# The effect of leaders’ emotion on team members’ creativity and performance in South Korean ICT service companies

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**Abstract**

We examined the influence of team members’ emotional reactions to leaders’ emotional displays, and their effect on creativity and job performance in temporally different types of teams. To reveal the variables’ relations, surveys were conducted on 50 teams in South Korean ICT service companies, classified into two temporal types: temporary and permanent. We found that, although team members’ positive emotions affect their creativity positively in both types, leaders’ negative emotions affect members’ creativity positively only in temporary teams. These results offer implications for the way leaders should control their displays of emotions to enhance their team members’ creativity and performance.

**Keywords**: Emotional display, Emotional reaction, Emotional contagion, Employee creativity, Job performance

# 1. Introduction

Business environments today are considerably more uncertain and dynamic than ever before. Highly automated innovation and progressive trends in Information and Communication Technology (ICT) are bringing revolutionary changes to factories. Further, ICT has led to dramatic changes in service industries, such as engineering, technical consultancy, software, and maintenance to achieve business’s effective and superior performance (Kindström & Kowalkowski, 2014; Ryu & Lee, 2017). Hence, expectations of ICT-supported innovation in organizations are higher than ever. Under these circumstances, ICT service employees’ creative work is indispensable in developing innovative products and services.

In the field of organizational research, leaders’ influence on employees’ creativity and performance has been a favorite topic among scholars, and has shown that teams or groups produce the most creative work outcomes (Anderson, Potočnik, & Zhou, 2014). One of the common topics in this research to date has been leadership styles, which have been investigated extensively to describe ways to enhance employees’ creativity and intrinsic motivation (Boies, Fiset, & Gill, 2015; Zhang & Bartol, 2010; Zhang & Zhou, 2014). Recently, with the growing understanding of emotion and its effects in the management field, leaders’ emotions have captured scholars’ attention as a major factor that affects employees’ creativity. Researchers agree that, in most cases, a leader’s positive emotions affect followers’ creativity and performance positively, as we would expect; however, the effect of leaders who display negative emotions has been somewhat inconclusive, and appears to depend on team members’ current circumstances. Although leadership styles and their influence on employees’ work outcomes have been discussed extensively in the literature, there are fewer studies about the way leaders’ emotional displays affect team members’ behavior.

For these reasons, we investigated the relations between leaders’ emotional displays, team members’ emotional reactions, and their influence on the latter’s creativity and performance in ICT service workgroups. Moreover, we shed light on the temporal frame in which the work takes place (relatively permanent or temporary) because team members’ perceptions and interactions with leaders differ with temporal type (Mohammed & Nadkarni, 2011). Thus, this approach is particularly meaningful for ICT service organizations, in which employees work more often in temporary teams and with temporary leaders because their work frequently is performed on a project basis.

To address our research questions, we structured our research models such that they consisted of leaders’ emotional displays, team members’ emotional reactions, and these reactions’ effect on members’ creativity and performance in the two temporal types of ICT service organizations. In doing so, we attempted to reveal: 1) the way leaders’ emotional displays affect team members’ emotional reactions; 2) the way members’ emotional reactions affect their creativity and performance outcomes, and 3) whether the mechanisms of emotional contagion and members’ creativity and performance depend on whether the teams are permanent or temporary. The remainder of the paper is organized as follows. In Sections 2 and 3, we review related theories and literature briefly and then propose our model and research hypotheses. Next, we describe the methodology used in the study and the statistical analysis conducted, followed by our findings. In Sections 6 and 7, we conclude with a discussion of our study’s implications and suggest possible directions for future research.

# 2. Theoretical Background

***2.1 Leaders’ emotional displays***

Leaders’ influence on employees’ creativity and performance in organizations has been a favorite topic of researchers for more than two decades. Prior research has investigated specific leadership styles and revealed what aspects affect creativity and performance. Recently, researchers have investigated leaders’ emotional displays and employees’ reactions in organizations (Koning & Van Kleef, 2015; Van Kleef, Homan, Beersma, Van Knippenberg, Van Knippenberg, & Damen, 2009). Emotions are more intense, have definite causes, and have clearer cognitive contents than moods. Thus, a leaders’ emotion is believed to influence employees’ emotional states consciously or unconsciously. For example, Humphrey et al. (Humphrey, Pollack, & Hawver, 2008) revealed that when leaders display positive emotions and moods, such as confidence and optimism, followers are likely to experience the same emotions and moods through emotional contagion. Madrid et al. (Madrid, Totterdell, Niven, & Barros, 2016) argued that when leaders display positive emotions, followers’ cooperation and prosocial behavior will increase. On the other hand, when leaders display negative emotions, employees exhibit avoidance behavior and a lack of cooperation. Cropanzano et al. (Cropanzano, Dasborough, & Weiss, 2017) investigated affective events theory and leader-member exchange (LMX) development. They examined three stages of LMX progress and found that, in the role-taking stage, the leader’s emotion influences followers’ emotions through the process of emotional contagion and affective empathy. During the role-taking stage, the leader and followers’ emotions tended to fluctuate in synchrony. Consequently, most literature on leaders’ emotional displays has shown consistently its vital role in affecting followers’ outcomes, regardless of emotional polarity.

***2.2. Emotional reaction***

Hareli and Hess (Hareli & Hess, 2010) found that people react emotionally to others with anger, sadness, or joy, or remain neutral. Furthermore, one’s emotional reaction can be used to judge his/her character. Erlandsson et al. (Erlandsson, Björklund, & Bäckström, 2015) focused on personal distress and sympathy as two representative types of emotional reactions that motivate people to help others in organizations. They viewed distress as an inward-directed negative feeling that motivates the individual to rid himself of it, while they viewed sympathy as an outward-directed negative feeling that motivates him/her to help others. Huy et al. (Huy, Corley, & Kraatz, 2014) insisted that emotional reactions can be a trigger that changes judgments of legitimacy and makes information evaluators more noticeable. They also argued that those evaluators of emotional influence co-occur with cognition to interpret information and behavior. To situate our work in a team context, the way in which leaders’ emotional displays affect team members’ emotional reactions needs to be examined.

***2.3. Members’ creativity and performance in ICT service***

In ICT service industries, employees are challenged to create innovative products or services. The dynamic and rapid pace of technological changes and new competitors’ entry make employees’ creativity a key in a firm’s survival (de Souza Bermejo, Tonelli, Galliers, Oliveira, & Zambalde, 2016). Employees’ ability to create and apply solutions to provide better value is considered an important driver in software development, as well as maintenance service, where innovation is required for new design and ICT solutions (de Souza Bermejo, Tonelli, Galliers, Oliveira, & Zambalde, 2016; McComb, Green, & Compton, 2007; Ocker, Hiltz, Turoff, & Fjermestad, 1995).

Although creativity is required strongly to solve problems and produce innovative products and services (Wang, Huang, & Yang, 2012), only a few studies have investigated the antecedents of team members’ creativity in the ICT service context. For example, Jo et al. (Jo, Lee, Lee, & Hahn, 2015) discussed the way leadership style affects employees’ trust in the leader and their creativity. They found that when employees trust an organization more, they are more likely to produce innovative outcomes. In another study, the relations among team member exchange (TMX), job stress, and individual creativity in the ICT service industry were investigated. The authors argued that managers attempt to reduce members’ job stress, although TMX does not reduce it significantly, because members’ stress affects their creativity adversely (Lee, Lee, & Jo, 2013).

***2.4. Temporary and permanent teams***

A team is a basic unit, a collection of individuals who work and collaborate to achieve outcomes, and is constituted for different durations (Quintane, Pattison, Robins, & Mol, 2013). The previous literature has classified teams’ temporal frames into short- and long-term, or temporary and permanent (Chae, Seo, & Lee, 2015; Quintane, Pattison, Robins, & Mol, 2013), and has found that the temporal frame affects the way individuals work in teams. For example, task variety affects an individual’s creativity in permanent teams directly; however, it affects an individual’s creativity indirectly through knowledge sharing in temporary teams (Chae, Seo, & Lee, 2015).

Similarly, previous research has shown that team duration influences team members’ behavior and performance. For example, on short-term projects, team members are less immersed in their task and use more heuristic modes of information processing compared to members on more permanent teams. Thus, individuals on temporary project teams can have a short-term focus on immediate deliverables because meeting deadlines is one of the measures of project success used most frequently (Bakker, Boroş, Kenis, & Oerlemans, 2013). Therefore, in this study, rather than merely comparing leaders’ emotional displays with members’ emotional reactions in the course of producing creative and efficient outcomes, we contrasted those mechanisms in temporary teams and more permanent teams and argue that leaders’ emotional displays affect members differently depending upon the teams’ temporal duration.

# 3. Theory and Hypotheses Development

***3.1. Leaders’ emotional displays and members’ emotional reactions***

According to the emotional contagion theory, one person’s emotion can spread to another by emotional expressions, tone of voice, and body language. Thus, in the organization, the way leaders display their emotions is a critical cause of changing members’ emotion (Ashkanasy & Humphrey, 2011). The extant literature has shown that leaders’ emotions affect members’ creativity or performance through emotional contagion. For example, leaders’ positive emotions are related positively to members’ positive emotions, while leaders’ negative affect is related negatively to their positive emotion (Johnson, 2008). Further, Damen et al. (2008) revealed that leaders’ emotions interact with members’, such that very positive members are more susceptible to positive emotional stimuli, while somewhat positive members are more susceptible to negative emotional stimuli. Therefore, we hypothesize:

**H1.** Leaders’ positive emotional displays influence members’ positive emotional reactions positively.

**H2.** Leaders’ positive emotional displays influence members’ negative emotional reactions negatively.

**H3.** Leaders’ negative emotional displays influence members’ positive emotional reactions negatively.

**H4.** Leaders’ negative emotional displays influence members’ negative emotional reactions positively.

***3.2. Members’ emotional reactions, creativity, and performance in ICT service***

Although most studies have suggested that leaders’ displays of positive rather than negative emotions are conducive to organizational functioning, some literature has suggested that negative emotions might also may enhance individuals’ job performance. For example, a leader’s display of anger is known to motivate members more effectively than a leader who displays pleasure or a neutral emotion (Van Kleef, De Dreu, & Manstead, 2004). In another example, leaders’ displays of sadness are known to enhance members’ negative emotions, which in turn improves their analytic performance (Visser, van Knippenberg, van Kleef, & Wisse, 2013).

Leaders who display positive emotions affect their team members’ emotions positively and enhance their performance. According to the affect-as-information theory, members’ emotional reactions provide information that can affect their job performance. In addition, members’ emotional reactions affect their ability to invest themselves in their work roles (Fredrickson, 1998; Hobfoll, 1989). Therefore, the more frequently members display positive reactions, the more information and emotional resources they can invest in performing their jobs. Conversely, the more members exhibit negative reactions, the less information and fewer emotional resources they have to invest in their jobs. Therefore, our hypotheses are:

**H5**. Members’ positive emotional reactions affect their creativity positively.

**H6.** Members’ positive emotional reactions affect their job performance positively.

**H7**. Members’ negative emotional reactions affect their creativity negatively.

**H8.** Members’ negative emotional reactions affect their job performance negatively.

**H9.** Members’ creativity affects their job performance positively.

In summary, our research framework was used to investigate the relation between team members’ emotional reactions to leaders’ emotional displays and its influence on members’ creativity and job performance in ICT service organizations. In addition, we considered the influence of organizations’ temporal diversity (i.e., relatively temporary or permanent teams). Leadership involves structuring, coordinating, and managing task pacing in teamwork according to team duration. Further, members pace their team goals’ accomplishment by scheduling key milestones ahead of task deadlines and allocating temporal resources (Mohammed & Nadkarni, 2011). Therefore, we attempted to investigate the way team duration affects the mechanism of leaders’ and members’ emotional states, and, in turn, the way this influences team members’ creativity and performance. Based on prior research, our proposed research model is as shown in Figure 1.

== Insert Figure 1 here ==

# 4. Research Methodology

***4.1. Survey instrument***

A questionnaire was designed based on the extensive literature on this subject, and adapted to the context of ICT service industries. All measures were constructed based on a 7-point Likert scale that ranged from 1 = strongly disagree to 7 = strongly agree. All items were adopted from prior research, and 5 researchers who have studied team and individual creativity in organizations were invited to validate whether translated items (English-Korean) were understandable and maintained the intentions of the original survey questions. Appendix A provides the literature referenced for the items.

***4.2. Data collection***

Authors acquired permission from the IRB in Sungkyunkwan University to collect data sample from participants for this study (IRB 2015-05-007-008). To survey leaders and members in temporally diverse teams, we contacted three types of ICT service-providing organizations in major Korean ICT service companies (Samsung SDS, LG CNS, and Lotte Data Communication). The services they provide customers are divided into three types: consultation, system integration (SI), and ICT system maintenance (SM). Their consulting services consist of proposing ICT solutions appropriate to a particular business strategy, and designing business processes or ICT infrastructure for innovation. SI, which follows consulting service largely, is the integrated service that consists of developing, testing, and incorporating ICT systems into an organization’s ICT infrastructure. Typically, temporary project teams provide these two services because they are subjected to tight deadlines and short time horizons (Quintane, Pattison, Robins, & Mol, 2013). SM is a service that most often follows SI service and operates companies’ ICT infrastructures, conducts adaptive action for continually changing businesses, and takes action to prevent errors and ICT service failures. Largely, relatively permanent teams provide SM services, in which leaders and members interact with each other over time, because ICT infrastructure requires maintenance throughout an organization’s existence. Thus, SM teams were considered permanent teams for the purposes of our study as in Chae et al. (Chae, Seo, & Lee, 2015).

We contacted the three ICT service companies and asked a number of participants to send us their consent to participate in this survey. Total 256 participants responded with qualified consents. They were full-time employees in their companies. The subjects’ mean age was 30, and 168 (66%) of them were male and 88 (34%) were female. The employees belonged to 50 teams that ranged from 4 to 7 members in size. Half consisted of temporary teams that provided consultation or SI service to their clients for limited periods defined in advance (e.g., 2 years at the longest). The other half consisted of permanent teams that had provided ICT routine SM to their client organizations for more than 5 years.

== Insert Table 1 here ==

# 5. Data Analysis and Results

***5.1. Measures’ validity and reliability***

We adopted SmartPLS (Ringle, Wende, & Becker, 2015) as the primary statistical tool to analyze our structural model and hypotheses. The partial least square (PLS) method was selected because it accommodates smaller data samples (i.e., N = 256 in our study) and is known to be more suited for predictive studies and theory building than is covariance-based SEM (Chin, Marcolin, & Newsted, 2003; Gefen, Straub, & Boudreau, 2000). When the PLS method is employed, it is recommended to calculate Cronbach’s α and composite reliability to test the measures’ validity. Variables can be included in the SEM only if the values of Cronbach’s α and composite reliability are higher than 0.7, and any items with item loadings less than 0.5 should be dropped (Janz, & Prasarnphanich, 2003).

We examined a total of six constructs: two for members’ cognition of leaders’ emotional displays, two for members’ emotional reactions, one for members’ creativity, and the last for members’ job performance. Specifically, we conducted three sequential experiments to compare the subject teams’ temporal diversity (all sets → set A → set B). With respect to the factor loadings, no item had a value lower than 0.5. In addition, the Cronbach’s α and composite reliability values of all indicators were greater than 0.8, exceeding the recommended value of 0.7 (Nunnally, 1967). Thus, the measurement of item loading overall demonstrated adequate reliability.

== Insert Table 2 here ==

A confirmatory factor analysis was performed to confirm the measurement data’s reliability and validity. In the reliability test, the smallest of the composite reliabilities was 0.89 in the temporary teams’ set, and the Average Variance Extracted (AVEs) values were greater than 0.8 in all datasets, higher than the 0.5 recommended (Bagozzi & Yi, 1988). Then, we assessed discriminant validity by comparing the correlation between two factors and the square root of each factor’s AVE. Table 3 shows that, in all experiments, the square root of each construct’s AVE was greater than the correlation involving that construct. All the correlations were lower than the cutoff value of 0.8 (Bryman & Cramer, 1994) in all datasets, indicating the absence of multicollinearity.

In addition, as the data for all of the variables were self-reported, common method bias could be present. Thus, we applied a post-hoc remedy to address this bias. According to Harman’s one factor test, if there is common method bias, a single factor will explain more than 50% of the variance in a principle component analysis with no rotation. However, our test revealed that only one factor explained 29.9% of the variance in the analysis, which indicated that common method bias did not influence our results substantially (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Thus, all datasets in our experiments could be considered reliable and valid.

== Insert Table 3 here ==

***5.2. Hypotheses tests***

To verify the SEM of our hypotheses, the coefficients’ size (*β*), sign, statistical significance, and R2 should be examined. Each experiment’s results are shown in Figure 2 (a), (b), and (c). To investigate the paths’ significance, bootstrap resampling was conducted with the 1,000 iteration criteria (Hair, Anderson, Tatham, & Black, 1998). In the analysis of the set for all teams, the R2 of members’ positive emotional reactions was 0.43 and that of members’ negative emotional reactions was 0.48, while the R2 of members’ creativity was 0.08 and that of members’ job performance was 0.20. In the structural model, the R2 of members’ negative emotional reactions was the highest and the value of members’ creativity was the lowest. Although the R2 values of each construct differed depending on the teams’ temporal type, the values’ order was consistent regardless of type.

== Insert Figure 2 here ==

Most of the coefficients’ signs and significances in the SEM models in our tests were consistent with prior research. However, there was an inconsistent result between temporary teams and permanent teams: the paths from members’ negative emotional reactions to their creativity in the set for all teams (H7) and that for temporary teams (H7a) were significantly positive (e.g., *β*= 0.142, *p* < 0.05 in the set for all teams, *β*= 0.290, *p* < 0.01 in the temporary teams’ set), but were not significant in the permanent teams’ set (H7b). In the temporary teams, those engaged in consultation or SI ICT service for shorter periods, members were more creative regardless of whether they reacted positively or negatively.

Furthermore, we analyzed temporal diversity’s moderating effect, and compared the coefficients between temporary and permanent teams statistically to the coefficients that were significant in the SEM of all teams’ data. This test has special implications in our study, as it reveals the mechanism by which negative emotions affect teams depending upon duration type. The formula below was applied to compare the significant difference between path coefficients (Keil, Tan, Wei, Saarinen, Tuunainen, & Wassenaar, 2000; Teo, Chan, Wei, & Zhang, 2003).

$$t=\frac{Path\_{sample1}- Path\_{sample2}}{\sqrt{\frac{1}{m}+\frac{1}{n}}\*\sqrt{\frac{(m-1)}{(m+n-2)}\*SE\_{sample1}^{2}+\frac{(n-1)}{(m+n-2)}\*SE\_{sample2}^{2}}}$$

Path sample : ith path coefficients in each group

*m*, *n*: sample size

*SEi*: standard error at ith

*t*: t value at *m*+*n*-2 freedom of degree

== Insert Table 4 here ==

As specified in Table 4, all coefficients differed significantly from each other (*p* < 0.01). Specifically, leaders’ positive emotional displays had a stronger influence on members’ positive reactions in temporary teams (*β* = 0.59) than in permanent teams (*β* = 0.46); however, leaders’ positive emotional displays had a weaker effect on members’ negative reactions (*β* = -0.15) in temporary teams than that in permanent teams (*β* = -0.19). Similarly, leaders’ negative emotional displays in temporary teams had a weaker influence on members’ positive reactions in temporary teams (*β* = - 0.18) than that in permanent teams (*β* = -0.29); however, its influence on members’ negative reactions was stronger in temporary teams (*β* = 0.65 vs. *β* = 0.56). In addition, members’ positive reactions had a stronger influence on their creativity in temporary teams (*β* = 0.35) than in permanent teams (*β* = 0.28), although the negative influence of members’ negative emotional reactions on their performance was weaker in temporary teams (*β* = - 0.19) than in permanent teams (*β* = - 0.35). Finally, the influence of members’ creativity on their performance was stronger in temporary teams (*β* = 0.29) than in permanent teams (*β* = 0.23).

# 6. Discussion and Implications

***6.1. Findings and theoretical implications***

In this study, we discussed leaders’ emotional displays, members’ emotional reactions to those displays, and their reactions’ influence on members’ creativity and job performance. We investigated their structures with teams of two different durations, developed a research model, and tested it with 256 questionnaires collected from employees of three major Korean ICT service companies. Our statistical analysis provided significant support for all of our hypotheses. In determining the mechanism by which leaders’ emotional displays influence members’ emotions and subsequently, their creativity and performance in two types of teams, temporary and permanent, we shed light on successful emotional display practices in work environments.

Our findings contribute to the existing literature about emotion and organizational creativity. First, we found that members working on relatively short-term teams react more sensitively with the same polarity of emotion as their leaders and less sensitively with the opposite polarity of emotion. The empirical results of our hypotheses tests showed that leaders’ positive emotional displays affect members’ corresponding emotional reactions positively regardless of teams’ temporal duration (H1, H1a, H1b), but affect members’ negative emotional reactions negatively (H2, H2a, H2b). Leaders’ negative emotions affect members’ positive emotional reactions negatively (H3, H3a, H3b), and their negative emotional reactions positively (H4, H4a, H4b) regardless of teams’ temporal diversity. These results are not surprising and are consistent with previous studies (Glaso, Ekerholt, Barman, & Einarsen, 2006; Humphrey, Pollack, & Hawver, 2008) that argued that leaders’ emotional labor controls emotional contagion and influences members’ emotions. The emotional contagion theory also supports the effect in which members mimic leaders’ emotional and facial expressions (Hatfield, Cacioppo, & Rapson, 1994). Nonetheless, we focused on the fact that the strength of emotional contagion functioned differently with respect to teams’ temporal diversity, as shown in Table 4. Considering that relationships between leaders and members, which are affected by advice, trust, and friendship, need time to develop (Quintane, Pattison, Robins, & Mol, 2013), temporary team members are more likely to be sensitive to leaders’ emotions of the same polarity. Thus, their leaders’ positive emotional displays are unlikely to influence members’ negative emotions, and the converse—leaders’ negative emotional displays are unlikely to influence members’ positive emotions (Hatfield, Cacioppo, & Rapson, 1994). Second, we found that, while a positive emotional reaction does not affect members’ job performance significantly (H6, H6a, H6b), a negative emotional reaction affects performance negatively (H8, H8a, H8b). Van Kleef et al. (2009) and Ilies and Judge (2005) argued that leaders’ positive emotions influence members’ emotions positively, which, in turn, leads members to demonstrate a high level of performance. However, the ultimate effect of members’ emotions on performance has been shown to be relatively weak, particularly in the case of negative emotions. According to the social-functional approach to emotion, emotions may affect receivers’ social behavior (Keltner & Haidt, 2007) Similarly, leaders’ emotions can control members’ behavior in the leaders’ intended direction; however, our study found that, although leaders’ emotions can control members’ emotional reactions, only negative emotional reactions affected members’ performance, while positive emotional reactions did not. Moreover, the negative effect was stronger for permanent than temporary teams. Third, we found that only temporary team members’ negative emotions affected their creativity positively (H7a) although their positive emotional reactions affected their creativity positively regardless of teams’ duration (H5, H5a, H5b),). In a positive emotional state, individuals felt more playful and safer, which in turn caused them to become more creative and broaden their thought-action repertoires, a fact that the “broaden-and-build” theory supports (Fredrickson, 2004). However, negative emotion has shown inconsistent effects in the prior literature on individual creativity. George and Zhou (George & Zhou, 2007) supported our findings by insisting that negative moods signal a problematic state of affairs and encourage people to attempt to solve those problems. Further, Kaufman and Vosburg (Kaufmann & Vosburg, 2002) argued that being in a negative mood leads to better creative problem solving than being in a positive or neutral mood. Their argument supports our hypothesis that negative emotion enhances knowledge creation, which, in turn, motivates performance outcomes, particularly in project teams (Stephens & Carmeli, 2016). The rationale for these ideas is that members’ negative emotions evoked by a leader’s negative emotional displays motivate them to complete their projects. Thus, negative emotions enhance members’ creativity, as a positive mood inspires them to generate more ideas in a temporary team environment that includes a greater variety of jobs compared to the rather routine jobs in the permanent team environment (Vosburg, 1998a,b).

***6.2. Practical implications***

This study conducted a comparative analysis between teams of two principal durations. Both types of teams are prevalent among those providing services in the ICT industry. Temporary teams are involved largely in providing such services as consultation and ICT SI for a limited duration, while permanent teams generally are involved in providing services such as ICT SM for an unlimited duration. As the results in Table 4 show, temporary team members were more susceptible to leaders’ emotional displays regardless of emotional polarity. However, their emotional reactions were less sensitive to leaders’ opposite emotional displays compared to those on permanent teams. We presume the reason for this is because members in teams of longer duration are likely to know more about their leaders, so they are more cognitively than emotionally contagious compared to temporary team members. They also understand that leaders have opposite emotions and can refrain from showing their own opposite emotions. Therefore, leaders of permanent teams should be careful not to display negative emotions to prevent members’ negative emotions from increasing, which decreases their creativity and performance ultimately. Second, the coefficient of the path from members’ positive reactions to their creativity was higher in temporary than in permanent teams. Thus, leaders’ who demonstrate positive emotions elicit members’ positive reactions, and, in turn, their creativity in temporary teams. In addition, the members’ reactions to leaders’ displays of an opposite emotion showed that temporary team members decreased their opposite emotion less sensitively than permanent team members did. In addition, the studies of Vosburg (1998a, 1998b) suggested that when temporary teams are engaged in a more divergent idea-seeking process, positive emotion is more effective. Again, with temporary teams’ tasks that are novel, original, and innovative, creativity’s influence on performance is stronger than that of permanent teams.

***6.3. Limitations***

Our research has some limitations related to the data, methodology, and theory that provide areas for future research. First, our study surveyed 256 employees from two types of teams, temporary and permanent, as Chae et. al (2015) did in their research. The sample size was relatively small, given that it was divided into 131 temporary team members and 125 permanent team members for comparison. With larger samples, more reliable statistics might have been conducted and sophisticated test results obtained. Second, we surveyed employees in three major companies with the same service domains: ICT consultation, system integration, and system maintenance. Thus, our members surveyed performed very similar types of work. However, temporary and permanent teams differ not only in their duration, but also in the precise nature of their jobs, in that temporary teams engage in consulting and SI services, while permanent teams engage in SM. Although the services are broadly homogeneous, in that all are B2B-oriented ICT services, the subtle traits of the work in which temporary teams engage are more innovative compared to the rather incremental improvements of permanent teams. Therefore, it is unclear whether these work traits affected our different results between the two duration types, and future research is needed to explore this question further. Third, although most literature on emotional contagion theory argues the mimicry process, in which individuals display the same type of emotion synchronously, our study argues that the process is elicited not only to synchronize the same type of emotion, but also to desynchronize the opposite emotion. Future study may be needed to confirm whether this desynchronization process is valid.

# 7. Conclusions

In this study, we examined the influence of leader’s emotional displays, members’ emotional reactions, and their influences on creativity and performance in ICT service organizations. Our questions were the way leaders’ emotions are contagious to members, and the way their emotions affect creativity and performance in teams of two main durations. Thus, we surveyed two distinctly classifiable teams, temporary consultation and SI service teams and permanent SM teams. We concluded that: (1) leaders’ positive emotional displays are related positively to the same emotional reactions on the part of team members, but negatively to the opposite type of emotional reaction in both types of teams; (2) members’ positive emotional displays affect their creativity positively but do not affect their job performance directly in either type of team; (3) members’ negative emotional reactions affect members’ creativity positively in temporary teams, but do not affect it significantly in permanent teams; (4) in both types of teams, members’ negative emotional reactions affect members’ job performance negatively, and (5) temporary team members’ creativity affects their job performance significantly. From these results, we argue that, in temporary teams, members are more susceptible to “catching” the leader’s emotional state through emotional contagion. Conversely, in permanent teams, members are more likely to conceal their emotions if they are opposite to the leader’s. We shed light on the distinct traits of temporary teams, in that both positive and negative members’ emotions can affect creativity positively. Thus, leaders of temporary teams have more flexibility in the way they choose to display their emotions to members. However, leaders of permanent teams should be more careful not to express their negative emotions because it reduces members’ positive emotions strongly, and affects their job performance more negatively than that of temporary team members.

In summary, this study contributes to a better understanding of the influence of leaders’ emotions and members’ emotional reactions on creativity and job performance through an empirical investigation of employees working in Korean ICT companies. Considering that few studies have been conducted in this industry domain, our research has practical implications for current and future leaders of ICT companies, in that it suggests the way they might control their emotional behavior according to their team’s duration type. Through this study, we hope to fill some of the gaps in emotion and creativity research, particularly with respect to the inconsistent effects of negative emotion. Future study might consider task types in the theoretical model and examine empirically the way emotional contagion between leaders and members affects members’ creativity and performance.

**Appendix A. The Survey Instrument**

|  |  |  |  |
| --- | --- | --- | --- |
| *Construct* | *No.* | *Items* | *references* |
| *Leaders’ emotional display* |  | *Please indicate how often your direct leader expresses the following emotions when interacting with you. Mark the circle with an X that corresponds to the frequency that is most appropriate. (1=rarely, 2, occasionally, 3=sometimes, 4, fairly often, 5=very often)* |  |
| *1**2**3**4**5**6**7**8**9**10* | *Happiness* *Enthusiasm* *Optimism* *Excitement* *Interest* *Frustration**Disappointment* *Anger* *Anxiety* *Irritation* | *(Bono, Foldes, Vinson, & Muros, 2007)*  |
| *Members’ positive emotional reaction* |  | *Please indicate to what extent you agree or disagree with the statements below.* |  |
| *1**2**3**4* | *My leader makes me enthusiastic.**My leader makes me feel good.* *My leader makes me feel energetic.**My leader makes me feel optimistic.* | *(Bono, Foldes, Vinson, & Muros, 2007;* *Van Kleef, Homan, Beersma, Van Knippenberg, Van Knippenberg, & Damen, 2009)* |
| *negative emotional reaction* | *1**2**3**4* | *My leader makes me feel disappointed* *My leader makes me feel angry.* *My leader makes me feel bad.**My leader makes me feel frustrated.* |  |
| *Members’ job performance* |  | *Please indicate to what extent you agree or disagree with the statements below.* |  |
| *1**2**3**4**5* | *I consistently meet the formal performance requirements of the job.**I conscientiously perform tasks that are expected of me.**I adequately complete all of my assigned duties.* *I perform essential duties of the job.**I pay attention to aspects of the job that I am obligated to perform.* | *(O'Reilly & Chatman, 1986;* *Turnley, Bolino, Lester, & Bloodgood,2003)* |
| *Members’ Creativity* |  | *Please indicate to what extent you agree or disagree with the statements below.* |  |
| *1**2**3**4**5**6**7**8* | *I suggest new ways to achieve goals or objectives.**I come up with new and practical ideas to improve performance.**I search out new technologies, processes, techniques, and/or product ideas.**I am a good source of creative ideas.**I often have new and innovative ideas.**I come up with creative solutions to problems.**I often have a fresh approach to problems.**I suggest new ways of performing work tasks.* | *(Zhou & George, 2001)* |

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 *Set A*

 *Set B*

*unified sets*

*\* Note: Three sets are classified for conducting separate tests. Set A consists of subjects in temporary teams, set B consists of subjects in permanent team, and all subjects are in the unified set*

Figure 1. Conceptual Model for Study

 

1. Unified sets

 

1. Set A

 

(c) Set B

 Figure 2. Results of PLS

**Table 1.** **Description of Participants**

|  |  |  |  |
| --- | --- | --- | --- |
| *Respondents’ characteristics*  | *unified sets**(N = 256)* | *Set A* *(N = 131)* | *Set B**(N = 125)* |
| *Num* | *%* | *Num* | *%* | *Num* | *%* |
| *Sex* | *Male* | *168* | *66%* | *87* | *66%* | *81* | *65%* |
| *Female* | *88* | *34%* | *44* | *34%* | *44* | *35%* |
| *Age* | *20-30* | *46* | *18%* | *23* | *18%* | *23* | *18%* |
| *30-40* | *158* | *62%* | *86* | *66%* | *72* | *58%* |
| *40-50* | *52* | *20%* | *22* | *17%* | *30* | *24%* |
| *Education* | *High school* | *2* | *1%* | *1* | *1%* | *1* | *1%* |
| *College* | *7* | *3%* | *6* | *5%* | *1* | *1%* |
| *Bachelor’s* | *219* | *86%* | *102* | *78%* | *117* | *94%* |
| *Master’s & PhD* | *28* | *11%* | *22* | *17%* | *6* | *5%* |

**Table 2.**  **Results of Reliability and Factor Analyses**

1. Unified sets

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Construct* | *Indicator* | *Item loading* | *T-statistic* | *Cronbach’s alpha* | *Composite Reliability* | *AVE* |
| *leaders’ positive emotion* | *LPE1**LPE2**LPE3**LPE4* | *0.784* *0.864* *0.888* *0.746* | *19.447* *34.116* *66.136* *20.319* | *0.840* | *0.893* | *0.676* |
| *leaders’ negative emotion* | *LNE1**LNE2**LNE3**LNE4**LNE5* | *0.756* *0.894* *0.886**0.736* *0.893* | *16.809* *52.162* *56.359* *20.690* *58.910* | *0.891* | *0.920* | *0.699* |
| *members’ positive emotional reactions* | *MPR1**MPR2**MPR3**MPR4* | *0.880* *0.950**0.934* *0.938*  | *42.011**143.48**86.583**87.233* | *0.944* | *0.960* | *0.857* |
| *members’ negative emotional reactions* | *MNR1**MNR2**MNR3**MNR4* | *0.870**0.925* *0.933**0.901* | *29.867* *68.006* *86.581* *53.732* | *0.929* | *0.949* | *0.824* |
| *members’ job performance* | *MJP1**MJP2**MJP3**MJP4**MJP5* | *0.796**0.811**0.863**0.841* *0.817* | *19.352* *24.636* *40.611* *25.288* *22.972* | *0.884* | *0.915* | *0.682* |
| *members’ creativity* | *ICR1**ICR2**ICR3**ICR4**ICR5**ICR6**ICR7**ICR8* | *0.877**0.862**0.880* *0.909* *0.895* *0.902* *0.872**0.888* | *48.5526**37.587**48.3583**66.499* *59.548* *62.050* *49.831* *56.530* | *0.961* | *0.967* | *0.785* |

(b) set A

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Construct* | *Indicator* | *Item loading* | *T-statistic* | *Cronbach’s alpha* | *Composite Reliability* | *AVE* |
| *leaders’ positive emotion* | *LPE1**LPE2**LPE3**LPE4* | *0.776* *0.846* *0.875* *0.753* | *11.430* *20.295* *41.340* *14.608* | *0.830* | *0.887* | *0.663* |
| *leaders’ negative emotion* | *LNE1**LNE2**LNE3**LNE4**LNE5* | *0.687* *0.902* *0.909* *0.716* *0.880* | *9.016* *34.910* *40.844* *11.524* *30.938* | *0.879*  | *0.913*  | *0.679*  |
| *members’ positive emotional reactions* | *MPR1**MPR2**MPR3**MPR4* | *0.854* *0.944* *0.924* *0.933* | *22.577* *80.145* *52.202* *55.878*  | *0.934*  | *0.953*  | *0.836*  |
| *members’ negative emotional reactions* | *MNR1**MNR2**MNR3**MNR4* | *0.835* *0.908* *0.934* *0.919* | *14.994* *40.028* *64.607* *56.784* | *0.921*  | *0.944*  | *0.810*  |
| *members’ job performance* | *MJP1**MJP2**MJP3**MJP4**MJP5* | *0.803* *0.799* *0.888* *0.776* *0.756* | *11.521* *12.029* *40.942* *8.961* *9.479* | *0.866*  | *0.902*  | *0.649*  |
| *members’ creativity* | *ICR1**ICR2**ICR3**ICR4**ICR5**ICR6**ICR7**ICR8* | *0.881* *0.869* *0.890* *0.911* *0.903* *0.910* *0.855* *0.886* | *39.968* *25.520* *40.323* *48.516* *41.994* *50.788* *35.573* *41.521* | *0.962*  | *0.968*  | *0.789* |

(c) set B

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Construct* | *Indicator* | *Item loading* | *T-statistic* | *Cronbach’s alpha* | *Composite Reliability* | *AVE* |
| *leaders’ positive emotion* | *LPE1**LPE2**LPE3**LPE4* | *0.794* *0.874* *0.905* *0.741* | *19.022* *26.224* *52.154* *12.296*  | *0.851*  | *0.899*  | *0.691*  |
| *leaders’ negative emotion* | *LNE1**LNE2**LNE3**LNE4**LNE5* | *0.818* *0.883* *0.863* *0.755* *0.904* | *16.567* *39.092* *34.552* *17.432* *65.764* | *0.900*  | *0.926*  | *0.716*  |
| *members’ positive emotional reactions* | *MPR1**MPR2**MPR3**MPR4* | *0.893* *0.954* *0.939* *0.940* | *37.126* *112.186* *64.865* *64.999*  | *0.949* | *0.963*  | *0.868*  |
| *members’ negative emotional reactions* | *MNR1**MNR2**MNR3**MNR4* | *0.892* *0.934* *0.927* *0.880* | *30.227* *62.552* *55.778* *27.056* | *0.930*  | *0.950*  | *0.826*  |
| *members’ job performance* | *MJP1**MJP2**MJP3**MJP4**MJP5* | *0.736* *0.724* *0.790* *0.843* *0.746* | *14.322* *24.212* *23.990* *34.575* *25.969* | *0.904*  | *0.928*  | *0.719*  |
| *members’ creativity* | *ICR1**ICR2**ICR3**ICR4**ICR5**ICR6**ICR7**ICR8* | *0.876* *0.864* *0.872* *0.903* *0.881* *0.893* *0.895* *0.889* | *26.879* *21.923* *27.323* *36.663* *29.985* *27.240* *32.287* *31.744* | *0.960*  | *0.966*  | *0.781*  |

**Table 3.** **The AVEs and the Correlations between Constructs**

(a) unified sets

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | P-LE | N-LE | P-ERM | N-ERM | TPF | CRE |
| leaders’ positive emotion | ***0.822*** |  |  |  |  |  |
| leaders’ negative emotion | -0.400  | ***0.836*** |  |  |  |  |
| members’ positive emotional reactions | 0.618  | -0.446  | ***0.926*** |  |  |  |
| members’ negative emotional reactions | -0.414  | 0.678  | -0.623  | ***0.908*** |  |  |
| members’ job performance | 0.301  | -0.344  | 0.351  | -0.340  | ***0.826*** |  |
| members’ creativity | 0.278  | -0.034  | 0.265  | -0.078  | 0.303 | ***0.886*** |

*\* Note: Values on the italicized diagonal are the square roots of the AVEs*

(b) set A

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | P-LE | N-LE | P-ERM | N-ERM | TPF | CRE |
| leaders’ positive emotion | ***0.814*** |  |  |  |  |  |
| leaders’ negative emotion | -0.346 | ***0.824*** |  |  |  |  |
| members’ positive emotional reactions | 0.647 | -0.379 | ***0.914*** |  |  |  |
| members’ negative emotional reactions | -0.372 | 0.702 | -0.512 | ***0.900*** |  |  |
| members’ job performance | 0.361 | -0.348 | 0.307 | -0.239 | ***0.806*** |  |
| members’ creativity | 0.265 | 0.057 | 0.201 | 0.111 | 0.295 | ***0.888*** |

*\* Note: Values on the italicized diagonal are the square roots of the AVEs*

(c) set B

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | P-LE | N-LE | P-ERM | N-ERM | TPF | CRE |
| leaders’ positive emotion | ***0.831*** |  |  |  |  |  |
| leaders’ negative emotion | -0.446 | ***0.846*** |  |  |  |  |
| members’ positive emotional reactions | 0.593 | -0.497 | ***0.932*** |  |  |  |
| members’ negative emotional reactions | -0.442 | 0.649 | -0.690 | ***0.909*** |  |  |
| members’ job performance | 0.261 | -0.362 | 0.430 | -0.466 | ***0.848*** |  |
| members’ creativity | 0.293 | -0.134 | 0.329 | -0.267 | 0.356 | ***0.884*** |

*\* Note: Values on the italicized diagonal are the square roots of the AVEs*

**Table 4. Comparison of Path Coefficient**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Number of Hypothesis* | *Description* | *set A* | *set B* | *Test of Hypothesis* |
| H1 (positive emotional display → positive emotional reaction) | Path CoefficientStd. Errort-value | 0.5860.079 | 0.4640.102 | Accepted(temporary teams are stronger) |
| 10.618\*\*\* |
| H2 (positive emotional display → negative emotional reaction) | Path CoefficientStd. Errort-value | -0.1460.053 | -0.1910.093 | Accepted(permanent teams are stronger) |
| 4.733\*\*\* |
| H3 (negative emotional display → positive emotional reaction) | Path CoefficientStd. Errort-value | -0.1760.088 | -0.2900.081 | Accepted(permanent teams are stronger) |
| 10.667\*\*\* |
| H4 (negative emotional display → negative emotional reaction) | Path CoefficientStd. Errort-value | 0.6520.062 | 0.5630.067 | Accepted(temporary teams are stronger) |
| 10.929\*\*\* |
| H5 (positive emotional reaction → creativity) | Path CoefficientStd. Errort-value | 0.3500.125 | 0.2760.137 | Accepted(temporary teams are stronger) |
| 4.473\*\*\* |
| H8 (negative emotional reaction → performance) | Path CoefficientStd. Errort-value | -0.1940.102 | -0.3050.114 | Accepted(permanent teams are stronger) |
| 8.136\*\*\* |
| H9 (creativity → performance) | Path CoefficientStd. Errort-value | 0.2860.102 | 0.2270.100 | Accepted(temporary teams are stronger) |
| 4.625\*\*\* |

\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001