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Does transformational leadership foster innovative work behavior? The roles of psychological empowerment, intrinsic motivation, and creative process engagement

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ABSTRACT

This study examines how transformational leadership relates to employee's innovative work behavior through intrinsic motivation, psychological empowerment, and creative process engagement. On the basis of an interactional approach, this study hypothesized that (a) there is an interaction between transformational leadership, intrinsic motivation, and psychological empowerment, such that transformational leadership has the strongest positive relationship with innovative work behavior when employees have high levels of intrinsic motivation and psychological empowerment; and (b) creative process engagement mediates the effect that this three-way interaction between transformational leadership, intrinsic motivation, and psychological empowerment has on innovative work behavior. In Study 1, we used a time-lagged research design, collecting multi-source data from 347 software engineers and their respective supervisors, working in IT companies in China. The results of Study 1 supported our hypotheses. In Study 2, we used a more temporally rigorous research design in which data were collected in three stages, with a six-month time interval separating Stages 1 and 2, and Stages 2 and 3. On the basis of the time-lagged and multi-source data from 393 software engineers and their respective supervisors, from IT companies in Pakistan, we found that Study 2 produced the same results as Study 1.

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1. Introduction

The literature focusing on services has largely emphasized the fundamental role of employees to innovate in service organizations. Employees help to build client satisfaction, loyalty, and competitive advantage through direct interactions with clients. To succeed, knowledge intensive organizations such as IT firms should try to promote innovative work behaviors among employees (Slåtten, Svensson, & Svaeri, 2011). Effective leadership acts as a catalyst to foster employee's creative outcomes. However,

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the empirical evidence for the effect of transformational leadership on innovative work behavior is scarce and inconsistent (e.g., Afsar, Badir, & Bin Saeed, 2014; Basu & Green, 1997), with some studies finding positive effects and others finding negative effects. These contradictory findings suggest that our understanding of the relationship between transformational leadership and innovative work behavior may benefit from the identification of moderator variables on which these relationships are contingent and that helps to predict and understand when these relationships would be positive or negative. Such focus on the moderation in the leadership–innovation relationship is also consistent with the contingency approaches in leadership research more generally, which hold that the effectiveness of leadership behavior is dependent on factors within the leadership context (e.g., Charbonnier-Voirin, El Akremi, & Vandenberghe, 2010; Michaelis, Stegmaier, & Sonntag, 2010). This paper specifically examines whether transformational leadership, intrinsic motivation, and psychological empowerment are linked to an employee's innovative work behavior.

According to the Componential Theory of Creativity (Amabile, 1983), intrinsic motivation is just a necessary, but not sufficient, condition for an individual to achieve favorable creative outcomes. Engagement in the innovative process has an equal, if not more important, influence on individual creative behaviors (Vinarski-Peretz & Carmeli, 2011). In particular, the Regulatory Engagement Theory suggests that what an individual experiences in the goal pursuit process would affect the strength of process engagement and thus influence the effects of motivation on the behavior outcomes (Higgins, 2006; Higgins & Scholer, 2009). Process includes factors that affect an individual's experiences in conducting activities to pursue a specific goal (Higgins, 2006). Specifically, psychological empowerment is regarded as a critical factor that would help to keep employees engaged in the creative work process and strengthen the effects of motivation (Spreitzer, 1995; Zhang & Bartol, 2010). It is defined as a set of cognitions or states that are influenced by the work environment, and helps employees create an active-orientation toward job tasks (Thomas & Velthouse, 1990). Therefore, it is imperative to investigate how intrinsic motivation and psychological empowerment jointly moderate the relationship between transformational leadership and innovative work behavior.

Overall, the purpose of this study was to examine how the complex interplay between transformational leadership, intrinsic motivation, psychological empowerment, and creative process engagement explain employees' innovative work behavior. Following the interactional approach of innovative work behavior (Rank, Pace, & Frese, 2004), this study proposed that transformational leadership would have the strongest positive relationship with employees' innovative work behavior when they are intrinsically motivated and psychologically empowered. The current study also revealed the psychological mechanism underlying the hypothesized interaction effects and further proposed that creative process engagement, which refers to employee involvement in creativity-relevant cognitive methods or processes (Reiter-Palmon & Illies, 2004), would mediate this relationship. Zhang and Bartol (2010) propose that intrinsic motivation and psychological empowerment are necessary but not sufficient conditions for creative outcomes and hence engaging in creative activities has an equal, if not more important, role in promoting employee creativity.

2. Theoretical framework and hypotheses development

Innovative work behavior is defined as the recognition of problems and initiation and intentional introduction (within a work role, group, or organization) of novel and useful ideas concerning products, services, and work methods, as well as set of behaviors needed to develop, launch and implement these ideas with an aim to enhance personal and/or business (De Jong & Den Hartog, 2007). A plethora of academics and scholars have found that transformational leadership is particularly effective in promoting employee's innovative work behavior but it has been suggested that the relationship between transformational leadership and creative outcomes is dependent on a host of factors and therefore is likely to be more complicated than previously thought (Afsar et al., 2014; Majumdar & Ray, 2011; Pieterse, Van Knippenberg, Schippers, & Stam, 2009). To effectively foster innovative work behavior in organizational setting, the supervisors have to be informed through research evidence as to how individual differences affect employee reactions to transformational leadership.Wang, Oh, Courtright, and Colbert (2011) propose that the outcome of transformational leadership may not be as positive as intended for all employees. One possible difference that may stand out in this regard is levels of intrinsic motivation, for the reason that they are essentially related to both innovative work behavior and transformational leadership. This study undertakes the complex interaction mechanism between transformational leadership, creative process engagement, intrinsic motivation, and psychological empowerment. Our results reveal an interesting phenomenon—transformational leadership may be especially effective at fostering innovative work behavior of those employees who have high levels of both intrinsic motivation and psychological empowerment. The burgeoning interest in understanding how transformational leadership leads to an increase in employees' innovative work behavior through interaction effects is the purpose of this study.

Thomas and Velthouse (1990) defined psychological empowerment as gestalt of four types of feelings: meaning, competence, self-determination, and impact. Lack of psychological empowerment refers to the propensity of employees to avoid being creative (Zhang & Bartol, 2010). Employees with such feelings try to follow rules, regulations, organizational policies, and do not try out new solutions to organizational problems due to lack of confidence. Intrinsic motivation is the extent to which an individual experiences enjoyment and interest when performing a work task, without being controlled by external contingencies, such as rewards and punishments. Shin and Zhou (2003) suggest that intrinsic motivation is a critical condition when considering the interactional perspective of innovative work behavior, especially for employees who have high perceptions of psychological empowerment. From the literature reviewed thus far, we have found that transformational leaders do promote the innovative work behavior of their followers but the posited relationship is further explained by intervening variables. The mixed effects of transformational leadership on creative outcomes of followers motivate us to further probe into this relationship and by examining potential interaction mechanisms, we may better understand why expected influences on innovative work behavior have been observed in some studies but not in others. Transformational leaders delegate authority to followers to think, generate, and execute any idea, highlight the importance of cooperation in

performing collective tasks, often seek followers' participation in group work, and provide opportunity to learn from shared experience.

3. Joint moderating role of psychological empowerment and intrinsic motivation on the relationship between transformational leadership and innovative work behavior

Scholarly debate has emerged on when transformational leadership is particularly effective in promoting employee outcomes. Whereas few studies showed a positive relation between transformational leadership and innovative work behavior (e.g., Afsar et al., 2014; Basu & Green, 1997; Michaelis, Stegmaier, & Sonntag, 2010), other theoretical and empirical work suggests that the influence of transformational leadership on employee outcomes is likely to be more complex than previously thought, contingent upon a host of factors (e.g., Basu & Green, 1997; Jung, Wu, & Chow, 2008; Wang et al., 2011). First, transformational leaders may sometimes take a directive approach, they often seek followers' participation by highlighting the importance of cooperation in performing collective tasks, providing the opportunity to learn from shared experience, and delegating to followers the authority to execute any necessary action for effective performance. Gong, Huang and Farh (2009) found that followers with a transformational leader were more self-confident and took more critical and independent approaches toward their work than followers in a control group.

Extrapolating this insight to innovative work behavior, we propose that transformational leadership may be especially beneficial for enhancing innovative work behavior in employees who work in high task autonomy work environment. Second, whether employees are intrinsically motivated may be a necessary condition for transformational leadership to promote innovative work behavior in employees working in high task autonomy work environment (Jung, Chow, & Wu, 2003). Third, although leaders can have a substantial impact on the work environment of their followers they are bound by many factors within organizations, for example, the rules and regulations of the organization, HRM policies, and organizational and social settings (Pieterse et al., 2009). These can all to a great extent influence a follower's sense of psychological empowerment and intrinsic motivation independent of leadership. In the present study, we therefore focus on psychological empowerment an intrinsic motivation that may be relatively independent of transformational leadership and argue that they may be important moderators of the influence of transformational leadership on innovative work behavior. Hence, we aim to help resolving this debate by investigating how an employee psychological empowerment and intrinsic motivation jointly moderate the contribution of transformational leadership to employee innovative work behavior.

Psychological empowerment is a psychological state residing within individuals, reflecting an active orientation towards a work role (Thomas & Velthouse, 1990). People who are empowered are more likely to exhibit creative behavior (Jung et al., 2003). Sheldon (1995) demonstrates that personal autonomy is a core characteristic of creative people, and Mumford and Gustafson (1988) suggest that innovative achievement might increase when organizations support autonomy. Deci and Ryan (1985)

argued that intrinsic motivation is different from psychological empowerment. Intrinsic motivation is the resulting will and energy that drives behavior, whereas the feelings of competence are cognitive evaluations of the context and of oneself. The more positive these evaluations become, the more energized one is expected to be. Intrinsic motivation influences employees' cognition, behavior and emotion, thus affecting their work performance. When an individual's behavior is regulated by intrinsic motivation, his/her actions show more stability and persistence and better performance. When an employee is intrinsically attracted to a task, he or she is more likely to focus on it and explore and experiment with it, hence exhibit more creative behavior. Empirical studies have also shown that when employees are intrinsically motivated, they exhibit more creative performance (e.g., Jaussi & Dionne, 2003).

Intrinsic task motivation is passion: the motivation to undertake a task or solve a problem because it is interesting, involving, personally challenging, or satisfying. The main function of motivation was to control attention. As motivational interventions such as evaluations and reward systems redirect attention away from heuristic aspects of the creative activities and toward the technical or rule-bound features of task performance, they are likely to negatively affect intrinsic motivation toward a creative task. Although one may expect that actual positive evaluation improves creativity as a result of positive impacts on self-efficacy, such evaluation may negatively influence ensuing creative performance, for it conduces to expectations of future evaluation.

4. Three-way interaction effects on innovative work behavior

Several theorists have suggested that the interactional perspective of contextual factors such as transformational leadership is likely to have a greater effect when the employees' internal characteristics mean that they desire such external input (Yukl, 2006). Characteristics of employees such as needs for affiliation, emulation and social approval, a supportive work group, relational self-conception, and sensitivity to the supervisors' expectations, establish the effectiveness of supervisory behavior. Yukl (2006) found that employees who are considerate of the supervisors' needs and actively accept their influence are strongly affected by supervisors' behaviors as compared to employees who do not show such attributes. In order for creative ideas to take place and be implemented, support for employees by their leaders is essential (Lee, 2008). Consistent with this theory, research on transformational leadership also suggests that it has different effects on job related behaviors of different employees due to diversity in how they perceive and react to situations (e.g., Shin & Zhou, 2003), while there has been little research into one of the most critical job behaviors in today's highly competitive world i.e. innovative work behavior.

An employee's innovative work behavior implies going beyond the scope of basic job requirements and responsibilities. Unlike regular work performance, innovative work behavior involves the initiation, realization, and commercialization of useful, novel, and creative ideas and solutions. The dynamic nature of the work activities in innovative work behavior involves complicated non-standardized and non-routine tasks (Zhang & Bartol, 2010). The rapid changes in technology, high level of competition to innovate regularly and frequently, shortened product life cycles, and greater

pressure on organizations to respond quickly and creatively to frequent technical problems have made the structured procedures and systems ineffective. Employees therefore, need to be able to perform tasks that go beyond the established routines for a team, group, or organization (Gumusluoglu & Ilsev, 2009). They may search out new technologies, suggest new ways to achieve objectives, apply new work methods, and investigate and secure resources to implement new ideas. Therefore, innovative work behavior is inherently oriented around uncertainty, indistinctness, and ambiguity. There is no guarantee that the new transformation, novel ideas, and creative solutions would deliver what they are expected to achieve.

Psychological empowerment makes employees to see themselves as competent, capable, and proficient to initiate changes, influence work roles, shape empowerment work contexts according to their own preferences, and extract meaning from their activities by acting independently. Psychologically empowered individuals see themselves as competent and able to influence their jobs and work environments in meaningful ways, facilitating proactive behavior, showing initiative, and acting independently (Spreitzer, 1995). Transformational leadership can make them willing to be innovative, but they also need to feel able to be innovative (via psychological empowerment) in order to move into action and behave innovatively. In contrast, inspiring followers with low psychological empowerment is less effective, because these followers do not believe they have the possibility to take initiative. This might cause followers to become demotivated, which in turn could even hinder innovative behavior. Employees who feel high level of psychological empowerment engage in proactive behavior more often due to independence in decision making. Thomas and Velthouse (1990) suggest that employees become less productive and are unable to utilize full creative potential due to existing traditional organizational practices which render feelings of powerlessness. Thus, feelings of powerlessness lead to operational ineffectiveness and inhibit employee creativity. Edmondson (2003) recommended that leaders should try to energize psychological dimensions of empowerment and inculcate feeling of free will among their followers to translate organizational vision and mission into their daily routine tasks and job contexts.

Although we generally expect transformational leadership to positively influence psychological empowerment, there is some evidence that employees differ in the extent to which they welcome and see themselves as psychologically empowered, even in a context of transformational leader behaviors (Pieterse et al., 2009). An employee may differ in the way he or she views himself/herself as a person who feels or wants to be empowered in a particular job. In the case of empowerment, Kirkman and Shapiro (1997) theorized that employees differ in the extent to which they desire self-control or self-management. In other words, although transformational leadership practices may provide employees with feelings of autonomy and control, whether it will result in a sense of self-control and self-efficacy should depend on the individual's preference which should be partly shaped by the individual's personality as well as cultural background. Due to various reasons, some employees may feel uncomfortable with work-related decision making, are unwilling to work autonomously, feel unready to handle new responsibilities and have other reasons for not wanting to take on more empowered roles. Therefore, some workers consider empowerment as inconsistent

with their desires, expectations and role perceptions. Some other employees, however, who envision empowerment in a positive way are likely to regard it as fitting within their role desire and expectations and to experience greater psychological empowerment in a transformational leadership context. In line with this research, Pieterse et al. (2009) also noted that to achieve an adequate understanding of empowerment processes it is important to consider the "perspective of the individual employee" and pointed out that transformational leadership is unlikely to have its intended impact unless followers actually experience psychological empowerment. Thus, we suggest that transformational leadership is likely to have a stronger impact on innovative work behavior to the extent that an employee feels psychologically empowered.

Reuvers, Van Engen, Vinkenburg, and Wilson-Evered (2008) commented that association of high expectations motivates individuals to initiate positive changes and engage in achievement-oriented behaviors. Thus, transformational leaders inspire and motivate employees to solve current problems, challenge status-quo, propose out of the box solution for existing issues, handle complicated, risky and uncertain situations, accomplish difficult, ill-defined, and ill-organized objectives, and develop themselves to a higher level of competence. Innovative behaviors are complicated as they include multiplicity of possible solutions, making unexpected combinations, identifying connections among remote associates, recognizing the right problem, readiness to be daring, reapplying techniques and revising solutions, amassing existing resources, building social support in favor of the solution, and convincing all the stakeholders about the usefulness of the new solution (Zhou & Hoever, 2014). As such, innovative work behavior requires effort, enthusiasm, resources, propensity to take risks, persistence and ways to handle uncertainty, throughout the process. Individuals may experience anxiety and ambiguity about whether their ideas are worth pursuing, feasible, and in line with organizational goals and objectives. The success of an idea also depends on how effectively it is implemented by others, and an idea initiator is always uncertain about the commitment of others towards his/her idea implementation.

Intrinsic motivation refers to interest, pleasure, fascination, and satisfaction that employee derives while engaging in an activity or task. Intrinsic motivators are an endogenous part of a person's engagement in the activity; they arise from the person's feelings about the activity, and they are necessarily bound up with the work itself. The relationship between autonomy and intrinsic motivation has been demonstrated by using self-determination theory as a framework (Ryan & Deci, 2000). As a subtheory of Self Determination Theory, Deci and Ryan (1985) defined Cognitive Evaluation Theory (CET) to specify the factors in social contexts that produce variability in intrinsic motivation. CET views intrinsic motivation as a construct involving interest in the focal task predicated on feelings of self-determination and competence. In short, interpersonal events and structures (e.g. rewards, feedback) that produce feelings of competence can enhance intrinsic motivation. More specifically, CET suggests that feelings of competence will not enhance intrinsic motivation unless accompanied by autonomy, which provides a sense of control. Thomas and Velthouse (1990) posited that psychological empowerment is "presumed to be a proximal cause of intrinsic task motivation and satisfaction". Employees need to feel psychologically empowered to maintain their intrinsic motivations.

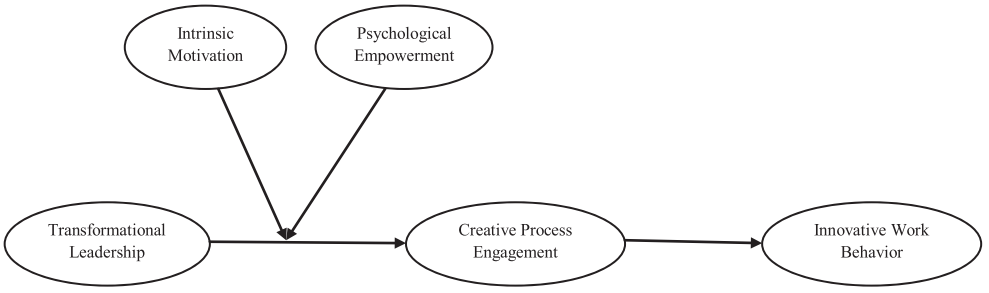

Figure 1. The hypothesized model.

Conversely, lack of intrinsic motivation inhibits creative ideas (Amabile, Conti, Coon, Lazenby, & Herron, 1996; Eisenberg & Aselage, 2009). Employees do not initiate ideas if they fear that they would be held responsible in case ideas are unable to meet objectives. With low level of psychological empowerment, the detrimental effect on crafting new solutions is likely to be exacerbated because people buy into their leaders first and then into their visions, meaning that despite demonstrating transformational leadership characteristics, if people are not intrinsically motivated and inspired to carry out innovative tasks, they would respond negatively to transformational leadership. As mentioned previously, intrinsic motivation is critical for employees to display innovative work behavior, and research has shown significant and positive relationship between intrinsic motivation and employee creativity (Zhang & Bartol, 2010). Figure 1 illustrates the hypothesized model of the current study.

According to norm-activation model, innovative work behavior results from multiple motivations among which intrinsic motivation is the most important. People are willing to engage in discretionary, volunteer, non-obligatory, citizenship, and non-conformance behaviors only if they are motivated intrinsically that these behaviors are important to their personal self-concepts as well as collective good. In a nutshell, consistent with the interactional perspective of innovation process (e.g., Shalley, Zhou, & Oldham, 2004), we propose that when employees have high levels of intrinsic motivation and psychological empowerment, transformational leadership may become useful in fostering innovative work behavior of such employees. Fundamentally, we suggest that innovative work behavior is the outcome of a three-way interaction involving transformational leadership, intrinsic motivation and psychological empowerment. Based on above arguments, we propose:

Hypothesis 1. Transformational leadership, intrinsic motivation and psychological empowerment interact to affect an employee's innovative work behavior in such a way that when intrinsic motivation and psychological empowerment are both high, transformational leadership has the strongest positive relationship with innovative work behavior.

5. Mediating role of creative process engagement

Researchers must identify mediating mechanisms to develop the interactional perspective of innovative work behavior (Reiter-Palmon & Illies, 2004). Previous literature confirms the mediating effect of motivational cognitive states like flexible role

orientation, supervisor support, and role breadth self-efficacy on the relationship between leadership styles and creativity (Pearce, 2007; Tierney, 2008). This research may advance previous literature by explaining further the effect of creative process engagement on the relationship between transformational leadership, intrinsic motivation and psychological empowerment by testing these relationships empirically. This study proposes that creative process engagement is a psychological mechanism that may transmit the effects of our hypothesized three-way interaction on innovative work behavior.

Although "creativity" can be used to describe both an outcome and a process (Shalley & Zhou, 2008), in this article we use the word in the outcome sense—that is, to denote the extent to which novel and useful ideas are produced. We use "creative process engagement" to refer to the process by which creativity occurs. Our use of these two terms allowed us to differentiate creative processes from creative outcomes in our model building. Creative process engagement refers to "employee involvement in creativity-relevant methods or processes, including (1) problem identification, (2) information searching and encoding, and (3) idea and alternative generation" (Zhang & Bartol, 2010, p. 108). Considerably less literature has addressed innovative work behavior considered as the process by which creative outcomes are achieved (Afsar et al., 2014; Shalley & Zhou, 2008). Scholars have criticized this focus because it does not fully account for the activities that lead to the creative outcome (Gilson & Shalley, 2004). These activities constitute the creative process and precede the creative outcome. Engagement in the creative process represents a necessary first step toward innovation.

Creativity can be viewed as the first stage of an innovation process (Baer, 2012). Creativity refers to the development of ideas that are both novel — something that has been done for the first time — and useful, either in the short or the long term (Amabile et al., 1996). Idea implementation is more complex (Carmeli & Schaubroeck, 2007) and describes the process of converting these ideas into new (radical) and improved (incremental) products, services, or ways of doing things (Baer, 2012). Innovative work behavior cannot be predicted because the intended benefits are new and there is no surety of results. Hence, employees with low levels of psychological empowerment because of their inclination to avoid risky situations may not believe that they have the ability to display innovative work behavior at workplace (Rank et al., 2004). Nevertheless, intrinsic motivation helps to shape followers' creative process engagement, specifically for those who prefer clarity and seek out supervisor guidance. When employees involve or engage in creativity relevant cognitive processes, it is referred to as creative process engagement. There are three critical dimensions of creative process engagement which starts with identification of the problem followed by searching and encoding information and finally it ends at generation and initiation of novel ideas and alternative solutions (Reiter-Palmon & Illies, 2004).

In the first stage of creative process engagement, the employee has to structure the problem and has to identify goals, procedures, restrictions, and information relevant for the solution to the problem. Research found that the amount of time spent on this first stage of the creative process is positively related to the quality and originality of the solution (Reiter-Palmon & Illies, 2004). After the problem is identified, the person moves toward collecting and processing relevant information (Zhang & Bartol,

2010). This second stage involves the search for information and concepts relevant for an advanced understanding of the identified problem (Mumford, 2000). Information search and encoding involves both the consideration of already existing concepts and the development of new concepts by using information from the memory and external sources (Reiter-Palmon & Illies, 2004). Time spent on information search and encoding is positively related to solution quality and, thus, is likely to increase creativity. Considering and developing concepts related to the problem, and integrating the relevant information, triggers the final stage of the creative process: The generation of ideas and alternatives (Zhang & Bartol, 2010). The combination and reorganization of the gathered information fosters a new understanding, and the exploration of applications and implications of this new understanding leads ultimately to a set of new ideas (Mumford, 2000).

When employees do not engage or involve in this process, ideas may still generate but these ideas lack novelty, out of the box component, usefulness, and practicality. Conversely, when an employee puts effort in understanding the dynamics of the problem keeping in mind the current and potential internal and external factors, correctly identifies the issue or problem, assimilates as much information as possible, and then on the basis of the information and knowledge, generates alternative solutions, the likelihood of initiation of novel, practical, useful, and feasible ideas increases tremendously (Zhang & Bartol, 2010). Baer (2012) also supports this notion that initially the ideas generated in response to a certain situation or problem are less creative and novel, but as the time passes by, better understanding of the problem, availability of more and more information, and emergence of increasing number of possible alternative solutions, make new ideas more novel, creative, and useful.

When supervisors display transformational leadership, such as giving individual consideration, stimulating intellectually, inspiring motivation, and providing freedom, the ambiguity, anxiety, fear, frustration, and uncertainty linked with innovative work behavior is reduced. As a result, these employees may put more efforts in understanding a problem from multiple perspectives and searching for maximum number of possible potential solutions. Employee engages in more rigorous understanding of a problem and searches for new solutions when his/her confidence to try out new things is reinforced with feeling of empowerment and intrinsic motivation (Reiter-Palmon & Illies, 2004). If creative process engagement is not fully executed (e.g., a problem is poorly identified or understood, not all relevant information is gathered and analyzed, or too few alternative ideas are initiated), the quality of the creative output and innovative behaviors will suffer (Zhang & Bartol, 2010).

When employees have low levels of psychological empowerment and intrinsic motivation, the effect of transformational leadership on the creative process engagement of such employees may be limited. Even if their supervisors display characteristics of transformational leadership, they feel that their job requirements are not meaningful and personally important and they cannot shape desired outcomes through their behaviors. This lack of psychological empowerment impedes their ability to take risks, explore new cognitive pathways, be playful with ideas successfully, and carry out innovative work behavior. Therefore, they are likely to experience low levels of creative process engagement.

Association of high expectations motivates individuals to initiate positive changes and engage in achievement-oriented behaviors (Shin & Zhou, 2003). Thus, transformational leaders inspire and intrinsically motivate employees to solve current problems, challenge status-quo, propose out of the box solution for existing issues, handle complicated, risky and uncertain situations, accomplish difficult, ill-defined, and ill-organized objectives, and develop themselves to a higher level of competence. For a creative response to emerge, an individual must engage in creative activities such as problem identification, environmental scanning, data gathering, unconscious mental activity, solution generation and evaluation, and solution implementation (Simon, 1967). This creative process determines the flexibility with which cognitive pathways are explored, the attention given to particular aspects of the task, and the extent to which a particular pathway is followed in pursuit of a solution. If cognitive processing is interrupted, then critical information will not have been accessed or used in problem solving, which may decrease innovative work behavior as an outcome.

Reiter-Palmon and Illies (2004) theorized that there are individuals who feel under confident to take proactive roles, take passive rather than active stance in dealing with work goals, think about decision making process as complicated and uncomfortable, feel reluctant to work autonomously, and do not like to work freely and autonomously. Such individuals are usually resistant towards change, new and novel ideas, and transformation in procedures and processes. When individuals are intrinsically involved in their work, they are more likely to devote all of their attention to the problems they encounter. Such attention directs people to engage in a creative process through self-regulation. Moreover, Amabile et al. (1996) argued that when employees are intrinsically involved in their work, they are more likely to devote all of their attention to the identification of problems, self-regulate and display persistence in carrying out creative processes. Stryker and Burke (2000) explained that some employees want to take on more and more challenges, seek new roles and responsibilities, feel empowerment as consistent with their desires and role perceptions, think and act proactively, and envisage empowerment in a positive way. Such individuals according to role identity theory feel a stronger sense of integration within their role identity sets and are likely to experience higher level of psychological empowerment under transformational leadership context. Creative process engagement helps employees to engage in creative activities and remain committed throughout the creative process until novel, feasible, practical, and useful ideas are realized (Hennessey & Amabile, 2010; Kirkman, Chen, Farh, Chen, & Lowe, 2009). Based on the above arguments, we hypothesize:

Hypothesis 2. The relationship between the three-way interaction predicted in Hypothesis 1 and innovative work behavior is mediated by creative process engagement.

6. Method (Study 1)

The first study was conducted in three major IT companies (Baidu, Alibaba, and Tencent) located in Beijing, China. Our sample comprised of the employees and their respective supervisors. Data was collected from two resources with a three-month time lag. Firstly, we distributed surveys to 658 software engineers during work hours

recording their opinions about transformational leadership, intrinsic motivation, psychological empowerment, and creative process engagement. A total of 464 usable surveys were received (71% response rate). Three months after the initial survey, a separate rating form was distributed to each of the 128 relevant supervisors, asking them to evaluate their subordinates' innovative work behavior. In total, 347 matching usable surveys (a supervisor rated an engineer who had also turned in a survey) were returned. On average, each supervisor rated the innovative work behaviors of almost four engineers. The average age of engineer was 31.6 years with a standard deviation of 4.3 whereas the average age of supervisor was 36.9 years. The average tenure of engineers with the companies was 5.7 years with a standard deviation of 2.2 years. Approximately 51 percent of the sample consisted of females.

7. Measures

All items were measured on a five-point Likert scales ranging from 1 "strongly disagree" to 5 "strongly agree". A 20 items scale was taken from Multifactor Leadership Questionnaire (MLQ) Form 5X to measure transformational leadership, including idealized behaviors, idealized attributes, inspirational motivation, intellectual stimulation, and individualized consideration (Bass & Avolio, 1997). We converted these scales into one higher-order factor which is consistent with recent empirical studies (Afsar et al., 2014; Pieterse et al., 2009). The employees were asked to rate the frequency with which their supervisors displayed leadership behaviors. The 10-item scale measuring innovative work behavior (e.g., "The employee *pays attention to issues that are no part of his daily work.*") used the studies by De Jong and Den Hartog (2007). The 12-item Empowerment at Work Scale, developed by Spreitzer (1995), using the four cognitive aspects of empowerment (meaning, competence, self-determination, and impact) was used in this study. Employees were asked to rate the extent to which they believe they are empowered in their jobs on a five-point scale (1-strongly disagree to 5- strongly agree). Sample item: 'I have considerable opportunity for independence and freedom in how I do my job'. Employee intrinsic motivation to be innovative was measured with three items adapted from the work of Tierney, Farmer, and Graen (1999). The items were rated on a 5-point scale (1 = not at all,

Table 1. Descriptive statistics, correlations, and reliabilities (Study 1).

	Variables	Mean (SD)	α	1	2	3	4	5	6	7	8	9
1	IWB	3.99(.36)	.89	1								
2	TL	4.17(.52)	.79	.41*	1							
3	IM	3.69(.36)	.82	.26*	.34**	1						
4	PE	4.22(.48)	.84	.47**	.31**	.44**	1					
5	CPE	3.86(.55)	.91	.19**	.27***	.33**	.21**	1				
6	Age	31.6(4.3)		.02	−.04	.04	.06	.09	1			
7	Gender	.62(.31)		.07	.05	.03	.02	.08	.06	1		
8	Education level	2.19(1.75)		.26*	.09	.03	.07	.02	.17*	.04	1	
9	Job tenure	5.7(2.2)		.08	.02	.06	.05	.04	.06	.03	.07	1

Note. IWB for innovative work behavior; TL for transformational leadership; IM for intrinsic motivation; PE for psychological empowerment; CPE for creative process engagement;
*p<.05;
**p<.01;
***p<.001.

5 = exactly). The 11-item creative process engagement scale, developed by Zhang and Bartol (2010), was used in this study. A representative item was: "I spend considerable time sifting through information that helps to generate new ideas."

8. Results and discussion (Study 1)

Table 1 presents descriptive statistics, correlations, means, and scale reliabilities. To examine the discriminant validity of our measures, confirmatory factor analyses (Amos 19.0) was conducted. The test result of adaptability showed that the five-factor model (transformational leadership, intrinsic motivation, psychological empowerment, creative process engagement, and innovative work behavior) fits the data well (χ^2 (371) = 819.91, $p < 0.01$; χ^2/df = 2.21; NNFI = 0.92; CFI = 0.91; and RMSEA = 0.059), as compared to other models. Because subordinates work under the same supervisor, their ratings might not be independent of each other and thus might violate the assumption of ordinary least squares (OLS) regression, which could result in a biased estimate of standard errors and invalid test statistics. For this reason, we applied hierarchical linear modeling (HLM; Bryk & Raudenbush, 1992) analyses to explicitly account for non-independence among observations.

We computed the intraclass correlation coefficients (ICCs) to see if transformational leadership should be conceptualized and aggregated into the unit level. The test results show that ICC(1) was very low, .06, and ICC(2) was .233, which is below the conventionally acceptable level of .70 (Bliese, 2000). Furthermore, we also computed ICC due to the fact that supervisors evaluated innovative work behavior of more than one subordinate. There was no systematic difference in supervisors' ratings of innovative work behavior (F = 2.24, $p > .10$; ICC (1) = 0.066). We therefore treated transformational leadership as an individual-level variable and entered all predictors at the individual level using HLM to test the hypotheses. In addition, we employed Muller, Judd, and Yzerbyt (2005) recommended procedures and ran follow-up analyses by using Edwards and Lambert's (2007) moderated path analysis approach to examine our hypotheses. Specifically, Edwards and Lambert's (2007) moderated path analysis approach integrates moderated regression procedures into a path-analytic method for the mediation test. Based on this approach, the examination of mediated and moderated effects needs an estimation of product terms such as indirect effects, which are not normally distributed (Shrout & Bolger, 2002). We followed Edwards and Lambert's (2007) suggestions and constructed bias-corrected confidence intervals using a bootstrap procedure with 1000 samples to examine all hypothesized effects.

To test the hypotheses, we used hierarchical moderated regression (Edwards & Lambert, 2007). We conducted collinearity diagnostics and mean-centred all interaction variables to reduce multicollinearity (Aiken & West, 1991). The hypothesized model had all VIF values well below 10, the average VIF value was 2.35, and the tolerance statistic well above 0.1, indicating that there is no multicollinearity within our data. Hypothesis 1 proposed that the relationship between transformational leadership and innovative work behavior was moderated by intrinsic motivation and psychological empowerment in such a way that transformational leadership had the strongest positive relationship with innovative work behavior when intrinsic motivation

Table 2. Results of regression analysis (Study 1).

	Creative process engagement			Innovative work behavior				
	M1	M2	M3	M4	M5	M6	M7	M8
Control variable								
Age	.02	.04	.08	.12	.11	.14	.09	.16
Gender	−.04	−.01	−.08	−.05	−.07	−.11	−.14	−.06
Education level	.05	.06	.03	.19*	.11	.17*	.23*	.14
Job tenure	.06	.12*	.09	.14*	.15	.19*	.12	.09
Independent variable								
TL	.21	.22*	.27**		.19	.17	.21	.09
Moderators								
IM	−.13	.07	−.08		−.18	−.11	−.13	−.12
PE	.40***	.36**	.22		.45***	.41**	.31**	.30*
Interactions								
TL*IM		.19	−.15			.26***	.09	.11
TL*PE		.31***	.28**			.17	.15	−.08
IM*PE		−.45***	−.44***			−.31**	−.30**	−.22
TL*IM*PE			.42***				.34*	.22
Mediator and interaction controls								
CPE z								.29**
IM*CPE								.17
PE*CPE								.03
IM*PE*CPE								.14
R^2	.39	.55	.63	.28	.47	.56	.61	.67
ΔR^2	.15	.16	.09	.28	.19	.09	.05	.06
F	4.55***	6.27***	7.06***	4.89**	6.48**	6.97**	7.28***	5.99**
ΔF	6.86***	7.33***	9.84***	4.89**	8.95**	5.39*	5.92**	1.91

*$p<.05$;
**$p<.01$;
***$p<.001$.

and psychological empowerment were both high. According to Table 2, Hypothesis 1 was supported ($\beta = .34$, $p < 0.05$, $\Delta R^2 = .05$, Model 7). A three-way interaction was plotted following Aiken and West (1991)'s procedure. Transformational leadership had the strongest positive relationship with innovative work behavior when intrinsic motivation and psychological empowerment were both high, thus supporting Hypothesis 1. Hypothesis 2 stated that creative process engagement mediated the effect of the previous three-way interaction on innovative work behavior. We used Muller et al. (2005) four conditions procedures to test the mediated moderation. Table 2 shows that (1) the three-way interaction was significantly related to creative process engagement ($\beta = .42$, $p < .001$, $\Delta R^2 = .09$, Model 3); (2) the three-way interaction was also significantly related to innovative work behavior ($\beta = .34$, $p < .05$, $\Delta R^2 = .05$, Model 7); (3) creative process engagement was positively related to innovative work behavior, after controlling for the interactions among the mediator and moderators and other predictors ($\beta = .29$, $p < .01$, $\Delta R^2 = .06$, Model 8); and (4) the three-way interaction effect on innovative work behavior of employees became non-significant after entering the mediator and controlling all other two-way and three-way interactions and predictors ($\beta = .22$, n.s., Model 8).

Table 3 presents the HLM results. The results of model 1 in Table 3 show that both the interaction of transformational leadership and psychological empowerment ($\gamma = .18$, $p < .01$) and the interaction of transformational leadership and intrinsic motivation ($\gamma = .11$, $p < .01$) had significant effects on subordinates' creative process engagement. The results met the first condition of a mediated-moderation effect.

Table 3. Results of the hierarchical linear modeling (Study 1).

Variables	Creative process engagement		Innovative work behavior	
	Model 1	Model 2	Model 3	Model 4
Control variable				
Age	.02	.04	.12	.11
Gender	−.04	−.01	−.05	−.07
Education level	.05	.06	.07	.11
Job tenure	.06	.05	.08	.12
Independent variable				
TL	.24*	.02	.03	.01
Moderators				
PE	.04	.36**	.32**	.29***
IM	.08	.09	.07	.07
Interactions				
TL*PE	.18**		.15***	.12*
TL*IM	.11**		.09**	.07
Mediator				
CPE		.36***		.28**
Model deviance	734.72	727.95	743.39	731.82

*$p<.05$;
**$p<.01$;
***$p<.001$; *In all models, all predictors were grand-mean centered. Entries presented are estimations of HLM regression coefficients, γs, with robust standard errors.*

Next, in model 3 of Table 3, both the interaction of transformational leadership and psychological empowerment ($\gamma = .15$, $p < .001$) and the interaction of transformational leadership and intrinsic motivation ($\gamma = .09$, $p < .01$) had significant impacts on subordinates' innovative work behavior. The results met the second condition of a mediated-moderation effect. Furthermore, in model 4 of Table 3, we found that creative process engagement had a significant effect on subordinates' innovative work behavior ($\gamma = .28$, $p < .01$), which met the third condition of a mediated-moderation effect, while the interaction of transformational leadership and psychological empowerment ($\gamma = .12$, $p < .05$) was reduced in magnitude, and the interaction of transformational leadership and intrinsic motivation ($\gamma = .07$, n.s.) became non-significant. These findings met the fourth condition of a mediated-moderation effect. Finally, we used the information from models 1 and 2 of Table 3 to conduct path moderation analyses at high and low levels of psychological empowerment and intrinsic motivation.

This study also used a method developed by Dawson and Richter (2006) to further examine interactions. This method estimates whether the ratio of the differences between a pair of slopes and its standard error differs from zero. Table 4 presents the simple slopes and slope difference tests related to Figure 2. The test results suggested that transformational leadership fostered greater innovative work behavior when both intrinsic motivation and psychological empowerment were high (condition 1: $t = 4.27$; $p < .01$). Conversely, when employees lacked intrinsic motivation, and/or had lower levels of psychological empowerment (conditions 2, 3, and 4), transformational leadership was actually statistically insignificant. Moreover, simple slope difference indicated that the interaction between transformational leadership and intrinsic motivation was significant when psychological empowerment was high (Slopes 1 and 3; $t = 3.94$; $p < .001$), and the interaction between transformational leadership and psychological empowerment was significant when intrinsic motivation levels were high (Slopes 1 and 2; $t = 3.08$; $p < .05$), further supporting Hypothesis 1.

Table 4. Simple slopes comparisons for three-way interactions (Study 1).

Pairs of comparison	Innovative work behavior behavior	
	Slope	t
1 (High IM, high PE)	.62	4.27**
2 (High IM, low PE)	−.26	−1.04
3 (Low IM, high PE)	−.05	−.13
4 (Low IM, low PE)	.31	1.13
Slope difference		
1 and 2		3.08*
1 and 3		3.94***
1 and 4		.82
2 and 3		−.61
2 and 4		−1.19
3 and 4		−.82

*$p<.05$;
**$p<.01$;
***$p<.001$.

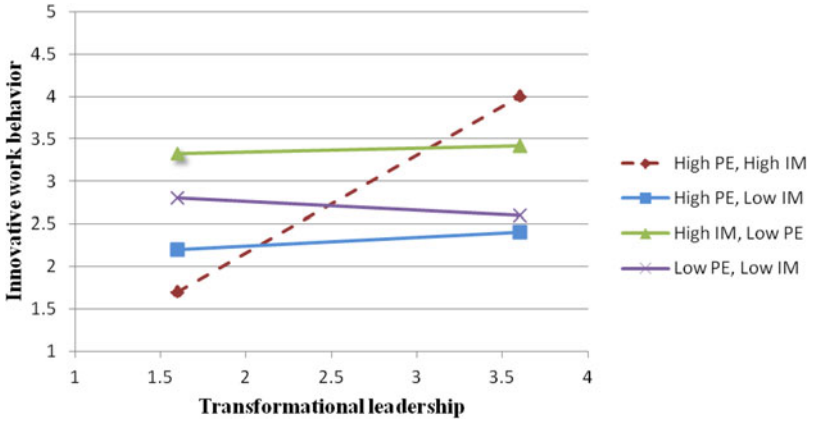

Figure 2. Three-way interaction effects on innovative work behavior (Study 1).

A parametric bootstrapping procedure suggested by Preacher and Hayes (2008) was then used to test the significance of the indirect effect. We found that there was a positive indirect relationship between the three-way interaction and innovative work behavior through creative process engagement (indirect effect = .33, 95% biased-corrected bootstrap CI was [.011, .665]), hence supporting Hypothesis 2, as shown in Table 5. This study then conducted a moderated path analysis (Edwards & Lambert, 2007), to better integrate the mediator and multiple moderators into our research model.

The results showed that the indirect effect was significant (PYMPMX = 0.384, $p < .01$), when intrinsic motivation and psychological empowerment were both high. Furthermore, the differences in the indirect effect across condition 1 (high intrinsic motivation and high psychological empowerment) and condition 2 (low intrinsic motivation and high psychological empowerment), and across conditions 1 and 4 (low intrinsic motivation and low psychological empowerment) were significant (ΔPYMPMX = 0.132, 0.329, $p < .01$, $p < .001$, respectively), supporting our theory of mediated moderation.

Table 5. Results of the moderated path analysis (Study 1).

	Three-way interaction (XZZ′) → Creative process engagement (M) → Innovative work behavior (Y)				
	Stage			Effect	
Moderator variable	First P_{MX}	Second P_{YM}	Direct effects (P_{YX})	Indirect effect ($P_{YM}P_{MX}$)	Total effect ($P_{YX} + P_{YM}P_{MX}$)
1 (Simple paths for high IM, high PE)	.628*	.537*	.314	**.384****	.618**
2 (Simple paths for high IM, low PE)	.439**	.542**	.129	.288	.384
3 (Simple paths for low IM, high PE)	.228	.527***	.158	.129	.339
4 (Simple paths for low IM, low PE)	−.083	.319	.306**	−.019	.253*
Differences (1 and 2)	.192**	−.005	.153***	**.132****	.265**
Differences (1 and 3)	.333	−.038	.118	.139	.217
Differences (1 and 4)	.692***	.227	−.011	**.329*****	.313
Differences (2 and 3)	.144	−.041	−.041	.048	.004
Differences (2 and 4)	.512**	.228	−.166	.219	.088
Differences (3 and 4)	.338	.284	−.125	.216	.099

Note: P_{MX} is path from three-way interaction to CPE; P_{YM} is path from CPE to innovative work behavior; P_{YX} is path from three way to innovative work behavior;
*$p<.05$;
**$p<.01$;
***$p<.001$.

9. Limitations of study 1

There were some limitations of Study 1. First, to increase the reliability of a three-way interaction between transformational leadership, intrinsic motivation and psychological empowerment, we replicated the results because such higher-order interactions might not be stable. Second, to increase the validity and generalizability of these results across other countries, we decided to conduct Study 2 on software engineers of the IT companies in Pakistan. Third, although we used a time-lagged design for the sources in Study 1, but data for transformational leadership, intrinsic motivation and psychological empowerment, and creative process engagement (independent and mediator variables) were collected from employees at the same time. Therefore, in Study 2, to increase the rigorousness of the design, we decided to collect the data at three points in time.

10. Method (study 2)

For study 2, we selected three major IT firms from Islamabad, Pakistan. We collected data from two sources (software engineers and their respective supervisor) at three points in time, with a three-month interval between each point. At Time 1, surveys measuring transformational leadership, intrinsic motivation and psychological empowerment, and creative process engagement were distributed to 688 software engineers. Of these, 462 usable surveys were returned, giving a 67.1% response rate. A separate survey was then distributed to each of the 83 relevant supervisors asking them to evaluate their employees' innovative work behavior, and 75 of these were returned. The human resources managers confirmed that those supervisors had received ample opportunities to observe their employees' innovative work behaviors. We then matched employees with supervisor, giving us 441 useable surveys.

At Time 2, three months after the first round of surveys was completed, another survey measuring creative process engagement and creative job requirements was

distributed to the 441 employees. We received 407 usable surveys, giving us a 92% response rate. Finally, at Time 3, another three months later, a separate survey was distributed to the 75 corresponding supervisor asking them to evaluate their employees' innovative work behavior and 68 completed surveys were returned. Finally, we matched employee responses with supervisor to give us 393 useable responses. The number of employees evaluated by each supervisor ranged from 5 to 11, with an average of 8. The average age of engineers was 29.3 years, and the average tenure of engineer with the organization was 3.9 years. Approximately 71 percent of the sample consisted of males. We used same scales for Study 2. As in Study 1, we controlled for age, gender, organization tenure, and level of education. We also controlled for creative self-efficacy to differentiate it from creative process engagement. A three item creative self-efficacy scale by Tierney and Farmer (2011) was used in this study. Further, we developed a 4-item measure to control for job requirement for creativity ($\alpha = .94$).

11. Results and discussion (Study 2)

Table 6 presents descriptive statistics, means, correlations, and scale reliabilities. The employees self reported data at Times 1 and 2 (except Time 1 supervisor ratings), therefore, extra steps were taken to examine the potential for response bias among the participants in the time-lagged design.

To test whether there were systematic differences in responses between the first and second waves of data collection, we conducted multiple logistic regression (Goodman & Blum, 1996). The results showed that all logistic regression coefficients were non-significant, suggesting that participant drop out was random. To examine the discriminant validity of our measures, confirmatory factor analyses (Amos 19.0) was conducted. The test result of adaptability showed that the hypothesized seven-factor model (transformational leadership, intrinsic motivation, psychological empowerment, job requirement for creativity, creative process engagement, creative self-efficacy, and innovative work behavior) fits the data well (χ^2 (645) = 1722.15, $p < 0.001$; $\chi^2/df = 2.67$; NNFI = 0.93; CFI = 0.94; SRMR = 0.06 and RMSEA = 0.056), as compared to other models.

We also computed the inter-class correlation coefficient (ICC) due to the fact that supervisors evaluated innovative work behavior of more than one employee

Table 6. Descriptive statistics, correlations, and reliabilities (Study 2).

	Variables	Mean (SD)	α	1	2	3	4	5	6	7	8	9	10	11
1	TL	3.84(.38)	.83	1										
2	IM	3.96(.57)	.92	.27**	1									
3	PE	4.12(.39)	.88	.36**	.25**	1								
4	CPE	4.22(.41)	.93	.22**	.28**	.24**	1							
5	IWB	4.08(.32)	.82	.37***	.29**	.34**	.47**	1						
6	Creative self-efficacy	3.23(.18)	.86	.15*	.27**	.19**	.21*	.06	1					
7	Job requirement for creativity	3.53(.55)	.94	.26**	.39*	.25**	.16*	.37**	.45**	1				
8	Age	29.3(4.1)		.02	−.03	.04	.05	.05	.05	.06	1			
9	Gender	.75(.19)		.04	.05	.03	.03	.04	.01	.02	.03	1		
10	Education level	3.04(.82)		.13*	.03	.05	.05	.03	.16*	.03	.05	.04	1	
11	Job tenure	3.9(3.5)		.02	.03	.05	.04	.05	.06	.04	.04	.06	.07	1

*$p<.05$;
**$p<.01$;
***$p<.001$.

(subordinate). No systematic differences in supervisors' ratings of innovative work behavior was found ($F = 2.28$, $p > .10$; ICC (1) = 0.068). The study used hierarchical moderated regression (Cohen & Cohen, 1983) to test hypotheses. We conducted collinearity diagnostics and mean-centred all interaction variables to reduce multicollinearity (Aiken & West, 1991). The hypothesized model had all VIF values well below 10, the average VIF value was 3.81, and the tolerance statistic well above 0.1, indicating that there is no multicollinearity within our data.

Table 7 presents the HLM results. The results of model 1 in Table 7 show that both the interaction of transformational leadership and psychological empowerment ($\gamma = .13$, $p < .01$) and the interaction of transformational leadership and intrinsic motivation ($\gamma = .06$, $p < .01$) had significant effects on subordinates' creative process engagement. The results met the first condition of a mediated-moderation effect. Next, in model 3 of Table 7, both the interaction of transformational leadership and psychological empowerment ($\gamma = .10$, $p < .001$) and the interaction of transformational leadership and intrinsic motivation ($\gamma = .04$, $p < .01$) had significant impacts on subordinates' innovative work behavior. The results met the second condition of a mediated-moderation effect. Furthermore, in model 4 of Table 7, we found that creative process engagement had a significant effect on subordinates' innovative work behavior ($\gamma = .23$, $p < .01$), which met the third condition of a mediated-moderation effect, while the interaction of transformational leadership and psychological empowerment ($\gamma = .07$, $p < .05$) was reduced in magnitude, and the interaction of transformational leadership and intrinsic motivation ($\gamma = .02$, n.s.) became non-significant. These findings met the fourth condition of a mediated-moderation effect. Finally, we used the information from models 1 and 2 of Table 7 to conduct path moderation analyses at high and low levels of psychological empowerment and intrinsic motivation.

According to Table 8, Hypothesis 1 was supported ($\beta = .30$, HC standard error = .21, $p < .001$, $\Delta R^2 = .04$, Model 3 (significantly related to creative process

Table 7. Results of the hierarchical linear modeling (Study 2).

Variables	Creative process engagement		Innovative work behavior	
	Model 1	Model 2	Model 3	Model 4
Control variable				
Age	.03	.05	.03	.04
Gender	−.04	−.03	−.02	−.01
Education level	.06	.06	.14	.11
Job tenure	.06	.08	.11	.12
Independent variable				
TL	.19*	.03	.02	.00
Moderators				
PE	.03	.31**	.27**	.24***
IM	.04	.05	.03	.02
Interactions				
TL*PE	.13**		.10***	.07*
TL*IM	.06**		.04**	.02
Mediator				
CPE		.31***		.23**
Model deviance	567.13	561.74	584.63	557.11

*$p<.05$;
**$p<.01$;
***$p<.001$; In all models, all predictors were grand-mean centered. Entries presented are estimations of HLM regression coefficients, γs, with robust standard errors.

engagement); $\beta = .23$, HC standard error = .13, $p < .01$, $\Delta R^2 = .06$, Model 7 (significantly related to innovative work behavior); $\beta = .66$, HC standard error = .09, $p < .01$, $\Delta R^2 = .22$, Model 8 (creative process engagement was significantly related to innovative work behavior after controlling for the interactions); $\beta = -.08$, HC standard error = .11, n.s., Model 8 (after controlling all other two-way and three-way interactions, the three-way interaction effect on innovative work behavior became insignificant)). A three-way interaction was plotted following Aiken and West (1991)'s procedure. Transformational leadership had the strongest positive relationship with innovative work behavior when intrinsic motivation and psychological empowerment were both high, thus supporting Hypothesis 1. Similar to Study 1, we used a method developed by Dawson and Richter (2006) to further examine interactions. This method estimates whether the ratio of the differences between a pair of slopes and its standard error differs from zero. Table 9 presents the simple slopes and slope difference tests related to Figure 3. The test results suggested that transformational leadership fostered greater innovative work behavior when both intrinsic motivation and psychological empowerment were high (condition 1: slope = 0.39; $t = 3.28$; $p < .001$).

Conversely, when employees lacked intrinsic motivation, and/or had lower levels of psychological empowerment (conditions 2, 3, and 4), transformational leadership was actually statistically insignificant. Moreover, simple slope difference indicated that the interaction between transformational leadership and psychological empowerment was significant when intrinsic motivation levels were high (Slopes 1 and 2; $t = 2.71$; $p < .05$) and the interaction between transformational leadership and intrinsic motivation was significant when psychological empowerment was high (Slopes 1 and 3; $t = 1.62$; $p < .01$). These results further supported Hypothesis 1. To test mediated moderation as proposed in Hypothesis 2, we found support for this hypothesis. Table 10 confirms that Study 2 had a significant three-way interaction similar to Study 1. A parametric bootstrapping procedure suggested by Preacher and Hayes (2008) was then used to test the significance of the indirect effect, and we found a positive indirect relationship between the three-way interaction and innovative work behavior through creative process engagement (indirect effect = .14, 95% biased-corrected bootstrap CI was [.012, .331]), hence supporting Hypothesis 2.

Finally, to better integrate the mediator and multiple moderators into our research model, a moderated path analysis suggested by Edwards and Lambert (2007) was conducted. The results showed that when intrinsic motivation and psychological empowerment were both high, the indirect effect was significant ($P_{YM}P_{MX} = 0.327$, $p < .001$). Furthermore, the differences in the indirect effect across condition 1 (high intrinsic motivation and high psychological empowerment) and condition 2 (low psychological empowerment and high intrinsic motivation), and across conditions 1 and 4 (low psychological empowerment and low intrinsic motivation) were significant ($\Delta P_{YM}P_{MX} = 0.457$, 0.329, $p < .01$, $p < .001$, respectively), supporting our theory of mediated moderation.

12. General discussion

This study investigated the complex effect that the interaction between transformational leadership, psychological empowerment and intrinsic motivation has on

Table 8. Results of regression analysis using heteroskedasticity-consistent standard error approach.

	Creative process engagement			Innovative work behavior				
	M1	M2	M3	M4	M5	M6	M7	M8
Control variable								
Age	.06(.01)	.06(.01)	.06(.01)	.08(.01)	.08(.01)	.08(.01)	.06(.01)	.02(.01)
Gender	.18(.13)*	.19(.13)*	.20(.13)**	.24(.08)*	.23(.08)**	.22(.08)*	.22(.08)*	.07(.03)
Education level	.25(.08)**	.26(.08)**	.26(.07)**	.23(.03)*	.23(.03)*	.23(.03)**	.23(.03)**	.06(.02)
Job tenure	.05(.02)	.06(.02)	.07(.02)	.04(.01)	.04(.01)	.03(.01)	.04(.01)	.02(.01)
Creative self-efficacy	.15(.23)	.13(.24)	.09(.23)	.05(.11)	−.06(.13)	−.06(.11)	−.08(.12)	−.12(.11)
Job requirement for creativity	.05(.12)	.05(.12)	.06(.12)	.29(.06)**	.23(.07)***	.22(.07)*	.25(.07)*	.19(.04)
Independent variable								
TL	.17(.15)	.18(.15)	.15(.15)		.25(.08)*	.26(.09)*	.24(.08)*	.16(.08)
Moderators								
IM	.07(.14)	.05(.15)	−.06(.14)		−.04(.06)	−.05(.07)	−.12(.07)*	−.1(.08)
PE	.23(.08)*	.23(.08)*	.20(.08)*		.18(.04)**	.19(.03)**	.16(.03)**	.06(.02)
Interactions								
TL*IM		−.04(.26)	.04(.23)			.04(.14)	.05(.13)	.03(.13)
TL*PE		.16(.08)	.09(.07)			.09(.04)	.08(.03)	.06(.03)
IM*PE		.07(.15)	.08(.14)			.04(.09)	.05(.08)	−.03(.1)
TL*IM*PE			.30(.21)***				.23(.13)**	−.08(.11)
Mediator and interaction controls								
CPE								.66(.09)**
IM*CPE								−.04(.08)
PE*CPE								.03(.05)
IM*PE*CPE								.25(.09)**
R^2	.33	.35	.39	.29	.38	.39	.45	.67
ΔR^2	.04	.02	.04	.29	.09	.01	.06	.22
F	6.13***	5.86***	6.16***	10.04**	8.26**	6.83**	7.07***	15.11**
ΔF	3.47**	1.95***	8.35**	10.04**	4.29**	.59	5.48**	21.49**

*$p<.05$;
**$p<.01$;
***$p<.001$; Heteroskedasticity-consistent (HC) robust standard errors are in parentheses.

Table 9. Simple slopes comparisons for three-way interactions (Study 2).

Pairs of comparison	Innovative work behavior	
	Slope	t
1 (High IM, high PE)	.39	3.28***
2 (High IM, low PE)	.07	.22
3 (Low IM, high PE)	.05	.14
4 (Low IM, low PE)	.27	1.91
Slope difference		
1 and 2		2.71*
1 and 3		1.62**
1 and 4		.72
2 and 3		.06
2 and 4		−1.14
3 and 4		−.1.36

*$p<.05$;
**$p<.01$;
***$p<.001$.

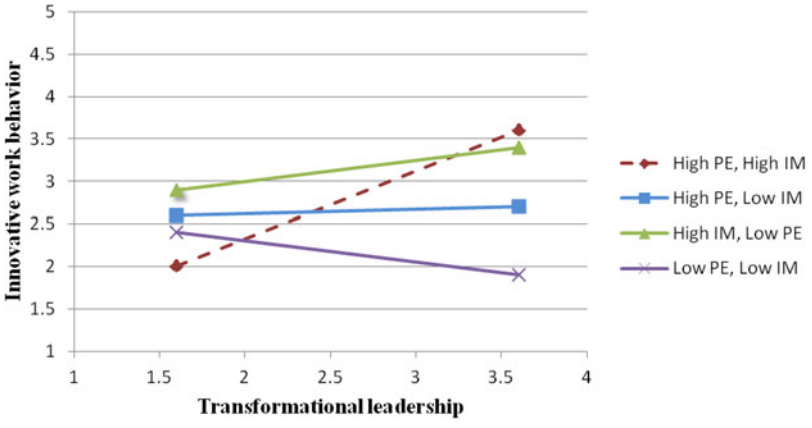

Figure 3. Three-way interaction effects on innovative work behavior (Study 2).

employee's innovative work behavior. Two studies were conducted to test the hypotheses. In Study 1, we drew a sample of software engineers from IT companies in China, and used a time-lagged design in which we collected data for our outcome variable—innovative work behavior two months after we had collected data for the predictors (i.e., transformational leadership, intrinsic motivation, psychological empowerment, and creative process engagement). In Study 2, a more temporally rigorous design was used in which data collection was performed in three stages with a sample of software engineers working in IT companies based in Pakistan.

We found that when psychological empowerment and intrinsic motivation were both high, transformational leadership had the strongest positive relationship with innovative work behavior. We also found that when psychological empowerment is high but employees are not intrinsically motivated to try out and implement novel ideas, the effect of transformational leadership on innovative work behavior slightly weakens. Another important finding of the study was that creative process engagement mediated the three-way interaction's effect on innovative work behavior. This study makes several distinct contributions. First, our overall contribution is that we have built and tested a conceptual model that uniquely integrates transformational leadership

Table 10. Results of the moderated path analysis (Study 2).

	Three-way interaction (XZZ′) → Creative process engagement (M) → Innovative work behavior (Y)				
	Stage			Effect	
Moderator variable	First P_{MX}	Second P_{YM}	Direct effects (P_{YX})	Indirect effect ($P_{YM}P_{MX}$)	Total effect ($P_{YX} + P_{YM}P_{MX}$)
1 (Simple paths for high IM, high PE)	.615*	.426**	.237	.327***	.403***
2 (Simple paths for high IM, low PE)	−.091	.253	.329	−.081	.292
3 (Simple paths for low IM, high PE)	.016	.327***	.207	.005	.211
4 (Simple paths for low IM, low PE)	.419**	.533**	.039	.273*	.292
Differences (1 and 2)	.705*	.169**	−.071*	.457**	.139
Differences (1 and 3)	.692	.135	−.009	.329***	.172
Differences (1 and 4)	.227	−.096	.169	.066	.142
Differences (2 and 3)	−.063	−.056	.078	−.09	.05
Differences (2 and 4)	−.318	−.267	.239	−.168	−.006
Differences (3 and 4)	−.422	−.227	.165	−.229	−.051

Note: P_{MX} is path from three-way interaction to CPE; P_{YM} is path from CPE to innovative work behavior; P_{YX} is path from three way to innovative work behavior;
*$p<.05$;
**$p<.01$;
***$p<.001$.

theory with important innovation process theories. Second, this was the first study to investigate the circumstances in which transformational leadership can foster innovative work behavior in employees with high levels of intrinsic motivation and psychological empowerment. We found that transformational leadership was most effective at increasing innovative work behavior for employees when they were intrinsically motivated and psychologically empowered to create and implement new ideas. However, transformational leadership was shown not to be very effective for other combinations of psychological empowerment and intrinsic motivation e.g., when employees had high psychological empowerment and low levels of intrinsic motivation, or when they had low psychological empowerment and high levels of intrinsic motivation.

We found an interesting result that low psychological empowerment and low intrinsic motivation showed similar patterns in both studies, however, low psychological empowerment and high intrinsic motivation appeared to vary somewhat between the two studies. This could be attributed to the fact that the extent to which employees experience enjoyment and interest when performing a work task, without being controlled by external contingencies, such as rewards and punishments, is regarded as more important in China. Third, the use of more temporally rigorous designs across IT companies of two countries (China and Pakistan) makes this study unique. We compared the interaction effects of intrinsic motivation and psychological empowerment of engineers working in IT companies located in China and Pakistan and found interesting results. Fourth, this paper contributes to the innovative work behavior literature by providing an in-depth understanding of the relationships intrinsic motivation and psychological empowerment have with innovative work behavior.

13. Managerial implications

Our theoretical model also has important implications for managers. First of all, to engender innovative work behavior among employees, the leadership does matter.

Second, the managers should understand that a leadership approach such as transformational leadership that can lift the heart and engage the soul, instead of just being impeccably logical, is the way forward to trigger workplace innovation at organizations. Leaders should dedicate more to leveling their employees' intrinsic motivation by shifting their attention from the external rewards to the enjoyment, interest, and satisfaction derived by sharing knowledge and creating and implementing new ideas. Employees are driven to transform their workload-elicited arousal into innovative work behavior when they enjoy sharing knowledge and generating new ideas. Third, management should provide a flexible and participatory management system where employees feel psychologically empowered so that they do not feel afraid to speak and dissent with their supervisor. A working environment where employees express themselves, share best practices and good experiences, share mistakes, sensitive information, and problems at workplace with their supervisors are likely to display higher levels of innovative work behaviors. Fourth, for employees with low levels of intrinsic motivation, the managers should give even a higher priority to developing intrinsic motivation.

By focusing on the interactions between transformational leadership, intrinsic motivation, and psychological empowerment and the effect of these interactions on innovative work behavior, this study aims to make three significant contributions to the literature. First, this study extends previous research (such as Afsar et al., 2014) by examining the effect of transformational leadership on innovative work behavior as the criterion variable. Zhang and Bartol (2010) found that intrinsic motivation facilitates the positive effect of empowering leadership in nurturing creativity of employees with high levels of psychological empowerment and suggested that transformational leadership could also have the same effect. Second, by divulging the intricate synergy between transformational leadership, intrinsic motivation, and psychological empowerment to nurture the initiation and implementation of creative outcomes, this study extends the interactional perspective of innovative work behavior beyond a simple person-by-context interaction.

The current study evinces the mechanism as to how a focal employee views the instigator of a contextual influence (e.g., intrinsic motivation) may intensify the effect of that contextual factor (e.g., transformational leadership) on the innovative work behavior of employee, subject to individual attributes such as levels of psychological empowerment. Third, the interactional perspective of innovative work behavior currently lacks the investigation of a psychological mechanism that might explain why a particular person-context interaction occurs (e.g., Shalley et al., 2004). This study investigates the effect of creative process engagement as a mediating mechanism for innovative work behavior which may contribute to the development of the interactional perspective of innovative work behavior.

14. Limitations and directions for future research

The current study in not without limitations. First, data were collected with self-reported from employees, raising the possibility of same-source bias. Since these constructs (transformational leadership, intrinsic motivation, and psychological

empowerment) address individuals' internal states, we would argue that it is logical to collect the data from participants themselves. Second, future studies can also improve the explanatory power of the model proposed by adding further variables that could more comprehensively explain link between transformational leadership and innovative work behavior. Third, we were still unable to establish causality, thus, future research could use a longitudinal design to replicate our results.

Disclosure statement

No potential conflict of interest was reported by the authors.

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References

Afsar, B., F., Badir, Y., & Bin Saeed, B. (2014). Transformational leadership and innovative work behavior. *Industrial Management & Data Systems*, *114*(8), 1270–1300. doi:10.1108/IMDS-05-2014-0152

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.

Amabile, T. M. (1983). The social psychology of creativity: A componential conceptualization. *Journal of Personality and Social Psychology*, *45*(2), 357–373. doi:10.1037/0022-3514.45.2.357

Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. (1996). Assessing the work environment for creativity. *Academy of Management Journal*, *39*(5), 1154–1184.

Baer, M. (2012). Putting creativity to work: The implementation of creative ideas in organizations. *Academy of Management Journal*, *55*(5), 1102–1119. doi:10.5465/amj.2009.0470

Bass, B. M., & Avolio, B. J. (1997). *Full range leadership development: Manual for the Multifactor Leadership Questionnaire* (pp. 43–44). Palo Alto, CA: Mind Garden.

Basu, R., & Green, S. G. (1997). Leader–member exchange and transformational leadership: An empirical examination of innovative behaviors in leader–member dyads. *Journal of Applied Social Psychology*, *27*(6), 477–499. doi:10.1111/j.1559-1816.1997.tb00643.x

Bliese, P. D. (2000). Within-group agreement, non-independence, and reliability: Implications for data aggregation and analysis. Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions. In K. J. Klein, & S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions* (pp. 349–381). San Francisco: Jossey-Bass.

Bryk, A. S., & Raudenbush, S. W. (1992). *Hierarchical linear models*. Newbury Park, CA: Sage.

Carmeli, A., & Schaubroeck, J. (2007). The influence of leaders' and other referents' normative expectations on individual involvement in creative work. *The Leadership Quarterly*, *18*(1), 35–48. doi:10.1016/j.leaqua.2006.11.001

Charbonnier-Voirin, A., El Akremi, A., & Vandenberghe, C. (2010). A multilevel model of transformational leadership and adaptive performance and the moderating role of climate for innovation. *Group & Organization Management*, *35*(6), 699–726.

Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ, USA: Erlbaum.

Dawson, J. F., & Richter, A. W. (2006). Probing three-way interactions in moderated multiple regression: Development and application of a slope different test. *Journal of Applied Psychology*, *91*(4), 917–926. doi:10.1037/0021-9010.91.4.917

De Jong, J. P., & Den Hartog, D. N. (2007). How leaders influence employees' innovative behaviour. *European Journal of Innovation Management*, *10*(1), 41–64. doi:10.1108/14601060710720546

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic Motivation and Self-Determination in Human Behavior*. New York: Plenum.

Edmondson, A. C. (2003). Speaking up in the operating room: How team leaders promote learning in interdisciplinary action teams. *Journal of Management Studies*, *40*(6), 1419–1452. doi:10.1111/1467-6486.00386

Edwards, J. R., & Lambert, L. S. (2007). Methods for integrating moderation and mediation: A general analytical framework using moderated path analysis. *Psychological Methods*, *12*(1), 1–22. doi:10.1037/1082-989X.12.1.1

Eisenberg, R., & Aselage, J. (2009). Incremental effects of reward on experienced performance pressure: Positive outcomes for intrinsic motivation and creativity. *Journal of Organizational Behavior*, *30*, 95–117. doi:10.1002/job.543

Gilson, L. L., & Shalley, C. E. (2004). A little creativity goes a long way: An examination of teams' engagement in creative processes. *Journal of Management*, *30*(4), 453–470. doi:10.1016/j.jm.2003.07.001

Gong, Y., Huang, J., & Farh, J. (2009). Employee learning orientation, transformational leadership, and employee creativity: The mediating role of employee creative self-efficacy. *Academy of Management Journal*, *52*(4), 765–778. doi:10.5465/amj.2009.43670890

Goodman, J. S., & Blum, T. C. (1996). Assessing the non-random sampling effects of subject attrition in longitudinal research. *Journal of Management*, *22*(4), 627–652.

Gumusluoglu, L., & Ilsev, A. (2009). Transformational leadership, creativity, and organizational innovation. *Journal of Business Research*, *62*(4), 461–473.

Hennessey, B. A., & Amabile, T. M. (2010). Creativity. *Annual Review of Psychology*, *61*, 569–598.

Higgins, E. T. (2006). Value from hedonic experience and engagement. *Psychological Review*, *113*(3), 439–448. doi:10.1037/0033-295X.113.3.439

Higgins, E. T., & Scholer, A. A. (2009). Engaging the consumer: The science and art of the value creation process. *Journal of Consumer Psychology*, *19*(2), 100–114. doi:10.1016/j.jcps.2009.02.002

Jaussi, K. S., & Dionne, S. D. (2003). Leading for creativity: The role of unconventional leader behavior. *The Leadership Quarterly*, *14*(4-5), 475–498. doi:10.1016/S1048-9843(03)00048-1

Jung, D. D., Wu, A., & Chow, C. W. (2008). Towards understanding the direct and indirect effects of CEOs' transformational leadership on firm innovation. *The Leadership Quarterly*, *19*(5), 582–594. doi:10.1016/j.leaqua.2008.07.007

Jung, D. I., Chow, C., & Wu, A. (2003). The role of transformational leadership in enhancing organizational innovation: Hypotheses and some preliminary findings. *The Leadership Quarterly*, *14*(4-5), 525–544. doi:10.1016/S1048-9843(03)00050-X

Kirkman, B. L., & Shapiro, D. L. (1997). The impact of cultural values on employee resistance to teams: Toward a model of globalized self-managing work team effectiveness. *Academy of Management Review*, *22*(3), 730–757. doi:10.2307/259411

Kirkman, B. L., Chen, G., Farh, J., Chen, Z. X., & Lowe, K. B. (2009). Individual power distance orientation and follower reactions to transformational leaders: A cross-level, cross country examination. *Academy of Management Journal*, *52*(4), 744–764. doi:10.5465/amj.2009.43669971

Lee, J. (2008). Effects of leadership and leader–member exchange on innovativeness. *Journal of Managerial Psychology*, *23*(6), 670–687. doi:10.1108/02683940810894747

Majumdar, B., & Ray, A. (2011). Transformational leadership and innovative work behaviour. *Journal of the Indian Academy of Applied Psychology*, *37*(1), 140–148.

Michaelis, B., Stegmaier, R., & Sonntag, K. (2010). Shedding light on followers' innovation implementation behavior: The role of transformational leadership, commitment to change, and climate for initiative. *Journal of Managerial Psychology*, *25*(4), 408–429. doi:10.1108/02683941011035304

Muller, D., Judd, C. M., & Yzerbyt, V. Y. (2005). When moderation is mediated and mediation is moderated. *Journal of Personality and Social Psychology*, *89*(6), 852–863.

Mumford, M. D. (2000). Managing creative people: Strategies and tactics for innovation. *Human Resource Management Review*, *10*(3), 313–351. doi:10.1016/S1053-4822(99)00043-1

Mumford, M. D., & Gustafson, S. B. (1988). Creativity syndrome: Integration, application, and innovation. *Psychological Bulletin*, *103*(1), 27–43. doi:10.1037//0033-2909.103.1.27

Pearce, C. L. (2007). The future of leadership development: The importance of identity, multi-level approaches, self-leadership, physical fitness, shared leadership, networking, creativity, emotions, spirituality and on-boarding processes. *Human Resource Management Review*, *17*(4), 355–359. doi:10.1016/j.hrmr.2007.08.006

Pieterse, A. N., Van Knippenberg, D., Schippers, M., & Stam, D. (2009). Transformational and transactional leadership and innovative behavior: The moderating role of psychological empowerment. *Journal of Organizational Behavior*, *31*(4), 609–623. doi:10.1002/job.650

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, *40*(3), 879–891. doi:10.3758/BRM.40.3.879

Rank, J., Pace, V. L., & Frese, M. (2004). Three avenues for future research on creativity, innovation, and initiative. *Applied Psychology: An International Review*, *53*(4), 518–528. doi:10.1111/j.1464-0597.2004.00185.x

Reiter-Palmon, R., & Illies, J. J. (2004). Leadership and creativity: Understanding leadership from a creative problem-solving perspective. *The Leadership Quarterly*, *15*(1), 55–77. doi:10.1016/j.leaqua.2003.12.005

Reuvers, M., Van Engen, M. L., Vinkenburg, C. J., & Wilson-Evered, E. (2008). Transformational leadership and innovative work behaviour: Exploring the relevance of gender differences. *Creativity and Innovation Management*, *17*(3), 227–244.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*(1), 68–84. doi:10.1037//0003-066X.55.1.68

Stryker, S., & Burke, P. J. (2000). The past, present, and future of an identity theory. *Social Psychology Quarterly*, *63*(4), 284–297.

Shalley, C. E., & Zhou, J. (2008). Organizational creativity research: A historical overview. In Zhou, J., and Shalley, C. E. (Eds.), *Handbook of organizational creativity*: 95–123. New York: Taylor and Francis.

Shalley, C. E., Zhou, J., & Oldham, G. R. (2004). The effects of personal and contextual characteristics on creativity: Where should we go from here? *Journal of Management*, *30*(6), 933–958. doi:10.1016/j.jm.2004.06.007

Sheldon, K. M. (1995). Creativity and self-determination in personality. *Creativity Research Journal*, *8*(1), 25–36. doi:10.1207/s15326934crj0801_3

Shin, S. J., & Zhou, J. (2003). Transformational leadership, conservation, and creativity: Evidence from Korea. *Academy of Management Journal*, *46*(6), 703–714.

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods*, *7*(4), 422–445. doi:10.1037//1082-989X.7.4.422

Simon, H. A. (1967). Motivational and emotional controls of cognition. *Psychological Review*, *74*(1), 29–39.

Slåtten, T., Svensson, G., & Svaeri, S. (2011). Empowering leadership and the influence of a humorous work climate on service employees' creativity and innovative behaviour in frontline service jobs. *International Journal of Quality and Service Sciences*, *3*(3), 267–284. doi:10.1108/17566691111182834

Spreitzer, G. M. (1995). Psychological empowerment in the workplace: Dimensions, measurement, and validation. *Academy of Management Journal*, *38*(5), 1442–1465. doi: 10.2307/256865

Thomas, K. W., & Velthouse, B. A. (1990). Cognitive elements of empowerment: An "interpretive" model of intrinsic task motivation. *Academy of Management Review*, *15*(4), 666–681. doi:10.2307/258687

Tierney, P. (2008). Leadership and employee creativity. In J. Zhou & C. E. Shalley (Eds.), *Handbook of organizational creativity* (pp. 125–147). New York, NY: Erlbaum.

Tierney, P., & Farmer, S. M. (2011). Creative self-efficacy development and creative performance over time. *Journal of Applied Psychology*, *96*(2), 277–293. doi:10.1037/a0020952

Tierney, P., Farmer, S. M., & Graen, G. B. (1999). An examination of leadership and employee creativity: The relevance of traits and relationships. *Personnel Psychology*, *52*(3), 591–620. doi:10.1111/j.1744-6570.1999.tb00173.x

Vinarski-Peretz, H., & Carmeli, A. (2011). Linking care felt to engagement in innovative behaviors in the workplace: The mediating role of psychological conditions. *Psychology of Aesthetics, Creativity, and the Arts*, *5*(1), 43–54. doi:10.1037/a0018241

Wang, G., Oh, I. S., Courtright, S. H., & Colbert, A. E. (2011). Transformational leadership and performance across criteria and levels: A meta-analytic review of 25 years of research. *Group & Organization Management*, *36*(2), 223–270.

Yukl, G. (2006). *Leadership in organizations* (6th ed.). Upper Saddle River, NJ: Prentice-Hall.

Zhang, X., & Bartol, K. M. (2010). Linking empowering leadership and employee creativity: The influence of psychological empowerment, intrinsic motivation, and creative process engagement. *Academy of Management Journal*, *53*(1), 107–128. doi:10.5465/amj.2010.48037118

Zhou, J., & Hoever, I. J. (2014). Workplace creativity: A review and redirection. *Annual Review of Organizational Psychology and Organizational Behavior*, *1*(1), 333–359. doi: 10.1146/annurev-orgpsych-031413-091226