td><strong>Boundary conditions</strong></td>
<td>Magnitude (Madsen &amp; Dasai, 2010; Sitkin, 1992); heterogeneity of failure (Haunschild &amp; Sullivan, 2002); volition (Haunschild &amp; Rhee, 2004); organizational complexity (Haunschild &amp; Sullivan, 2002); momentum (Chuang &amp; Baum, 2003)</td>
<td>Accountability (Morris &amp; Moore, 2000); outcome scale (Morris &amp; Moore, 2000); negative emotion (Shepherd, 2003)</td>
</tr>
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</table>
adaptation strategy is further determined by benchmarking the performance to the organization’s aspiration level (Cyert & March, 1963; March & Shapira, 1992). When an organization is performing near aspirations, lessons from earlier experiences are reinforced, current efforts continue without much change, and learning focuses on local search and minor adjustments of existing routines (Baum & Dahlin, 2007). When an organization is not performing near aspirations, an exploration strategy is triggered, which results in nonlocal search and larger changes with the potential to raise the organization’s performance closer to aspirations (Singh, 1986). Performance that is well below the aspiration level imposes higher urgency for the organization to explore new alternatives (Baum & Dahlin, 2007).

The organizational learning literature has categorized failure as poor performance that is significantly below aspiration level (Baum & Dahlin, 2007; Cannon & Edmondson, 2001; Chuang & Baum, 2003; Cyert & March, 1963; March & Simon, 1958). According to the aspiration level and performance feedback model (Baum & Dahlin, 2007; Cyert & March, 1963; March, 1991), failure upsets the status quo, draws attention to potential problems, and stimulates exploration of new practices and strategies rather than reinforcing or refining current ones (Baum & Dahlin, 2007; Chuang & Baum, 2003).

The notion that failures are “vital engines for change” (Chuang & Baum, 2003, p. 27) has received substantial empirical support. In their study of the naming strategy of nursing home chains, Chuang and Baum (2003) found that failure of a specific naming strategy decreased the use of the current strategy and increased the use of a different naming strategy, indicating learning and exploration. In Baum and Dahlin’s (2007) research on U.S. Class 1 freight railroad accidents, railroads performing far below social
accident aspirations in the prior year exhibited lower accident costs in the following year, confirming the idea that when a railroad’s performance was unsatisfactory, the organization implemented more extensive changes to improve its accident prevention (Baum & Dahlin, 2007). Haunschild and Rhee (2004) analyzed the data on automaker recalls in the U.S. between 1966 and 1999 and found that prior recall history (both voluntary and involuntary) reduced automakers’ future error rates.

In addition to the findings concerning an overall pattern of learning, a stream of qualitative research has emerged on how high-reliability organizations (HROs) learn from catastrophic failure (Madsen & Desai, 2010; Starbuck & Farjoun, 2005; Vaughan, 1996; Weick & Sutcliffe, 2001). HROs’ complex, interactive technologies, such as space shuttles, aircraft carriers, nuclear power generation plants, and air traffic control systems (Baum & Dahlin, 2007), make them especially vulnerable to catastrophic failure. Once failure does occur, the decision makers of HROs are under intense pressure to search for explanations and solutions. If they fail to do so, the decision makers will have to face intense scrutiny from shareholders, the media, and the general public (Baum & Dahlin, 2007). For this reason, the decision makers of HROs respond to failure with a learning strategy that is characterized by a sense of urgency that is rare in other forms of learning. This strategy consists of a search aiming to correct problems, challenge old assumptions, and rethink existing organizational practices (Madsen & Desai, 2010).

In general, data show that HROs improve substantially from their prior failure experiences. To illustrate, between 1983 and 1997, the subsequent accident rates of U.S. commercial airlines were negatively related to prior accidents (Haunschild & Sullivan, 2002). More recently, Madsen and Desai (2010) modeled the failure rates in the global
orbital launch industry and found that a focal organization’s past failure experience was significantly negatively related to its future failure likelihood. These authors further claimed that although most organizational knowledge depreciates over time (Arthur & Huntley, 2012; Epple, Argote, & Devadas, 2011), lessons learned from failure are better retained than knowledge gained from past success (Madsen & Desai, 2010).

Learning from other organizations’ failure. For many organizations, failures are infrequent (Weick, Sutcliffe, & Obstfeld, 1999), and thus the learning available from past failure is limited. Fortunately, organizations learn not only from their own experiences, but also from observation of others’ failure (Baum & Dahlin, 2007; Kim & Miner, 2007; Madsen & Desai, 2010). The failure experiences of other organizations have been shown to negatively correlate with the focal organization’s failure in various industries, including the global orbital launch industry (Madsen & Desai, 2010), railroad industry (Baum & Dahlin, 2007), and commercial banking industry (Kim & Miner, 2007). Observational learning is vital for creating organizational and system-level changes that benefit the focal organization. Research on HROs suggests that when exploration within the organization is costly, the organization should examine meaningful analogues, such as mistakes and failures of similar organizations (Weick et al., 1999). Building on this line of research, Baum and Dahlin (2007) proposed that organizations emphasize learning from their own experience (local search) when performance is near aspirations, and emphasize learning from others’ lessons (nonlocal search) when performance deviates from aspirations, especially when it falls significantly below aspirations.
The value of other organizations’ experience depends on their similarity with the target organization. Experience held by organizations in a common domain could produce reactions that are similar to direct failures (Madsen & Desai, 2010). Hence, the more similarity in the two organizations’ characteristics and situations, the greater relevance their experiences have to each other (Baum, Li, & Usher, 2000).

**Boundary conditions of organizational learning from failure.** No two failures are identical (Haunschild & Rhee, 2004), and neither are they of equal value in promoting organizational learning (Madsen & Desai, 2010). Researchers have speculated that the magnitude (Madsen & Desai, 2010; Sitkin, 1992) and diversity (Haunschild & Sullivan, 2002; Jehn, Northcraft, & Neale, 1999) of failure are likely to cause different learning. The most popular belief regarding the relationship between failure magnitude and the learning effect is the “small losses” hypothesis (Sitkin, 1992), which considers small failures to be ideal facilitators of organizational learning. In contrast, Madsen and Desai (2010) argued that organizations learn more substantially from severe failures than from minor failures, and they found empirical support from the global orbital launch industry. Haunschild and Sullivan’s (2002) investigation of U.S. commercial airlines demonstrated that heterogeneous failures are more conducive to learning than homogeneous ones. Building on prior work (Jehn et al., 1999), Haunschild and Sullivan (2002) articulated three main advantages associated with failure heterogeneity: it leads to deeper analysis of the problem, promotes a situational approach rather than simply blaming the operator, and creates constructive conflicts in groups.

The degree of volition in an organization’s reaction to failure is also likely to make a difference (Haunschild & Rhee, 2004; Marcus & Nichols, 1999). Haunschild and
Rhee (2004) contended that the voluntary nature of learning is crucial in creating changes that are permanently retained in organizational routines and better accepted by organizational members. Mandates or changes imposed externally may provoke a defensive response and result in only surface compliance. Consistent with this reasoning, Haunschild and Rhee (2004) found that voluntary recalls resulted in better learning than mandated ones, when learning was viewed as reduction in subsequent involuntary recalls. Earlier research on nuclear power plants also showed that when solutions to problems were internally developed and voluntarily adopted, plants were better able to improve safety (Marcus & Nichols, 1999).

Aside from the nature of failure and the change it generates, organizational characteristics play an equally important role. Many researchers have challenged the assumption that organizations of all kinds learn equally from failure (Cannon & Edmondson, 2001; Chuang & Baum, 2003; Haunschild & Sullivan, 2002). Haunschild and Sullivan (2002) suggested that organizational complexity might dampen learning from heterogeneous failure experiences, since the organization has already been overloaded with diverse information. Organizational momentum, as another example, is found to be a significant obstacle to organizational learning (Chuang & Baum, 2003). Organizations share a tendency to maintain the direction and to persist with prior choices and actions in current practices, despite evidence of unsatisfactory results (Miller & Freisen, 1980). Moreover, the more an organization engages in a particular strategy, the more that strategy becomes institutionalized, constituting an organizational momentum against any challenges or changes to the status quo (Chuang & Baum, 2003). A possible mitigation to organizational-level barriers comes from a supportive context within groups...
(Cannon & Edmondson, 2001). In particular, group members share certain learning-oriented beliefs such as how to respond to mistakes, unexpected events, and conflicts. Cannon and Edmondson (2001) found that groups that tolerated and openly discussed failure perform better over time than those who covered up failure.

**Individual-Level Research**

Individual-level research on learning from failure focuses on the psychological reactions triggered by personal failures. A few mechanisms have been recognized: self-focused upward counterfactual thinking (Morris & Moore, 2000), attributional search (Wong & Weiner, 1981), and the enrichment of mental maps (Ellis & Davidi, 2005).

**Learning by imagining: Self-focused upward counterfactual thinking.** When a failure is fatal (e.g., an airplane crush), the impact of failure on individuals cannot be identified, since no survivors can provide information. Hence, alternative methods need to be employed to probe into the individual’s mind. Morris and Moore’s (2000) study of “close calls” in an aviation setting provided intriguing findings regarding how failure induced learning from “imagination” (p. 738). Cognitive and social psychology research indicates that counterfactual thoughts are most frequently provoked by unexpected and negative outcomes (Roese & Olson, 1997; Williams & Lees-haley, 1996). Morris and Moore (2000) argued that failures and accidents, while causing both surprise and frustration to individuals, could induce counterfactual thinking. Furthermore, among the four types of counterfactual thinking—upward, downward, self-focused, and external-focused—one combination (upward, self-focused) is especially conducive to learning. Defining learning as “performance-promoting lessons” (Morris & Moore, 2000, p. 739), these authors contended that upward counterfactual comparisons help people draw useful
lessons for future reference by focusing on a factor that has causal potency to make the
difference between the actual outcome and a better one (Roese & Olson, 1997).
Particularly for those self-focused thoughts, there is a direct link between the focal factor
and a behavioral intention to improve performance (Morris & Moore, 2000). Using both
archival data of pilots’ reflection over actual close-calls reports and experimental results
from college students’ reflection on simulated flights, Morris and Moore (2000)
demonstrated that the degree of future action improvement was significantly higher in the
presence of self-focused upward counterfactual thinking, confirming that self-focused
upward counterfactual thinking is a mechanism for learning, more so than other types of
counterfactual thinking.

Learning by asking “why”: Attributional search. In addition to pondering
“what I could have done differently” (Morris & Moore, 2000), another common reaction
to failure is to ask oneself, “Why did I fail in the first place?” (Weiner, 1985; Wong &
(unexpected events) and frustration (failure to attain a certain goal) give rise to an
attributional search. Individuals carry with them sets of beliefs, schemas, or hypotheses to
interpret how various causes and effects are related (Kelley & Michela, 1980). An
attributional search will take place when one’s experiences cannot be readily assimilated
into one’s existing belief system (Wong & Weiner, 1981). The law of effect indicates that
organisms are motivated to terminate or prevent a negative state of affairs, and effective
coping depends on locating the causes of failure and eliminating that behavior. Hence,
To validate these hypotheses, Wong and Weiner (1981) conducted five experiments using a variety of reporting techniques, including self-rating, self-coding, and information seeking. Their experiments provided consistent results supporting the idea that failure and unexpected outcomes promote an attributional search. Intriguingly, they also found that the attributional focus after failure was toward internal and controllable causes, which is in contrast to traditional findings of research on self-serving attributions (Miller & Ross, 1975). These findings suggest that when individuals personally reflect upon their failures, the mechanism might be different than when they offer public explanations (Wong & Weiner, 1981).

**Learning by enriching mental maps: Hypothesis generation and validation.** Individuals carry with them mental models to interpret the world (Kelley & Michela, 1980). The concept of mental models covers a range of similar ideas of individual knowledge structures, including belief structures (Fiske & Taylor, 1991), cognitive maps (Weick & Bougon, 1986), and schemas (Neisser, 1976). Ellis and Davidi (2005) asserted that the creation of mental models starts with generating and then testing hypotheses. In particular, individuals tend to generate new hypotheses when they encounter unexpected problems, when their acts are frustrated, or when there is a notable failure. Furthermore, failure leads individuals to switch their information processing from an automatic to conscious mode, where cognitive activities are characterized by awareness, attention, active information gathering, and reflection (Louis & Sutton, 1991). In the conscious mode, people invest time and effort in deepening their understanding of the problems they are facing. As a result, the number of constructs representing objects or phenomena increases and the potential connections among constructs expand. To the
extent that the complexity and extensiveness of one’s mental model reflects the depth and breadth of knowledge (Evans, 1988), failure helps individuals learn by discovering new variables and recognizing causal relationships between old and new constructs. This process of discovery and exploration, as Ellis and Davidi (2005) viewed it, is a course of generating hypotheses and validating them through experiments. In direct support of the arguments above, Ellis and Davidi (2005) found that a group of Israeli soldiers who just experienced failed assignments had mental maps richer in constructs and links than the group with successful events.

**Boundary conditions of individual learning from failure.** Morris and Moore (2000) found that the scale of outcomes made a significant difference in the overall rate with which counterfactual thinking was evoked. Pilots who experienced more severe incidents demonstrated a significantly higher rate of counterfactual thinking than the group with less severe incidents. However, these authors did not point out a threshold in the scale of failure for learning to take place.

Lerner and Tetlock (1999) suggested that accountability to hierarchical supervisors has an impact on individuals’ information processing strategy and thus the way they draw lessons from failure. Morris and Moore (2000) further presented two reasons why accountability influences the likelihood that an individual will apply self-focused upward counterfactual thinking. For one, self-focused upward counterfactual comparison is critical and implicating to oneself. Essentially, it admits the existence of a better action than the one that was taken, or even worse, it indicates a certain level of culpability of the person in charge. Second, this type of counterfactual thinking requires a complex cognitive process that is less likely to be generated under a threatening authority.
power. When individuals are faced with audiences with known views or power, a defensive information processing strategy dominates. Both field and experimental data from Morris and Moore (2000) supported their hypothesis that individuals are less likely to utilize an effective learning strategy when operating under the condition of accountability to organizational authorities.

Finally, Shepherd (2003) noted that negative emotion interferes with one’s ability to learn from failure. In the context of entrepreneurship, business failure involves an involuntary change in both the ownership and management of the business owing to poor performance. For individuals who owned or managed a business, failure represents a personal loss that will generate a particular negative emotional response: grief. Since negative emotions interfere with individuals’ allocation of attention in information processing (Mogg, Mathews, Bird, & Macgregor-Morris, 1990), grief causes attention to be focused on the personally salient moments of loss rather than the key antecedents of those moments, thus losing sight of the valuable feedback a business failure is able to provide. Consequently, Shepherd (2003) suggested that the level of grief moderates the relationship between feedback information and the amount of self-employment knowledge learned from business failure. There are two coping strategies for grief recovery: loss orientation, or directly facing and working through the negative emotions, and restoration orientation, or suppressing feelings of loss and carrying on with one’s life. Shepherd proposed that oscillation between the two coping strategies enables an entrepreneur to obtain the benefits of both and results in a speedier recovery. Eventually, one who employs effective regulating mechanisms learns more from business failure.
Comparing Research at the Organizational and Individual Levels

Research at the organizational level has provided compelling evidence that organizations exhibit a learning curve over their own and others’ failure experience. The impact of failure has been measured as improvement in strategy selection and implementation (Chuang & Baum, 2003), decrease in error or accident rate (Baum & Dahlin, 2007; Haunschild & Rhee, 2004; Haunschild & Sullivan, 2002), and decrease in future failure likelihood (Madsen & Desai, 2010). Since most studies relied on historical data and mathematical modeling, organizational researchers were not able to observe an organization’s reactions or learning behaviors directly (Baum & Dahlin, 2007; Haunschild & Rhee, 2004; Madsen & Desai, 2010). Although results have been consistent with what organizational scholars have theorized, they can at best offer post hoc explanations, while leaving the underlying learning mechanism unexamined. Organizational scholars have thus been calling for more research into the mechanisms by which organizations deal with and learn from failure (Madsen & Desai, 2010).

Individual-level research, on the other hand, places a much heavier emphasis on the psychological reactions of the focal individual. Investigation of the impact of failure seems to be focused on the process of knowledge acquisition, storage, retrieval, and transfer. The impact of failure has thus been conceptualized as improved future performance (Morris & Moore, 2000) and an expanded problem-solving repertoire (Ellis & Davidi, 2005; Wong & Weiner, 1981).

In addition to the distinct focus on organizational performance versus individual growth, organizational research and individual-level research diverge in their emphasis on observational learning. In the organizational literature, a large number of studies have
addressed learning from others’ failure, whereas at the individual level, empirical evidence is sparse despite a solid conceptual foundation laid out by social learning theory. One possible explanation for such difference has to do with a necessary condition of observational learning: accessibility of information (Baum & Dahlin, 2007). Failures at the organizational level often are salient and well-publicized events (Ingram & Baum, 1997), such as the recent catastrophic failures in Japanese nuclear power plants. Organizations are under public scrutiny to reveal key information regarding their failures. In addition, organizations are less protective about the knowledge deduced from failures, since such knowledge is normally not considered intellectual property or competitive advantage (Madsen & Desai, 2010). It is therefore possible for organizations with insufficient failure experience to turn to others’ failures for clues about the causes of their own problems (Baum & Dahlin, 2007).

In contrast, failures at the individual level are private and are less susceptible to public scrutiny. Moreover, individuals may feel shameful or guilty (Shepherd, 2003; Weiner, 1985) and be reluctant to talk about their failures and mistakes. With information about failure concealed, it is difficult for others to access it and learn from it. This points to another distinction between individuals and organizations: individual learning from failure is subject to the influence of one’s emotions (Shepherd, 2003), whereas organizations are exempt from such complexity. The emotional aspect of individual learning is discussed in depth later in this chapter.

Despite the aforementioned differences, organizational- and individual-level research converges in two important aspects. First, there seems to be general agreement among scholars in defining failure as an outcome that deviates from certain expectations,
be it aspirations or a set of right solutions (Cannon & Edmondson, 2001; Cyert & March, 1963; Ellis & Davidi, 2005; March & Simon, 1958; Morris & Moore, 2000). Organizations or individuals start with a standard (although this standard is subject to modification), with which they constantly compare outcomes, and the feedback generated by such comparison provides important messages for learning. Second, the strategy or process of exploration emerges as an overarching theme of the learning mechanism.

Scholars have learned that in organizations, failure upsets the status quo, draws the decision makers’ attention to potential problems, and stimulates exploration of new strategies (Baum & Dahlin, 2007; Chuang & Baum, 2003). For individuals, failure promotes critical reflection and self-questioning and leads to information gathering and validating (Ellis & Davidi, 2005; P. T. Wong & Weiner, 1981). What these two sets of reactions have in common is an active effort to sort out existing assumptions that are no longer effective and to explore new possibilities that increase the variance in a problem-solving repertoire.

**Entrepreneurial Failure Defined**

Based on both the organizational and individual-level research, the most straightforward definition of failure in an entrepreneurial context is the bankruptcy and insolvency of a venture (e.g., Zacharakis, Meyer, & DeCastro, 1999). However, other scholars argue that the concept of failure is broader than bankruptcy or insolvency (Cannon & Edmondson, 2001; Singh, Corner, & Pavlovich, 2007). General conceptualizations of failure include the termination of an initiative that has fallen short of its goals (R. G. McGrath, 1999), performance that falls below the aspiration level (Cyert & March, 1963), and deviation from expected and desired results (Cannon &
Edmondson, 2001), encompassing both avoidable errors and unavoidable negative outcomes of experimenting and risk-taking. Still others attempted to define failure while incorporating the causes of it. For example, Bruno, Mcquarrie, and Torgrimson (1992) defined failure as business discontinuance due to legal problems, partnership dispute, death of an initial funding member, or a shift in interest to carry on with the same business. More recently, Shepherd (2003) pointed out financial difficulty as an important reason for business failure. He stated, “Failure occurs when a fall in revenues and/or a rise in expenses are of such a magnitude that the firm becomes insolvent and is unable to attract new debt or equity funding; consequently it cannot continue to operate under the current ownership” (2003, p. 318).

The entrepreneurial journey is “riddled with interrupted plans, unexpected obstacles, conflicting goals, and unattainable aspirations” (Morris, Kuratko, Schindehutte, & Spivack, 2012, p. 21). From a learning perspective, both minor mistakes and major mishaps could offer valuable lessons. Consequently, for the present research, I used Cannon and Edmondson’s (2001) definition of failure as deviation from expected and desired results, including both avoidable errors and unavoidable negative outcomes of entrepreneurial activities. While a variety of reasons for such deviation have been discussed in the literature, including legal problems, partnership dispute, the withdrawal or death of a founding partner (Bruno et al., 1992), financial difficulty, lack of relevant experience (Shepherd, 2003), and simply a shift of interest (Singh et al., 2007), I do not consider a shift in the entrepreneur’s interest to be a form of business failure, for it does not imply an inability to meet initial expectations.
Learning from Failure

The vast literature on failure suggests that the learning implication of failure is both motivational and informational. As Madsen and Desai (2010) aptly stated, failure promotes learning because it facilitates two necessary conditions of learning: “the motivation to alert knowledge and ability to extract meaningful knowledge from experience” (p. 454). With the lens of ELT, failure is conducive to learning by providing the source of critical experience and promoting the transformation of that experience.

On the one hand, failure motivates individuals to reflect upon the attributes of an event and their own actions and emotions during the incident. Individuals are urged to ponder their personal failures by asking themselves, “Why did I fail?” (Wong & Weiner, 1981) and “What could I have done better?” (Morris & Moore, 2000). In either case, failure leads individuals to question their taken-for-granted beliefs and assumptions and reframe their appreciation of the situation (Argyris & Schön, 1978; Ellis & Davidi, 2005). For entrepreneurs, an essential feature of crises is their capacity to stimulate deep reflection, which is instrumental in generating higher-level learning from these experiences (Cope, 2003).

On the other hand, failure provides a roadmap, showing why previously learned responses and habitual ways of behaving are ineffective (Marsick & Watkins, 1990). With the guidance of this roadmap, individuals can actively search for information and seek feedback about the failure experience. This information or feedback then helps individuals experiment with new ways of doing things and increase the variance in their decision-making algorithms, which together signify a shift into the exploration mode of solution search (Minniti & Bygrave, 2001). In the exploration mode, individuals strive to
deepen their understanding of the nature of the problem and the environment where the problem is situated. As a result, individuals gain knowledge about new variables and recognize causal relationships between old and new constructs (Ellis & Davidi, 2005). In the entrepreneurial context, an experience of failure helps the entrepreneur pinpoint why and how failure occurred (Sitkin, 1992) and discover uncertainties that were previously unpredictable (R. G. McGrath, 1999). Politis (2005) thus concluded that prior failure expands the entrepreneur’s knowledge base by reducing uncertainty, increasing variety, and expanding the search for new opportunities.

Accounting for all the learning implications of failure demonstrated in the literature, there should be a positive relationship between failure experience and entrepreneurial learning. Failure experience does not play a direct role in all four dimensions of transformational leadership, but it motivates and facilitates the learning that makes a leader transformational. Thus, the entrepreneur’s learning behaviors should mediate the effect of his or her failure experience on transformational leadership. Accordingly, I hypothesize a full mediation effect of entrepreneurial learning, as depicted in Figure 2.2.

\[ H2. \text{The positive relationship between the entrepreneur’s failure experience and his or her transformational leadership is fully mediated by entrepreneurial learning.} \]

![Figure 2.2. Hypothesis 2 regarding the mediation effect of learning.](image)

H2 (+)
**Emotional intelligence.** As briefly mentioned earlier in this section, an individual’s learning from failure is “not automatic or instantaneous” (Shepherd, 2003, p. 319); rather, it is complicated by emotions. In fact, intrapersonal psychological factors create a dilemma for learning, which, unless effectively managed, presents a significant obstacle for individuals to learn from failure (Cannon & Edmondson, 2001).

Because of the substantial financial and personal resources devoted to found, nurture, and develop a venture, entrepreneurs are personally identified with their business. Their business is of such personal significance that it could be compared to a child (Melissa S. Cardon, Zietsma, Saparito, Matherne, & Davis, 2005). Therefore, business failure represents a form of personal loss that could generate negative emotional responses (Shepherd, 2003). Shepherd (2003) argued that the failure of a business has the emotional intensity of the death of a loved one, and entrepreneurs who experience failure are subject to a specific form of negative emotion—grief. Through in-depth interviews with five entrepreneurs who had recently experienced a business failure, Singh, Corner, and Pavlovich (2007) found that besides grief, interviewees experienced negative emotions such as guilt, frustration, anger, and depression.

Emotion is an indispensable piece in the learning puzzle (Vince, 1998, 2001). The onset of a learning process is often characterized by anxiety, fear, and doubt (Vince, 1998). These negative emotions tend to trigger a defensive reaction (Bion, 1961), either fight (taking a hostile stance toward the difficult situation) or flight (running away from difficult emotions). Individuals involved in a defensive reaction move in the direction of “willing ignorance” (Vince & Martin, 1993, p. 210), meaning that they develop avoidance strategies and search for information for self-justification. Although “willing
ignorance” might be an effective means to maintain self-esteem and thus protect one against the threat of self-destruction (Vince, 1998), it is detrimental to learning, especially higher-level learning that failure entails.

As individuals proceed further into the learning process, emotion and affect play a dual role in impacting what and how they think (Morris, Kuratko, Schindehutte, & Spivack, 2012). Baron (2008) articulated two influences of affect on entrepreneurs’ cognition that are particularly pertinent to learning from failure. First, individuals experiencing positive affect tend to be more creative than those experiencing negative affect; thus, the former are better able to connect informational “dots” in a complex and ambiguous situation such as business failure. Second, positive affect encourages use of more effective coping strategies, such as direct efforts to address problems, whereas negative affect enhances preferences for less effective strategies such as withdrawal, denial, or even reliance on substances.

Since emotions can take learning in two directions, either discouraging learning or promoting it, an entrepreneur’s ability to master emotions will determine the effectiveness of his or her learning from failure. Hence, an important individual difference, emotional intelligence (EI), is likely to moderate the relationship between failure experience and entrepreneurial learning. Mayer and colleagues (Mayer et al., 2004; Salovey & Mayer, 1990) defined EI as the capability to accurately perceive emotions and access and generate emotions so as to assist thought, to understand emotions, and to reflectively regulate emotions so as to promote personal growth. In short, EI indicates the extent to which individuals’ cognitive capabilities are informed by emotions and the extent to which emotions are cognitively managed (George, 2000).
EI consists of four interrelated abilities: understanding and expressing one’s own emotions, managing and regulating one’s emotions, perceiving and understanding the emotions of others, and channeling one’s emotions toward constructive activities that facilitate performance. The critical role of EI has received empirical support from various learning contexts, including school children’s academic performance (Parker, Summerfeldt, Hogan, & Majeski, 2004) and individuals’ moving forward from project failure (Shepherd, Patzelt, & Wolfe, 2011). Therefore, I advance the following hypothesis, as depicted in Figure 2.3:

\[
H3. \text{The entrepreneur’s EI positively moderates the relationship between failure experience and entrepreneurial learning, so that the higher the EI, the stronger the relationship.}
\]

\[\text{Figure 2.3. Hypothesis 3 regarding the moderation effect of emotional intelligence.}\]

\textbf{Learning goal orientation.} Another reason why learning from failure is not universal is that emotional responses to failure vary across individuals with different goal orientations. Dweck and colleagues referred to goal orientation as the cognitive framework that defines individuals’ appraisal and reaction to an event (Dweck, 1986; Elliott & Dweck, 1988; Heyman & Dweck, 1992). According to affective event theory
(Weiss & Cropanzano, 1996), failure is subject to appraisal, which results in the experience of emotions. Integrating cognition with emotion, Weiss and Cropanzano (1996) advocated a two-stage appraisal process. Appraisal begins with evaluating an event for its relevance to one’s personal set of goals in simple positive or negative terms. The initial appraisal then leads to more specific interpretation, focusing on the focal event’s consequences attributions and available options to cope with failure. The relevance of an event is determined by goal relevance, the extent to which it touches on personal desires or concerns (Lazarus, 1991). The positive or negative emotional valence of an event is later evaluated against goal congruence, whether the event is consistent (beneficial) or inconsistent (harmful) with one’s desires and concerns. In addition, the intensity of the emotions associated with an event is closely tied to the importance or desirability of the goals.

Depending on the personal goals, events of similar characteristics could eventuate in the experience of different emotions, or emotions with different intensity, due to varied appraisal processes. In the situation of learning from failure, individuals’ learning goals are of particular relevance. Learning goal orientation (LGO) refers to the desire to understand something new or to improve one’s level of competence in a given activity (Button et al., 1996; Elliott & Dweck, 1988; Heyman & Dweck, 1992; Payne, Youngcourt, & Beaubien, 2007). When individuals are learning goal oriented, they strive to increase their ability. They tend to view failure as an event that is diagnostic and provides valuable feedback for developing their competencies. Since individuals with LGO tend to believe their ability can be improved (Chen & Mathieu, 2008), failure does not represent a fixed hopeless state but motivates them to engage in learning activities to
bridge the gap between their current level of ability and that required to reach desired outcomes. In other words, if an individual is learning goal oriented, the negative valence of failure is partially offset by its motivational and informational value. Individuals with higher LGO are expected to be less anxious about the end result and focus on mastery of the task. As a result, when presented with failure and obstacles, individuals with higher LGO are able to maintain higher levels of self-efficacy and develop more effective learning strategies (Chen & Mathieu, 2008).

Early empirical research supported these considerations. In an experimental study with school children, Elliot and Dweck (1988) found that with salient learning goals, participants actively sought challenging tasks despite public errors, and as a result, their problem-solving strategies became more sophisticated. Similarly, Button, Mathieu, and Zajac (1996) found that when individuals’ LGO were heightened, they felt challenged by failure but continued to strive for improvement despite the negative feedback that accompanied difficult or novel tasks (LePine, 2005).

In summary, individual difference in LGO has a profound impact on individuals’ appraisal of failure experience and the emotional response following that appraisal, which in turn influences the effectiveness of learning from failure. Additionally, as the intensity of affect is determined by the desirability or importance of goals (Weiss & Cropanzano, 1996), the strength of an individual’s learning goal orientation should predict its impact on learning from failure. Based on theoretical grounds and empirical findings, I advance the following hypothesis, as presented in Figure 2.4:
**H4.** LGO positively moderates the relationship between failure experience and entrepreneurial learning, so that the stronger the LGO, the stronger the relationship.

![Diagram](image)

*Figure 2.4.* Hypothesis 4 regarding the moderation effect of learning goal orientation.

**Conclusion**

The goal of chapter 2 was to establish a solid theoretical foundation for the present study. The chapter began by establishing the significance of transformational leadership in the entrepreneurial context. It then systematically reviewed the major theoretical approaches of entrepreneurial learning. These reviews supported a relationship between failure experience and leadership as well as among failure, learning and transformational leadership. In reviewing the theories and empirical findings on learning from failure, two moderators were identified: EI and LGO. Hypotheses were developed to predict the relationships between failure, entrepreneurial learning, and transformational leadership, as well as the moderating mechanisms involved. Having built the theoretical model, chapter 3 provides the research methodology for empirically testing this model.
CHAPTER 3:
METHODOLOGY

This chapter details the methodology employed for testing the model. I begin with a discussion of the sample and the procedure to be used to recruit subjects and collect the data. I then present measures for the variables in the theoretical model and the analytical strategy to test the hypotheses set forth in chapter 2.

Sample and Participant Recruitment

Small and medium-sized enterprises (SMEs) in the information technology (IT) industry (Standard Industrial Classification Code: 7371–7379) comprised the population for this study. IT SMEs are appropriate for testing my hypotheses because the IT industry is adjusting rapidly to economic globalization and technology innovation, which bring significant challenges to SMEs. Scholars have also identified the need for learning in the IT industry due to its high rate of change (Bingham & Davis, 2012; Davis & Eisenhardt, 2011). Moreover, focusing on one industry exclusively allowed control for unobserved heterogeneity across industrial sectors.

According to the U.S. Small Business Administration, firms with less than 500 employees are considered SMEs. Since I collected data from the CEO and two direct reports, firms had to have at least three employees to be eligible for participation. As leadership has been shown to be most critical for firms in their post-launch period—typically 18 months to 6 years after launch (R. A. Baron, 2007)—this study targeted SMEs established between 2006 and 2010. Data were collected in the United States and Finland, where ample technology-based firms are available and the IT industries are of
similar maturity (Bingham & Davis, 2012). In both countries, a random sample of 500 companies with 3 to 499 employees was drawn from all eligible firms listed in comprehensive commercial databases (Dun & Bradstreet in the United States and Fonecta in Finland). The surveys were presented to the Finnish participants in their native language after using a back-translation procedure from English to Finnish, and then from Finnish to English (Brislin, 1980).

Participants were sought from the CEOs of the targeted firms and those CEOs’ direct reports. Individual contact information for the CEOs was obtained from the two aforementioned commercial databases. Data collection in Finland was administered using a Web-based survey. Data collection in the United States employed a tailored mail survey design (Dillman, 2007), since mail surveys there have been shown to have a significantly higher response rate than Web-based surveys, especially with multiple contacts (Kwak & Radler, 2002). CEOs were contacted with (a) a cover letter explaining the purpose of the study and (b) a hard copy of the questionnaire with a business reply envelope (in the United States) or a link to the Web-based survey (in Finland). The focal CEO questionnaire collected information on the control variables, independent variable, and moderators. Once CEOs’ replies were received, they were contacted again and asked to invite two direct reports to participate. The mediator and dependent variable were assessed via a separate survey sent to direct reports. Assessing independent variables and dependent variables using different sources enables researchers to alleviate common-source bias and to minimize social desirability bias (Morrison & Phelps, 1999).

As an incentive for participation, the CEOs received a $5 Starbucks card (in the United States) or an entry to a lottery for one of two iPads (in Finland). Up to three
reminders were sent out at a 2-week interval. Finally, all of the nonrespondents in both countries were contacted by phone and asked to complete the survey. Nonrespondents in the United States were also given the opportunity to participate via a Web-based survey, if they so preferred.

Thirty-three packages and 14 emails were not delivered due to nonexisting recipients or false addresses. During the telephone follow-up, 29 companies were found to have undergone changes of CEO. These attritions reduced the sample size to 924. Eleven CEOs indicated that they preferred not to participate in the study, through either an email response or by returning a blank questionnaire. By the end of October 2012, 196 CEOs had responded to the survey, rendering a response rate of 21.21%. A total of 211 managers provided evaluations of their CEOs. On average, direct reports responded 3 weeks later than their CEOs. However, since there was no information about whether or not a CEO had distributed the packages to two direct reports, the response rate of managers could not be determined. After matching the CEOs’ response with that of their direct reports, 130 pairs were obtained. Listwise deletion of missing data rendered a final sample size of 125.

Sample characteristics are described in Table 3.1. Since data collection took place in two countries, a series of independent sample t tests was conducted to detect possible between-group differences on demographic variables. Results indicated that there was no significant difference between the respondents from these two sites except for education level (see Table 3.1). I decided to combine the two sets of data, since the effect of education would be controlled for in all subsequent analyses. In addition, a dummy variable was created (1 = United States; 2 = Finland) before the two samples were merged,
so that unobservable differences could be controlled for. Most (73.26%) of the CEOs were also the founders of their current companies. They had an average age of 45.36 years (\(s.d. = 9.01\)) and 19.06 years of industry experience (\(s.d. = 8.96\)). CEOs were predominantly male (93.58%) and often had at least a university degree (68.3%).

Table 3.1
CEO Sample Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Overall mean</th>
<th>United States</th>
<th>Finland</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>45.36 (9.01)</td>
<td>46.99 (9.24)</td>
<td>44.38 (8.77)</td>
<td>1.92</td>
<td>.06</td>
</tr>
<tr>
<td><strong>Gender: Male</strong></td>
<td>93.58%</td>
<td>94.29%</td>
<td>93.16%</td>
<td>-.30</td>
<td>.76</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>6.42%</td>
<td>5.71%</td>
<td>6.84%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Education: university degree or higher</strong></td>
<td>68.30%</td>
<td>88.57%</td>
<td>57.94%</td>
<td>5.24</td>
<td>.00</td>
</tr>
<tr>
<td><strong>Industry experience</strong></td>
<td>19.06 (8.96)</td>
<td>20.38 (9.47)</td>
<td>18.29 (8.59)</td>
<td>1.64</td>
<td>.10</td>
</tr>
<tr>
<td><strong>Venture experience: No. of businesses founded and remain operating</strong></td>
<td>1.78 (2.00)</td>
<td>1.59 (1.25)</td>
<td>1.81 (2.08)</td>
<td>.84</td>
<td>.40</td>
</tr>
<tr>
<td><strong>Founding status: Percentage of founders</strong></td>
<td>73.26%</td>
<td>72.86%</td>
<td>73.50%</td>
<td>.10</td>
<td>.92</td>
</tr>
</tbody>
</table>

*Note:* Numbers in parentheses are standard deviations.

The CEOs’ direct reports were younger, with an average age of 39.98 years (\(s.d. = 9.48\)) but with a similar education level (61% had a university degree or higher). About a quarter (26.19%) of the managers were female. On average, direct reports had been working with their CEOs for 6.11 years (\(s.d. = 5.21\)), and the majority of them (71.4%) interacted with their CEOs on a daily basis. Based on this evidence, these managers were in a good position to evaluate the CEOs’ learning and transformational leadership behaviors. The average participating company was small,\(^1\) with 43.16 employees (\(s.d. = 65.60\)) and $6.17 million in gross revenue in the year 2011.

\(^1\)According to the standard of the World Bank Group, SMEs are categorized as follows: micro enterprises: 1–9 employees; small: 10–49 employees; and medium: 50–249 employees.

\(^2\)Following the definitions of previous research (Hambrick & Mason, 1984), in this study, I considered
All surveys were completed on a voluntary and anonymous basis. Social desirability bias was mitigated by ensuring respondents that no individuals would be identified with their responses. To alleviate common-source bias, data were collected from two sources. The CEOs self-reported study variables including failure experience, learning behaviors, emotional intelligence, and learning goal orientation; control variables such as demographics, personality, industry experience, and venture experience. Direct reports\(^2\) evaluated their CEOs’ transformational leadership and learning behaviors. Responses from the CEO and direct reports were paired using the name of the company. A summary of the definition, operationalization, and rating source of each study variable is provided in Table 3.2.

I checked for the existence of nonresponse bias and common method variance. Nonresponse bias was tested based on Armstrong and Overton's (1977) extrapolation method, which assumes that non-respondents are similar to late respondents. By splitting the sample into early and late respondent groups, I compared the sample means for each of the study variables across groups. The \(t\) tests revealed no significant differences between groups (\(p\) values ranged from .14 to .86), suggesting that nonresponse bias did not pose a threat to this study.

\(^2\)Following the definitions of previous research (Hambrick & Mason, 1984), in this study, I considered direct reports senior managers with whom the CEO shared the strategic decision-making process.
### Table 3.2
**Summary of Study Variables**

<table>
<thead>
<tr>
<th>Study variable</th>
<th>Role</th>
<th>Definition</th>
<th>Subcategories</th>
<th>Source of Scale</th>
<th>Items</th>
<th>Type</th>
<th>CEO report</th>
<th>Mgr report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure</td>
<td>Independent variable</td>
<td>Deviation from desired or expected results</td>
<td>None</td>
<td>Self-developed</td>
<td>4</td>
<td>Reflective</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Transformational leadership</td>
<td>Dependent variable</td>
<td>An influence process in which the leader elevates followers beyond self-interests through idealized influence or charisma, inspiration, individualized consideration, or intellectual stimulation</td>
<td>Charisma, inspiration, individualized consideration, intellectual stimulation</td>
<td>Podsakoff et al., 1990</td>
<td>12</td>
<td>Formative</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Learning</td>
<td>Mediator</td>
<td>A dynamic process in which individuals transform experience into knowledge, skills, and competencies</td>
<td>None</td>
<td>Edmondson, 1999</td>
<td>7</td>
<td>Reflective</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Emotional intelligence</td>
<td>Moderator</td>
<td>The ability to accurately perceive emotions, assess and generate emotions to assist thought, understand emotions, reflectively regulate emotions to promote personal growth</td>
<td>Others’ emotion appraisal, self-emotion appraisal, regulation of self-emotion, and uses of emotion to facilitate performance</td>
<td>Wong &amp; Law, 2002</td>
<td>16</td>
<td>Formative</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Learning goal orientation</td>
<td>Moderator</td>
<td>The desire to understand something new or to improve competence in a given activity</td>
<td>None</td>
<td>Vande Walle, 1997</td>
<td>5</td>
<td>Reflective</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>
Measures

Well-established scales were employed to measure most of the study variables. A five-point Likert scale was used for all survey items.

Dependent Variable

Transformational leadership. I measured transformational leadership using the 12 items adapted by Rafferty and Griffin (2004) from Podsakoff, Mackenzie, Moorman, and Fetter’s (1990) Transformational Leadership Scale. This adapted measure has been validated and used by numerous researchers (e.g., Bommer, Rich, & Rubin, 2005; Herold, Fedor, Caldwell, & Liu, 2008; Hill, Seo, Kang, & Taylor, 2012; Rubin et al., 2005). More importantly, this measure is consistent with my conceptualization of transformational leadership. The four transformational leadership dimensions measured included charisma (e.g., “My CEO has a clear sense of where he/she wants our company to be in the future”), inspiration (e.g., “My CEO inspires others when he/she discusses our direction for the future”), intellectual stimulation (e.g., “My CEO challenges others to reexamine some of their basic assumptions about their work”), and individual consideration (e.g., “My leader behaves in a manner which is thoughtful of the personal needs of others”). Managers identified by the CEOs to be their direct reports evaluated their leader’s transformational leadership. Since I was concerned with transformational leadership in a general sense, rather than its specific manifestations, I collapsed the measure into a single construct. This approach has been justified by previous research (e.g., Herold et al., 2008; Rubin et al., 2005) as well as by the overall measure’s high reliability (α=.90).
Independent Variable

**Failure experience.** Any entrepreneurial experience differs in its *volume*, the number of salient events making up the stream; *velocity*, the rate at which those events are processed; and *volatility*, the intensity associated with those events (M. H. Morris et al., 2012). I aimed to capture both the volume and volatility of an entrepreneur’s failure experience. The volume of failure experience was measured by the number of businesses terminated due to legal problems, partnership dispute (Bruno et al., 1992), and/or financial deficiencies (Shepherd, 2003).

Since no existing measure sufficiently captures the volatility dimension of failure experience, I developed a measurement to gauge the personal saliency of failure experience. In-depth interviews and case studies on entrepreneurial failure revealed that entrepreneurs experience failure in multiple aspects of their lives, especially in the financial and psychological dimensions (Cope, 2003; Singh et al., 2007). Based on a comprehensive review of the literature, I generated 16 items that tap into entrepreneurs’ failure experience. One potential risk associated with attempts to study entrepreneurial failure, as Zacharakis and colleagues (1999) noted, is that questions regarding failure are likely to be threatening for entrepreneurs due to the stigma associated with failure and an instinct for self-preservation. I therefore avoided inquiring directly about failure, but set the referent as “*events that deviated from your expected and desired results, such as the termination of a business that fell short of its goals.*” Three experts from the fields of entrepreneurship, organizational psychology, and management learning independently rated these items for face validity. Eight items were selected to form the initial scale of
failure experience, with four items for the financial dimension and four for the psychological dimension.

A pilot study was conducted to test the internal validity of this self-developed scale. Thirty-three members of the Entrepreneurs Organization Washington, DC, chapter completed the pilot survey and provided feedback regarding survey items. I used exploratory factor analysis to explore the factor structure of the new measurement. The results revealed that a single factor explained most of the variance, suggesting that entrepreneurs experience failure in a holistic manner rather than differentiating it in financial or psychological perspectives. Four items with the highest factor loadings were retained and used in the larger-scale data collection (Table 3.3). With the final survey data, I further conducted confirmatory factor analysis to examine the internal consistency of this failure scale. One item with factor loading lower than .50 was eliminated. The alpha value for the final three-item scale was .83. The correlation between this scale and the actual number of terminated businesses was .21 (p < .05), supporting the criterion validity of this self-developed measure.

Table 3.3
Item Factor Loading for the Self-Developed Failure Measurement

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>These events are of great personal importance to me.</td>
<td>0.82</td>
</tr>
<tr>
<td>These events have defined me as a person.</td>
<td>0.86</td>
</tr>
<tr>
<td>These events do not influence the way I view myself.</td>
<td>0.78</td>
</tr>
<tr>
<td>I have been deeply concerned about these events.</td>
<td>0.47</td>
</tr>
</tbody>
</table>

Note: Loadings stronger than 0.50 are bold. The extraction method was principal component analysis with varimax rotation.
Intervening Variables

Learning behaviors. I assessed entrepreneurs’ learning behavior using a seven-item scale created and validated by Edmondson (1999). Consistent with the individual level of analysis of this study, the referent point was changed from team to individual. When self-reported by CEOs, an example item is “I regularly take time to figure out ways to improve my company’s performance.” When rated by managers, a sample item is “My CEO regularly takes time to figure out ways to improve the company’s performance.” The alpha value for this scale in the present study was .83.

Emotional intelligence. I measured EI using the Wong and Law Emotional Intelligence Scale (WLEIS; Wong & Law, 2002). The WLEIS consists of four dimensions, three of which relate to self and one of which relates to others: self-emotion appraisal, others’ emotion appraisal, regulation of self-emotion, and uses of emotion to facilitate performance. Self-emotion appraisal measures the ability to understand and express one’s own emotions (e.g., “I have good understanding of my own emotions”), whereas others’ emotion appraisal measures the ability to perceive and understand others’ emotions (e.g., “I am a good observer of others’ emotions”). Regulation of self-emotion measures the ability to regulate one’s emotion (e.g., “I can always calm down quickly when I am very angry”), and, finally, uses of emotion to facilitate performance measures the ability to channel one’s emotions toward constructive activities (e.g., “I am a self-motivated person”). The alpha value for the entire scale in the present study was .80.

Learning goal orientation. The learning goal orientation was measured by five items developed by Vande Walle (1997). Example items include “I look for opportunities
to develop new skills and knowledge” and “For me, development of my ability is important enough to take risks.” The alpha value was .81 in the present study.

**Control Variables**

In selecting variables to include as controls, I focused on those variables that have been shown to influence learning and leadership outcomes in past research or that could potentially be viewed as alternative explanations.

**Demographics.** I controlled for CEOs’ age and gender, as they have been shown to impact individuals’ learning and leadership outcomes in previous studies (e.g., Button et al., 1996; Maurer, 2001). In addition, existing studies have suggested that cognitive or mental ability impacts learning (Ackerman, 1988; Yeo & Neal, 2004) and leadership effectiveness (Judge et al., 2004). In the present study, I controlled for CEOs’ cognitive ability by using education as a proxy. Education was coded as 1, high school diploma; 2, associate’s degree; 3, bachelor’s degree; 4, master’s degree; and 5, doctorate or professional degree (e.g., M.D. or J.D.).

**Experience.** Both industry experience and venture experience have implications for learning (J. R. Baum, Bird, & Singh, 2011; Venkataraman, 1997). I controlled for these experiences to focus the present study on failure as a special type of experience. Industry experience was measured by the number of years that the entrepreneur has been working within the industry pertaining to his or her current business. Venture experience was reflected by the number of ventures that were founded by the entrepreneur and that were still operating.

**Personality.** Existing research on transformational leadership has identified two Big Five personality dimensions, extraversion and agreeableness, as the strongest and
most consistent correlate of transformational leadership (Judge et al., 2002; Rubin et al., 2005). By controlling for these two factors, I focused my analysis on that portion of transformational leadership not explained by personality factors. Individuals’ agreeableness and extraversion were measured by the five-item scales adapted by Rubin and colleagues (2005) from Goldberg’s (1999) Big Five Inventory.

**Analytical Strategy**

**Level of Analysis**

Accurate analysis and interpretation of data within the context of organizational research require conceptually and empirically identifying level(s) of analysis (Kenny, Kashy, & Cook, 2006). This study was concerned with a single level of analysis—the individual level. Two direct reports from each company were invited to participate with the hope that at least one of them would respond. In 57% of the participating firms ($N = 74$), both solicited direct reports evaluated the learning behavior and transformational leadership of their CEOs. In this case, the two evaluations were aggregated to form a single score for each construct. Before proceeding to averaging the two managers’ responses, I calculated median $r_{wg}$ values (James, Demaree, & Wolf, 1993) and the internal consistency ($\alpha$) based on the average item response of each team (G. Chen, Mathieu, & Bliese, 2004). These values were, for transformational leadership, .97 ($r_{wg}$) and .90 ($\alpha$), and for learning behaviors, .71 ($r_{wg}$) and .83 ($\alpha$). The $r_{wg}$ values indicated a high degree of agreement between the two managers, and the $\alpha$ values of the average items suggested a high internal consistency between the two aggregate-level scales. Taken together, these results provide strong justification for averaging the evaluations.
Testing for Moderated Mediation

The hypothesized model involved a moderated mediation effect. According to MacKinnon and colleagues (Mackinnon, Lockwood, Hoffman, & West, 2002; Mackinnon, Lockwood, & Williams, 2004), there are four major strategies for gauging the extent and significance of mediation: causal steps, distribution of the product, resampling or bootstrapping, and product of coefficients. The most traditional approach to mediation testing, the causal steps approach (R. M. Baron & Kenny, 1986), has been criticized for its low power in detecting mediation, especially in scenarios with complete mediation where the direct effect is close to zero, and with inconsistent mediation where the direct effect and indirect effect have opposite signs (Mackinnon, Fairchild, & Fritz, 2007; Mackinnon, Krull, & Lockwood, 2000). A useful complement to Baron and Kenny’s method is the product-of-coefficients approach, or Sobel test (Sobel, 1982, 1986), which often serves as a means of testing the significance of the mediation effect. However, both approaches are based on the assumption of normal sampling distribution, thus being recommended only in large samples. Given the relatively small sample size of the present sample, I decided to combine the product-of-coefficients approach with a bootstrapping strategy (Shrout & Bolger, 2002), as advocated by Preacher et al. (2007).

Bootstrapping is a resampling strategy for estimation and hypothesis testing. A growing literature has recommended the use of bootstrapping for assessing mediation effects (Lockwood & MacKinnon, 1998; Mackinnon et al., 2004; Preacher & Hayes, 2004; Preacher, Rucker, & Hayes, 2007; Shrout & Bolger, 2002), since its accuracy does not rely on stringent assumptions. This is particularly useful for smaller samples, in that the assumption of normality is usually not warranted in these samples (Mackinnon et al., 2002; Preacher & Hayes, 2004). In bootstrapping, the original sample forms a pseudo-
population from which the bootstrapped samples are derived, and the resamples carry a distribution in accordance with the skewness of the original sample. An indirect effect is estimated through bootstrapping by sampling N units with replacement from the original sample K times (e.g., K = 1000). For each resample, the product of coefficients is computed and sorted from low to high. “The upper and lower bounds of a 100(1 – α)% confidence interval (e.g., α = .05) for the $a_1b_1$ is defined as the $(α/2)k$th and $(1+(1–α/2)k)$th values in this sorted distribution” (Preacher et al., 2007, p. 191). The null hypothesis of no indirect effect is rejected when confidence intervals do not include 0.

Statistically, moderated mediation occurs when the strength of a mediation effect is contingent on the level of a moderator. A series of SPSS macros developed by Hayes has been widely used to test various mediation and moderation models (e.g., Buffardi & Campbell, 2008; Cole, Walter, & Bruch, 2008; Rees & Freeman, 2009; Ruva & McEvoy, 2008). In this study, I employed the INDIRECT macro for testing mediation and MODMED for testing moderated mediation.

**Conclusion**

This chapter has outlined the methodology for testing the hypotheses set forth in chapter 2. A total of 196 CEOs and 211 managers from 130 companies participated through both Web-based and paper-and-pencil surveys. CEOs provided information on control variables and study variables including failure experience, EI, and learning goal orientation. Direct reports evaluated CEOs’ learning behavior and transformational leadership. Chapter 4 presents the results of the data analysis.
CHAPTER 4:
RESULTS

In this chapter I first report the preliminary analyses and characteristics of my final sample. Next, I present results of hypothesis-testing analyses using SPSS macros combined with bootstrapping strategies. Interpretation of results is also provided.

Preliminary Analyses

Data preparation and analyses were performed using SPSS 21. Data were first examined for missing values and data entry errors, with a random sample of entries checked against original data to confirm accuracy. Using box-and-whisker plots, two cases were identified for possible exclusion. Upon closer examination, these two cases did not lay outside three standard deviations with regard to more than one variable. Therefore, these cases were retained for subsequent analyses.

Before hypothesis testing, I conducted preliminary analyses to check for multicollinearity and for violations of the assumption of normality. The variance inflation factor values associated with independent variables ranged from 1.02 to 2.24, suggesting no major problem of multicollinearity. I assessed the degree of skewness and kurtosis for each of the study variables to test the normality assumptions for regression analysis. Beginning with a visual inspection of the data using histograms, some study variables showed variation from the normal curve. Next, statistical tests for skew and kurtosis were conducted. The results of these tests are shown in Table 4.1.

---

3 A variance inflation factor value larger than 5 indicates high multicollinearity (Kutner, Nachtsheim, & Neter, 2004).
Table 4.1
Normality Tests on Study Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statistic</td>
<td>s.e.</td>
</tr>
<tr>
<td>Transformational leadership</td>
<td>−0.35</td>
<td>0.21</td>
</tr>
<tr>
<td><strong>Learning behaviors</strong></td>
<td>−0.54 **</td>
<td>0.21</td>
</tr>
<tr>
<td>Personal saliency of failure</td>
<td>−0.08</td>
<td>0.21</td>
</tr>
<tr>
<td><strong>Number of terminated businesses</strong></td>
<td>2.43 **</td>
<td>0.22</td>
</tr>
<tr>
<td>Emotional intelligence</td>
<td>−0.13</td>
<td>0.21</td>
</tr>
<tr>
<td>Learning goal orientation</td>
<td>−0.10</td>
<td>0.21</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>−0.45</td>
<td>0.21</td>
</tr>
<tr>
<td>Extroversion</td>
<td>−0.36</td>
<td>0.21</td>
</tr>
</tbody>
</table>

*Note: Variables in bold indicate a violation of the normality assumption (**p < .01, two-tailed).*

Kurtosis is a measure of the peak of a normal distribution, with positive kurtosis indicating a relatively sharp or pointy distribution and negative kurtosis reflecting a flat distribution. As shown in Table 4.1, most study variables demonstrated satisfactory distribution in terms of sharpness, other than the number of terminated businesses.

Moving to the measure of distributional symmetry, a positive skew indicates that the mean lies to the right of the distribution with relatively few high values, while a negative skew reflects relatively few low values with the mean to the left of the distribution. The present data showed a significantly negative skew for learning behaviors and a significantly positive skew for the number of terminated businesses. This pattern of distribution suggests that the participating CEOs centered at a relatively high level of learning behaviors and most of them had limited experience with business termination.

Given this violation of normality assumption, bootstrapping results were considered in conjunction with normal theory tests for all subsequent analyses.
Overview of Data

Mean, standard deviations, and correlations for the study variables are displayed in Table 4.2. Examining the control variables (1-7), age was significantly negatively related to learning and learning goal orientation (LGO). Agreeableness and education were significantly positively related to emotional intelligence (EI). Venture experience was significantly positively related to the personal saliency of failure experience. Among the primary variables of interest (8-13), correlations were found to be in line with the hypothesized relationships. For example, personal saliency of failure related positively to learning behaviors ($r = .20, p < .05$) and transformational leadership ($r = .11$), although the latter relationship was not statistically significant. Learning behaviors were significantly positively related to transformational leadership ($r = .83, p < .01$). Finally, EI ($r = .25, p < .01$) and LGO ($r = .19, p < .05$) were significantly positively associated with learning behaviors.

Hypothesis Testing

Hypothesis testing was conducted in the following sequence. First, I examined the relationship between failure experience and transformational leadership as specified in Hypothesis 1. Next, I estimated a simple mediation model, testing for Hypothesis 2. Third, I tested for hypothesized interactions in the relationship between failure experience and learning behaviors (Hypotheses 3 and 4). In addition, I assessed the existence of a conditional indirect effect, testing for the overall moderated mediation model.
Table 4.2

*Bivariate Correlations between Study Variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td>46.20</td>
<td>9.06</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Gender</td>
<td>0.08</td>
<td>0.27</td>
<td>0.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Education</td>
<td>2.61</td>
<td>1.09</td>
<td>0.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Venture experience</td>
<td>1.78</td>
<td>2.01</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Industry experience</td>
<td>19.71</td>
<td>9.47</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Agreeableness</td>
<td>3.71</td>
<td>0.46</td>
<td>0.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Extroversion</td>
<td>3.36</td>
<td>0.71</td>
<td>0.07</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. No. of terminated businesses</td>
<td>0.34</td>
<td>0.66</td>
<td>0.03</td>
<td>0.14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Personal saliency of failure</td>
<td>3.23</td>
<td>0.70</td>
<td>0.13</td>
<td>0.02</td>
<td>0.16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Emotional intelligence</td>
<td>3.83</td>
<td>0.62</td>
<td>0.02</td>
<td>0.04</td>
<td>0.19</td>
<td>0.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Learning goal orientation</td>
<td>4.22</td>
<td>0.55</td>
<td>0.08</td>
<td>0.16</td>
<td>0.05</td>
<td>0.10</td>
<td>0.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Learning behaviors</td>
<td>3.80</td>
<td>0.62</td>
<td>0.13</td>
<td>0.05</td>
<td>0.07</td>
<td>0.03</td>
<td>0.12</td>
<td>0.14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Transformational leadership</td>
<td>3.76</td>
<td>0.56</td>
<td>0.14</td>
<td>0.10</td>
<td>0.12</td>
<td>0.06</td>
<td>0.02</td>
<td>0.08</td>
<td>0.07</td>
<td></td>
<td>0.11</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: N = 125 (listwise).*

*p< .05, two-tailed; **p<.01, two-tailed; ***p< .001, two-tailed.*
Hypothesis 1: Relationship of Failure and Transformational Learning

The first hypothesis expected prior failure experience to be positively related to current transformational leadership. To test for Hypothesis 1, I regressed transformational leadership on failure experience, after controlling for age, gender, education, personality, industry experience, venture experience, founder status, and country of business operation. Table 4.3 provides the unstandardized regression coefficients. Failure showed no significant association with transformational leadership, either when it was measured by personal saliency ($\beta = .09, p = \text{n.s.}$) or the number of terminated businesses ($\beta = -.09, p = \text{n.s.}$). Therefore, Hypothesis 1 was not supported.

Although not hypothesized, country and founder status had a significant negative relationship with transformational leadership in both cases. Country was coded with 0 representing the United States and 1 representing Finland; founder status was coded with 0 indicating founder and 1 indicating non-founder of the current company. These results suggested that on average CEOs in the United States received higher transformational leadership evaluations than their counterparts in Finland. Founders of their current companies also enjoyed higher transformational leadership scores than non-founders.
### Table 4.3

**Regression Analysis Results for Hypothesis 1**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Personal saliency of failure</th>
<th>No. of terminated businesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.01</td>
<td>.01</td>
</tr>
<tr>
<td>Gender</td>
<td>.19</td>
<td>.21</td>
</tr>
<tr>
<td>Education</td>
<td>.04</td>
<td>.02</td>
</tr>
<tr>
<td>Industry experience</td>
<td>.00</td>
<td>–.00</td>
</tr>
<tr>
<td>Venture experience</td>
<td>–.02</td>
<td>–.02</td>
</tr>
<tr>
<td>Extroversion</td>
<td>–.02</td>
<td>–.05</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>.12</td>
<td>.12</td>
</tr>
<tr>
<td>Country</td>
<td>–.31**</td>
<td>–.34**</td>
</tr>
<tr>
<td>Founder status</td>
<td>–.29*</td>
<td>–.29*</td>
</tr>
<tr>
<td>Failure experience</td>
<td>.09</td>
<td>–.09</td>
</tr>
<tr>
<td>Model summary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(F)</td>
<td>2.74**</td>
<td>2.78**</td>
</tr>
<tr>
<td>(R^2)</td>
<td>.19</td>
<td>.20</td>
</tr>
<tr>
<td>Adjusted (R^2)</td>
<td>.12</td>
<td>.13</td>
</tr>
</tbody>
</table>

*Note: N= 125 (listwise). DV: Transformational leadership. Unstandardized regression coefficients are reported.*

**Hypothesis 2: Learning Behaviors as a Mediator**

Hypothesis 2 predicted that learning behaviors would fully mediate the relationship between failure experience and transformational leadership. The SPSS macro INDIRECT was employed to test the total, direct, and indirect effect of failure experience on transformational leadership. This macro incorporates the Sobel test for the effect size of mediation and provides biased-corrected confidence intervals for estimated coefficients. Table 4.4 and Figure 4.1 present the results for Hypothesis 2 with regard to the personal saliency of failure experience. Failure experience was shown to relate positively to learning behaviors (a path, \(\beta = .25, p < .001\)), and learning behaviors related positively to transformational leadership (b path, \(\beta = .51, p < .001\)). The personal saliency of failure experience had a positive indirect effect on transformational leadership (\(a^b = .13\)). After controlling for the mediation effect of learning behaviors, the relationship between failure experience and transformational leadership was reduced to –.04 (\(p = \text{n.s.}\)).
demonstrating a full mediation. Bootstrapping tests demonstrated that learning behaviors mediated the relationship between failure and transformational leadership, with a 95% bias-corrected confidence interval around the mediation effect not containing zero (.04, .23). Together these results lent full support to Hypothesis 2.

Table 4.4
Simple Mediation Results for Hypothesis 2, with Failure Measured by Personal Saliency of Failure Experience

<table>
<thead>
<tr>
<th>Path/variable</th>
<th>Estimate</th>
<th>s.e.</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Path a</td>
<td>.25</td>
<td>.07</td>
<td>3.44</td>
<td>.00</td>
</tr>
<tr>
<td>Path b</td>
<td>.51</td>
<td>.08</td>
<td>6.59</td>
<td>.00</td>
</tr>
<tr>
<td>Path c</td>
<td>.09</td>
<td>.07</td>
<td>1.24</td>
<td>.22</td>
</tr>
<tr>
<td>Path c’</td>
<td>-.04</td>
<td>.06</td>
<td>-.64</td>
<td>.52</td>
</tr>
<tr>
<td>Age</td>
<td>.01</td>
<td>.00</td>
<td>1.16</td>
<td>.25</td>
</tr>
<tr>
<td>Gender</td>
<td>.19</td>
<td>.16</td>
<td>1.24</td>
<td>.22</td>
</tr>
<tr>
<td>Education</td>
<td>.04</td>
<td>.04</td>
<td>.85</td>
<td>.40</td>
</tr>
<tr>
<td>Industry experience</td>
<td>-.00</td>
<td>.004</td>
<td>-.35</td>
<td>.72</td>
</tr>
<tr>
<td>Venture experience</td>
<td>-.01</td>
<td>.02</td>
<td>-.33</td>
<td>.74</td>
</tr>
<tr>
<td>Extroversion</td>
<td>-.07</td>
<td>.06</td>
<td>-1.12</td>
<td>.26</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>.10</td>
<td>.09</td>
<td>1.08</td>
<td>.28</td>
</tr>
<tr>
<td>Country</td>
<td>-.10</td>
<td>.09</td>
<td>-1.01</td>
<td>.32</td>
</tr>
<tr>
<td>Founder</td>
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<td>.10</td>
<td>-1.41</td>
<td>.16</td>
</tr>
</tbody>
</table>

Model summary

<table>
<thead>
<tr>
<th>R²</th>
<th>Adjusted R²</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>.42</td>
<td>.36</td>
<td>7.36</td>
<td>.00</td>
</tr>
</tbody>
</table>

Bootstrapping results for indirect effect

<table>
<thead>
<tr>
<th>Estimate</th>
<th>s.e.</th>
<th>LL 95%</th>
<th>UL 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>a*b</td>
<td>.13</td>
<td>.05</td>
<td>.04</td>
</tr>
</tbody>
</table>

Note: N= 125(listwise). Unstandardized regression coefficients are reported. Bootstrap sample size= 1000. LL indicates lower limit (bias-corrected); UL, upper limit (bias-corrected).

Figure 4.1. Simple mediation model, with failure measured by personal saliency of failure experience. Path c represents the regression coefficient between the personal saliency of failure experience and transformational leadership; Path c’ represents the regression coefficient for the focal relationship after controlling for the effect of learning behaviors. ***p < .001, two-tailed.
The simple mediation model was not supported when the number of terminated businesses represented failure experience. Table 4.5 and Figure 4.2 report the results generated by the INDIRECT macro. Only the positive direct effect of learning behaviors on transformational leadership ($\beta = .49$, $p < .001$) was statistically significant.

Table 4.5. Simple Mediation Results for Hypothesis 2, with Failure Measured by Number of Terminated Businesses

<table>
<thead>
<tr>
<th>Path/variable</th>
<th>Estimate</th>
<th>s.e.</th>
<th>$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
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<td>.08</td>
<td>-.83</td>
<td>.40</td>
</tr>
<tr>
<td>B</td>
<td>.49</td>
<td>.07</td>
<td>6.63</td>
<td>.00</td>
</tr>
<tr>
<td>C</td>
<td>-.09</td>
<td>.07</td>
<td>-1.26</td>
<td>.21</td>
</tr>
<tr>
<td>c’</td>
<td>-.06</td>
<td>.06</td>
<td>-.96</td>
<td>.34</td>
</tr>
<tr>
<td>Age</td>
<td>.00</td>
<td>.00</td>
<td>1.04</td>
<td>.30</td>
</tr>
<tr>
<td>Gender</td>
<td>.20</td>
<td>.16</td>
<td>1.22</td>
<td>.23</td>
</tr>
<tr>
<td>Education</td>
<td>.03</td>
<td>.04</td>
<td>.85</td>
<td>.40</td>
</tr>
<tr>
<td>Industry experience</td>
<td>-.00</td>
<td>.00</td>
<td>-.35</td>
<td>.72</td>
</tr>
<tr>
<td>Venture experience</td>
<td>-.00</td>
<td>.02</td>
<td>-.37</td>
<td>.71</td>
</tr>
<tr>
<td>Extroversion</td>
<td>-.07</td>
<td>.05</td>
<td>-1.21</td>
<td>.23</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>.11</td>
<td>.09</td>
<td>1.21</td>
<td>.23</td>
</tr>
<tr>
<td>Country</td>
<td>-.10</td>
<td>.10</td>
<td>-1.05</td>
<td>.29</td>
</tr>
<tr>
<td>Founder</td>
<td>-.15</td>
<td>.10</td>
<td>-1.47</td>
<td>.15</td>
</tr>
<tr>
<td><strong>Model summary</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$R^2$</td>
<td>Adjusted $R^2$</td>
<td>$F$</td>
<td>$p$</td>
</tr>
<tr>
<td></td>
<td>.42</td>
<td>.36</td>
<td>7.47</td>
<td>.00</td>
</tr>
<tr>
<td><strong>Bootstrapping results for indirect effect</strong></td>
<td>Estimate</td>
<td>s.e.</td>
<td>LL 95%</td>
<td>UL 95%</td>
</tr>
<tr>
<td>a*b</td>
<td>-.03</td>
<td>.04</td>
<td>-1.14</td>
<td>.03</td>
</tr>
</tbody>
</table>

*Note: N= 125 (listwise). Unstandardized regression coefficients are reported. Bootstrap sample size= 1000. LL indicates lower limit (bias-corrected); UL, upper limit (bias-corrected).*

---

Figure 4.2. Simple mediation model, with failure measured by number of terminated businesses. Path c represents the regression coefficient between the number of terminated businesses and transformational leadership; Path c’ represents the regression coefficient for the focal relationship after controlling for the effect of learning behaviors. ***$p < .001$, two-tailed.**
Hypothesis 3: Emotional Intelligence as a Moderator

All continuous predictors were mean-centered prior to the test for moderation (Aiken & West, 1991). Hypothesis 3 predicted that EI would positively moderate the relationship between failure experience and learning behaviors, so that the relationship would be stronger as the level of EI increased. Table 4.6 presents the results of the hierarchical regression analysis (with the independent variable being the personal saliency of failure) for testing the moderation effect. The hypothesized model accounted for 30% of the variance in the CEOs’ learning behaviors. The partial coefficient associated with the interaction term Failure × EI was in line with Hypothesis 3 but was not statistically significant ($\beta = .19, p = n. s.$) Adding the interaction term to the model only improved the explanatory power of the model marginally ($\Delta R^2 = .01, p = n.s.$).

Table 4.6
Hierarchical Regression Results for Hypothesis 3, with Failure Measured by Personal Saliency of Failure Experience

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.01</td>
<td>.01</td>
<td>.01</td>
</tr>
<tr>
<td>Gender</td>
<td>.01</td>
<td>.02</td>
<td>.01</td>
</tr>
<tr>
<td>Education</td>
<td>−.03</td>
<td>−.00</td>
<td>.00</td>
</tr>
<tr>
<td>Industry experience</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>Venture experience</td>
<td>−.02</td>
<td>−.04</td>
<td>−.04</td>
</tr>
<tr>
<td>Extroversion</td>
<td>.07</td>
<td>.10</td>
<td>.10</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>−.01</td>
<td>.01</td>
<td>−.00</td>
</tr>
<tr>
<td>Country</td>
<td>−.47***</td>
<td>−.35**</td>
<td>−.35**</td>
</tr>
<tr>
<td>Founder</td>
<td>−.28*</td>
<td>−.31*</td>
<td>−.30*</td>
</tr>
<tr>
<td>Personal saliency of failure (PS)</td>
<td>.25**</td>
<td>.24**</td>
<td></td>
</tr>
<tr>
<td>Emotional intelligence (EI)</td>
<td>.22</td>
<td>.19</td>
<td></td>
</tr>
<tr>
<td>PS × EI</td>
<td>.19</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model summary

\[
\begin{align*}
F & \quad 3.06** \quad 4.15*** \quad 3.91*** \\
R^2 & \quad .19 \quad .29 \quad .30 \\
\text{Adjusted } R^2 & \quad .13 \quad .22 \quad .23 \\
\Delta R^2 & \quad .09** \quad .01 \\
\end{align*}
\]

Note: N= 125(listwise). DV: Learning behaviors. Moderator: EI. Coefficients are unstandardized. *p < .05, two-tailed; **p < .01, two-tailed, ***p < .001, two-tailed.
EI is a formative measure consisting of four dimensions: understanding one’s own emotions, regulating and managing one’s own emotions, perceiving and understanding the emotions of others, and channeling emotions toward constructive activities (Wong & Law, 2002). In the situation of learning from failure, regulating and managing one’s own negative emotions such as anxiety, fear, and doubt (Vince, 1998) is key. Thus, one would expect the emotion regulation aspect of EI to matter more than the other dimensions (i.e., understanding others’ emotion).

It is likely that using a composite score of all four dimensions diluted the effect of the dimension of EI that was actually influential. Hence, I tested emotion regulation as a moderator in the relationship between failure and learning.\(^4\) Hierarchical regression analysis results are shown in Table 4.7. The new model accounted for 33% of the variance in learning behaviors. The partial coefficient associated with the interaction term Failure × Emotional Regulation was statistically significant (\(\beta = .27, p < .05\)). Adding the interaction term to the model significantly improved the explanatory power of the model (\(\Delta R^2 = .03, p = .05\)).

To further inspect the interaction, the simple slopes analysis (Aiken & West, 1991; Hayes & Matthes, 2009) was conducted. I evaluated the effects of failure experience on learning behaviors for low (one standard deviation below the mean), medium (mean), and high (one standard deviation above the mean) levels of emotion regulation. Supporting Hypothesis 3, the regression slopes were significant and stronger at high (\(\beta = .39, p < .001\)) and medium (\(\beta = .24, p < .001\)) levels of emotion regulation than

\(^4\) I also examined the other three dimensions (i.e., understanding one’s own emotion, understanding others’ emotion, and channeling emotion toward constructive activities) of EI individually, with failure measured both by personal saliency and by the number of terminated businesses. However, none of these dimensions moderated the relationship between failure and learning. The partial coefficients of the interaction terms ranged from -.07 to .05 (\(p = n.s.\)) while the change in \(R^2\) ranged from .00 to .01 (\(p = n.s.\)).
at a low level of emotion regulation ($\beta = .08$, $p = \text{n.s.}$). Figure 4.3 illustrates the interaction effect. These results fully support Hypothesis 3.

Table 4.7
Hierarchical Regression Results for Hypothesis 3, Focusing on Emotion Regulation Only, with Failure Measured by Personal Saliency of Failure Experience

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.01</td>
<td>.01</td>
<td>.01</td>
</tr>
<tr>
<td>Gender</td>
<td>.01</td>
<td>.00</td>
<td>-.02</td>
</tr>
<tr>
<td>Education</td>
<td>-.03</td>
<td>-.00</td>
<td>.01</td>
</tr>
<tr>
<td>Industry experience</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>Venture experience</td>
<td>-.02</td>
<td>-.04</td>
<td>-.04</td>
</tr>
<tr>
<td>Extroversion</td>
<td>.07</td>
<td>.10</td>
<td>.12</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>-.01</td>
<td>-.00</td>
<td>.01</td>
</tr>
<tr>
<td>Country</td>
<td>-.47***</td>
<td>-.40***</td>
<td>-.37**</td>
</tr>
<tr>
<td>Founder</td>
<td>-.28*</td>
<td>-.30*</td>
<td>-.27*</td>
</tr>
<tr>
<td>Personal saliency of failure (PS)</td>
<td>.26**</td>
<td>.25**</td>
<td></td>
</tr>
<tr>
<td>Emotion regulation (ER)</td>
<td>.17*</td>
<td>.16*</td>
<td></td>
</tr>
<tr>
<td>PS $\times$ ER</td>
<td></td>
<td></td>
<td>.27*</td>
</tr>
</tbody>
</table>

**Model summary**

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>$F$</td>
<td>3.06**</td>
<td>4.39***</td>
<td>4.68***</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.19</td>
<td>.30</td>
<td>.33</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>.13</td>
<td>.23</td>
<td>.26</td>
</tr>
<tr>
<td>$\Delta R^2$</td>
<td>.10***</td>
<td>.03*</td>
<td></td>
</tr>
</tbody>
</table>

*Note: N= 125(listwise). DV: Learning behaviors. Moderator: Emotion regulation. Coefficients are unstandardized. *$p < .05$, two-tailed; **$p < .01$, two-tailed, ***$p < .001$, two-tailed.*
Since moderation took place in the first half of the mediation model (Path a), emotion regulation would also moderate the mediation effect (a*b). The above results can be bolstered by evidence of how the indirect effect of failure experience on transformational leadership through the mediator learning varied as a function of emotion regulation. Thus, the next logical step was to examine the moderated mediation effect.

The SPSS macro MODMED was employed, and bootstrapping results revealed a significant conditional indirect effect (see Table 4.8). The 95% bias-corrected confidence intervals around the indirect effect did not contain zero for an emotion regulation value at the mean (.04, .22) and at one standard deviation above the mean (.10, .35). Taken together, these results suggest that one can be 95% confident about the positive mediation effect of learning in the relationship between failure experience and transformational leadership when individuals had moderate to high levels of emotion regulation, but not when individuals’ emotion regulation was low. Hypothesis 3 was partially supported.

Table 4.8

<table>
<thead>
<tr>
<th>Emotion regulation</th>
<th>Indirect effect</th>
<th>s. e.</th>
<th>Z</th>
<th>P</th>
<th>LL</th>
<th>UL</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.21</td>
<td>.04</td>
<td>.05</td>
<td>.80</td>
<td>.42</td>
<td>-.07</td>
<td>.16</td>
</tr>
<tr>
<td>3.83</td>
<td>.12</td>
<td>.04</td>
<td>2.98</td>
<td>.00</td>
<td>.04</td>
<td>.22</td>
</tr>
<tr>
<td>4.45</td>
<td>.20</td>
<td>.06</td>
<td>3.47</td>
<td>.00</td>
<td>.10</td>
<td>.35</td>
</tr>
</tbody>
</table>

Note: Bootstrapping sample size = 1000. LL indicates lower limit (bias-corrected); UL, upper limit (bias-corrected).

Next I tested for the moderation effect of emotion regulation with failure measured by the number of terminated businesses. As shown in Table 4.9, the hypothesized model accounted for 22% of the variance in learning behaviors. The partial coefficient (β = .07) associated with the interaction term Failure × Emotional Regulation
was not significant at the $p < .05$ level. Adding the interaction term to the model did not improve the explanatory power of the model ($\Delta R^2 = 0$, $p = \text{n.s.}$). Simple slopes analysis echoed the results of hierarchical regression analysis. None of the regression slopes at high ($\beta = .02$, $p = \text{n.s.}$), medium ($\beta = .06$, $p = \text{n.s.}$), or low ($\beta = .10$, $p = \text{n.s.}$) levels of emotion regulation was statistically significant.

Table 4.9
*Hierarchical Regression Results for Hypothesis 3, with Failure Measured by Number of Terminated Businesses*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.01</td>
<td>.01</td>
<td>.01</td>
</tr>
<tr>
<td>Gender</td>
<td>.01</td>
<td>.02</td>
<td>-.02</td>
</tr>
<tr>
<td>Education</td>
<td>-.03</td>
<td>-.04</td>
<td>-.03</td>
</tr>
<tr>
<td>Industry experience</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>Venture experience</td>
<td>-.02</td>
<td>-.02</td>
<td>-.02</td>
</tr>
<tr>
<td>Extroversion</td>
<td>.07</td>
<td>.06</td>
<td>.06</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>-.01</td>
<td>-.03</td>
<td>-.03</td>
</tr>
<tr>
<td>Country</td>
<td>-.47***</td>
<td>-.47***</td>
<td>-.47**</td>
</tr>
<tr>
<td>Founder</td>
<td>-.28*</td>
<td>-.30*</td>
<td>-.29*</td>
</tr>
<tr>
<td>Terminated businesses (TB)</td>
<td>-.06</td>
<td>-.06</td>
<td></td>
</tr>
<tr>
<td>Emotion regulation (ER)</td>
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<td>.15*</td>
<td></td>
</tr>
<tr>
<td>TB $\times$ ER</td>
<td></td>
<td></td>
<td>.07</td>
</tr>
<tr>
<td><strong>Model summary</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>$F$</td>
<td>2.96**</td>
<td>2.86**</td>
<td>2.63**</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.19</td>
<td>.22</td>
<td>.22</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>.13</td>
<td>.14</td>
<td>.14</td>
</tr>
<tr>
<td>$\Delta R^2$</td>
<td>.03</td>
<td>.00</td>
<td></td>
</tr>
</tbody>
</table>

*Note: $N = 125$ (listwise). DV: Learning behaviors. Unstandardized coefficients were reported. $^*p < .05$, two-tailed, $^{**}p < .01$, two-tailed, $^{***}p < .001$, two-tailed.*

**Hypothesis 4: Learning Goal Orientation as a Moderator**

Hypothesis 4 predicted that LGO would positively moderate the relationship between failure experience and learning, so that the relationship would be stronger as the level of LGO increased. Table 4.10 presents the results of the hierarchical regression analysis (with failure measured by the personal saliency of failure experience). The hypothesized model accounted for 28.3% of the variance in learning behaviors. The
partial coefficient ($\beta = -0.09$) associated with the interaction term Failure $\times$ LGO was not statistically significant at the $p < .05$ level. Adding the interaction term to the model did not improve the explanatory power of the model ($\Delta R^2 = .00, p = \text{n.s.}$).

Table 4.10
Hierarchical Regression Results for Hypothesis 4, with Failure Measured by Personal Saliency of Failure Experience

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
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<td>.01</td>
<td>.01</td>
</tr>
<tr>
<td>Gender</td>
<td>.01</td>
<td>.01</td>
<td>.02</td>
</tr>
<tr>
<td>Education</td>
<td>-.03</td>
<td>-.00</td>
<td>-.00</td>
</tr>
<tr>
<td>Industry experience</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>Venture experience</td>
<td>-.02</td>
<td>-.03</td>
<td>-.04</td>
</tr>
<tr>
<td>Extroversion</td>
<td>.07</td>
<td>.09</td>
<td>.09</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>-.01</td>
<td>.02</td>
<td>.03</td>
</tr>
<tr>
<td>Country</td>
<td>-.47***</td>
<td>-.40***</td>
<td>-.41***</td>
</tr>
<tr>
<td>Founder</td>
<td>-.28*</td>
<td>-.29*</td>
<td>-.29*</td>
</tr>
<tr>
<td>Personal saliency of failure</td>
<td>.24**</td>
<td>.24**</td>
<td></td>
</tr>
<tr>
<td>Experience (PS)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning goal orientation</td>
<td>.13</td>
<td>.13</td>
<td></td>
</tr>
<tr>
<td>LGO</td>
<td>-.09</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model summary

| F    | 3.06** | 3.99*** | 3.68*** |
| $R^2$ | .19   | .28     | .28     |
| Adjusted $R^2$ | .13 | .21 | .21 |
| $\Delta R^2$ | .09** | .00 | |

Note: $N = 125$ (listwise). DV: Learning behaviors. Unstandardized coefficients were reported.

Bootstrapping results from Table 4.11 showed that the conditional indirect effect at high, medium, and low levels of LGO did not differ from each other. Interestingly, the relationship between failure experience and learning seemed to decrease as the level of LGO went up, which contradicted Hypothesis 3.

Table 4.11
Conditional Indirect Effect for Different Levels of Learning Goal Orientation, with Failure Measured by Personal Saliency of Failure Experience

<table>
<thead>
<tr>
<th>LGO</th>
<th>Indirect effect</th>
<th>SE</th>
<th>Z</th>
<th>P</th>
<th>LL</th>
<th>UL</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.70</td>
<td>.14</td>
<td>.06</td>
<td>2.43</td>
<td>.02</td>
<td>.01</td>
<td>.27</td>
</tr>
<tr>
<td>4.22</td>
<td>.12</td>
<td>.04</td>
<td>2.82</td>
<td>.00</td>
<td>.04</td>
<td>.22</td>
</tr>
<tr>
<td>4.74</td>
<td>.10</td>
<td>.05</td>
<td>1.83</td>
<td>.07</td>
<td>.02</td>
<td>.20</td>
</tr>
</tbody>
</table>

Note: Bootstrapping sample size = 1000. LL indicates lower limit (bias-corrected); UL, upper limit (bias-corrected).
Intrigued by this result, I further explored the role of LGO using the MODMED macro. Figure 4.4 presents the mediation effect at various levels of LGO. As shown, the mediation effect of learning behaviors in the relationship between the personal saliency of failure and transformational leadership was a function of LGO. However, one could not be 95% confident in claiming that mediation existed at lower levels of LGO, as the confidence intervals contained zero. Once LGO reached the value of 3.6, the mediation effect of learning became substantial. Further, above the threshold of 3.6, as LGO continued to go up, the mediation effect of learning decreased.

Figure 4.4. The mediation effect of learning behaviors as a function of learning goal orientation, with failure measured by personal saliency of failure experience.

However, when the number of terminated businesses was used to indicate failure, LGO did moderate the relationship between failure experience and learning. Hierarchical analysis results (see Table 4.12) indicated that the hypothesized model accounted for 24% of the variance in learning behaviors. The partial coefficient associated with the interaction term TB × LGO was statistically significant ($\beta = .43, p < .05$). Adding the
interaction term to the model significantly improved the explanatory power of the model \( (\Delta R^2 = .03, p < .05) \).

Table 4.12
Hierarchical Regression Results for Hypothesis 4, with Failure Measured by Number of Terminated Businesses

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.01</td>
<td>.01</td>
<td>.01</td>
</tr>
<tr>
<td>Gender</td>
<td>.04</td>
<td>.01</td>
<td>–</td>
</tr>
<tr>
<td>Education</td>
<td>–.03</td>
<td>–.04</td>
<td>–.05</td>
</tr>
<tr>
<td>Industry experience</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>Venture experience</td>
<td>–.02</td>
<td>–.02</td>
<td>–.01</td>
</tr>
<tr>
<td>Extroversion</td>
<td>.05</td>
<td>.05</td>
<td>.04</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>.02</td>
<td>–.00</td>
<td>–.03</td>
</tr>
<tr>
<td>Country</td>
<td>–.47***</td>
<td>–.47***</td>
<td>–.50***</td>
</tr>
<tr>
<td>Founder</td>
<td>–.27*</td>
<td>–.28*</td>
<td>–.25*</td>
</tr>
<tr>
<td>Terminated businesses (TB)</td>
<td>–.06</td>
<td>–.09</td>
<td></td>
</tr>
<tr>
<td>Learning goal orientation (LGO)</td>
<td>.16</td>
<td>.21*</td>
<td></td>
</tr>
<tr>
<td>TB × LGO</td>
<td></td>
<td></td>
<td>.43*</td>
</tr>
</tbody>
</table>

**Model Summary**

<table>
<thead>
<tr>
<th></th>
<th>F</th>
<th>2.96*</th>
<th>2.74*</th>
<th>2.92**</th>
</tr>
</thead>
<tbody>
<tr>
<td>R²</td>
<td>.19</td>
<td>.21</td>
<td>.24</td>
<td></td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>.13</td>
<td>.13</td>
<td>.16</td>
<td></td>
</tr>
<tr>
<td>( \Delta R^2 )</td>
<td>.02</td>
<td>.02</td>
<td>.03*</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** N= 125 (listwise). DV: Learning behaviors. Unstandardized coefficients were reported. *\( p < .05 \), two-tailed; **\( p < .01 \), two-tailed; ***\( p < .001 \), two-tailed.

Simple slopes analysis further supported Hypothesis 4. The relationship between failure and learning was significantly negative (\( \beta = –.33, p < .05 \)) at low levels of LGO, in contrast to being not significant at medium levels of LGO (\( \beta = –.08, p = n.s. \)) and being significantly positive at high levels of LGO (\( \beta = .14, p < .05 \)). Figure 4.5 illustrates the interaction effect. For individuals with limited experience in terminating businesses, the level of learning behaviors was almost identical regardless of the level of LGO. On the other hand, as the number of terminated businesses increased, only those with high LGO exhibited more learning behaviors while individuals with medium and low LGO decreased their learning behaviors.
Figure 4.5. Learning goal orientation as a moderator of the relationship between failure and learning behaviors, with failure measured by number of terminated businesses.

Bootstrapping results from Table 4.13 showed a drastic change in mediation effects according to the level of LGO. The mediation effect of learning had a negative value of $-0.16$ (CI: $-0.43$, $-0.01$) at low LGO, whereas the indirect effect rose to a positive value of $0.07$ at high LGO (CI: $0.05$, $0.18$). These results not only lent solid support to Hypothesis 4, but also explained why mediation was not detected when testing for Hypothesis 3 with failure measured by the number of terminated businesses. That is, although the mediation effects of learning were significant at both low and high levels of LGO, they were in opposite directions. Until now Hypothesis 3 received support when the model was tested with both failure measures.

Table 4.13

<table>
<thead>
<tr>
<th>LGO</th>
<th>Indirect effect</th>
<th>s.e.</th>
<th>Z</th>
<th>P</th>
<th>LL</th>
<th>UL</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.70</td>
<td>$-0.16$</td>
<td>0.08</td>
<td>$-1.99$</td>
<td>0.05</td>
<td>$-0.43$</td>
<td>$-0.01$</td>
</tr>
<tr>
<td>4.22</td>
<td>$-0.04$</td>
<td>0.04</td>
<td>$-1.07$</td>
<td>0.29</td>
<td>$-0.16$</td>
<td>0.03</td>
</tr>
<tr>
<td>4.74</td>
<td>0.07</td>
<td>0.07</td>
<td>1.05</td>
<td>0.30</td>
<td>0.05</td>
<td>0.18</td>
</tr>
</tbody>
</table>

Note: Bootstrapping sample size $= 1000$. LL indicates lower limit (bias-corrected); UL, upper limit (bias-corrected).
Summary of Results

In this study, I sought to understand failure experience in terms of two interlinked features: the personal saliency and the actual number of critical events that deviated from expected or desired results. A metaphor of this approach is the examination of hurt by gauging the pain and counting the scars. The results associated with two different aspects of failure largely supported the hypothesized model. A summary of the results regarding the tests of hypotheses is provided in Table 5.14.

Table 4.14
Summary of Hypothesized Relationships

<table>
<thead>
<tr>
<th>Theoretical relationship</th>
<th>Focus of failure experience:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Saliency</td>
</tr>
<tr>
<td><strong>Hypothesis 1.</strong> The entrepreneur’s failure experience is positively associated with his or her transformational leadership.</td>
<td>Not supported</td>
</tr>
<tr>
<td><strong>Hypothesis 2.</strong> The positive relationship between the entrepreneur’s failure experience and his or her transformational leadership is fully mediated by entrepreneurial learning.</td>
<td>Supported</td>
</tr>
<tr>
<td><strong>Hypothesis 3.</strong> The entrepreneur’s emotional intelligence positively moderates the relationship between failure experience and entrepreneurial learning, so that the higher the emotional intelligence, the stronger the relationship.</td>
<td>Partially supported</td>
</tr>
<tr>
<td><strong>Hypothesis 4.</strong> Learning goal orientation positively moderates the relationship between failure experience and entrepreneurial learning, so that the stronger the learning goal orientation, the stronger the relationship.</td>
<td>Not supported</td>
</tr>
</tbody>
</table>

Conclusion

This chapter has reported the results of analysis conducted to test the proposed model. The details of the regression analyses and bootstrapping results were provided along with interpretations as they pertain to the hypotheses. The following chapter provides a discussion that integrates these findings with the theoretical foundations upon which this study was built. In addition, chapter 5 reviews the implications and limitations of the present research and lays out directions for future research.
CHAPTER 5:
DISCUSSION

This chapter provides a discussion of findings and summarizes the theoretical and practical implications of the present study. Limitations are addressed, and avenues of future research enhancing this study are provided.

Discussion within the Context of the Literature

This dissertation was motivated by three objectives: to empirically test the relationship between failure and transformational leadership; to investigate the mediating role of learning behaviors in the focal relationship; and to identify moderators in the relationship between failure and learning behaviors. Using a representative sample of CEOs and managers of small and medium-sized information technology enterprises in the United States and Finland, I tested a moderated mediation model explaining the mechanism of how and when entrepreneurs learn from failure and emerge as transformational leaders. My findings led to four conclusions:

1. An entrepreneur’s failure experience is not always positively associated with his or her transformational leadership, as perceived by followers.

2. Learning behaviors mediate the relationship between failure experience and transformational leadership. Depending on the aspect of the failure experience (i.e., personal saliency vs. the number of terminated businesses), the mediating mechanism differs.
3. Emotion regulation moderates the positive relationship between the personal saliency of failure experience and learning behaviors, as well as the indirect effect of failure on the individual’s transformational leadership.

4. Learning goal orientation (LGO) moderates the relationship between the number of terminated businesses and learning behaviors, as well as the indirect effect of failure on the individual’s transformational leadership.

I now discuss how these empirical results extend the findings of prior research.

**Failure and Transformational Leadership**

The leadership literature suggests that failure as a traumatic form of developmental experience could foster transformational leadership (Bennis & Thomas, 2002; Kayes & Kayes, 2011; Reid, 2008; Tedeschi & Calhoun, 1995). This stream of research has highlighted the qualitative characteristics (e.g., challenging) of certain experiences (e.g., hardship) as conducive to leadership development. However, no such positive association was found in the present study. One possible explanation is that although the personal saliency of failure challenges the individual in a way that facilitates transformational leadership, its developmental value may level off. Once saliency exceeds the threshold, its positive effect on transformational leadership will diminish due to the detrimental effects on the individual’s self-efficacy and energy. In this regard, the present study echoes research on the role of challenging experiences and leadership development, arguing that overly challenging experiences can hinder key learning processes and ultimately take away the developmental value for leadership (Boud, Keogh, & Walker, 1985; DeRue & Wellman, 2009). These findings also serve to verify the truth of longstanding folklore wisdom that “failure is the crucible of leadership” (Bennis &
Thomas, 2002). Perhaps a modified version of this wisdom better represents the entrepreneurial reality: “Failure, if it does not defeat you, is the crucible of leadership.”

**Learning as a Mediator**

This study revealed a full mediation effect of learning in the relationship between failure experience and transformational leadership. Once the effect of learning was controlled for, the relationship between failure experience and transformational leadership was reduced to nearly zero, suggesting that the realization of failure’s value for transformational leadership relied solely on one’s active engagement in learning behaviors. Without establishing a link to learning, a leader could experience failure intensely, or numerous times, without being perceived as transformational by followers.

In addition, this study established a strong positive association between learning and transformational leadership. Although a previous study (Johnson et al., 1998) found that genes, rather than learning, explained most variance in transformational leadership, their measure of transformational leadership came exclusively from the self-reports of participants. Thus, the high covariance in transformational leadership could be due to a tendency among the twins to consider themselves in similar terms. The present study, on the other hand, invited direct reports to evaluate their CEOs’ transformational leadership and thus provides a more objective assessment of the dependent variable. The results are consistent with those of Bass and Avolio (1998), who reported positive effects of a training program for executives and community leaders on the increasing ratings of transformational leadership. The present study also extends the work of Bass and Avolio (1998) to a sample of entrepreneurial leaders. In light of the debate of whether transformational leaders are made or born (e.g., Avolio, 1994; Bass & Avolio, 1994;
Johnson et al., 1998; Ruvolo, Peterson, & LeBoeuf, 2004), findings from this study offer compelling empirical evidence that transformational leadership can be learned.

While learning is always positively associated with transformational leadership, the relationship between failure experience and learning is much more complex. When the personal saliency of failure experience is concerned, learning mediates the positive relationship between failure and transformational leadership. The mediation effect of learning is significant regardless of one’s emotion regulation, but it was stronger for those who could better regulate their emotions. In terms of the relationship between the number of terminated businesses and transformational leadership, both the direction and strength of the mediation effect of learning were contingent on the level of LGO. Learning negatively mediated the relationship between failure and transformational leadership among those with low LGO, as failure was negatively correlated with learning. In contrast, learning positively mediated the focal relationship among those with high LGO, as failure in this case related positively with learning. These findings provide empirical support for Shepherd’s (2003) observation that learning from failure is not automatic. Indeed, the “learning journey” following failures can be an arduous one, and without internalizing these critical events and coming to terms with them, one cannot turn painful experiences like failure into material for learning (Melissa S. Cardon & McGrath, 1999; Cope, 2011; Mezirow, 1991).

The Role of Emotional Intelligence

Although much research (R. A. Baron, 2008; Bion, 1961; M. H. Morris et al., 2012; Shepherd, 2003, 2009; Vince, 1998, 2001; Vince & Martin, 1993) suggests that emotional intelligence would moderate the relationship between failure experience and
learning, only one dimension of emotional intelligence (regulation of emotion) showed significant moderation in the relationship between the personal saliency of failure experience and learning. No significant moderation effect of emotional intelligence was found in the relationship between the actual number of terminated businesses and learning. There are methodological as well as theoretical reasons that could potentially explain these findings. I proceed with two theoretical reasons while leaving methodological issues for the limitations session.

Understanding why emotion regulation was the only aspect of emotional intelligence that showed a moderation effect requires a closer examination of the four dimensions conceptualized by Mayer and Salovey (1997) and operationalized by Wong and Law (2002). These four dimensions of emotional intelligence are as follows: (1) appraisal and expression of emotion in the self (SEA), which relates to the ability to understand one’s own emotions and to express these emotions naturally; (2) appraisal and recognition of emotion in others (OEA), which refers to the ability to perceive and understand the emotions of people around; (3) use of emotion to facilitate performance (UOE), which relates to the ability to direct emotions towards constructive activities for better performance; and (4) regulation and management of emotion in the self (ROE), which refers to the ability to manage the intensity and duration of emotional responses.

Individuals who have strong abilities in the first two dimensions are sensitive to the feelings of themselves as well as others. While being able to perceive and understand emotions can aid social interactions in some circumstances, high emotional sensitivity could also be a burden for the individuals in other circumstances. The emotional toll of failure is likely to make entrepreneurs with high SEA and OEA vulnerable, as they could
get caught up by an excessive amount of emotional cues. For example, an entrepreneur who just lost her training business shared with Cope (2011): “I was so low, I was so down . . . just depressed. I couldn’t see a way out of it. . . . It was just so stressful” (p. 610). Moreover, a deep understanding of one’s own negative emotions could be exacerbated by sensing emotions from family, friends, employees, and investors. Another entrepreneur interviewed by Cope (2011) had the following to say: “In the end the hardest part is that you do feel responsible . . . to the people who work for you, the people that invested in you, your customers who gave you money for things that you can no longer do” (p. 611).

Individuals who are strong in UOE are able to use emotions to facilitate performance; however, they may or may not enjoy the same emotional strength when the outcomes of their activities turn out to be disappointing. On the other hand, individuals with high ROE are capable of managing their emotions, which enables a more rapid recovery from psychological distress (C.-S. Wong & Law, 2002). Recalling the theoretical argument put forth by Shepherd (2003, 2009) and Cope (2003, 2011), it becomes clear that in the situation of learning from failure, what is critical is the ability to regulate and manage negative emotions such as grief, guilt, frustration, anger, and depression (S. Singh et al., 2007) and move forward from them. In this regard, it is less surprising that emotion regulation was the only aspect of emotional intelligence that had a significant moderating effect in the relationship between failure and learning.

Another theoretical explanation rests in the nature of failure experience. As a salient event that contradicts individuals’ prior assumptions, the experience of failure involves the interaction of emotions and cognition. However, the emotional implication
of failure is determined by how it is personally experienced. While the number of terminated businesses informs the volume of salient events, it fails to provide key information regarding the personal saliency of these events, which generates negative emotional response and makes emotion regulation indispensable. It is likely that for two entrepreneurs who have closed the same number of businesses, the personal significance of their business closures differs drastically. Therefore, without considering the personal saliency of failure experience, the moderating role of emotion regulation can be obscure.

The Role of Learning Goal Orientation

Findings with regard to LGO echo prior research on managerial development (Dragoni, Tesluk, Russell, & Oh, 2009) demonstrating that individuals do not learn equally from experience, even if they go through a similar set of highly developmental events. In fact, the moderating role of LGO in the relationship between the number of terminated businesses and subsequent learning behaviors was so strong that it completely altered the direction of failure’s influence on learning. Individuals with a high LGO increased learning behaviors as they experienced more business terminations. This pattern is consistent with Dweck's (1986) initial arguments that high-LGO individuals respond constructively to challenging situations. In Dragoni and colleagues’ (2009) study, the relationship between challenging assignments and learning was always positive, but the slopes differed according to the level of LGO. This study extended previous research by showing that with a low LGO, an individual’s learning behaviors decreased as he or she experienced more business failures. In other words, low-LGO individuals respond to failure in a maladaptive manner that prevents them from extracting valuable lessons from failure. These findings suggest that only individuals who have high
LGO react to business terminations by being proactively engaged, soliciting feedback from others, actively reflecting upon critical experiences, and striving for improvements.

Results regarding the moderating role of LGO in the relationship between the personal saliency of failure experience and learning are less conclusive. No significant moderation effect of LGO was found. What’s more perplexing was that the slope depicting the mediation effect of learning as a function of LGO showed a downward tendency at LGO values greater than 3.6. An investigation into the mediation role at various levels of LGO revealed two findings: (1) a moderate level of LGO is needed for learning to play a role in the relationship between the personal saliency of failure experience and transformational leadership; and (2) above a certain threshold, an increase in LGO actually hinders learning from failure.

Extent theorizing typically depicts LGO as being conducive to learning and facilitating adaptive response to failure in various achievement situations (e.g., Dweck, 1986; Heyman & Dweck, 1992). Findings regarding the personal saliency of failure experience seemed to contradict prevailing empirical results (Colquitt & Simmering, 1998; LePine, 2005; Vande Walle, Cron, & Slocum Jr., 2001; VandeWalle & Cummings, 1997). One possible explanation is that many previous studies used student samples and measured learning by test results. The present study, on the other hand, was based on entrepreneurs in learning situations outside the classroom, and the raw experience for learning had more significant financial and personal implications. It is likely that in achievement situations such as creating and managing a business, negative feedback would generate intense emotional responses and afflict self-efficacy, even for those with high LGO. Learning goals could no longer buffer the psychological impairment to the
same extent when failure occurred (as compared to situations such as doing poorly on an exam). The potential toll of failure could be further exacerbated as LGO went beyond a healthy level. This finding is in line with Heimbeck and colleagues’ (2003) (Heimbeck, Frese, Sonnentag, & Keith, 2003) experiment on error training and Kayes’(2006) conceptualization of destructive goal pursuit. As such, I build upon these thoughtful works and venture to define the boundary conditions of LGO: in situations where the trigger for learning is of such personal significance and learning already seems imperative, excessive goal setting (even for the learning goals) could backfire.

**Implications for Theory and Practice**

This study makes an important contribution to the leadership literature. Despite growing interest to better understand the antecedents of transformational leadership, existing research has offered a limited view by looking at a few stable individual traits (Atwater & Yammarinol, 1993; Barbuto Jr et al., 2002; Pillai et al., 2003; Rubin et al., 2005) and singular organizational factors (Bommer et al., 2004). However, transformational leadership requires the leader to have reached a mature development stage that is usually fostered by prior critical experience (Avolio, 1994; Avolio & Bass, 1994; Avolio & Gibbons, 1988; DeRue & Wellman, 2009; Kuhnert & Lewis, 1987). While much theoretical and practical work has alluded to failure experience as “the crucible of leadership,” no study has empirically tested the relationship between failure experience and transformational leadership. By theorizing and empirically testing a model that focuses on failure as the antecedent of transformational leadership, this study took a first step toward addressing the gap by providing insight into failure, the most challenging and personally significant form of developmental experience.
The unique taking of failure experience in the present study extends existing theorizing of failure. While a stream of work by Shepherd and colleagues (Patzelt & Shepherd, 2011; Shepherd, 2003, 2004, 2009; Shepherd & Cardon, 2009) has made substantial contributions to the research on entrepreneurial failure, this study advances their works in two aspects. First, it broadens the current conceptualization of failure in the entrepreneurship context, going beyond a simple count of business closure. Shepherd (2003) pointed out that chapter 7 bankruptcy understates the number of failures, because it fails to account for those businesses that were sold or merged with another firm to avoid bankruptcy. Business failure, according to Shepherd (2003, 2009), refers to a change of ownership and management due to a fall in revenues and/or a rise in expenses of such a magnitude that the firm becomes insolvent and is unable to acquire additional financing. While advancing prior research, Shepherd’s (2003, 2009) definition of failure does not account for other common causes of business closure, such as legal problems and partnership disputes (Bruno et al., 1992). Building on Shepherd’s definition (2003), this study included business terminations caused by a more comprehensive list of reasons, including financial difficulties, legal problems, and partnership disputes.

Second, the present study did not limit failure experience to business termination, but also included major events that deviated from the expected or desired outcomes and accounted for the personal saliency of these events. Entrepreneurs and leaders alike do not learn only from business terminations, but also learn from critical events from their daily operations. Failure, apart from its implications for family members, friends, and investors, is an experience of personal significance for the entrepreneurs. In response to the call for more research that seeks to articulate failure at the level of lived experience
(Cope, 2011), this study joins a group of researchers (Cope, 2005, 2011; S. Singh et al., 2007) in highlighting the internalization of failure experience and adds quantitative weight to the predominant qualitative research within this line of inquiry. Further, this study has validated a new measure of the personal saliency of failure, which can be used by future scholars who are interested in investigating the lived experience of failure.

The present study has important implications for research on entrepreneurial learning in particular and management learning in general. Recently, an emerging stream of research has begun to highlight the influence of emotion on entrepreneurial activities (e.g., Cardon, Foo, Shepherd, & Wiklund, 2012; X. Chen et al., 2009; Foo, 2011; Foo, Uy, & Baron, 2009; M. H. Morris et al., 2012; Shepherd & Cardon, 2009; Welpe, Spörrle, Grichnik, Michl, & Audretsch, 2012) and has called for a better understanding of “the exact cognitive and emotional intraperson process and their interplay” (Welpe et al., 2012, p. 70). As an extension of this conversation, the present study revealed the moderating roles of LGO and emotion regulation in entrepreneurs’ learning from failure. As Cope(2003) observed, “The emotional complexity and intimacy of the relationship between the entrepreneur and the small business is unique” (p. 400). The close bond between the entrepreneur and organization (Melissa S. Cardon et al., 2005) makes entrepreneurship an ideal emotional context within which to study learning beyond traditional cognitive frameworks. In developing and empirically testing a theoretical model that accounts for failure’s emotional repercussions and the defense mechanisms entrepreneurs exhibit as a result—both of which experiential learning theory seems unable to fully explain (Vince, 1998)—this study went beyond simple application of experiential learning theory in the entrepreneurial context. As such, it aimed to seize the
unique opportunity to address aspects that were not previously articulated in extent learning theories. This extension adds to the theoretical development of experiential learning theory and contributes to the core literature on management learning.

In addition to their implications for research on leadership, failure, and learning, the results of this study also provide insight into the training and education of entrepreneurial leaders. Practice in leadership training and development has demonstrated that, although developing the willingness and ability to become a transformational leader is difficult, it is not impossible (Bass, 1999). Training programs for both business and community leaders show that a reduction in managing-by-exception behaviors notably improved transformational leadership (Avolio & Bass, 1994). This evidence suggests that behavior change could be an effective vehicle for leadership training and development. The present research has identified a specific set of learning behaviors that are positively linked to transformational leadership evaluation from followers. These behaviors, as compared to certain personality traits or organizational culture, are more readily incorporated into training programs of transformational leadership. Practitioners in leadership training can design programs targeting the development of individuals’ learning patterns that feature critical reflection, feedback seeking, and active involvement of followers. One caveat is that since moral development is a prerequisite for transformational leaders (Kuhnert & Lewis, 1987), no training or development program that focuses solely on behavior change would be truly effective. Instead, as educators, we should help individuals examine their values and assumptions and make plans to truly empower their followers.
From an educational perspective, failure could be more powerful than success because “it’s often easier to pinpoint why a failure has occurred than to explain a success” (McGrath, 1999, p. 28). Since there is a significant undersampling of failure in contrast to the high rates of failure reported in entrepreneurial businesses (Denrell, 2003), this study urges entrepreneurship educators, inside and outside universities, to design training and education programs that better reflect the reality facing entrepreneurs. As Shepherd (2004) suggested, a number of actions can be taken to improve entrepreneurship education. First, lecture content should offer statistics on the likelihood of business failure and highlight the point that failure and drawbacks represent opportunities for learning. Second, entrepreneurs who closed their business or once experienced major mistakes should be considered potential guest speakers in class. Third, case studies should include a more diverse range of business cases, including near-failure and failure stories. Fourth, first-hand experiences of failure can be developed through role-play activities and simulations. Finally, classroom discussion should include when and how one considers terminating a business with dignity. A “real options” (McGrath, 1999) mindset together with thorough cost-benefit analysis of the emotional and financial costs (Shepherd, Wiklund, & Haynie, 2009) would prevent entrepreneurs from wasting resources in inevitable business closure. In short, as educators we should share the responsibility of informing future entrepreneurs about both the ups and downs of entrepreneurship and thereby better prepare them to deal with future challenges.

A review of entrepreneurship training and mentoring programs reveals a heavy focus on “hard facts,” such as commercializing technology, analyzing markets, creating business plans, and developing skills in finance and accounting (Henry, Hill, & Leitch,
While these interventions are highly relevant to successfully launching and managing a business, the present research and many other studies show that a range of “soft skills” (e.g., social skills and emotion regulation) are equally important for entrepreneurial success (R. A. Baron & Markman, 2000; Shepherd, 2009). Hence, it would be beneficial to add the domain of self-development (e.g., understanding one’s own experience, managing emotions, setting appropriate goals, learning how to learn, and developing leadership competence) to existing entrepreneurship training programs. Prior research has shown that it is possible to improve one’s emotional competence through training and life experiences (C.-S. Wong, Foo, Wang, & Wong, 2007). Training programs can be designed to help entrepreneurs develop their emotional capabilities so that they can better cope with difficult situations. Accepting that one’s emotional competence may take time to develop, entrepreneurship mentors can invest in helping entrepreneurs reflect upon their entrepreneurial journeys, extract valuable lessons, and avoid being fixated on short-term outcomes. A healthy level of LGO would not only lower the level of anxiety and fear over uncertainty, but would also contribute to the long-term success of their ventures.

In addition, the results of this study can guide venture capitalists in their funding decisions. An increasingly popular assumption among venture capitalists is that entrepreneurs who have experienced failure are more prepared for their next venture. This study suggests that, when venture capitalists are looking at the number of previously failed business, they should also consider the LGO of entrepreneurs, as only those with high LGO are likely to benefit from previous failures. They should also try to gauge the personal saliency of those failure experiences and the entrepreneurs’ ability to regulate
emotions. Apparently, entrepreneurs with stronger emotion regulation ability enjoy a steeper learning curve than those with weaker emotion regulation ability.

**Limitations and Future Research Direction**

Notwithstanding the theoretical and practical contributions, there are several possible limitations to this study that can be addressed in future research. First and foremost, this study relied on retrospective accounts of failure experience, both in terms of the actual number of critical events and the personal saliency of these events. Due to imperfect memory, bias caused by implicit or espoused theories of the past, as well as cognitive processes such as rationalization, simplification, and attribution, retrospective accounts are subject to errors and biases (DeRue & Wellman, 2009). However, previous research shows that when carefully designed, retrospective reports converge with real-time report of life events (Ptacek, Smith, Espe, & Raffety, 1994). Accordingly, this study followed a set of guidelines recommended by DeRue and Wellman (2009) for minimizing recall bias: (a) the experience examined in this study occurred within the last 12 months; (b) these events were meaningful enough to be remembered and distinguished by participants; and (c) all participants were directly involved in the experiences they reported. As such, although issues related to retrospective memories are important limitations, they are not likely to pose a serious threat to the present study. Future studies could consider using a longitudinal design and measuring the personal saliency of each failure experience right after the event takes place.

Second, the correlational analysis used in this study could not offer causal inference. Although a temporally lagged design was employed for testing the relationship between failure experience (Time 1) and transformational leadership (Time 2), CEOs’
learning behaviors and transformational leadership were measured at the same time (Time 2). This limitation didn’t allow the study to rule out the possibility that a high level of transformational leadership brought out more learning behaviors. Ideally, future researchers should employ a field experiment to establish causality.

Third, the distribution of one failure measure (i.e. the number of terminated businesses) was positively skewed. Only 28.5% of the participants had business closure experience. However, it is not likely that sampling bias caused the skew. The sample was randomly selected based on comprehensive lists of small and medium-sized information technology enterprises in the United States and Finland, and it should be true to the distribution in the population. Nevertheless, the possibility of selection bias cannot be excluded, since those who failed and never tried again were not reachable by the present method. Insofar as the focus of this study was the relationship between failure experience and transformational leadership, the interest was in individuals currently holding a leadership role in a business. Hence, the potential selection bias does not undermine the implications of this study. It does, however, confirm a general difficulty in entrepreneurship research focusing on entrepreneurs with failure experience (Cope, 2011). Future research can employ strategic sampling methods to reach serial entrepreneurs who had experience with founding and terminating multiple businesses as well as those who experienced “hard shocks” and left the field for good. In-depth qualitative analysis will be needed to produce fine-grained, contextualized knowledge based on these samples.

Fourth, emotional intelligence was measured by the Wong and Law Emotional Intelligence Scale (WLEIS), a self-report instrument. As with all self-report measures,
social desirability biases are a concern (e.g., Bagozzi & Yi, 1990; L. J. Williams & Brown, 1994). This concern was somewhat alleviated by Law and colleagues’ (Law, Wong, & Song, 2004) effort to establish the convergent validity of WLEIS with non–self-report assessments of emotional intelligence. WLEIS has also demonstrated high internal consistency, convergent and discriminate validity, and incremental validity in a number of empirical studies (Hur, van den Berg, & Wilderom, 2011; Sy, Tram, & O’Hara, 2006; Wong & Law, 2002). Yet emotional intelligence as a set of abilities is ideally measured by tests. In particular, as shown by the present study, individuals are likely to experience difficulty evaluating their abilities in terms of understanding and leveraging the emotions of others. Future research can employ ability tests, such as the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEI; Mayer, Salovey, & Caruso, 2002) to better gauge emotional intelligence. However, researchers should note that MSCEI consists of 141 items and requires 30 to 45 minutes to complete. Given the demanding tasks and challenges entrepreneurs face every day, it can be challenging for researchers to solicit their participation in lengthy tests.

Fifth, there are likely confounding variables at the national level. Post-hoc analysis revealed different patterns in the relationship between failure and transformational leadership in the United States and Finland, especially when failure was measured by personal saliency. While the focal relationship in the United States was a positive linear one, the relationship was an inverted U-shape in the Finnish sample. There is evidence (Cave, Eccles, & Rundle, 2001) that failure has a more negative connotation in Europe, and as a result European entrepreneurs perceive a more acute social stigma to failure than do entrepreneurs in the United States. The attitudes toward failure do not
only vary between countries and cultures but also between regions and subcultures. For instance, Cardon, Stevens, and Potter (2009) found that in some regions of the United States, failure is perceived as mistakes by entrepreneurs and results in stigmatization, whereas in other regions the reason for failure is more often seen as misfortune. Negative attitudes towards failure cause barriers for learning, primarily due to fears of stigmatization (Cannon & Edmondson, 2005; Cope, 2011). Although further exploration along this line of inquiry is beyond the scope of the current dissertation, identifying and examining the influences of cultural variables such as the tolerance or stigmatization of failure are promising future directions. A cross-cultural study on the learning patterns and mediation and moderation mechanisms linking factors from the individual and the society will provide an even richer understanding of this phenomenon.

Conclusion

This dissertation developed and empirically tested a model of how and when entrepreneurs learn from failure experience, which subsequently contributes to their transformational leadership perceived by followers. The results reiterated an emerging understanding that failure represents one of the most difficult, complex, and yet valuable experiences for entrepreneurs (Cope, 2011). Further, the findings of this study extend the knowledge of failure and its learning implications by demonstrating that for individuals who have the (mis)fortune to engage in failure, not all learn equally from it. With these findings, the present study contributes to the leadership literature by identifying a set of learning behaviors as an antecedent of transformational leadership above and beyond the effects of age, gender, education, experience, and personality. Its contribution to failure research includes an extension of current conceptualizations of failure and the
development of a measure of the personal saliency of failure that can be used in future empirical studies. By employing the entrepreneurial context as a unique setting to study the role of emotion regulation in learning, this study also contributes to the management learning literature by advancing a model that simultaneously considers the emotional and cognitive aspects of learning. Finally, this study has important implications for venture capitalists as well as educators in the areas of leadership and entrepreneurship.
REFERENCE


Cardon, Melissa S., & McGrath, R. G. (1999). When the going gets tough...Toward a psychology of entrepreneurial failure and re-motivation. *Frontiers of Entrepreneurship Research Conference, Babson College*.


APPENDIX A:
FIRST COVER LETTER FOR CEOS

June 6, 2012

Dear Mr. XX,

Greetings! We are researchers from The George Washington University School of Business. We cordially invite you to participate in a research project to understand how entrepreneurs learn from experience and become effective leaders. Results from this survey will be used to help design better entrepreneurship education and mentoring programs for entrepreneurs like you. Once surveys are collected, we are happy to share our findings with you.

Due to the specific nature of our study, we have carefully selected a sample of IT entrepreneurial firms worldwide. It is my understanding that you are leading one such firm. Therefore, we ask you to complete this 8-minute survey and send it back to us in the business reply envelope. Your answers are completely confidential and will be released only as summaries in which no individual’s answers can be identified. When you return your completed questionnaire, your name will be deleted from the mailing list and never connected to your answers in any way. This survey is voluntary. However, you can help us very much by sharing your experiences. If, for some reason you prefer not to respond, please let us know by returning the blank questionnaire.

If you have any questions about this study, please feel free to contact the principal investigator, Dr. George Solomon, at 202.994.3760 or gsolomon@gwu.edu or the research coordinator, Fang He, at 202.994.7375 or fanghe@gwu.edu.

Thank you very much for helping with this important study. We have enclosed a $5 Starbucks gift card to express our gratitude.

Sincerely,

George T. Solomon
Director, Center for Entrepreneurial Excellence
APPENDIX B:
SECOND COVER LETTER FOR CEOS

June 21, 2012

Dear Mr. XX,

I hope your business is prospering. About two weeks ago we sent a questionnaire to you that asked about your experience as an entrepreneur. We have received your response and we thank you very much!

The nature of this study requires us to also understand the experience of your direct reports. It’s only by hearing from both you and your colleagues could we complete this research. Therefore, we are writing again to ask for your help. Please pass the enclosed envelopes to two colleagues and encourage them to respond. In particular, these colleagues should be people with whom: a) you make strategic decisions; and b) you have worked closely for at least one year.

Your colleagues will receive the same token of appreciation as you did last time.

Should you have further questions about this study, please feel free to contact the principal investigator, Dr. George Solomon, at 202.994.3760 or gsolomon@gwu.edu or the research coordinator, Fang He, at 202.994.7375 or fanghe@gwu.edu.

Thanks again for helping to advance entrepreneurship research.

Sincerely,

George T. Solomon
Director, Center for Entrepreneurial Excellence
July 6, 2012

Dear Participant,

Greetings! We are researchers from The George Washington University School of Business. We cordially invite you to participate in a research project to understand how IT entrepreneurs learn from experience and become effective leaders. Results from the survey will be used to help design better entrepreneurship education and mentoring programs for entrepreneurs like you. We are happy to share the findings with you should you be interested.

Due to the specific nature of our study, we have carefully selected a sample of IT entrepreneurial firms worldwide. It is my understanding that you are working for one such firm. Therefore, we ask you to complete this 5-minute survey and send it back to us in the enclosed business reply envelope. Please DO NOT return the survey back to the person who passed you this survey.

Your answers are completely confidential. You will never be connected to your answers in any way. Although your supervisor may also participate in this study, he or she has absolutely no access to your answers. This survey is voluntary. However, you can help us very much by sharing your opinions. If, for some reason you prefer not to respond, please let us know by returning the blank questionnaire.

If you have any questions about this study, please feel free to contact the principal investigator, Dr. George Solomon, at +1.202.994.3760 or gsolomon@gwu.edu or the research coordinator, Fang He, at +1.202.994.7375 or fanghe@gwu.edu.

Thank you very much for helping with this important study.

Sincerely,

George Solomon
Director, Center for Entrepreneurial Excellence
APPENDIX D:
SURVEY QUESTIONNAIRE FOR CEOS

1. How long have you been working in the IT industry?
   □ □ year(s)

2. Are you the founder or one of the co-founders of the company where you received this questionnaire?
   □ Yes □ No

3. How many other businesses have you founded, other than this company?
   □ □ (Please give a number)

4. Of all the businesses you started, how many are still operating (including those you have sold)?
   □ □ (Please give a number)

5. Of all the businesses you started, how many have you terminated due to any of the following reasons: financial difficulty, legal problems, or partnership dispute?
   □ □ (Please give a number)

Think about major events in the past 12 months that deviated from your expected or desired objectives, such as closing a business that fell short of its goals. Please indicate to what extent you agree or disagree with the following statements. (Please circle your answer)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. These events are of great personal importance to me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. These events have defined me as a person.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. These events do not influence the way I view myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. I have been deeply concerned with these events.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Please indicate to what extent you feel this way after experiencing those events that deviated from your expected or desired objectives. (Please circle your answer)

<table>
<thead>
<tr>
<th></th>
<th>Never ▼</th>
<th>Sometimes ▼</th>
<th>Always ▼</th>
<th>Never ▼</th>
<th>Sometimes ▼</th>
<th>Always ▼</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Ashamed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>12. Inspired</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>14. Nervous</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>16. Attentive</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>18. Hostile</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>11. Alert</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Upset</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Determined</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Afraid</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. Active</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The following section presents a series of statements describing aspects of entrepreneurial experience. Please indicate to what extent you agree or disagree with these statements. (Please circle your answer)

<table>
<thead>
<tr>
<th>Goals</th>
<th>Strongly Disagree ▼</th>
<th>Disagree ▼</th>
<th>Neutral ▼</th>
<th>Agree ▼</th>
<th>Strongly Agree ▼</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am willing to select a challenging work that I can learn a lot from.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. I often look for opportunities to develop new skills and knowledge.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. I enjoy challenging and difficult tasks where I'll learn new skills.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. For me, development of my ability is important enough to take risks.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. I prefer to work in situations that require a high level of ability and talent.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. I am concerned with showing that I can perform better than others.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. I try to figure out what it takes to prove my ability to others.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. I enjoy it when others are aware of how well I am doing.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. I prefer to work on things that I can prove my ability to others.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. I would avoid taking on a new task if there was a chance that I would appear rather incompetent to others.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. Avoiding showing low ability is more important to me than learning new skills.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. I am concerned about taking on a task if my performance would reveal that I had low ability.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. I prefer to avoid situations where I might perform poorly.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
The following section continues with statements describing aspects of entrepreneurial experience. Please indicate to what extent you agree or disagree with these statements. (Please circle your answer)

<table>
<thead>
<tr>
<th>Learning</th>
<th>Strongly Disagree ▼</th>
<th>Disagree ▼</th>
<th>Neutral ▼</th>
<th>Agree ▼</th>
<th>Strongly Agree ▼</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I regularly take time to figure out ways to improve my work processes.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I tend to handle differences of opinion privately, rather than addressing them directly at an organization level.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I go out and get all the information I possibly can from others, such as customers or other entrepreneurs.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I frequently seek new information that leads me to make important changes.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I always make sure that I stop to reflect on the vision of my company.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I encourage my employees to challenge my assumptions under discussion.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. I invite my employees to present information or have discussions with me.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Personality</th>
<th>Strongly Disagree ▼</th>
<th>Disagree ▼</th>
<th>Neutral ▼</th>
<th>Agree ▼</th>
<th>Strongly Agree ▼</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. I have a soft heart.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I take time out for others.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. I feel others’ emotions.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. I am not interested in other people’s problems.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. I make people feel at ease.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. I don’t like to draw attention to myself.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. I am quiet around strangers.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. I start conversations.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. I talk to a lot of different people at parties.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. I don’t mind being the center of attention.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Societal Culture

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>18. Social communications signal that failure is considered an ordinary occurrence.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19. The society takes failure in stride.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20. As far as the society is concerned, failure is not seen as anything extra-ordinary.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

### Emotion Management

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I have a good sense of why I have certain feelings most of the time.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. I am able to control my temper and handle difficulties rationally.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. I am a self-motivated person.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. I always know whether or not I am happy.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. I always know my colleagues’ emotions from their behavior.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. I always encourage myself to try my best.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. I am sensitive to the feelings and emotions of others.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. I can always calm down quickly when I am very angry.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. I always set goals for myself and then try my best to achieve them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. I always tell myself I am a competent person.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. I really understand what I feel.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. I am a good observer of others’ emotions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. I have a good understanding of my own emotions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. I am quite capable of controlling my own emotions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. I have a good understanding of the emotions of people around me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16. I have good control of my own emotions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
17. Your company’s name?


18. Your company’s gross revenue last year?

___ ___ ___ ___ ___ thousand dollars

19. Your company’s number of employees?

___ ___

20. Your age?

___ ___

21. Your gender?
   □ Female
   □ Male

22. Your highest level of education?
   □ High school
   □ Associate degree
   □ Bachelor’s/undergraduate degree or similar
   □ Master’s/graduate degree
   □ Doctoral degree

Thank you very much for taking the time to help advance entrepreneurship research! Please send the completed questionnaire to GWU in the enclosed postage-paid envelope.
APPENDIX E:
SURVEY QUESTIONNAIRE FOR MANAGERS

1. How long have you been working with the person who handed you this survey?
   __ __ year(s)

2. How often do you interact with him/her?
   □ Not at all
   □ Occasionally
   □ A few times a week
   □ Everyday

The following section presents a series of statements about the person who handed you this survey. Please indicate to what extent you agree or disagree with each statement. (Please circle your answer)

<table>
<thead>
<tr>
<th>Learning Pattern</th>
<th>Strongly Disagree</th>
<th>Disagree ▼</th>
<th>Neutral ▼</th>
<th>Agree ▼</th>
<th>Strongly Agree ▼</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. He/she regularly takes time to figure out ways to improve the company’s work processes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. He/she handles differences of opinion privately, rather than addressing them in front of the organization.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. He/she goes out and gets all the information he/she possibly can from others.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. He/she frequently seeks new information that enables him/her to make important changes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. He/she always makes sure that he/she stops to reflect on the vision of the company.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. He/she encourages employees to challenge his/her assumptions under discussion.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. He/she invites employees to present information or have discussions with him/her.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Emotion Management</td>
<td>Strongly Disagree ▼</td>
<td>Disagree ▼</td>
<td>Neutral ▼</td>
<td>Agree ▼</td>
<td>Strongly Agree ▼</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------------------</td>
<td>-----------</td>
<td>-----------</td>
<td>---------</td>
<td>------------------</td>
</tr>
<tr>
<td>10. He/she always understands his/her employees’ emotions from their behavior.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. He/she is able to control his/her temper and handle difficulties rationally.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. He/she is sensitive to the feelings and emotions of others.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. He/she can always calm down quickly when he/she is very angry.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. He/she is a good observer of others’ emotions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. He/she is quite capable of controlling his/her own emotions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16. He/she has a good understanding of the emotions of people around him/her.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17. He/she has good control of his/her own emotions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Leadership</th>
<th>Strongly Disagree ▼</th>
<th>Disagree ▼</th>
<th>Neutral ▼</th>
<th>Agree ▼</th>
<th>Strongly Agree ▼</th>
</tr>
</thead>
<tbody>
<tr>
<td>18. He/she has a clear understanding of where we are going.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19. He/she has a clear sense of where he/she wants our unit to be in the future.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20. He/she provides us with a compelling vision.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>21. He/she inspires others when he/she discusses our direction for the future.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>22. He/she encourages people to see changes as situations full of opportunities.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>23. He/she is able to get others to commit to what we need to accomplish.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>24. He/she challenges others to think about problems in new ways.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>25. He/she stimulates me to rethink some things that I have never questioned before.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>26. He/she challenges others to reexamine some of their basic assumptions about their work.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>27. He/she considers people’s feelings before acting.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>28. He/she behaves in a manner which is thoughtful of others’ personal needs.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>29. He/she sees the interests of employees are given due consideration.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Below is a set of statements about the culture of your country. Please indicate to what extent you agree or disagree with these statements. (Please circle your answer)

<table>
<thead>
<tr>
<th>Societal Culture</th>
<th>Strongly Disagree ▼</th>
<th>Disagree ▼</th>
<th>Neutral ▼</th>
<th>Agree ▼</th>
<th>Strongly Agree ▼</th>
</tr>
</thead>
<tbody>
<tr>
<td>30. Social communications signal that failure is considered an ordinary occurrence in my society.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. The society takes failure in stride.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32. As far as the society is concerned, failure is not seen as anything extra-ordinary.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

33. Your company’s name? 

34. Your age? 

35. Your gender? 
  □ Female 
  □ Male 

36. Your highest level of education? 
  □ High school 
  □ Associate degree 
  □ Bachelor’s/undergraduate degree or similar 
  □ Master’s/graduate degree 
  □ Doctoral degree 

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