

A study of ICT for leader-member exchange that facilitates employee's innovative behavior: a moderated mediation analysis in the Taiwanese service industry

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Abstract

In the past study, many researchers believed that leader-member exchange (LMX) had a significant influence on employee innovative behavior. This study extends previous research by examining of ICT for LMX that facilitates employee's innovative behavior and the moderated mediating role played by employee perceived psychological empowerment and motivational orientations in the Taiwanese service industry. This study explores whether employees' motivational orientations have significant moderating effects on the relationship between employees' psychological empowerment and their innovative behaviors. This study also examines whether the mediating effect of employees' psychological empowerment on the relation between LMX and innovative behaviors is, in turn, moderated by motivational orientations. Data were collected from 359 employees and their immediate supervisors in 46 companies in Taiwan. We tested the proposed relationships with robust data analytic techniques. Results were consistent with the hypothesized conceptual scheme, in that psychological empowerment mediated the relationship between LMX and innovative behavior when intrinsic or extrinsic motivation was high, but not when intrinsic or extrinsic motivation was low. On the basis of these findings, we conclude that the connection between LMX and innovative behavior in situations is more complex than was previously believed — there-by yielding a pattern of moderated mediation.

Keywords: leader-member exchange, psychological empowerment, innovative behavior, moderated mediation analysis, ICT

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1. Introduction

In today's rapidly changing business environments, economic trends demand the more effective delivery of new products and services. I also have encouraged organizations to depend more and more on creative ideas from employees (George, 2007). Creativity and innovation play important roles in this change process. As a novel industry, the information and communications technology (ICT) industry combines people with various abilities in different areas. It obviously requires more creativity and innovation in the ICT industry than in the traditional industry. We can't overemphasize the importance of employee's innovative behavior and service innovation. Every employee's job performance plays an important role in a company. For example, open service innovation would become a breakthrough in the next decades (Iwasaki, 2019). Considerable research shows that the creativity and innovative behavior of employees can contribute to organizational innovation, effectiveness, and survival (Amabile and Mueller, 1996; Oldham and Cummings, 1996; Scott and Bruce, 1994; Shalley, 1995; Shalley, Zhou and Oldham, 2004; West, Hirst, Richter and Shipton, 2004; Woodman, Sawyer and Griffin, 1993). Therefore, organizations that want sustainable competitive advantage have to focus on how to more effectively use potential employees. Organizations also need to support and promote managers' creativity and innovative behaviors because they can have a greater influence on the creativity and innovative behaviors of employees (Shalley and Gilson, 2004).

Researchers often use the two terms "innovation" and "creativity" interchangeably (West and Farr, 1990). But there are several distinctions between innovation and creativity. The crucially important factor which distinguishes innovation from creativity is as follows; creativity refers to idea generation alone, while workplace innovation includes both idea generation and implementation. In other words, creativity is the development of new ideas, while innovation is the application of those new ideas into practice (West and Altink, 1996; West and Farr, 1990). The first aim of our study is to examine the effect of the leader's creativity on innovative behavior. Although the majority of previous studies have investigated the impact of leaders on creativity, these investigations have largely focused on issues of positive leadership theories like the Leader – Member Exchange (LMX) theory and the transformational leadership theory (e.g., Tsai, 2006; Bono and Judge, 2003; Janssen and Yperen, 2004; Jung, Chow and Wu, 2003). Furthermore, previous studies showed shortcomings in terms of theoretical diversity, data analysis, and measurement issues (Tse, Troth, Ashkanasy and Collins, 2018). More recently, researchers have begun investigating the side effects of leadership, such as abusive supervision (Einarsen, Aasland and Skogstad, 2007; Tepper, 2007).

Noticeably, in Taiwanese society, a considerable amount of attention is paid to "relationships". Therefore, our study will also explore the leadership effect of LMX to build and test those theories that address the connection between LMX and innovative behavior. Regarding the relationship between intrinsic motivation and extrinsic motivation, motivational theorists have discussed the issues of this heated debate, and some scholars have viewed the relationship among three types of motivation as confrontation, promotion, and coexistence. Also, the proposed has been the concept of synergistic motivational combinations (Amabile, 1996), which refers to motivations that often not only exist at the same time but also complement each other. Hence, this study further examines the interactive relationships between the effects of different motivations for innovative behavior, including psychological empowerment and several important intervening variables, such as intrinsic motivation and extrinsic motivation.

With the contention in mind, in this study, we also focused on investigating the mediating mechanism linking LMX and innovative behaviors. The prior research on innovative behaviors has largely focused

on intrinsic motivation theory in which intrinsic motivation is often considered as a mediating variable to innovative behavior (Amabile, 1996; Oldham and Cummings, 1996; Shalley, 1995). However, the previous research has pointed out that such a claim showed a mixed result (Amabile, Goldfarb and Brackfield, 1990; Shalley and Perry-Smith, 2001). Recent research which focused on developing and testing a novel theoretical framework showed that envious employees can use their emotion to promote self-enhancing actions rather than other-diminishing behaviors (Lee and Duffy, 2019).

According to this gap, we pointed out psychological empowerment as a mediator to explain the relationship between LMX and innovative behavior. Because psychological empowerment involves the shared power to enhance employees' motivation and investment in their work (Kirkman and Rosen, 1997, 1999; Thomas and Velthouse, 1990), as the researchers have argued, we believe that there are major reasons to expect psychological empowerment to have a positive impact on innovative behavior (Amabile, 1988; Amabile, Conti, Coon, Lazenby and Herron, 1996; Amabile, Schatzel, Moneta and Kramer, 2004; Thomas and Velthouse, 1990; Zhou, 1998). We thus drew on the psychological empowerment and the innovative behavior to posit a mediating mechanism with high potential to help explain linkages between LMX and innovative behavior. Past study also explores the prediction of congruence between employee and organization values on innovative work behavior through employees' motivation (Saether, 2019).

Furthermore, the present research focus on empowerment mediates the effects of LMX on innovative behavior were moderated by the two motivational aspects, intrinsic motivation and extrinsic motivation, respectively. On the while, the previous studies mainly investigated the mediating effect of psychological empowerment on the relationship between leader-member exchange and employees' innovative workplace behavior (Schermyly, Meyer and Dämmer, 2013). Finally, in building a model linking the mediating mechanism, we have further examined an integrated conceptual scheme that proposes a relationship between LMX and innovative behavior, which is depicted in Figure 1. Overall, the purpose of this article is to build a theory that conceptually and empirically links LMX theory, psychological empowerment theory, motivation theory and relevant creativity theories, in answer to calls for a more comprehensive understanding of the motivation theory phenomenon as it relates to employee creativity (Tsai and Kao, 2004; Amabile, 1985; Amabile et al., 2004; Elsbach and Hargadon, 2006). The rest of this paper is organized as follows. Section 2 discusses the literature review and hypotheses, Section 3 outlines our research design, Section 4 covers our empirical results, and finally, Section 5 concludes.

2. Literature review and hypothesis

2.1 The bright side of leadership: a mediation mechanism of psychological empowerment between LMX and innovative behavior

LMX refers to the quality of the social exchange between supervisors and subordinates (Graen, 1976; Graen and Scandura, 1987). According to the LMX theory, supervisors have a unique relationship to each of their employees with high-quality relationships characterized by respect, trust, and mutual obligation (Graen and Uhl-Bien, 1995). They determine and develop their relationship exchange through a role-making process (Graen, 1976; Graen and Cashman, 1975). When they find that their expectations are met by their partner, they are likely to form high-quality exchanges or high-quality LMX (Liden, Wayne and Stilwell, 1993). In organizations, because of limited resources, supervisors develop a different exchange relationship with their subordinates (Banks, Batchelor, Seers, Boyle, Pollack and Gower, 2014). In high LMX relationships,

subordinates not only receive support and encouragement from their leader but also receive more responsibility challenges. On the contrary, in low LMX relationships, work is performed according to a formal set of rules and the employment contract; information is communicated downward, and relationships are characterized by distance between the leader and subordinates. More precisely, subordinates and their leader those who interact with high quality LMX tend to trust and mutually respect each other more, and to exhibit a greater possibility for engaging in a return relationship.

2.1.1 LMX and innovative behavior

Previous research showed that the most influential contextual factor to innovation behavior is leadership. According to the self-fulfilling prophecy effect, Scott and Bruce (1994) had pointed out that leaders may have expectations about their subordinates and further affect their innovative behavior. In addition, leaders may also use their own powers and abilities to influence their subordinates, such as by giving support, intellectual stimulation, supervision, and a chance to have an influence on the decision-making process to their subordinates, by empowering them, by sharing expert knowledge and information, and by practicing the subordinates' new ideas (De Jong and Den Hartog, 2007; Krause, 2004) Among them, the most important factor is the leader's support for subordinates. As uncertainty in the innovation process becomes greater, such as with unpredictable results and the consumption of time, money or resources (Kanter, 1988), the leaders' support has become a crucial factor. Previous studies found such correlations that subordinates' high perception of supervisors' support lead the more innovative the behavior of subordinates (Oldman and Cummings, 1996). Previous studies also showed that employees who perceived a high relationship quality of LMX will exhibit a highly innovative performance (Janssen and Yperen, 2004; Martin, Guillaume, Thomas, Lee and Eptropaki, 2015; Schermuly et al., 2013). Accordingly, we predict that LMX can positively affect the innovative behavior of employees.

2.1.2 LMX and psychological empowerment

The mediating mechanism, referred to as psychological empowerment, is defined as a psychological state that is represented by four cognitions: meaning, competence, self-determination, and impact (Spreitzer, 1995). It is a psychological state residing within individuals, and reflecting an active orientation towards a work role (Thomas and Velthouse, 1990). According to the social exchange theory (Blau, 1964), based on trust, managers exchange the legitimate power, control, and supervision that they have over their employees. Managers empower their subordinates with management practices that emphasize support and cooperation. The expectations of payback for such a social exchange relationship lies with the norms of reciprocity (Gouldner, 1960). In high-quality relationships, Keller and Dansereau (1995) argued that the leader will view his or her subordinates as members of the group, and will give them more power and support. Such empowerment and support enhance managers' conviction that their subordinates can produce a favorable outcome (Bandura, 1989; Spreitzer, 1995). Therefore, the response from employees is expected to fulfill their obligation to their supervisors by extending their trust in reciprocation (Rhoades and Eisenberger, 2002). In contrast, in a low-quality relationship, the leader will view their subordinates as outsiders, so that they will not give enough trust to their subordinates. As a result, the subordinates will not have a feeling of empowerment. In short, LMX can make employees innovative, but they also need to be felt innovative (via psychological empowerment) to be moved into innovative action. Thus, we argue that LMX inspires followers to be in high psychological empowerment so that it enables the possibility to take innovative behavior.

2.1.3 Psychological empowerment and innovative behavior

Psychologically empowered individuals view themselves as competent and influential in their jobs so that they are facilitating proactive behavior, showing initiative behavior, and acting independently (Spreitzer, 1995; Thomas and Velthouse, 1990). The subordinates' innovative behavior is likely to be formed through their psychological empowerment. Therefore, we argue that subordinates need to be felt psychologically empowered to believe that they can do their job. High psychological empowerment of employees can inspire both practical possibilities of implementation and initiative-taking, which will lead them to more innovative behavior. In contrast, low psychological empowerment results in less effective employees because they do not believe that they can take action. More specifically, those who feel empowered believe that they have more powers than other employees, and feel that they can do their job with less restriction. So that they can be more comfortable to do something new (Amabile, 1988). Pointed out that when employees are given the power to feel greater (Bowen and Lawler, 1992), relative to improving their capacity in the service, they will usually feel more confident in their ability to promote creative thinking and problem-solving. Employees felt empowered can develop strong self-efficacy, as well as increase their motivation to perform tasks (McClelland, 1975). So that they can drive them to keep trying even if they have some bottlenecks on their job (Amabile et al., 1996). Such factors encourage employees to keep passions for their work and to further explore new ways to solve problems (Amabile et al., 1996). Furthermore, we argue that psychological empowerment can predict employees' innovative behavior. As mentioned above, there are positive relationships between LMX and innovative behavior, and between psychological empowerment and innovative behavior. Together, the following hypotheses specify a model in which LMX indirectly increases innovative behavior by contributing to psychological empowerment. Formally, we believe that an individual's psychological empowerment might affect innovative behavior, and we propose:

Hypothesis 1. Psychological Empowerment will mediate the relationship between LMX and innovative behavior.

2.2 The moderating roles of intrinsic motivation and extrinsic motivation

2.2.1 The moderating role of intrinsic motivation

In considering the role of psychological empowerment in facilitating innovative behavior, we note available evidence demonstrating an interactive relationship between psychological empowerment and intrinsic motivation. Intrinsic motivation refers to how much an individual is inner-directed, is interested in, or is fascinated with a task, and engages in the task itself (Utman, 1997). According to Amabile's (1983) componential conceptualization of creativity, intrinsic motivation is one of the most important and powerful factors that lead employee to innovative behavior (Amabile, 1988, 1996; Amabile et al., 1996; Shalley, 1991, 1995). Previous research also posited that psychological empowerment is a proximal cause of intrinsic task motivation (Thomas and Velthouse, 1990). Drawing on the self-determination theory (SDT, Gagne and Deci, 2005), it suggests that autonomy-supportive leaders promote autonomous motivation, which refers to the process of being motivated by one's interest in an activity (i.e., intrinsic motivation) within the self. Psychological empowerment is interpreted as the subordinates' perception of meaning, competence, self-determination, and impact, which is parallel to the definition of autonomous motivation. Therefore, we can view psychological empowerment as a type of autonomous motivation, and it would be motivated by intrinsic motivation. As previously stated, we argue that the strength of this relationship will depend on the level of intrinsic motivation. In other words, the high intrinsic motivation of followers, in particular, may be viewed as controlling and demotivating, causing less innovative behavior (Deci and Ryan, 1987).

In short, we propose that psychological empowerment is more effective in engendering innovative behavior under high intrinsic motivation than under low intrinsic motivation, while psychological empowerment is more likely to be detrimental to innovative behavior under low intrinsic motivation.

Hypothesis 2a. The relationship between psychological empowerment and innovative behavior will be weaker for employees low in intrinsic motivation than for employees high in intrinsic motivation.

2.2.2 The moderating role of extrinsic

Many previous studies revealed inconsistent results on the effects of extrinsic motivation on creativity (Cameron and Pierce, 1994; Cameron, 2001; Deci, Koestner and Ryan, 1999), but many authors also pointed out that extrinsic motivation is not entirely detrimental to innovative behavior; it will have a positive impact on creativity even in some situations. Empirical studies proposed a model of motivation synergy (Amabile et al., 1996), and argued that given the right combination of personality traits and work environment contexts, extrinsic motivation will help reward innovative behavior. The degree to which people are motivated to do their jobs would be restricted from support in their work contexts. According to the model of motivation synergy, this study suggests that many of the factors that enhance intrinsic motivation would also facilitate the internalization of extrinsic motivation. For example, employees in a supportive environment would meet their needs for autonomy and competence by a combination of intrinsic motivation and extrinsic motivation. Specifically, promoting extrinsic motivation in the workplace allows employees to experience meaningfulness, competence, self-determination, and impact at work (Spreitzer, 1995; Thomas and Velthouse, 1990). It is because shared power involves a view that enhances employees' motivation and investment in their work. (Kirkman and Rosen 1997, 1999; Thomas and Velthouse, 1990). Therefore we propose that psychological empowerment is more effective in engendering innovative behavior under high extrinsic motivation than under low extrinsic motivation, while psychological empowerment is more likely to be detrimental to innovative behavior under high extrinsic motivation. Accordingly, we propose:

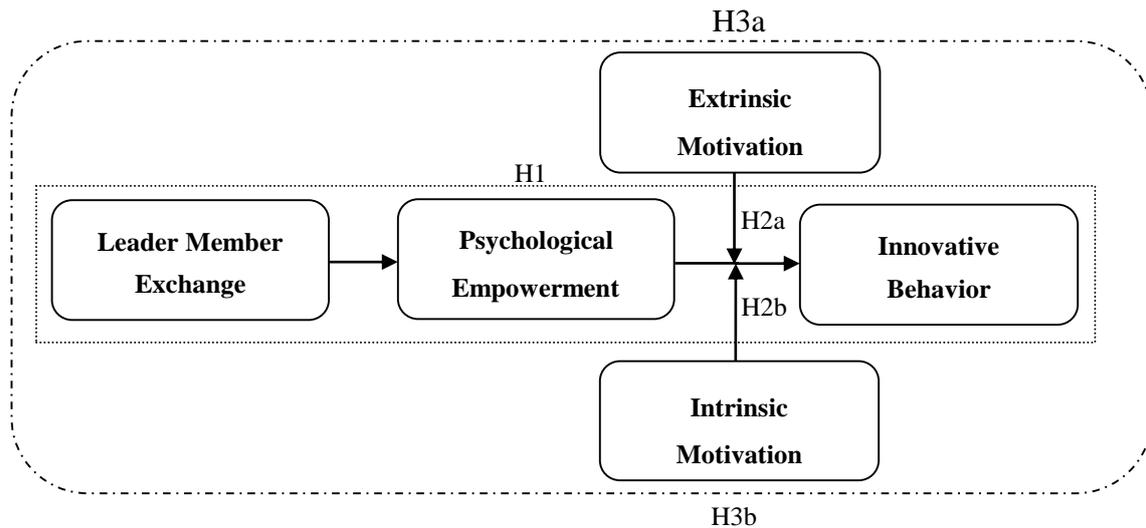
Hypothesis 2b. The relationship between psychological empowerment and innovative behavior will be weaker for employees low in extrinsic motivation than for employees high in extrinsic motivation.

Assuming that employees' intrinsic and extrinsic motivations moderate the association between psychological empowerment and innovative behavior respectively, we suggest that it is also likely that extrinsic and intrinsic motivations will conditionally influence the strength of the indirect relationship between LMX and innovative behavior—thereby demonstrating a pattern of moderated mediation between the study variables, as depicted in Figure 1. Because we predict a strong relationship between psychological empowerment and innovative behavior when extrinsic and intrinsic motivations are high, we expect the following:

Hypothesis 3a. Intrinsic motivation will moderate the positive and indirect effect of LMX on innovative behavior (through psychological empowerment). Specifically, psychological empowerment will mediate the indirect effect when intrinsic motivation is high but not when it is low.

Hypothesis 3b. Extrinsic motivation will moderate the positive and indirect effect of LMX on innovative behavior through psychological empowerment. Specifically, psychological empowerment will mediate the indirect effect when extrinsic motivation is high but not when it is low.

Figure 1. Hypothesized model



3. Method

The sample framework for this study includes the private and public companies of the service industry in Taiwan. Innovative behavior among service staff is a good topic of study because those in the service industry often contact customers and they also need to help customers solve problems instantly. We selected 46 firms in the service industry which consist of 18.2% from technology companies, 39.2% from transportation companies, 22.2% from financial companies, and 20.4 % from other companies such as retail stores. Survey packets included a cover letter, an informed consent form, and a questionnaire, and were distributed to the selected companies by mail. The envelopes were addressed by code numbers rather than specific individuals. Human resource representatives from the firm selected employees from each department to participate in the present study. Participants were asked to return the forms to the HR representatives within 2 weeks in an enclosed pre-addressed, stamped envelope. The set of questionnaires included scores from one manager and one subordinate. We delivered a total 450 sets and finally got 359 valid sets. The return rate was 80%. We conducted translation and back-translation procedures to formulate the Chinese version of each scale. All items used a 6-point Likert-type response scale anchored at 1 = disagree strongly and 6 = agree strongly. Following prior research (e.g., Tsai, 2006; Tsai and Kao, 2004; Janssen and Yperen, 2004), we controlled several demographic variables are related to creativity, such as age, gender, marital status, tenure (number of years working with the current company), education (years of education), and the industry of the company. Gender was coded as 0 = Male and 1 = Female. Marital status was coded as 0 = Married and 1 = Unmarried.

3.1 Employee measures

We measured LMX with 7 items developed by Grean and Uhl-Bien (1995). Each item was measured on a 6-point Likert scale in which 6 indicated “strongly agree” and 1 indicated “strongly disagree.” The Cronbach’s α reliability estimate for LMX was 0.90. The Psychological Empowerment Scale, developed by Spreitzer (1995), is a 9-item scale. Each item was measured on a 6-point Likert scale in which 6 indicated “strongly agree” and 1 indicated “strongly disagree”. The Cronbach’s α reliability estimate for psychological empowerment was 0.86. The intrinsic motivation and extrinsic motivation scale, developed by Amabile, Hill, Hennessey and Tighe (1994) Work Preference Inventory (WPI), included both intrinsic and extrinsic aspects. Each item was measured on a 6-point Likert scale, in which 6 indicated “strongly agree” and 1 indicated “strongly disagree”. The Cronbach’s α for the above two sub-scales were 0.86 and 0.79.

3.2 Supervisor measures

We measured individual innovational behavior by using supervisors’ ratings based on Janssen’s (2000) scale. It is a 9-item scale composed of three subscales: idea generation, idea promotion, and idea realization. Each component was measured by three items on a 6-point Likert scale, in which 6 indicated “strongly agree” and 1 indicated “strongly disagree.” The Cronbach’s α reliability estimate for innovative behavior was 0.93.

3.3 Confirmatory factor analysis

We adopted AMOS 21 to conduct a confirmatory factor analysis of LMX, psychological empowerment, intrinsic motivation, extrinsic motivation, and employee innovative behavior, which tested the discriminant validity of variables. We formed a hypothetical 5-factor model (i.e., LMX, psychological empowerment, intrinsic motivation, extrinsic motivation, and employee innovative behavior), a 4-factor model (i.e., LMX and psychological empowerment combined), a 3-factor model (i.e., LMX, psychological empowerment and intrinsic motivation combined), a 2-factor model (i.e., LMX, psychological empowerment, intrinsic motivation, and extrinsic motivation combined) and 1-factor model (i.e., all four factors combined). We also conducted a chi-square difference ($\Delta\chi^2$) tests to establish which model fit the data the best. According to Hu and Bentler’s (1999) fit indices, we found (Table 1) that the hypothetical 5-factor model showed acceptable fit indices, $\chi^2/df = 1.834$, RMSEA = .048, Incremental-fit index (IFI) = .91, Comparative-fit index (CFI) = .91. Whereas the 4-factor model ($\chi^2/df = 2.270$, RMSEA = .060, IFI = .87, CFI = .86), the 3-factor model ($\chi^2/df = 2.362$, RMSEA = .062, IFI = .85, CFI = .85), the 2-factor model ($\chi^2/df = 2.439$, RMSEA = .063, IFI = .84, CFI = .84), and the 1-factor model ($\chi^2/df = 3.347$, RMSEA = .081, IFI = .75, CFI = .75) did not fit well. Additionally, the chi-square difference test indicated that the 5-factor model fit the data significantly better than the other models; 4-factor model, $\Delta\chi^2 (4, n = 972) = 433.25, p = .00$, the 3-factor model, $\Delta\chi^2 (7, n = 972) = 529.73, p = .00$, the 2-factor model, $\Delta\chi^2 (9, n = 972) = 610.69, p = .00$, the 1-factor model, $\Delta\chi^2 (10, n = 972) = 1485.68, p = .00$. Such results revealed satisfactory discriminant validity for the five constructs.

Table 1. Results of confirmatory factor analysis

Models	χ^2	df	χ^2/df	RMSEA	IFI	CFI
Five Factors	1782.82	972	1.834	.048	.91	.91
Four Factors	2216.07	976	2.270	.060	.87	.86
Three Factors	2312.55	979	2.362	.062	.85	.85
Two Factors	2393.51	981	2.439	.063	.84	.84
One Factor	3278.50	982	3.347	.081	.75	.75

Note: Root mean square error of approximation is abbreviated as RMSEA. Incremental-fit index is abbreviated as IFI; Comparative-fit index is abbreviated as CFI.

4. Result

4.1 Descriptive statistics

We tested our study hypotheses in two steps. First, we examined a mediation model (Hypothesis 1). Next, we integrated the moderator variable into the model (Hypotheses 2a, 2b) and then tested the overall moderated-mediation model (Hypotheses 3a, 3b). We tested the mediation hypotheses using a four-step procedure proposed by Baron and Kenny (1986). First, we tested whether the independent variable (LMX) was correlated with the dependent variable (innovative behavior); second, whether the independent variable (LMX) was significantly related to the mediator (psychological empowerment); third, whether the mediator (psychological empowerment) affects the dependent variable (innovative behavior); fourth, whether the mediator (psychological empowerment) completely mediates the relationship between the independent variable (LMX) and dependent variable (innovative behavior), and finally whether the effect of the independent variable (LMX) on the dependent variable (innovative behavior) controlling for the mediator (psychological empowerment) should be zero or smaller, which provides evidence for a full or partial mediation.

Concerning Hypothesis 2a and 2b, we predicted that intrinsic motivation and extrinsic motivation would moderate the relationship between psychological empowerment and innovative behavior. Further, assuming such a moderation hypothesis is supported, it is plausible that the strength of the hypothesized indirect (mediation) effect is conditional on the value of the moderator, *i.e.*, the conditional indirect effects (Preacher, Rucker and Hayes, 2007; alternatively known as moderated mediation). Accordingly, the procedures adopted to test Hypotheses 2a, 2b, 3a, and 3b were integrated such that we fully considered the possibility of a statistically significant indirect effect being contingent on the value of the proposed moderator. To test Hypotheses 2a, 2b, 3a, and 3b, we again utilized an SPSS macro, provided by Preacher and his colleagues (2007). This utility facilitates the implementation of the recommended bootstrapping methods and provides a method for probing the significance of conditional indirect effects at different values of the moderator variable. Table 2 presents the means, standard deviations (SD), and intercorrelations for all variables. An inspection of the correlations reveals that LMX was positively related to psychological empowerment ($r = .55$, $p < .001$), whereas psychological empowerment was related to innovative behavior ($r = .27$, $p < .001$).

4.2 Tests of mediation

Table 2 shows the results for intercorrelations among study variables. Supporting Hypothesis 1, LMX was positively associated with innovation, as indicated by a statistically significant regression coefficient ($\beta = .19$, $p < .001$). Also, LMX was positively related to psychological empowerment ($r = .55$, $p < .001$), and psychological empowerment was related to innovative behavior ($r = .24$, $p < .001$). Table 3 indicates that LMX was found to have an indirect effect on innovative behavior; this indirect effect was a full mediation, as we proposed in Hypothesis 1. After controlling for psychological empowerment, the effect of LMX on innovative behavior was significantly and completely reduced ($\beta = .08$, ns), suggesting full mediation. Thus, Hypotheses 1 is supported.

4.3 Tests of moderated mediation

Table 4 and Table 5 show the results for Hypotheses 2. Regarding Hypothesis 2a, we predicted that the positive relationship between psychological empowerment and innovative behavior would be weaker for employees with low intrinsic motivation than for employees with high intrinsic motivation. Results indicated that the cross-product term between psychological empowerment and intrinsic motivation on innovative

Table 2. Means, standard deviations, and intercorrelations among study variables

No.	Vars.	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1.	Industry	2.45	1.01	—										
2.	Gender	.51	.50	-.15**	—									
3.	Age	34.57	8.02	.22**	.04	—								
4.	Marriage	.51	.50	-.16**	.05	.60	—							
5.	Tenure	7.34	6.65	.25*	.06	.67**	-.47**	—						
6.	Education	5.32	2.05	-.21**	-.12*	.25**	.18**	.20**	—					
7.	LMX	4.49	.82	-.03	.06	-.01	.00	.09	.12	(.90)				
8.	Intrinsic Motivation	4.80	.60	.05	.04	.03	-.01	.11**	.05	.48**	(.86)			
9.	Extrinsic Motivation	4.49	.70	.10	-.01	-.07	-.01	.04	.01	.49**	.58**	(.79)		
10.	Psychological Empowerment	4.69	.66	.10	.03	1.43**	-.17**	.21**	.01	.55**	.66**	.50**	(.86)	
11.	Innovative Behavior	4.62	.73	-.03	-.04	.06	-.12*	.13*	.20**	.22**	.16**	.19**	.27**	(.93)

Note: N=359. *p<.05, ** p<.01, *** p<.01
The numbers in the parentheses represent Cronbach's α .

Table 3. The mediation of psychological empowerment

Variables	Regression				
	Psychological Empowerment			Innovative Behavior	
	Model 1	Model 2	Model 3	Model 4	Model 5
Control variables					
Industry	.08	.08	-.03	-.05	-.05
Gender	.07	.02	-.01	-.01	-.01
Marriage	-.11	-.11*	-.12	-.09	-.10
Age	-.05	.02	-.03	-.04	-.03
Education	.08	.00	.21***	.21***	.21
Tenure	.18*	.07	.12	.11	.11
Main Variables					
LMX		.55***	.19***		.08
Psychological Empowerment				.24***	.20**
R^2	.04**	.33***	.09***	.11***	.11***
ΔR^2	.04**	.29***	.03***	.06***	.06***
F value	3.72**	26.49***	6.19***	7.55***	.83***

Note: *p<.05, ** p<.01, *** p<.01

behavior was significant ($\beta = .30, p < .01$). For Hypotheses 2b, we predicted that the relationship between psychological empowerment and innovative behavior would be weaker for employees with low extrinsic motivation than for employees with high extrinsic motivation. Results indicated that the cross-product term

between psychological empowerment and extrinsic motivation on innovative behavior was significant ($\beta = .26, p < .01$). Although the results show that intrinsic motivation and extrinsic motivation interacted with psychological empowerment to influence innovative behavior, they do not directly assess the conditional indirect effects model depicted in Figure 1 (i.e., Hypothesis 3a and 3b).

Table 4. The moderator of intrinsic motivation for conditional indirect effect

Predictor	β	SE	t	p
Psychological Empowerment				
Constant	2.69	.16	16.59	.000
LMX	.44	.04	12.48	.000
Innovative Behavior				
Constant	9.82	2.08	4.72	.011
Psychological Empowerment	-1.18	.46	-2.57	.066
Intrinsic Motivation (IM)	-1.45	.44	-3.30	.001
PE * IM	.30	.09	3.21	.002
Nonverbal negative expressivity	<i>Boot indirect effect</i>	<i>Boot SE</i>	<i>Boot LL</i>	<i>Boot UL</i>
Conditional indirect effect at IM = M \pm 1SD				
IM				
-1SD(-1.00)	.04	.04	-.05	.11
M(0.00)	.12	.04	.05	.19
+1SD(1.00)	.20	.05	.11	.29

Note. N = 359. Unstandardized regression coefficients are reported.

Bootstrap sample size = 1,000. LL = lower limit; CI = 95%; SD = standard deviation; M = mean; Indirect effect = \pm 1SD;

Table 5. The moderator of extrinsic motivation for conditional indirect effect

Predictor	β	SE	t	p
Psychological Empowerment				
Constant	2.69	.16	16.59	.000
LMX	.44	.04	12.47	.000
Innovative Behavior				
Constant	8.50	1.67	5.09	.000
Psychological Empowerment	-.93	.35	-2.64	.009
Intrinsic Motivation(IM)	-1.21	.38	-3.15	.002
PE * EM	.26	.08	3.32	.001
Nonverbal negative expressivity	<i>Boot Indirect effect</i>	<i>Boot SE</i>	<i>Boot LL</i>	<i>Boot UL</i>
Conditional indirect effect at EM = M \pm 1SD				
EM				
-1SD(3.78)	.03	.04	-.06	.10
M(4.49)	.11	.04	.04	.18
+1SD(5.19)	.19	.05	.10	.29

Note. N = 359. Unstandardized regression coefficients are reported.

Bootstrap sample size = 1,000. LL = lower limit; CI = 95%; SD = standard deviation; M = mean; Indirect effect = \pm 1SD.

Therefore, we examined the conditional indirect effect of LMX on innovative behavior (through intrinsic motivation and extrinsic motivation) at each of the three values of psychological empowerment. First, for intrinsic motivation (see Table 4): The mean of intrinsic motivation was 4.80, one standard deviation above the mean of intrinsic motivation was 5.40, and one standard deviation below the mean of intrinsic motivation was 4.20. Normal-theory tests indicated two of the three conditional indirect effects (based on moderator values at the mean and at 1 standard deviation) were significantly different from zero. Bootstrap CIs confirmed these results. Thus, Hypothesis 3a was supported. Results demonstrated the indirect effect of LMX on innovative behavior through psychological empowerment was observed when levels of intrinsic motivation were moderate to high, but not when intrinsic motivation was low. For extrinsic motivation (see Table 5): the mean of extrinsic motivation was 4.49, one standard deviation above the mean of extrinsic motivation was 5.19, and one standard deviation below the mean of extrinsic motivation was 3.78. Normal-theory tests indicated two of the three conditional indirect effects (based on moderator values at the mean and at 1 standard deviation) were significantly different from zero. Bootstrap CIs confirmed these results. Thus, Hypothesis 3b was supported. Results demonstrated the indirect effect of LMX on innovative behavior through psychological empowerment was observed when levels of extrinsic motivation were moderate to high, but not when extrinsic motivation was low.

5. Discussion

Our study is aimed to analyze the mediating effect of psychological empowerment between LMX and innovative behavior. We further examined an integrated conceptual scheme; we proposed that the relationship between LMX and innovative behavior is more complex than prior research has indicated (e.g., Scott and Bruce, 1994; Jeroen and Deanne, 2007; Krause, 2004). First, we hypothesized that psychological empowerment was a mediation between LMX and innovative behavior. We then determined whether intrinsic motivation and extrinsic motivation can regulate the indirect relationship between LMX and innovative behavior.

Results show that the hypothesized moderated mediation model is supported. The indirect relationship between LMX and innovative behavior was mediated by psychological empowerment. Otherwise, as expected, intrinsic motivation and extrinsic motivation can amplify or attenuate this indirect relationship. In other words, the indirect effect of psychological empowerment on the relationship between LMX and innovative behavior was contingent upon intrinsic motivation or extrinsic motivation. These results have several implications for both theory and practice. We believe that our results contribute to the literature by confirming and extending prior findings in several ways.

Past research has devoted attention to the relationship between LMX and innovative behavior; but, to our knowledge, no previous study has investigated the mechanisms connecting these constructs. For example, prior studies examined the relationship between LMX and innovative work behavior, and the relationship was mediated by creative self-efficacy (Atitumpong and Badir, 2018) or work engagement (Breevaart, Bakker, Demerouti and Heuvel, 2015). Our study is the first that broadens the focus of motivation research and proposes a more complex scenario of how LMX influences innovative behavior in situations of synergistic motivational combinations. We investigated a moderated mediation model of the relationship between LMX and innovative behavior.

The finding shows the unidentified boundary condition influencing the impact of LMX on innovative behavior. According to our results, subordinates who have the stronger intrinsic motivation or extrinsic motivation seem to be better able to enhance the innovative behavior implications of LMX and of the

resulting psychological empowerment. This finding is important because it suggests that, in spite of a strong relationship between LMX and subordinates' innovative behavior, the all-important second linkage between psychological empowerment and innovative behavior is diminished when intrinsic motivation or extrinsic motivation is low. Nowadays, with the rapid advance of technology, the innovative behavior of the employee is a critical component of organizational success, especially in the ICT industry. It follows that our results have several clinical implications for the field. First, our findings highlight the importance of psychological empowerment between LMX and innovative behavior. If leaders view their subordinates as members of a group and give them sufficient support, employees will have more power and resources to do their individual jobs. Therefore, leaders must keep a good relationship with employees, and encourage employees to struggle to increase their motivation for engaging in innovative behavior. Regarding motivation, our results show that intrinsic or extrinsic motivation can regulate the mediation mechanism of psychological empowerment between LMX and innovative behavior when intrinsic or extrinsic motivation is high, but can't when intrinsic or extrinsic motivation is low. On the one hand, the organizations can choose employees with high intrinsic motivation during its recruitment. We focus on their ability and intrinsic motivation. Hence, besides experiences and education, we should use scales to measure the candidate's intrinsic motivation. On the other hand, leaders can use several rewards as extrinsic motivations such as bonuses or promotions to encourage employees. According to the findings, our research can roughly sum up some managerial activities of the clinical implications or directions to apply this results in real-world settings, such as enhancing the employees' motivation during recruitment by hiring employees with high innovative behaviors to improve the competitiveness in ICT, promoting employees' motivation, confidence, and competence by evaluating training programs of ICT, investing for staff education (Oshima and Oshima, 2019) to enhance the innovative performance of good relationship quality between leader-subordinate, facilitating employees' job performance of innovative behaviors by designing compensation management (e.g., flexible salary and reward system) to induce employees' motivation to work hard.

As with any study, though we collected data from two sources to avoid issues of same-source bias (Podsakoff, MacKenzie, Lee and Podsakoff, 2003), there are limitations to consider. First, LMX is a perception of the relationship between leaders and employees. In this part, we wanted subordinates to truthfully indicate whether individual leaders have a good relationship with them. So that we need to avoid subordinates give incorrect answers or incline to answer dishonestly. Therefore, we took an anonymous way to increase the rate of answering the scale correctly to have truthful results. Second, although we took many control variables which influence the relationship, it was still not enough. There were many control variables that we couldn't control, such as the skills of employees. Due to individual skills, employees may have dissimilar abilities for innovative behavior. Consequently, future research will take more control variables. Finally, there are many leader styles, but we only take LMX in our study. By understanding different leadership styles, we will know whether we will have the same result via a negative leadership, such as trust in the leader (Gao, Janssen and Shi, 2011) or abusive supervision (Tepper, 2000), using this research model as a base for developing a similar research model which focuses on the relationship between abusive supervision and innovative behavior.

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