

# Examining Leader-Member Exchange as a Moderator of the Relationship between Emotional Intelligence and Creativity of Software Developers

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## Abstract

This paper investigates how leader-member exchange (LMX) and emotional intelligence (EI) are associated with employees' creativity in high-tech firms. We develop a model that considers LMX and EI as predictors of creativity with LMX as a boundary condition for the relationship between EI and creativity. Results reveal that LMX is a strong predictor of creativity. However, EI does not directly affect creativity. More interestingly, the interaction between EI and LMX negatively influences creativity such that EI is detrimental for creativity only when LMX is high. Thus, the role of LMX for employees' creativity may be paradoxical. Further, the positive role of EI reported in current literature may be overly simplistic, and its role may be contingent on the quality of LMX and the other context.

**Keywords:** creativity, emotional intelligence, leader-member exchange, paradoxical relationship

## 1. Introduction

### 1.1 Introduction

Employees' creativity plays a critical role in enhancing the competitive advantage of organizations (Amabile, 1997). Considering the importance of creativity, numerous scholars have investigated the nature of creativity and the means to enhance employees' creativity. These studies consider creativity as an individual's ability to have ideas, which are not only novel but also relevant for and useful to an organization (Oldham & Cummings, 1996). Thus, recent research highlights the social/contextual determinants that facilitate creativity in organizations (Eisenberger & Armeli, 1997; Oldham & Cummings, 1996; Perry-Smith & Shalley, 2003) and socially valuable outcomes that are required for individuals to be perceived as creative by others (Oldham & Cummings, 1996). Among the social factors, the previous creativity and innovation studies paid mounting attention to supportive leadership and leader-member exchange quality (hereafter LMX) between leaders and protégés (e.g., Deci & Ryan, 1987; Oldham & Cummings, 1996; Tierney, Farmer, & Graen, 1999; Zhou & George, 2003). Their main argument is that creative ideas may lead to innovations that require changes to the status quo in organizations (Zhou & George, 2003). Those who suggest creative ideas may run the risk of conflict with colleagues and supervisors who oppose the changes (Janssen, van de Vliert & West, 2004). Thus, supportive leadership is critical for enhancing employees' creativity. More recently, scholars (e.g., Antonakis, Ashkanasy, & Dasborough, 2009; George, 2000; Zhou & George, 2003) have argued that leaders feel that their emotional intelligence (hereafter EI) is the primary source of supportive leadership for awakening employee creativity.

Up-to-date review of the literature reveals that the role of subordinates' EI and perception of LMX is outside the purview of inquiry of creativity studies. LMX and EI from a protégé's standpoint may also be important because

LMX and EI together can help protégés increase understanding of supervisors' readiness and emotional reactions toward creative ideas. Subordinates need to consider the readiness of their supervisors before they voice their creative ideas (Janssen, Vries & Cozijnsen, 1998; Whitney & Cooper, 1989; Saunder, Sheppart, Knight & Roth, 1992). The readiness of supervisors is especially critical in the context of idea implementation, in that creative ideas often challenge conventionally accepted organizational patterns and routines (Janssen et al., 2004) and subordinates' voice relates mainly to communication toward superiors (Saunders et al., 1992). In this context, management of emotions may also be important, as emotions show reactions to creative ideas. Management of emotion can play a critical role for the enhancement of creativity (Fong, 2006) especially when creativity is evaluated by other colleagues.

Based on the above arguments, this study aims to empirically identify the effects of LMX and EI on creativity from a subordinate's standpoint. To examine these relationships, software developers in three large high-tech firms in South Korea participated in the survey as a part of consulting projects. Since creativity is an important attribute for software developers in performing their jobs (Gu & Tong, 2004), the data from this sample should be appropriate for this study. The results can practically help understand the role of leadership in enhancing employees' creativity. Theoretically, this study can clarify the role of EI along with LMX in Eastern Asia culture (Walter, Cole, & Humphrey, 2011).

The next section presents literature review on creativity with a focus on leadership and emotions. The following section proposes hypotheses and elaborates on their underlying theoretical foundation. A field study for testing hypotheses and results are described in the following sections. The final section presents conclusions and suggestions for future research.

### *1.2 Literature Review on Creativity Studies*

Researchers have employed two different approaches in their creativity studies (Mumford & Gustafson, 1988; Simonton, 2005). Early research on creativity identified individuals' disposition and/or inherent characteristics related to creativity (See Barron & Harrington (1981) for a detailed review). Complementing a person specific view, later research highlighted situational aspects of creativity (e.g., Oldham & Cummings, 1996; Perry-Smith & Shalley, 2003). Ford (1996) suggested that while a person may act as a source of innovation through her/his creative idea, it is the people in the domain who ultimately adopt and retain the creative act (i.e., the innovation) that may thereafter refine the domain itself. The people in the domain can provide feedback to the innovator and perpetuate the cyclical set of relationships between the innovator and the society or the domain. Perry-Smith and Shalley (2003) identified the importance of social networks to enhance individuals' creativity at work. The authors argued that since creativity is associated with problem solving skills, individuals' communications within their social networks might provide access to various alternatives, sample solutions, and related ideas for generating creative solutions.

Among the social factors related to creativity, previous research highlighted leadership and a role of leaders due to the contexts surrounding creative idea implementation in organizations. Employee voices regarding creative and novel ideas are likely to be the identification of the problems in organizations and suggestions for organizational changes that refine predominant routines (Janssen et al., 1998). The employees need to communicate mainly with their supervisors to suggest their ideas (Saunders et al., 1992). Thus, leaders can facilitate employees' innovative behaviors that may encourage or discourage employees from providing novel ideas that may sometimes threaten the status quo (Zhou & George, 2003). Scott and Bruce (1994) found that a high level of LMX positively influences employees' innovative behavior. Oldham and Cummings (1996) reported that controlling supervision (e.g., forcing subordinates to think and behave in a certain way) negatively affects protégés' creative behaviors evaluated by supervisors. Leaders also help employees enhance creativity by forming favorable environments such as organizational encouragement, work group supports, and sufficient resources (Amabile, Conti, Coon, Lazenby, & Herron, 1996).

More recently, researchers (e.g., Isen, Daubman, & Nowicki, 1987; George & Zhou, 2002; Kaufman & Vosburg, 1997) paid attention to emotion as a factor that can influence creativity; however the relationship between negative (positive) emotions and creativity is still on-going debate (Fong, 2006). Scholars (e.g., Forgas, 2000; Schwarz, 2002) explained the influence of emotions on creativity in organizations based on the informational theory of emotion. The tenet of the theory is that individuals are likely to utilize emotions as cues or signals regarding their environments (Forgas, 2000). The cues help the individuals adapt to the specific environments (Forgas, 2000). In a similar vein, Lerner and Keltner (2001) stated that individuals perceive emotions associated with risks, interpret the emotions as cues, and select more cautious options in the situations. Thus, in the context

where employees need to speak up to suggest their creative ideas and implement the ideas, they could consider the emotions of their supervisors and other colleagues in responding to their suggestions.

## 2. Hypotheses

Based on the prior studies discussed above, Figure 1 shows the research model in this study. The model is grounded in recent creativity research that stresses an integrated role of both personal and environmental factors (Woodman, Sawyer, & Griffin, 1993; Shalley, Zhou & Oldham, 2004; Zhou & George, 2003). Each of these relationships has been presented in this section.

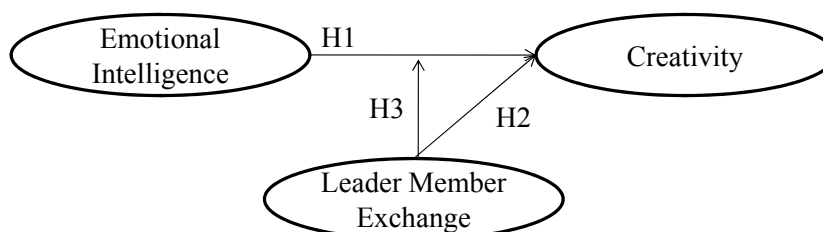


Figure 1. Research model

### 2.1 Emotional Intelligence and Creativity

Creativity requires the generation of novel and appropriate alternatives (Lubart, 1994), which would diverge from what is customary (Sternberg & O'Hara, 1999). Creative ideas and/or solutions may lead to changes or innovations in an organization (Woodman et al., 1993; Zhou & George, 2003) that increase insecurity, stress, and conflict with other actors (Janssen et al., 1998; Janssen, 2003; Janssen et al., 2004). Organizational members including supervisors may not always favor creative ideas. In this situation, emotions can be one of the cues that creative employees can utilize to observe the reactions of colleagues and supervisors. Emotions can play a role in information that can direct employees to think and behave in ways that adjust themselves to the situation (Fong, 2006).

Though the emotions of colleagues and supervisors can provide signals regarding the situation surrounding creative ideas, employees' identification of the emotions and reaction to the situation may depend on two conditions: 1) the ability to perceive and manage emotions of the self and others and 2) employees' coping strategies based on the perception of emotions. The first condition can relate to EI, which is defined as "...the ability to process emotion laden information competently and to use it to guide cognitive activities like problem solving and to focus energy on required behaviors" (Salovey, Mayer, & Caruso, 2005: 159). More specifically, Mayer and Salovey (1997) defined EI as a set of four inter-related emotional abilities: self-emotions appraisal (an ability to perceive, understand, and express one's emotions), others-emotions appraisal (an ability to perceive, understand, and express others' emotions), use of emotions (ability to use emotions for his/her constructive activities and performance), and regulation of emotions (an ability to regulate and control his/her emotions). Though emotions may provide signals regarding contexts, some employees based on the level of EI can more vividly perceive and more actively utilize the signal. In a similar vein, Salovey et al. (2005) suggested that EI might influence creativity.

The second and more specific condition is the coping strategies of employees who perceive emotions of colleagues and supervisors. Even though employees perceive similar signals from other colleagues and supervisors, they may show different patterns in their interpretations of the signals. According to Deci and Ryan (1987), others' emotions, as a part of the organizational environment, can play either an informational or a controlling role. When an informational aspect is more salient, individuals are likely to manage and change their environment to make it favorable to their creative ideas (Shalley et al., 2004). When a controlling aspect is more salient, employees tend to restrict the production of their creative ideas and avoid unfavorable situations (Shalley et al., 2004).

Though both aspects may coexist in this study, we believe that the controlling aspect with regard to creativity may be more salient in this study due to the Korean organizational and cultural context. According to Hofstede (2001), Korea is one of the most collectivist societies in the world. Confucian culture heavily influences Korean firms (Miles, 2008). Thus, such societies stress social community, collective goals, and harmony (Parsons & Shils, 1951), and the self-concept is rooted in the collective (Hofstede, 1991). Individuals in collectivistic cultures are likely to define their identity based on their membership in their reference group (Dorfman & Howell,

1998) and adjust their behavior to maintain the membership (Markus & Kitayama, 1991). In addition, collectivists place more weight on protecting harmonious relationships than gaining personal advantages (*creativity evaluation by supervisors in this study*) (Erdogan & Liden, 2006). Thus, employees may heavily consider others' reactions in the organization, which in turn can influence their presentation of creative ideas. Unlike employees under individualistic Western cultures, those under the collectivistic culture may employ EI to a greater extent for maintaining harmonious relationships with others. This may prompt employees in collectivistic cultures to suppress their innovative ideas (i.e., a controlling aspect) in order to reduce/avoid conflict with others stemming from their creative ideas and the associated changes. Jordan, Dasborough, Daus, and Ashkanasy (2010) and Walter et al. (2011) contended that the influence of EI on work outcomes could be contingent on the cultural context.

In sum, individuals with a high level of EI may be more likely to suppress the production of creative ideas, avoid unfavorable situations, and seek harmony with others based on their understanding of others' reactions. Therefore:

*H1: EI will negatively influence creativity.*

## *2.2 Leader-Member Exchange (LMX) and Creativity*

LMX represents the quality of the relationship (or exchange) between supervisors and subordinates (Graen & Scandura, 1987). According to Graen and Scandura (1987: 182, emphasis added), "...each party (a supervisor or a subordinate in the exchange relationship) must offer something the other party sees as valuable and each party must see the exchange as reasonably equitable or fair." LMX theorists (e.g., Graen & Scandura, 1987; Graen & Uhl-Bien, 1995) argued that the exchange relationship evolves from a low quality to a high quality relationship. Wherein, a low quality relationship is characterized by transactional social exchange, unidirectional downward influence, formally defined roles, and a lack of mutual goals; a high quality relationship is characterized by mutual trust, respect, and obligation (Gerstner & Day, 1997; Deluga, 1992).

A good LMX relationship may play a vital role in the production of creative ideas, since creativity may relate to innovative solutions or at least incorporate minor changes either of which is different from what is customary in the organization (Janssen et al., 1998). A high quality relationship is likely to be characterized by mutual trust, respect, and obligation (Gerstner & Day, 1997; Graen & Uhl-Bien, 1995). Those who have good relationships with their supervisors are likely to have greater opportunities for producing their creative ideas in an organization with the support from their supervisor (Tierney et al., 1999). Prior studies also directly support the above argument. Tierney et al. (1999) identified that LMX measured by subordinates influences their creativity assessed with supervisors' rating, the number of research reports, and the number of new ideas. In addition, several scholars (e.g., Deci & Ryan, 1987; Oldham & Cummings, 1996) indirectly supported the relationship between supportive supervision and encouragement of subordinates' voice by supervisors for increasing creativity.

Based on the above discussion, those with a high level of LMX may be better supported by their supervisors, which may positively influence production of their creative ideas. Individuals who have a better quality relationship may have a higher chance to be viewed as creative employees. Korean organizational culture is characterized as a high level of power distance, which refers to "the difference between the extent to which a boss can determine the behavior of a subordinate and the extent to which a subordinate can determine the behavior of a boss" (Hofstede, 2001: 83). Thus, supervisors' support based on a high level of LMX may be more critical for subordinates' production of creative ideas. Based on this, the following hypothesis is suggested:

*H2: LMX will positively influence creativity.*

## **Moderating Role of Leader-Member Exchange**

In addition to the direct influences of EI and LMX on creativity, there may be an interaction between both constructs in their influence on creativity. This interactional relationship is theoretically based on a current stream of creativity research that highlights the influences of both individual and organizational characteristics (a.k.a. *interactionism*) (e.g., Woodman et al., 1993; Amabile, 1983; Livingston, Nelson, & Barr, 1997; Shalley et al., 2004). Since creative ideas may need changes in current organizational routines, such controlling (negative) aspects of the context may be present in the Korean organizational contexts. EI may further heighten the perception of the controlling aspects under the context of a high level of EI. That is, protégés' may constrain their creative ideas in an organization, since they can better assess their supervisor's reactions toward the creative ideas based on their proximity to their supervisors derived from a high level of LMX. On the contrary, when protégés and their supervisor's have a lower level of LMX, the effect of EI may be relatively marginal,

since employees can depend only on their own abilities to understand supervisors' emotions and to manage their emotions with a lower quality of cues due to the relational distance in understanding supervisors' reactions. Thus, for the Korean context, the following hypothesis is suggested:

*H3: LMX will moderate the relationship between EI and creativity such that for those with a higher level of LMX, the negative influence of EI will be more salient, while for those with a lower level of LMX, the negative influence of EI will be less salient.*

### 3. Research Methodology

#### 3.1 Sample

Software developers were selected as the sample population, since creativity is critical in performing their jobs (Gu & Tong, 2004). Software development includes various tasks such as requirement engineering, software structure design, and programming, each of which requires creativity, idea generation, and intuition (Robillard, 1999). Software development also requires highly structured and organized efforts (such as U.S. based software standard CMM and CMMi) that do not leave much flexibility for an individual to be different without the approval of the team and the leadership. Thus, we believed that software developers would be a reasonable sample to test the hypotheses related to creativity.

This research was conducted as a part of consulting projects in three large software and telecommunication companies in South Korea. The authors participated in consulting projects related to business process re-engineering in these organizations, and the responses were collected as a part of the consulting projects. Before sending the survey, we solicited employees' participation. The organizations supported this research by encouraging their employees to participate in the survey. 151 software developers agreed to participate in the survey. Given the consent to participate in the survey, questionnaires were distributed to 151 software developers in the three organizations who were involved in the work related to the consulting project. The authors also contacted respondents' direct supervisors or managers through their respective human resources department, and sent separate questionnaires related to the evaluation of their creativity based on the supervisors' agreement. All the supervisors agreed to evaluate their protégés. A total of 27 supervisors provided the creativity ratings of software developers working under them. More specifically, a supervisor evaluated between 4 to 7 protégés, and each subordinate's creativity was rated by a supervisor. Among the 151 respondents, 67.1% were male, and 98.7% had a four-year-college degree or higher education, with 19.9% of them being in their 20's, 45% in 30's, and 22.7% in 40's. Additionally, 47% of the respondents had less than 5 years of experience in the current organizations, and 22.5% had less than 10 years of experience.

#### 3.2 Measurement

**EI.** We administered Wong and Law's (2002) Emotional Intelligence Scale (WLEIS). Consistent with Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Mayer, Salovey, & Caruso, 2002), WLEIS is composed of a four-factor structure, Self-Emotions Appraisal, Others-Emotions Appraisal, Use of Emotion, and Regulation of Emotion. Each sub-construct has 4 items, yielding a total of 16 items for EI. WLEIS was validated in prior studies (Wong & Law, 2002; Law, Wong, & Song, 2004). The response format of the WLEIS is a 7-point Likert-type scale (1=totally disagree to 7=totally agree).

**Creativity.** We employed Oldham and Cummings' (1996) creative performance scale to measure individuals' creativity. Supervisors rated the degree to which each of their subordinates produced work that have novelty and usefulness to the organization. This measure includes three items rated on a 7-point Likert scale (1=extremely low to 7=extremely high). Recommended by Zhang and Bartol (2010), effects associated with supervisors (rather than actual employees' creativity) were examined, since a supervisor rated creativity of multiple subordinates. A one-way analysis of variance (ANOVA) on subordinates' creativity revealed that no systematic difference in the creativity scores exists across supervisors ( $F = 1.018$ ,  $p = 0.450$ ). In addition, standard deviation of average creativity across supervisor-groups is 0.358 whereas average of within-group standard deviation, which shows the differences among within-group members, was 0.772. The difference within a supervisor was found to be greater than the difference across supervisor groups, confirming that subordinates' creativity scores are not dependent on supervisors, and supervisors rated creativity of their subordinates at different levels, without showing fatigue.

**LMX.** We employed Scandura and Graen's (1984) LMX 7 scale. Though prior studies reported different operationalization of LMX and developed several scales (Schriesheim, Castro, & Cogliser, 1999), this scale would be appropriate since the conceptualization of LMX focuses on relationship quality in this paper, consistent with Scandura and Graen's (1984) operationalization. Subordinates were asked to rate their relationship with the

immediate supervisor who evaluated their creativity. This scale includes seven items rated on a 7-point Likert scale (1=totally disagree to 7=totally agree). A higher score represents a higher level of LMX.

**Control variable.** We controlled for person-job fit (a type of person-environment fit) to rule out an alternative explanation of results as person-environment fit relates to individuals' creativity in an organization (Livingston et al., 1997; Shalley et al., 2004). Subordinate-respondents completed the questions related to the perception of person-job fit, which was measured with Lauver and Kristof-Brown's (2001) scale. In addition, we included demographic variables such as age and experience in the current organization, and dummy-coded education, gender and rank as covariates.

All the items used in this study were translated into Korean in several steps to reduce the threat from measurement equivalence: (1) initial translation of the survey from U.S.-based English to Korean by multi-lingual speakers of the local language, (2) back-translation of the survey from Korean to U.S. English by multi-lingual speakers of U.S. English, (3) comparison of the originals with the back-translated English version by independent researchers, (4) resolution of discrepancies by the translators and development of revised instruments, and (5) review and revision of instruments by a manager of the research site. An original English version of the questionnaire is included in Appendix 1.

### 3.3 Data Analysis

We conducted two-stage analysis to validate the measurement model of the constructs and to assess the relationships among the constructs, as recommended by Anderson and Gerbing (1988). At the measurement level, confirmatory factor analysis was conducted using MPLUS to identify factor structures and their goodness-of-fit indices. The reliability of the constructs employed in this study was assessed in terms of Cronbach's  $\alpha$  and average variance extracted (AVE). Based on construct and discriminant validity, we aggregated the items based on the constructs. As EI is composed of four sub-dimensions, we conducted a second-order factor analysis to assess construct validity along with other constructs (i.e., creativity, person-job fit, and LMX), and examined the reliability of each sub-dimension. At the nomological relationship level, we used hierarchical multiple regression using SPSS. Before the regression, we conducted Lance's (1988) residual centering technique to reduce the problem of multicollinearity during the analysis of the moderating effect of LMX. After the residual centering, the largest variance inflation factor (VIF) in our analysis is less than 2.50. We concluded that no significant undesirable multicollinearity is present.

## 4. Results

Table 1 shows descriptive statistics, Cronbach's alpha, and correlations among the variables. Reliability of the constructs was satisfactory as all constructs had Cronbach's alphas higher than .70 (Nunnally, 1978). The square root of the AVE is greater than all other cross-correlations, confirming discriminant validity (Fornell & Larcker, 1981). The theorized seven-factor model along with a second-order factor (EI) provided a reasonable fit to the data based on Browne and Cudek's (1993), Kline's (1998), and Medsker, Williams, and Holahan's (1994) recommendation:  $\chi^2$  (Degree of Freedom) = 629.73 (382),  $p = .00$ , CFI = .90, TLI = .89, RMSEA = .07, SRMR = .08. All items loaded significantly onto their intended constructs as evidenced by all the t-values greater than 4.40 ( $p < .001$ ). Taken together, the above results reveal that the seven-factor model along with a second order factor of EI is theoretically robust and provides a reasonable fit to the data.

Since confirmatory factor analysis provides fitness of a proposed model to data, the model may not guarantee an optimal model. Thus, we tested two plausible rival models: 1) a seven-factor model without a second order factor of EI and 2) a four-factor model which combine all the items related to EI in one factor and other items in three factors, LMX, creativity, and person-job fit as theorized. The first rival model had poorer fit to the data ( $\chi^2 = 686.25$ ,  $df = 377$ ,  $p = .00$ , CFI = .88, TLI = .86, RMSEA = .08, SRMR = .07) compared to the original model. The difference in the  $\chi^2$  values between the original and the first rival model ( $\Delta\chi^2 = 56.51$ ) indicate that the fit of the original model is significantly better than that of the rival model. The second rival model did not also have adequate fit to the data ( $\chi^2 = 1101.58$ ,  $df = 392$ ,  $p = .00$ , CFI = .72, TLI = .69, RMSEA = .11, SRMR = .10). Taken together, we concluded that the original model has an optimal fit to the data. Confirming validity and reliability of the constructs, the items are aggregated based on pre-defined constructs and employed in the hierarchical regression analysis in the next stage.

Table 1. Means, standard deviations, and correlations (n=149)

Variables	1	2	3	4	5	6	7	7.1	7.2	7.3	7.4	8	9
1. Gender	-												
2. Age	-.44**	-											
3. Experience in the current organization	-.29**	.74**	-										
4. Education	.10	-.14 <sup>†</sup>	-.00	-									
5. Rank	.39**	.76**	-.65**	.30**	-								
6. Person-Job Fit	-.34**	.25**	.14 <sup>†</sup>	-.21**	-.35**	.91							
7. Emotional Intelligence	-.21**	.01	.04	-.11	-.06	.46**	.92						
7.1 Self-Emotions Appraisal	-.08	.06	-.02	-.07	.03	.27**	.74***	.95					
7.2. Others-Emotions Appraisal	-.03	.11	-.04	-.09	.05	.26**	.75***	.41**	.94				
7.3. Use of Emotion	-.21**	-.00	.03	-.14 <sup>†</sup>	-.04	.43**	.78***	.48**	.43**	.94			
7.4. Regulation of Emotion	-.30**	.08	.12	-.05	-.19*	.40**	.75**	.33**	.43**	.44**	.96		
8. Leader-member Exchange	.19*	-.10	-.09	.14 <sup>†</sup>	.27**	-.17*	-.02	.10	.04	-.13	-.06	.93	
9. Creativity	.03	.00	-.07	.04	.03	.11	.06	.12	.05	-.01	.03	.65**	.97
Mean	-	-	-			4.87	5.04	5.12	5.00	5.19	4.84	5.58	5.30
Standard Deviation	-	-	-	-	-	.89	.75	1.00	.93	.98	1.08	.64	.84
Cronbach's Alpha	-	-	-	-	-	.80	-	.87	.83	.84	.87	.89	.94

\*\*p&lt;.01, \*p&lt;.05

## Dummy Coding

Italic diagonal elements are the square roots of AVE.

Hypothesis 1 predicted a negative influence of EI on creativity. Results in Table 2 (Model 2 and Model 3) indicate that the independent effects of EI on creativity ( $\beta = -.01$ , and  $.01$ ) are not significant. Therefore, *hypothesis 1 is not supported*. Hypothesis 2 predicted that LMX positively influence creativity. The results shown in Table 2 (Model 2 and Model 3) reveal that LMX positively affects creativity,  $\beta = .72$  ( $p < .01$ ) and  $\beta = .70$  ( $p < .01$ ), respectively. Thus, *hypothesis 2 is supported*.

Hypothesis 3 predicted that *the negative influence of EI on creativity would be more salient for those with a higher level of LMX*. The result shown in Table 2 (Model 3) reveals that the interaction between EI and LMX negatively influences creativity ( $\beta = -.12$ ,  $p < .05$ ), and  $\Delta R^2 (= .02)$  is also significant ( $p < .05$ ). To further investigate this result, we graphed this interaction based on LMX and EI scores above and below 1 standard deviation from the mean. The interaction, graphed in Figure 2, is consistent with hypothesis 3. This result indicates that though those who have a higher level of LMX have a higher level of relationship between EI and creativity, the negative influence of EI on creativity is found to be more salient. The simple slope representing the relationship between EI and creativity at one standard deviation in LMX above the mean is negative and significant with  $\beta = -.34$  ( $p = .06$ ). However, the simple slope representing the relationship between EI and creativity at one standard deviation in LMX below the mean is not significant,  $\beta = -.06$ , ( $p = .75$ ). We believe that EI plays a negative role with a boundary condition of high LMX in its influence on creativity. Overall these results *support hypothesis 3*.

Table 2. Results of hierarchical regression (n=149)

Dependent Variable: Creativity			
	Model 1	Model 2	Model 3
Gender	0.08	-0.02	-0.03
Age	0.17	-0.03	-0.04
Experience in the Current Organization	-0.14	-0.16	-0.16
Education	0.07	0.05	0.06
Rank	0.08	-0.23*	-0.21*
Person-Job Fit	0.14	0.19*	0.21*
Emotional Intelligence (EI)		-0.01	0.01
Leader-Member Exchange (LMX)		0.72**	0.70**
EI x LMX			-0.12*
R <sup>2</sup>	0.03	0.48	0.50
$\Delta R^2$ (Significance)		0.45**	0.02*

\*\*p&lt;0.01, \*p&lt;.05

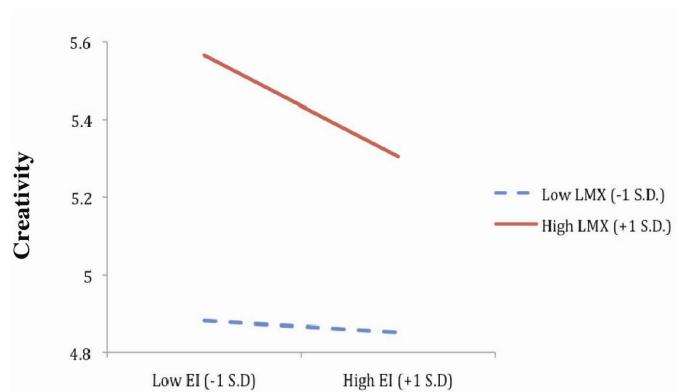


Figure 2. Interaction Effect of LMX and EI on

## 5. Discussion and Conclusion

### 5.1 Discussion

This study investigates the independent effects of EI and LMX and their interaction effect on creativity from the subordinates' standpoint. Although Salovey et al. (2005) proposed that EI may positively influence creativity, this study finds that EI does not have a direct influence on creativity in an organizational setting. This result can be theoretically interpreted through the two opposite mechanisms regarding emotion: buffering and personal engagement (Lam & Kirby, 2002). Buffering refers to encapsulating and separating emotions from the tasks at hand (Ashforth & Humphry, 1995), whereas personal engagement refers to emotional involvement in the tasks (Kahn, 1990). In this study, it appears that emotions may be buffered, and the emotional aspects may not directly influence individuals' creative performance in organizations.

LMX was found to be a strong predictor of creativity. Employees with a high LMX relationship were more creative as rated by their supervisors. This result is consistent with Tierney et al.'s (1999) finding and supports the role of social (organizational) aspects, especially supervisors' support (Oldham & Cummings, 1996), in enhancing employees' creativity. Since creative ideas may be different from organizational routines (Sternberg & O'Hara, 1999) and may not be favored by other members in an organization (Janssen, 2003), strong support from supervisors based on mutual trust and respect may encourage employees to produce creative ideas more frequently and enhance their creativity performance as perceived by supervisors. In cases where some of the supervisory staff may view an employee's creative idea from a different perspective (Kelin & Sorra, 1996),



encouragement from direct supervisors may be crucial for protégés to advance his/her creative idea. Protégés can obtain such support from supervisors based on their exchange quality with their supervisors.

Perhaps of the most significance, our results reveal that the interaction between EI and LMX appears to negatively influence creativity. Specifically, EI becomes a relatively stronger negative predictor of creativity for those who have a higher level of LMX. This may partially confirm the salience of controlling aspects of contexts (Deci & Ryan, 1987) along with LMX in the context of Korean organizations. In this situation, the controlling aspect appears to be more salient, indicating that employees are likely to avoid unfavorable situations by restricting the production of their creative ideas. As employees have a good relationship with their supervisors, they may have greater opportunities to appraise their supervisors' reactions and emotions in response to their creative ideas. Based on such appraisal, those who have higher EI may constrain their creative voice to avoid unfavorable situations and reactions, and maintain a good relationship with their supervisors, even though they may have better support from the supervisors for the implementation of accepted ideas. Thus, the supervisors' perception of their creativity may be lower than actual creativity. However, for those who have a lower level of LMX, the emotion-laden aspects may be comparatively limited since the employees may not have sufficient cues to assess their supervisor's reaction to their creative ideas due to relational distance. Thus, EI may neither increase nor decrease the level of creativity in the context of a low level of LMX.

### 5.2 Conclusion

Prior studies discussed the controversy about the role of EI in management research and practice. For example, Lindebaum (2009) suggested that EI might not be properly implemented in organizations due to inter-industry, inter-organizational, and inter-personal barriers. Jordan et al (2010) proposed the importance of contexts with regard to the effect of EI. In line with these studies, this study contributes to understanding the role of EI for creativity in organizations. Specifically, this study may hint that leadership (especially LMX) may be one of the main issues in understanding the role of EI in an organization; LMX can play a paradoxical role in employees' creativity at least in the context of Korean (collectivistic organizational) culture.

### 5.3 Limitations and Future Research

While the results of this study reveal a complex set of relationships among EI, LMX, and creativity in organizational settings, our measure of creativity invites some alternative explanations. In this study, the self-reported Wong and Law's (2002) scale was employed to measure EI in this study. However, Joseph and Newman (2010) identified that the relationships between self-reported measures and performance-based measures are not high. The results of this study may be different if other performance-based measures of EI are adopted. Thus, future studies with other measures should investigate these relationships to examine the generalizability of the results of this study.

Though we translated our questionnaire and back-translated it with care in iterative cycles, translation equivalence (Van Herk, Poortinga, & Verhallen, 2005) may still be an issue. Multiple-group factor analysis in a structural equation model is required for identifying the measurement model equivalence in multiple groups simultaneously (Malhotra, Agarwal, & Peterson, 1996). We were able to assess measurement equivalence for EI based on secondary data obtained from Law et al. (2004). We conducted a multi-group second-order factor analysis to compare the factor structure of EI in this study with the ones in Law et al. (2004), since the authors provided the correlation matrix, means, and standard deviations of sub-constructs of EI for their two samples. The results reveal that global goodness of fit statistics for the three samples (two from Law et al. and one from the current study) are CFI = .99, TLI = .97, RMSEA = .07, SRMR = .03, indicating that measurements are equivalent for three groups.

In this study, informational and controlling aspects of job contexts were not empirically measured and/or controlled, though the two aspects were conjectured in the development of H1. These variables may play a critical role in the results of this study. Since this study focused mainly on the relationships among EI, LMX, and creativity, these contextual variables were outside the purview of this study. Given the nature of the study, it was not possible for researchers to conduct experiments to identify the contextual effects in an organization. In addition, though controlling aspects of the job context was assumed to be salient due to Korean organizational culture, such assumptions about the effects of cultural background can be examined in a future study. Furthermore, the relationships among EI, LMX, and creativity may be different in other cultures. Thus, future studies need to examine organizational and cultural influences on the role of EI in organizations, similar to Lindebaum's (2009) suggestion.

Prior studies (Tierney et al., 1999; Tierney & Farmer, 2004) identified that subordinates with a high level of LMX have greater autonomy and that their managers will provide greater acceptance of risk taking in Western

cultures. This study clarifies prior results by showing that employees with a high level of LMX may be more sensitive, contingent on the level of EI; although employees with a high level of LMX are generally perceived to have higher creativity by their supervisors than those with a low level of LMX as shown in Figure 2. Although LMX can create a context for subordinates to take higher risks and explicate creative ideas in organizations, for those who have a high level of EI, the context may be detrimental. This result can be attributed to the sample from organizations in Korea – a country with a culture of a high level of power distance and collectivism (Hofstede, 2001). In such contexts, subordinates' creative ideas may be strongly perceived by other colleagues based on supervisors' judgment or opinion about the idea. In addition, due to power distance, employees may put the highest value on maintaining the relationship with their supervisors. Similar to Scandura, Von Glinow, and Lowe's (1999) suggestion for more cross-cultural studies of LMX, future studies need to be conducted in different organizations in other countries for a better understanding of the influence of cultural context on the relationship of LMX with creativity.

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## Appendix

### Appendix 1. Scales employed in this study

Constructs		Items
Emotional Intelligence	Self-Emotions	1. I have a good sense of why I have certain feelings most of the time.
	Appraisal	2. I have good understanding of my emotions.
		3. I really understand what I feel.
		4. I always know whether or not I am happy.
	Others-Emotions	1. I always know my friends' emotions from their behavior.
	Appraisal	2. I am a good observer of others' emotions.
		3. I am sensitive to the feelings and emotions of others.
		4. I have good understanding of the emotions of people around me.
	Use of Emotion	1. I always set goals for myself and then try to my best to achieve them.
		2. I always tell myself I am competent person.
	Regulation of Emotion	3. I am a self-motivating person.
		4. I would always encourage myself to try my best.
		1. I am able to control my temper so that I can handle difficulties rationally.
		2. I am quite capable of controlling my own emotions.
		3. I can always calm down quickly when I am very angry.
Perceived Person-Job Fit		4. I have good control of my own emotions.
		1. My abilities fit the demands of this work.
		2. I have little right skills and abilities for doing this job.
		3. There is a good match between the requirements of this job and my skills.
		4. My personality is a good match for this job.
Creativity		5. I am the right type of person for this type of work.
		1. How original and practical is this person's work?
		2. How adaptive and practical is this person's work?
Leader-member Exchange		3. How creative is this person's work?
		1. Do you usually know how satisfied your immediate supervisor is with what you do.
		2. My supervisor understands my problems and needs well enough.
		3. My supervisor recognizes my potential some but not enough.
		4. Regardless of how much power my supervisor has built into his or her position, my supervisor would be personally inclined to use his/her power to help me solve problems at work.
		5. I can count on my supervisor to 'bail me out' at his/her expense when I really need it
		6. I have enough confidence in my supervisor to defend and justify his/her decisions when he/she is not present to do so.
		7. My working relationship with my supervisor is effective.