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## **The Effects of Employees' Creative Self-Efficacy on Innovative Behavior: The Role of Entrepreneurial Leadership**

(Accepted Version)

Authors: Herman Tse, Alexander Newman, Gary Schwarz (SOAS University of London), and Ingrid Nielsen

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### **A B S T R A C T**

The present study explores the unique effect of entrepreneurial leadership on the relationship between employees' creative self-efficacy (CSE) and innovative behavior. Using multi-level data from multiple sources, namely, 66 middle-level managers and their 346 subordinates from a large Chinese multinational organization, the effect of CSE on innovative behavior was found to be more influential when employees work under a strong entrepreneurial leader in their team. We also found that entrepreneurial leadership exerts a stronger moderating effect on the CSE-innovative behavior link than transformational and participative leadership behaviors. Consistent with social cognitive theory, these results suggest that leaders who engage in the role modeling of entrepreneurial behaviors to employees and in directing employees towards identifying and exploiting entrepreneurial opportunities are more likely to foster innovative behavior among employees with higher levels of creative self-efficacy, than acting in a transformational manner or allowing employees to participate in decision-making.

### **Keywords**

Creative self-efficacy; Entrepreneurship; Leadership; Innovative behavior

## 1. Introduction

The innovative behavior of employees, defined as their ability to generate and implement new and useful ideas at work (Scott & Bruce, 1994), is critical to organizational innovation and a sustained competitive advantage (Montani, Courcy, & Vandenberghe, 2017; Ramamoorthy, Flood, Slattery, & Sardesai, 2005). Research indicates that employees are important sources of innovation in most organizations, responsible for approximately 80 per cent of new ideas for implementation (Getz & Robinson, 2003). Given this, as well as strong evidence that innovation positively influences organizational performance (Bowen, Rostami, & Steel, 2010; Wang and Dass, 2017), scholars have begun to investigate the antecedents of innovative behavior within the context of more entrepreneurial-based organizations, as well as more traditional “top-down” organizations (Basu & Green, 1997; Hülshager, Anderson, & Salgado, 2009; Li, Zhao, & Begley, 2015; Pieterse, van Knippenberg, Schippers, & Stam, 2010; Yuan & Woodman, 2010). One factor that has consistently been found to be a key driver of employees’ innovative behavior is creative-self efficacy (CSE), which is defined as “the belief one has the ability to produce creative outcomes” (Tierney & Farmer, 2002, p. 1138). For instance, Hsu, Hou, and Fan (2011) found a significant effect of CSE on employees’ innovative behavior and Tierney and Farmer (2011) reported that CSE was a strong predictor of employees’ creative performance over time.

Despite the valuable and insightful findings of this past research, an understanding of the boundary conditions of the CSE-innovative behavior relationship remains underdeveloped. In particular, there is a dearth of knowledge of whether contextual factors at work, such as leadership, may accentuate or attenuate the relationship between employees’ CSE and their innovative behavior (Tierney & Farmer, 2011). Moreover, despite growing research highlighting the importance of leadership as a key contextual factor driving innovative behavior (Hammond, Neff, Farr, Schwall, & Zhao, 2011; Miao, Newman, Schwarz, & Cooper,

2018), the role that the leader plays in maximizing the beneficial effects of employees' CSE on their innovative behavior has yet to be investigated in detail.

In the present study, we highlight the important role played by leadership in fostering those with high levels of CSE to engage in innovative behavior. In particular, we argue that the effect of CSE on innovative behavior is more likely to be influenced by the extent to which the leader exhibits entrepreneurial leadership behaviors than other effective leadership approaches, such as transformational leadership and participative leadership. More specifically, we examine whether entrepreneurial leadership, a leadership approach characterized by the leader influencing and directing the performance of team members to recognize and exploit entrepreneurial opportunities (Renko, El Tarabishy, Carsrud, & Brannback, 2015), influences the extent to which employees with different levels of CSE engage in innovative behavior. In doing so, we suggest that the influence of CSE on employees' innovative behavior will be stronger for employees who work in a team with strong entrepreneurial leadership because entrepreneurial behaviors motivate employees to derive creative ideas and implement them at work. We also argue that employees with high levels of CSE, compared to those with low levels of CSE, may identify more strongly with the entrepreneurial leader's focus on opportunity identification and exploitation and thus respond more positively to the encouragement given to them by their leader to develop and implement creative ideas.

In addition to examining the moderating effect of entrepreneurial leadership on the CSE-innovative behavior relationship, we also examine its relative importance in fostering those with CSE to engage in innovative behavior vis-a-vis two other leadership approaches (i.e., transformational and participative leadership), which have often been found to have direct effects on innovative behavior in previous research (e.g., Afsar, Badir, & Bin Saeed, 2014; Aryee, Walumbwa, Zhou, & Hartnell, 2012; Bednall, Rafferty, Shipton, Sanders, & Jackson, 2018; Jung, Chow, & Wu, 2003). In doing so, our research can provide insights into which

leadership approach is more effective and conducive for high CSE employees to engage in innovative behavior. We argue that, in line with the key tenets of social cognitive theory (Bandura, 1986), by role modeling entrepreneurial behaviors to followers and encouraging them to engage in entrepreneurial activity, the entrepreneurial leader is more likely to foster the innovative behavior of those high in CSE than transformational or participative leaders.

By examining these issues, the present study makes important contributions to the literature. First, our study makes a theoretical contribution by examining the critical role of leadership as an effective boundary condition that can influence the strength of the CSE-innovative behavior relationship. By exploring whether working in a team with strong entrepreneurial leadership can accentuate the effect of employees' CSE on their innovative behaviors, we respond to the repeated calls of researchers to examine how individual differences and situational factors interact to influence innovation outcomes at work (Hammond et al., 2011). Second, while existing research has demonstrated that different leadership approaches (e.g., entrepreneurial leadership, transformational leadership and participative leadership) are effective for employees' innovative behavior (Bagheri & Akbari, 2018; De Jong, & Den Hartog, 2010; Pieterse et al., 2010), prior work has not yet investigated the relative importance of these leadership approaches in encouraging employees with high levels of CSE to engage in innovative behavior. To address this issue, we examine whether entrepreneurial leadership will exert a stronger moderating effect on the CSE-innovative behavior link than transformational leadership and participative leadership. Finally, the present research also has important managerial implications. The present study not only improves our understanding of how leaders can foster the innovative behavior of employees who believe in their ability to develop and implement creative ideas but also highlights the need for organizations to match leaders with subordinates who are most likely to benefit from working under them. In doing so, it

assists organizations in effectively advising managers how to maximize the innovative behaviors of their employees and contribute to organizational success.

## **2. Theory and hypotheses development**

### *2.1. Social cognitive theory and self-efficacy*

Bandura's (1986) social cognitive theory views human functioning as a dynamic interplay of personal, behavioral and environmental influences. Within this framework, Bandura suggested that personal factors (in the form of cognition, affect and physiological events), behavior, and the environment interact in a manner that he termed 'triadic reciprocity'. Social cognitive theory is distinct from other learning theories in the central role afforded to cognition in the triadic interaction between the self, the environment and behavior (Hmieleski & Baron, 2009). Bandura argued that interpreting one's own behavior effects change in the self and change in the environment which in turn affects future behavior changes. This dynamic triadic process formed the basis of Bandura's notion of 'reciprocal determinism'.

Central to social cognitive theory is the idea that human functioning is influenced by "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura, 1986, p. 391). Bandura (1997) termed such judgment 'self-efficacy' and argued that motivation, affective states and actions are better predicted by what people believe they can achieve than by their objective capabilities, notwithstanding, of course, the necessary condition that requisite skills must be present to successfully accomplish a task. When requisite skills are present, however, self-efficacy beliefs help to explain why task accomplishment sometimes falls short of that which would be predicted by requisite skills, holding other factors constant. Self-efficacy also helps to explain why successful task accomplishment leads to improved capabilities (Maertz, Bauer, Mosley, Posthuma, & Campion, 2005).

According to Bandura (1997), self-efficacy influences human functioning through several different processes. First, it influences the tasks that people attempt to undertake, such that people tend to undertake tasks that they believe they can successfully complete. Second, it influences how much effort someone will be prepared to expend on a task as well as how much they will persevere to achieve positive task completion. Those with a greater belief in their ability to complete a task will work longer and harder to complete it. Finally, self-efficacy influences people's affective responses to approaching tasks, which in turn influences successful task completion.

## *2.2. Creative self-efficacy and innovative behavior*

CSE is a particular type of self-efficacy that refers to an individual's perception that he or she is capable of achieving creative outcomes (Tierney & Farmer, 2002). There is growing evidence that CSE is positively related to creativity in a workplace setting (Gong, Huang, & Farh, 2009; Tierney & Farmer, 2011). For example, empirical studies have reported that CSE is linked to creativity and creative task performance (e.g., Choi, 2004; Jaussi, Randel, & Dionne, 2007; Tierney & Farmer, 2004). Based on Bandura's (1986, 1997) social cognitive theory, CSE should lead to higher levels of innovative behavior for two main reasons. First, individuals high in CSE are likely to choose to engage in innovative behavior, as they will feel confident in their knowledge and skills to generate ideas and implement those ideas at work (Jiang & Gu, 2017). This will lead them to spend more time on creative cognitive processes in identifying problems and generating ideas to solve those problems as well as seeking sponsorship for such ideas from those higher up in the organizational hierarchy (Hsu et al., 2011). Second, those high in CSE will feel better equipped to address the challenges and uncertainty faced when developing and implementing new ideas in the workplace (Richter, van Knippenberg, Hirst, & Baer, 2012). Compared to those low in CSE, they will be more likely to perceive challenges as opportunities and persevere when faced with setbacks.

### *2.3. The influence of leadership on the CSE-innovative behavior relationship*

Despite growing evidence linking the CSE of employees to their innovative behavior (Orth & Volmer, 2017), there has been a dearth of research on contextual factors that may accentuate or attenuate the relationship between CSE and innovative behavior. Although leadership has been identified as a key determinant of employees' innovative behavior (see meta-analytical work by Hammond et al. (2011)), prior work has not fully examined whether the extent to which CSE predicts innovative behavior is contingent upon the behaviors exhibited by the leader. Research has demonstrated that key leadership approaches such as transformational leadership and participative leadership are effective for employees' innovative behaviors (Afsar et al., 2014; Somech, 2006). More recently, entrepreneurial leadership has also been identified as another potential leadership approach that may influence innovative behavior (Bagheri & Akbari, 2018; Miao et al., 2018). However, little research has been conducted to investigate whether entrepreneurial leadership is a key contextual factor which influences the positive effects of CSE on innovative behavior, and to explore the relative importance of entrepreneurial leadership vis-à-vis alternative leadership approaches such as transformational and participative leadership in fostering those with high levels of CSE to engage in innovative behavior.

### *2.4. The moderating effects of entrepreneurial leadership*

Although there is increasing recognition of the importance of leadership in the process of developing and implementing new ideas at work (e.g., Rank, Nelson, Allen, & Xu, 2009; Yoshida, Sendjaya, Hirst, & Cooper, 2014), scholars have only just begun to examine the effect of entrepreneurial leadership on employees' innovative behavior (Bagheri & Akbari, 2018; Miao, Eva, Newman, & Cooper, 2017). Entrepreneurial leadership has been defined as a leadership style in which the leader influences and directs "the performance of group members toward the achievement of organizational goals that involve recognizing and exploiting

entrepreneurial opportunities” (Renko et al., 2015, p. 55). Renko (2018, p. 388) emphasized the dual role of entrepreneurial leaders as ‘entrepreneurial accelerators’ and ‘entrepreneurial doers’. In addition to encouraging their subordinates to act in an innovative manner, challenge the status quo, and exploit business opportunities (entrepreneurial accelerators), entrepreneurial leaders also allow for vicarious learning to occur by acting as role-models who engage in entrepreneurial activities themselves and encourage followers to emulate their behaviors (entrepreneurial doers) (Renko et al., 2015). On this basis, social cognitive theory provides a relevant theoretical lens to why entrepreneurial leadership can be an effective leadership behavior, which is conducive for high CSE employees to engage in innovative behavior at work. As such, the theory can integrate entrepreneurial leadership and CSE and explicate their joint effect on innovative behavior.

In examining the moderating role played by leadership, we focus on entrepreneurial leadership behavior, rather than related approaches of leadership behavior such as creative leadership (Mainemelis, Kark, & Epitropaki, 2015; Tierney & Farmer, 2004), as entrepreneurial leaders not only motivate their followers to generate creative ideas in response to opportunities they face at work but also encourage them to engage in innovative behavior by exploiting such ideas for commercial gain. As Renko et al. (2015, p. 58) note, while creative leadership is “often focused on internal operations...the creative emphasis of entrepreneurial leadership is on inventing and, more importantly, commercializing products, services, or processes”, in other words, engaging in innovative behavior, which is the focus of our study. Accordingly, recent work has found a strong relationship between team members’ aggregated perceptions of entrepreneurial leadership and the innovative behavior of employees over time (Miao et al., 2018). Following previous leadership research, we treat entrepreneurial leadership as a team-level variable (Lord & Dinh, 2012). As such, we take a step further in examining whether team



members' perceptions of entrepreneurial leadership would accentuate the influence of CSE on employees' innovative behavior.

In arguing for the moderating effects of entrepreneurial leadership on the CSE-innovative behavior relationship, we highlight two key reasons why employees with high levels of CSE will respond more positively to the characteristics of entrepreneurial leaders to overcome setbacks in order to implement creative ideas than those with low levels of CSE. First, employees may be more likely to identify with the entrepreneurial leaders' focus on developing an environment where engaging in innovative behaviors in response to opportunities is both expected and rewarded. Modeled by the leader to his/her subordinates, employees with high levels of CSE will also feel more comfortable working in such an environment (Gupta, MacMillan, & Surie, 2004). Both factors will lead them to embrace the vicarious learning opportunities provided by the entrepreneurial leader and enhance their motivation to engage in innovative behavior.

In contrast, employees with low levels of CSE are likely to identify less strongly with the focus of the entrepreneurial leader on developing an environment where engaging in innovative behaviors is expected and rewarded and feel less comfortable working in an environment where the leader pressures them to develop innovative solutions to opportunities identified at work. As a result, they will be less likely to make use of the vicarious learning opportunities provided by the leader and feel less motivated to engage in innovative behavior than those high in CSE. This leads us to the following hypotheses:

**Hypothesis 1.** The effect of CSE on innovative behavior will be moderated by entrepreneurial leadership such that the CSE-innovative behavior relationship will be stronger when team members' perceptions of entrepreneurial leadership are higher rather than lower.

## *2.5. Entrepreneurial Leadership vis-à-vis other leadership approaches*

In addition to arguing that entrepreneurial leadership will moderate the relationship between CSE and employees' innovative behavior, we also propose that entrepreneurial leadership will have a stronger moderating effect on the CSE-innovative behavior relationship than two important alternative leadership approaches (i.e., transformational leadership and participative leadership) that have been found to be related to innovative behavior (e.g., Chen, Tank, Jin, Xie, & Li, 2014; Jung et al., 2003; Somech, 2006).

Bass and Avolio (1994) conceptualized transformational leadership as a higher-order construct consisting of four components: idealized influence (providing charismatic and ethical role modeling), inspirational motivation (articulating a shared vision), individualized consideration (attending to each follower's needs) and intellectual stimulation (challenging established assumptions). Transformational leadership shares some commonalities with entrepreneurial leadership in that it involves the leader providing role modeling to employees and inspiring them to think 'out of the box', which is crucial for innovative behavior (Bednall et al., 2018; Schwarz, 2017). However, Renko (2018, p. 392) notes that "entrepreneurial and transformational leadership styles have more differences than similarities." Entrepreneurial leaders focus more on opportunity oriented behaviors than transformational leaders, they may lack charisma, and may not provide followers with the individualized consideration that characterize transformational leaders (Renko, 2018). We argue that the more specific focus of entrepreneurial leadership on role modeling entrepreneurial behaviors and encouraging their followers to act in an entrepreneurial manner may be more likely to drive those with high levels of CSE to feel comfortable implementing their creative ideas at work than the more general role modeling and encouragement provided by transformational leaders. More specifically, it is expected that high CSE employees may tend to imitate and follow the role modeling of entrepreneurial behaviors such as risk taking, being persistent, and taking a growth mindset to manage potential setbacks in the idea implementation process (Jiang & Gu, 2017).

Participative leadership is defined as shared influence and joint decision making between a leader and their followers (Armenakis, Harris, & Mossholder, 1993; Koopman & Wierdsma, 1998), with the goal of giving followers greater discretion, extra attention and support, and involvement in solving problems and making decisions (Nystrom, 1990). Participative leadership signals to the employees that their manager has confidence in them and research suggests that participative leadership has strong implications for different types of performance, including creativity and innovative behavior (Huang et al., 2010; Somech, 2006). Although participative leaders involve employees in the processes of problem-solving and decision-making (Miao, Newman, Schwarz, & Xu, 2013), they do not necessarily provide the specific role-modeling and guidance that will encourage such employees to be more confident in their creative ability (i.e., high levels of CSE) and to engage in innovative behavior. In contrast, entrepreneurial leaders are effective in demonstrating entrepreneurial behaviors to followers and instill them with the confidence to engage in entrepreneurial endeavors that involve the implementation of creative ideas at work.

The above discussion suggests that entrepreneurial leadership is conceptually related but distinct from other effective leadership approaches (transformational leadership and participative leadership). The unique characteristics of entrepreneurial leadership are more likely to motivate employees with high levels of CSE to engage in innovative behaviors above and beyond the moderating effect exerted by transformational and participative leadership behaviors. This leads us to make the following hypothesis:

**Hypothesis 2.** Entrepreneurial leadership exerts a stronger moderating effect on the relationship between CSE and innovative behavior than transformational or participative leadership behavior.

### **3. Method**

#### *3.1. Sample and procedure*

A total of 346 supervisor-subordinate dyads from 66 teams in three branch offices of a Chinese state-owned enterprise in the transportation manufacturing sector participated in our study. The supervisors were all middle-level managers, while subordinates were frontline supervisors in the manufacturing and engineering departments involved in the production of trains and railway systems in China. Both middle-level managers and frontline supervisors were professionally qualified with engineering backgrounds. As part of their job duties, both sets of employees were encouraged by their organizations to develop and implement new and useful ideas to improve organizational effectiveness. Data were collected in two waves, four weeks apart, from two sources (i.e., frontline supervisors and their immediate middle-level managers) in order to minimize common method bias, as recommended by Podsakoff, MacKenzie and Podsakoff (2012). All of the measures used in this study were originally developed in English and subsequently back-translated into Chinese by bilingual members of the research team to obtain semantic equivalence and agreement (Brislin, Lonner, & Thorndike, 1973).

Prospective participants were informed about the voluntary nature of the research participation, and all participants were provided with a cover letter, a paper-based questionnaire, and a return envelope. The participants were assured that their answers would be kept confidential and were instructed to place their completed questionnaires in a sealed envelope and submit it to a post box located in their organization. Each questionnaire was coded with an identification number so that all responses provided by frontline supervisors and immediate middle-level managers in each team could be matched for subsequent data analyses.

We collected data from frontline supervisors on their creative self-efficacy, perceptions of their manager's entrepreneurial leadership, transformational leadership and participative leadership as well as their demographic information. Four weeks later, the middle-level managers rated their frontline supervisors' innovative behavior. All frontline supervisors working under each middle-level manager were invited to participate in the study. The response rate was 89%. The

high response rate reflected the high degree of interest in our study from the participant organization and the corresponding level of encouragement to participate given to employees by the organization's management team.

The average age of the respondents was 33.5 years, with approximately one-third being female. Nearly four-fifths of the sample (78%) had a university degree. On average, participants had worked for the organization for 10.8 years and had worked with their manager for 3.2 years. The high average organizational tenure was not surprising, given that the company was a state-owned company with favorable employment conditions.

### *3.2. Measures*

All measures consisted of items with five-point Likert scales ranging from 1 = strongly disagree to 5 = strongly agree, unless otherwise indicated.

#### *3.2.1. Entrepreneurial leadership*

Renko et al.'s (2015) 8-item ENTRELEAD scale was used by the frontline supervisors to rate the entrepreneurial leadership of their immediate manager. This scale was developed and validated using different samples in line with best practices in the field (Hinkin, 1995). Respondents were required to respond on a Likert scale ranging from 1 = not at all to 5 = frequently, if not always. Sample items included "My manager has creative solutions to problems" and "My manager challenges and pushes me to act in a more innovative way". The Cronbach's alpha for this scale was .89, indicating a high degree of internal consistency.

#### *3.2.2. Transformational leadership*

Transformational leadership was measured using the 7-item global transformational leadership scale developed by Carless, Wearing, & Mann (2000). Respondents were required to respond on a Likert scale ranging from 1 = not at all to 5 = frequently, if not always. Sample items included "My manager communicates a clear and positive vision of the future" and "My

manager encourages thinking about problems in new ways and questions assumptions”. The Cronbach's alpha for this scale was .93, indicating a high degree of internal consistency.

### *3.2.3. Participative leadership*

Participative leadership was measured using the 6-item Empowering Leadership Questionnaire developed by Arnold, Arad, Rhoades and Drasgow (2000). Respondents were required to respond on a Likert scale ranging from 1 = not at all to 5 = frequently, if not always. Sample items included “My manager encourages us to express ideas/suggestions”, and “My manager uses our suggestions to make decisions that affect us”. The Cronbach's alpha for this scale was .75.

### *3.2.4. Creative self-efficacy*

Creative self-efficacy was self-rated by frontline supervisors using the four-item scale developed by Tierney and Farmer (2002). Sample items included “I feel that I am good at generating novel ideas” and “I am good at finding creative ways to solve problems”. The Cronbach's alpha for this scale was .90 in this study.

### *3.2.5. Innovative behavior*

The innovative behavior of frontline supervisors was rated by their direct managers using five items developed by Scott and Bruce (1994). Sample items included “This employee generates creative ideas” and “This employee searches out new technologies, processes, techniques, and/or ideas”. The Cronbach's alpha for this scale was .93, indicating a high degree of internal consistency.

### *3.2.6. Control variables*

Past leadership and innovative behavior research suggests that the demographic background of subordinates could account for the variance in their innovative behavior that may affect the results of the hypothesized relationships in this study. Therefore, we controlled for subordinates' gender, age, and education level (Lee, Schwarz, Newman, & Legood, 2017).

Furthermore, we controlled for the duration frontline supervisors spent working under their present manager, as this may influence the managers' ratings of the frontline supervisors' innovative behavior. Specifically, frontline supervisors' gender was measured using a dummy variable (0 = female, 1 = male). Age and the length of time the frontline supervisor employee had worked under their present manager were measured in years. Finally, education level was measured using a dummy variable (0 = high school, 1 = university education).

## 4. Results

### 4.1. Measurement model

We performed a series of confirmatory factor analyses (CFAs) to determine the validity of our hypothesized measurement model compared to other underlying plausible measurement models based on several fit indices. The chi-square and fit indices were ( $\chi^2 = 766.197.18$ ,  $df = 395$ ; RMSEA = .052; CFI = .95, IFI = .95 and TLI = .94), showing that the hypothesized five-factor model (i.e., items of entrepreneurial leadership, transformational leadership, participative leadership, creative self-efficacy and innovative behavior loaded on their respective factors) fitted the data significantly better than a one-factor model (i.e., all items of the variables loaded on a single-factor:  $\chi^2 = 2886.930.45$ ,  $df = 405$ ; RMSEA = .133; CFI = .66, IFI = .64 and TLI = .66) with a change in chi-square ( $\Delta\chi^2 = 2120.733.49$ ,  $\Delta df = 10$ ,  $p < .001$ ). These results provide strong support for the distinctiveness of the five constructs in this study and suggest that common method variance does not affect the hypothesized relationships between the constructs (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

### 4.2. Analytical strategy

To determine the appropriateness of aggregating entrepreneurial leadership, transformational leadership, and participative leadership as group-level constructs for hypothesis testing, we conducted between-group variability and within-group agreement tests. The average  $r_{wg}$  of entrepreneurial leadership, transformational leadership and participative leadership across the

66 teams was .97, .97 and .97, respectively, which meets the within-group agreement requirement of .70 or above (James, Demaree, & Wolf, 1984). Furthermore, the results of an ANOVA show that the between-group variance in entrepreneurial leadership, transformational leadership and participative leadership was significantly different from zero,  $F = 2.95, p < .01$ ,  $F = 2.67, p < .01$  and  $F = 1.90, p < .01$ , respectively. For entrepreneurial leadership, the ICC(1) derived from the ANOVA was .27 and ICC(2) was .66; for transformational leadership, the ICC(1) was .24 and the ICC(2) was .62; and for participative leadership, the ICC(1) was .15 and the ICC(2) was .47. These results provide sufficient evidence for between-group variability in these three leadership variables. In this regard, Bliese (2000) suggests that ICC(1) values different from zero are desirable, with values close to .12 indicating high scores for group-level analysis. Glick (1985) proposed that ICC(2) values above .60 are desirable. Both  $r_{wg}$  and ICC results suggest that entrepreneurial leadership, transformational leadership, and participative leadership were appropriate to be aggregated as a group-level construct for multilevel analysis.

#### *4.3. Descriptive statistics*

Table 1 presents the means, standard deviations and correlations between the study variables. Consistent with our expectation, entrepreneurial leadership was found to have a positive effect on CSE and innovative behavior, and CSE was also positively associated with innovative behavior. These results provide some initial support for Hypothesis 1.

Insert Table 1 about here

#### *4.4. Test of hypotheses*

Before testing our hypotheses, we first ran a null model (no individual or team level predictors) to examine the extent of systematic between-group variance in innovative behavior. The results in Table 2 provide support for significant within-group variation in innovative behavior ( $F_{00} = .33, X^2(64) = 520.23, p < .01$ ), and ICC(1) was .56, indicating that innovative behavior had a



56 percent between-group variance that can be accounted for by group-level variables, such as leadership. These results supported the appropriateness of the data for cross-level analyses (Snijders & Bosker, 1999).

Hypothesis 1 predicted that entrepreneurial leadership would moderate the relationship between CSE and innovative behavior. This hypothesis was tested using the “slopes-as-outcomes” model, where the variance in the slope across teams is expected to be significantly related to team members’ perception of entrepreneurial leadership (Hofmann & Gavin, 1998). We followed the suggestion of Hofmann & Gavin (1998) to use group mean centering of CSE to capture the accurate group-level effect of entrepreneurial leadership. The results in Table 2 show that the cross-level interaction between entrepreneurial leadership and CSE on innovative behavior was significant ( $\gamma_{51} = .21$ ,  $t = 2.39$ ,  $p < .01$ ) after controlling for the effect of demographic factors at the individual level. Thus, Hypothesis 1 received support.

Insert Table 2 about here

To understand the nature of the cross-level interaction, we followed the procedure outlined by Aiken and West (1991) to plot an interaction graph using the “graph function” in HLM. We did this by plotting the CSE-innovative behavior graph at one standard deviation above and below the means of team members’ perception of entrepreneurial leadership (Aiken & West, 1991). Consistent with our prediction, Figure 1 illustrates that the relationship between CSE and innovative behavior is strong and positive in teams in which entrepreneurial leadership is strong, and the same relationship is not significant in teams in which entrepreneurial leadership is weak. These results suggest that the relationship between CSE and innovative behavior changes as a function of between-group differences in entrepreneurial leadership, which provides further support for Hypothesis 1.

Insert Figure 1 about here

Hypothesis 2 predicted that entrepreneurial leadership would exert a stronger moderating effect on the relationship between CSE and innovative behavior than both transformational leadership and participative leadership. We continued to test this hypothesis using the “slopes-as-outcomes” model, where the variance in the slope across teams is expected to be significantly related to entrepreneurial leadership after controlling for the moderating effect of transformational leadership and participative leadership (Hofmann & Gavin, 1998). As can be seen in Table 3, the cross-level interaction between entrepreneurial leadership and CSE on innovative behavior remained significant ( $\gamma_{53} = .64$ ,  $t = 2.79$ ,  $p < .01$ ) after controlling for the effect of demographic factors at the individual level and the effect of team members’ perception of transformational leadership ( $\gamma_{51} = .19$ ,  $t = 0.08$ , *n.s*) and participative leadership ( $\gamma_{52} = .40$ ,  $t = 1.23$ , *n.s*) at the group level. Thus, Hypothesis 2 also received support.

Insert Table 3 about here

## 5. Discussion

In the present study, while simultaneously controlling for the effect of other leadership approaches (i.e., transformational and participative leadership behaviors), entrepreneurial leadership was found to moderate the effect of CSE on innovative behavior in such a way that when entrepreneurial leadership was high, CSE had a significantly stronger influence on innovative behavior than when entrepreneurial leadership was low. In contrast, both transformational and participative leadership behaviors did not strengthen the effect of CSE on innovative behavior. Our findings are consistent with social cognitive theory (Bandura, 1986) in that they indicate that the role modeling and encouragement furnished by the entrepreneurial leader around generating and implementing creative ideas in the workplace is more likely to

lead those with confidence in their creative ability to engage in innovative behavior at work than simply acting in a transformational manner or encouraging employees to participate in decision-making alone.

### *5.1. Theoretical implications*

In examining the moderating effect of entrepreneurial leadership on the relationship between CSE and innovative behavior, the present study makes several important contributions to the literature. First, our results contribute to the literature on CSE by answering the repeated calls of researchers to examine the boundary conditions when CSE might have a positive effect on the workplace behaviors of employees (e.g., Tierney & Farmer, 2011). Although preliminary research has begun to examine how contextual factors present in the work environment may enable employees with high in CSE to exhibit higher levels of creativity than those low in CSE (Richter et al., 2012), our study is the first to examine which leadership approaches may lead employees with high levels of CSE to engage in more innovative behavior at work. By establishing that entrepreneurial leadership, rather than participative or transformational leadership behaviors, strengthens the relationship between CSE and innovative behavior, this study enhances our understanding of how leaders can encourage employees with high levels of confidence in their creative ability to generate creative ideas and implement those ideas in the workplace. Although prior research has examined the effect of different leadership approaches on employees' innovative behavior (e.g., Afsar et al., 2014; De Jong, & Den Hartog, 2010), we have taken a step forward to examine the relative importance of different leadership approaches in enhancing the likelihood that those with high CSE will develop and implement creative ideas in the workplace.

Second, by examining how contextual factors from the work environment interact with employees' CSE to elicit innovative behavior, the present study also makes an important contribution to the literature on innovative behavior. Although prior research has studied how

both contextual factors in the environment (at the team and organizational levels) and individual-level factors separately predict innovative behavior (Hsu et al., 2011; Prieto & Pérez-Santana, 2014; Ren & Zhang, 2015; Scott & Bruce, 1994), our research is the first to examine how these factors interact to predict employees' innovative behavior. In doing so, it provides a multi-level examination of key factors at the individual level (CSE) and team level (entrepreneurial leadership) that foster the development and implementation of new ideas in the workplace (innovative behavior), and allows us to address the calls of researchers to undertake more work on the contextual factors that influence the relationship between individual differences such as CSE and innovative behavior (Hammond et al., 2011).

Third, the present study also makes an important contribution to the entrepreneurial leadership literature (Renko et al., 2015) by establishing which individuals respond more positively to entrepreneurial leadership. Building on research that examines the direct effect of entrepreneurial leadership on subordinate behaviors at work (Chen, 2007), our study suggests that it is important to consider the personal characteristics of the employee when determining how influential entrepreneurial leadership is likely to be and not assume it will be universally effective for all individuals.

### *5.2. Practical implications*

The findings from this study provide practical insights for organizations looking to enhance the innovative behaviors of their employees. One important implication is that it would be beneficial to organizations to incorporate brief and easy-to-administer psychometric tests to identify candidates with high levels of CSE during the recruitment process and build it into existing HRM systems to ensure that such recruits are placed under leaders who can display entrepreneurial leadership behaviors (Maertz et al., 2005). Such employees are likely to respond more positively to the encouragement provided by entrepreneurial leaders to think of creative solutions to opportunities they identify in the workplace and make the most of the

vicarious learning opportunities provided by the entrepreneurial leader. Managers who want to obtain the most from employees with high levels of CSE should engage in entrepreneurial leadership behaviors such as role modeling entrepreneurial behaviors to employees and encouraging them to engage in entrepreneurial activity. Organizations should also run training courses wherein the importance of role modeling entrepreneurial behaviors and encouraging employees to identify and exploit entrepreneurial opportunities is highlighted.

### *5.3. Limitations and suggestions for future research*

The main limitation of the present research was that it was conducted in a single organization located in one geographical region of the world, China. To generalize the findings of this research outside of this specific industrial and cultural context, additional work using different samples is warranted. Moreover, we used middle-manager-provided ratings of innovative behavior rather than other objective measures. Future studies could consider using objective data on innovative behavior in addition to supervisor-provided ratings to better establish the effects of entrepreneurial leadership on the CSE-innovative behavior relationship.

A further limitation relates to the fact that the present research analyzed only the boundary conditions of the CSE-innovative behavior relationship. To ascertain why CSE leads to innovative behavior, future research may look at the mediating mechanisms underlying the relationship. As specified in Renko et al.'s (2015) research, such mechanisms may include entrepreneurial passion.

Using a panel design, researchers may also investigate whether entrepreneurial leadership enhances employees' CSE in addition to examining whether it interacts with their CSE to predict innovative behavior. Unfortunately, as we did not collect data on CSE at a different time period, we were unable to test this using the present data.

## **6. Conclusion**

This study examined whether entrepreneurial leadership moderated the CSE-innovative behavior relationship. Using a multi-level and multi-source design, we proposed that when entrepreneurial leadership was high, the effect of CSE on innovative behavior was stronger than when it was low. In contrast, alternative approaches to leadership, such as transformational leadership and participative leadership, did not moderate the effect of CSE on innovative behavior. These findings suggest that the role modeling provided by the leader through the exhibition of entrepreneurial behaviors and encouraging employees to identify and exploit entrepreneurial opportunities leads those high in CSE to engage in innovative behavior.

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**Table 1**

*Means, standard deviations, reliabilities, and correlations among study variables<sup>a</sup>*

<b>Variables</b>	<b>M</b>	<b>SD</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
1. Gender of employees <sup>b</sup>	.67	.47	--								
2. Age of employees	33.52	8.93	-.20***	--							
3. Education level <sup>c</sup>	.79	.45	.010	-.46***	--						
4. Subordinate tenure <sup>d</sup>	3.22	3.12	-.12**	.30***	-.07	--					
5. ENL <sup>e</sup>	3.53	.74	.17***	-.19***	-.08	-.14***	(.89)				
6. TFL <sup>f</sup>	3.76	.83	.09*	-.10*	-.20***	-.12**	.81**	(.93)			
7. PL <sup>g</sup>	3.69	.60	.13**	-.14**	-.14**	-.10*	.71**	.79**	(.75)		
8. CSE <sup>h</sup>	3.56	.59	.19***	.06	-.05	.08	.18**	.15**	.12**	(.83)	
9. Innovative behavior	3.66	.78	.21***	-.21***	.13**	-.05	.14**	.10*	.17**	.16***	(.93)

<sup>a</sup>  $N = 346$ . Internal consistency reliabilities appear in parentheses along diagonal.

<sup>b</sup> Gender of employee was coded: Male = 1, Female = 2.

<sup>c</sup> Education level = High school education of lower = 0, University education = 1.

Subordinate Tenure = Length of time in months employees have worked in the work-unit

<sup>e</sup> ENL = entrepreneurial leadership

<sup>f</sup> TFL = transformational leadership

<sup>g</sup> PL = participative leadership

<sup>h</sup> CSE = creative self-efficacy

\*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

**Table 2**

*Hierarchical linear modeling results of individual-level and team-level analyses*<sup>a</sup>

Variables	Null models		Innovative behavior	
Individual-level analysis	Variance	$\chi^2$	Coefficient	$t$
Innovative behavior $\gamma_{00}$	.33***	520.23		
<b>Control variables</b>				
Gender of employees $\gamma_{10}$			.16**	2.85
Age of employees $\gamma_{20}$			-.00	-0.02
Education level $\gamma_{30}$			.14	1.10
Subordinate tenure $\gamma_{40}$			.02	0.29
<b>Main effects</b>				
CSE <sup>b</sup> $\gamma_{50}$			.05	1.26

Variable	Relationship between CSE and innovative behavior	
<b>Group-level analysis</b>		
<b>Moderation effect</b>		
<b>Hypothesis 1</b>		
ENL <sup>c</sup> $\gamma_{51}$	Coefficient	$t$
	.21**	2.39

<sup>a</sup> Level 1, N = 346 employees; Level 2, N = 66 teams. Entries are estimations of fixed effects with robust standard error.

<sup>b</sup> CSE = creative self-efficacy

<sup>c</sup> ENL = entrepreneurial leadership

\* $p < .10$ ; \*\* $p < .05$ ; \*\*\*  $p < .01$



**Table 3**

*Hierarchical linear modeling results of individual-level and team-level analyses<sup>a</sup>*

Variables	Innovative behavior		<i>t</i>
<b>Individual-level analysis</b>	<b>Coefficient</b>		
<b>Control variables</b>			
Gender of employees $\gamma_{10}$	.17**	3.05	
Age of employees $\gamma_{20}$	.00	0.06	
Education level $\gamma_{30}$	.15	0.13	
Subordinate tenure $\gamma_{40}$	.00	0.00	
<b>Main effects</b>			
CSE <sup>b</sup> $\gamma_{50}$	.02	0.49	

Variable	Relationship between CSE and innovative behavior	
<b>Group-level analysis</b>		
<b>Moderation effect (after controlling for the effect of TFL and PL)</b>		
<b>Hypothesis 2</b>	<b>Coefficient</b>	<b><i>t</i></b>
TFL <sup>c</sup> $\gamma_{51}$	.19	0.80
PL <sup>d</sup> $\gamma_{52}$	.40	1.23
ENL <sup>e</sup> $\gamma_{53}$	.64***	2.79

<sup>a</sup> Level 1, N = 346 employees; Level 2, N = 66 teams. Entries are estimations of fixed effects with robust standard error.

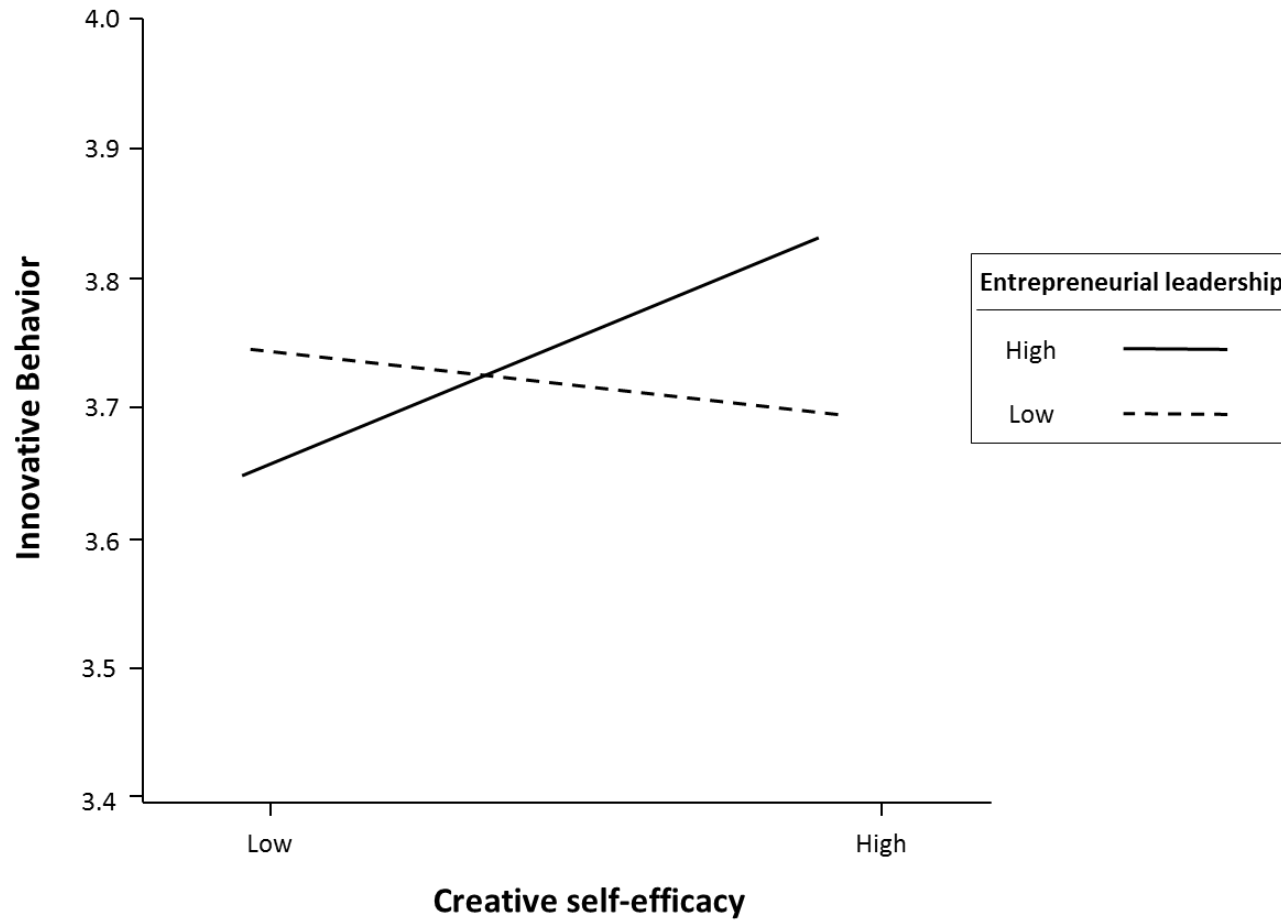
<sup>b</sup> CSE = creative self-efficacy

<sup>c</sup> TFL = transformational leadership

<sup>d</sup> PL = participative leadership

<sup>e</sup> ENL = entrepreneurial leadership

\* $p < .10$ ; \*\* $p < .05$ ; \*\*\* $p < .01$



**Fig. 1.** *Entrepreneurial leadership as a moderator of the relationship between creative self-efficacy and innovative behavior*