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## Article

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# A Multilevel Study of the Relationship between Leader Agreeable Communication Style and Team Creativity: Knowledge Sharing as Mediator and Knowledge Ownership as Moderator

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## ABSTRACT

**Purpose:** This study investigated the positive effects of a leader agreeable communication style on team creativity and team- and individual-level knowledge sharing. Also verified was the extent to which the level of effect of a leader agreeable communication style on team- and individual-level knowledge sharing varies depending on the team members' self-perception of knowledge ownership, applying a multilevel analysis to concurrently deal with team- and individual-level relations.

**Design/methodology/approach:** The 69 teams consisting of 350 employees were collected from Korean companies. We conducted a multi-level analysis to confirm the effect of the control variables on the relationship between the group level and the individual level, which affects team creativity. Analytical methods were performed by using HLM (Hierarchical Linear and Nonlinear Modeling) 7.01.

**Findings:** The analysis results confirmed the positive effect of a leader agreeable communication style on both team creativity and team- and individual-level knowledge sharing. Team knowledge sharing was found to completely mediate and individual-level knowledge sharing to partially mediate, between leader agreeable communication style and team creativity. Whereas the effect of a leader agreeable communication style on individual knowledge sharing was negatively intensified with the increase in team member's perception of individual knowledge ownership, it yielded insignificant results in terms of team knowledge sharing.

**Research limitations/implications:** This study expanded the understanding of source of team creativity by developing theoretical framework of the relationship between an agreeable leader's communication style and individual and team knowledge sharing and team creativity.

**Originality/value:** This study identified originally an agreeable leader's communication style as an important antecedent variable of knowledge sharing. In addition, by using a multilevel analysis model, this study first found that an agreeable leader's communication style had a significant effect on team creativity through the mediation of individual and team knowledge sharing.

*Keywords: Leader agreeable communication style, Knowledge sharing, Perceived team creativity, Psychological knowledge ownership*

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## I. Introduction

Creativity is a popular research topic which has been continuously studied, driven by the general perception of being the key source of corporate competitiveness, value creation and innovation (Baik & Kang, 2020). Kindled by the announcements and transformations with regard to the Fourth Industrial Revolution, the importance of creative activities has recently taken center stage. Previous studies presented various efficient methods of promoting individual and organizational creativity. As important factors for promoting creativity, autonomy (Amabile & Gitomer, 1984; Grawitch et al., 2003; Shalley, Gilson, & Blum, 2000; Unsworth & Clegg, 2010), leadership (Baer, Leenders, Oldham, & Vadera, 2010; Černe, Jaklič, & Škerlavaj, 2013), and organizational culture and diversity (Martins & Terblanche, 2003; Csikszentmihalyi, 2014) have been studied. Creativity is expressed in individual and team activities, and an increasing number of organizations have been building team-level working groups (Tjosvold, Tang, & West, 2004). New organizational forms such as team activities can maximize the flexibility and responsiveness in the dynamic corporate competitive environment (Byrne, 1993; Donnellon, 1996), and group effect is manifested more intensively than individual effect (De Vries, Van den Hooff, & de Ridder, 2006). These advantages of team activities have brought about a surge of creativity-related studies focusing on team-level creativity (Perry-Smith & Shalley, 2014; Han, Han, & Brass, 2014; Carmeli & Paulus, 2015; Lee, Choi, & Kim, 2018). Team-based working activities nurture creativity by assembling ingenious ideas into a new insight and promoting knowledge creation (Baer, Leenders, Oldham, & Vadera, 2010; DeRue & Rosso, 2009; Grawitch et al., 2003; Nijstad, Rietzschel, & Stroebe, 2006; Taggar, 2002; Woolley et al., 2010; Dong et al., 2017; Mo, Ling, & Xie, 2017). Conclusively, although creativity comes from individual members of an organization, it builds a simple cause-effect relationship in an organic network of team members. Team activities integrate all individual ideas into a new team-level idea resulting in creative team efficacy (Haas, 2010; Gardner, 2012).

Team leader's role is also important to boost team creativity (Eisenbeiss, van Knippenberg, & Boerner, 2008; Hu et al., 2018). For smooth and efficient team member interactions and unrestricted communication, it is crucial for a team leader to develop an appropriate communication style tuned to the given relationship, atmosphere, and task performance. Leader's communication skills are manifested when leadership is exhibited in interactions with team members. Given that team a leader agreeable communication style is listening to members' opinion and responding to them in a friendly manner based on understanding and consideration in interactions with team members (De Vries, Bakker-Pieper, & Oostenveld, 2010), it can be assumed that it has a positive effect on the team members' creativity.

Moreover, this process is expected to promote inter-member information and knowledge sharing by facilitating leader-member and member-member communications better during team operations. Knowledge sharing has been gaining traction for its importance in boosting corporate and future competitive advantage by increasing the innovative competency of an organization (Subramaniam & Youndt, 2005; Wang & Wang, 2012). Knowledge sharing has a positive effect not only on product innovation and financial achievements (Wang & Wang, 2012), but also on individuals and organizations by enhancing inter-member decision-making, problem-solving, and creativity (Kogut & Zander, 1992; Salisbury, 2001; Wang & Noe, 2010). A large number of studies have therefore been devoted to the issue of knowledge sharing using various approaches and tools.

Previous studies have presented factors promoting knowledge sharing: organizational culture or motivation, working conditions, communication environment (Suppiah & Singh Sandhu, 2011; Mueller, 2012; Inkpen & Tsang, 2005; De Vries, Van den Hooff & de Ridder, 2006). There are also a series of previous studies examining many different effects of knowledge sharing on innovation (Moon, 2017; Tsai & Ghoshal, 1998; Ahuja, 2000; Subramaniam & Venkatraman, 2001). Although these studies have identified the positive relationship between knowledge sharing and innovation, there is a need to expand the research with factors efficiently fostered or

inhibited by knowledge sharing. For example, knowledge sharing presupposes the willingness of organizational members to participate at individual and team levels (O'Dell & Grayson, 1998; Osterloh & Frey, 2000). A team requires dynamic interactions among its members to execute team tasks. A team leader presents a guide for specific information on team project or a task assigned to the team, and discusses concrete strategies for accomplishment of the project of task (Harrison & Rouse, 2014). This process involves knowledge sharing between the leader and members, and leader's communication style is likely to exert a positive effect on knowledge sharing. If the team leader's communication style is supportive and agreeable, it will increase the possibility of coordinating various task-related opinions among team members.

On the other hand, despite much research on the positive effect of knowledge sharing, research on the factors that hinder with knowledge sharing has not attracted much attention. Research on the factors that have a negative effect on knowledge sharing will help gain a broad understanding of knowledge sharing and find new clues to facilitating knowledge sharing. Therefore, this study analyzes the negative relationship between psychological knowledge ownership and knowledge sharing. Psychological knowledge ownership arises from a strong attachment to one's own knowledge (Van Dyne & Pierce, 2004) and is thus likely to take passive or defensive position towards knowledge sharing in pursuit of personal possession rather than sharing. Such restrictive notion can act as an obstacle to knowledge sharing (Holste & Fields, 2010). This allows the assumption that team leader's communication style and individual member's psychological knowledge ownership will have a important effect on knowledge sharing.

Drawing on the above discussion, the objectives of this study can be summarized as follows. First, the outcome variable of this study is team creativity, which has been neglected compared with individual creativity in numerous creativity-related studies. Although many studies on creativity deal with leadership as an antecedent variable, there is a lack of research on communication styles that are common in leadership programs. Therefore,

this study aims to identify the effect of a leader agreeable communication style on team creativity.

Second, it is aimed to examine the mediating effect of knowledge sharing from both individual and team levels in the relationship between agreeable leader communication style and team creativity. Most previous studies on knowledge sharing have used single-level analysis (Park & Lee, 2014; Bock, Zmud, Kim & Lee, 2005). In this study, however, multilevel approach will be adopted to differentiate between individual knowledge sharing and team knowledge sharing to better understand the effect of the leader's communication style on knowledge sharing and team efficiency.

Third, it is aimed to examine the moderating role of the interaction effect of a leader agreeable communication style and team psychological knowledge ownership in individual and team knowledge sharing. Although a leader agreeable communication style has a positive effect on individual and team knowledge sharing, interpersonal knowledge sharing will be adversely affected in the face of strong psychological knowledge ownership of individual team members, as well as team knowledge sharing. Therefore, if many individual team members have a high level of knowledge ownership, that of the team knowledge ownership increases, which will likely weaken the effect of leader's communication style on team creativity into the negative range. Accordingly, the understanding of the effects of knowledge sharing will be expanded through these contextual factors.

## II. Theory and Hypotheses

### A. Leader Agreeable Communication Style and Knowledge Sharing

A leader agreeable communication style is manifested in the leader's attitude and behaviors in the communication process with team members, whereby the team leaders communicates with team members with consideration, empathy, and kindness based on affection and trust (De Vries, 2005; De Vries, Van den Hooff, & de Ridder, 2006; De Vries, Bakker-Pieper, & Oostenveld, 2010).

More specifically, a leader agreeable communication style collects the opinions of team members, neither putting forward his/her own views or arguments nor condemning or reproving mistakes. Furthermore, with a sincere heart and kind attitude, he/she understands the situation of the team members and deals with it as if it were his/her own situation. Therefore, a leader agreeable communication style will promote free communication by improving the team atmosphere and providing psychological stability.

The hierarchical and vertical conventional organizational structure has been shifting to horizontal working group structures (Donnellon, 1996). The horizontal organizational structure requires rich inter-member communications (Nohria, 1991), and a team leader's support communication style is important because such a team subsists through interactions between the team leader and members via close communication. Newcombe and Ashkanasy (2002) demonstrated that nonverbal expressions and signs such as gestures have a positive effect on the communication partner. Besides, leader's communication style showing a supportive leadership positively affects team members in sharing knowledge (De Vries, Bakker-Pieper, & Oostenveld, 2010). Accordingly, an agreeable leader's communication style is expected to have a positive effect on knowledge sharing by listening to and empathizing with the team members' opinions.

Knowledge sharing is defined as the process by which individuals exchange knowledge and create new knowledge (Sihombing, Supartha, Subudi, & Dewi, 2017; Van den Hooff & De Ridder, 2004). Knowledge sharing involves a complex network of knowledge collecting and donating actions, which requires considerable communication. Therefore, a leader agreeable communication style will have a positive effect on knowledge sharing because it promotes communications significant for knowledge sharing. The relationship between team leader and members immediately gives rise to value congruence (Erdogan, Kraimer & Liden, 2004). Therefore, a leader agreeable communication style can bring about a shift in the communication style among the team members. As a result, knowledge sharing among team members

will be actively promoted, which will have a positive effect on team knowledge sharing. Thus, we hypothesizes,

**Hypothesis 1a:** A leader agreeable communication style will have a positive effect on individual knowledge sharing.

**Hypothesis 1b:** A leader agreeable communication style will have a positive effect on team knowledge sharing.

## B. Mediating Effect of Knowledge Sharing

Creativity is becoming increasingly important for survival in today's competitive environment (Baer et al., 2010). Creativity is regarded as a source of innovation that strengthens corporate competitive advantage and can be defined as a creation of new and useful ideas (Amabile, 1988; Scott & Bruce, 1994). Team creativity improves because collaboration among members is constantly required (Baer et al., 2010). Moreover, cooperative job activities are carried out within the team because job activities are in line with the common objectives or the structural characteristics of the team. Therefore, a leader agreeable communication style will positively affect team members and the team as a whole, which will have a positive effect on individual and team knowledge sharing.

Cooperative and supportive leadership style and sufficient resources in job activities were also found to be associated with individual creativity (Amabile et al., 1996; Glynn, 1996; Tierney, Farmer, & Graen, 1999). The positive effect of a leader agreeable communication style on creativity is considered ascribable to its psychological support such as consideration and empathy. Furthermore, some researchers proposed work environment factors (e.g., social activities) as important antecedent variables for creativity (Amabile, 1988; Woodman, Sawyer, & Griffin, 1993). Team activities have organizational characteristics and environment in which social activities are intensely manifested based on dynamic communication among the team members. Therefore, a leader agreeable communication style and team knowledge sharing can be regarded as social activities supporting individual- and team-level interactions,

which is positively associated with team creativity.

Team activities require active communication among team members (Harrison & Rouse, 2014). This active communication within the team has a positive effect on individual and team creativity by increasing the ability to improve team effectiveness based on sharing various ideas for achieving common goals and solving problems within the team (Campbell, 1960; Mumford & Gustafson, 1988; Simonton, 1999). Knowledge sharing at individual and team levels leads to an increase in the level of individual and team knowledge, which is expected to actively promote team creativity. Andrews and Smith (1996) demonstrated that product managers with more knowledge of the marketing environment created more creative marketing programs. A smooth communication environment among members to achieve common goals in team activities help better understand and improve relevant knowledge by promoting communication, and offers easy access to ways and means to find appropriate and practicable methods. Therefore, not only does a leader agreeable communication style have a positive effect on team creativity by activating individual and team communication, but it also promotes knowledge sharing at individual and team levels. Thus, a leader agreeable communication style is expected to have a positive effect on team creativity via knowledge sharing at individual level.

Team activities require coordination and conflict management because various ideas must be coordinated (Gladstein, 1984; Jehn, 1995). Leader's role is essential in this context, and a leader agreeable communication style is an effective method for coordination and conflict management, which is favorable for inter-member knowledge sharing environment. This allows the assumption that individual and team knowledge sharing has a positive effect on individuals and organizations by enhancing decision-making and problem-solving abilities and creativity (Kogut & Zander, 1992; Salisbury, 2001; Wang & Noe, 2010). Consequently, supposing that individual and team knowledge sharing will play a mediator role in the relationship between the leader agreeable communication style and team creativity, the following hypothesis is proposed:

**Hypothesis 2a:** Individual knowledge sharing will mediate the relationship between a leader agreeable communication style and team creativity.

**Hypothesis 2b:** Team knowledge sharing will mediate the relationship between a leader agreeable communication style and team creativity.

### C. Moderating Effect of Psychological Knowledge Ownership

Psychological ownership can be divided into organizational and occupational ownership; the latter can be manifested as psychological ownership that regards the knowledge created by "me" as "mine" (Pierce, Rubenfeld, & Morgan, 1991; Jarvenpaa & Staples 2001; Van Dyne & Pierce, 2004). In this study, psychological knowledge ownership was defined as a strong attachment to the knowledge created by one, claiming a sole ownership on it. This psychological knowledge ownership arises from an individual perspective rather than an organizational or collective perspective. It can be manifested as evasive or passive attitude and behavior to avoid sharing the personal knowledge with colleagues or organization, thus exerting a negative effect on knowledge sharing in personal relations with colleagues or team activities. In particular, the knowledge gained from personal activities rather than through one's share of contribution in team activities is likely to be regarded as one's own, not pertaining to the organization (Van Dyne & Pierce, 2004).

Any significant information obtained while executing job activities should be shared with other employees because it is considered to be pertaining to the organization (Constant, Kiesler, & Sproull, 1994). However, high psychological knowledge ownership among team members raises the team-level psychological knowledge ownership, thus impairing the 1:1 relation or the team's knowledge sharing climate required for team's efficient operations. If the team has a strong sense of knowledge ownership, knowledge sharing between team members in conflict within the team makes it difficult to communicate closely between the leader and team members. Therefore, the positive effect of leader-friendly commu-

nication weakens. In similar context, Constant, Kiesler, & Sproull(1994) reported reciprocate negative behavior by refusing to provide information for colleagues who failed to provide help on earlier occasions. Therefore, the psychological knowledge ownership within a team will likely create a negative atmosphere in knowledge sharing within the team, especially communication between leader and team members. Thus, the team-level psychological knowledge ownership will likely weaken the positive effect of an agreeable leader's communication style on individual and team knowledge sharing. Drawing on the above discussion, the following hypothesis is proposed:

**Hypothesis 3a:** Team-level psychological knowledge ownership will negatively moderate the relationship between an agreeable leader's communication style and individual-level psychological knowledge sharing.

**Hypothesis 3b:** Team-level psychological knowledge ownership will negatively moderate the relationship between an agreeable leader's communication style and team-level psychological knowledge sharing.

Figure 1 is the hypothesis model proposed in this study.

### III. Method

#### A. Sample and Procedure

The main target of this research was the members of teams in 19 small and medium-sized enterprises. In order to ensure anonymity and the avoidance of ethical issue in the process of survey, we firstly contacted the managers to explain the purpose of the survey clearly. Secondly, when we obtained their permission, we requested to ensure anonymity. Participants were informed the benefits and disadvantages that may arise from participating clearly, and we took an informed consent statement from all participants. Finally, we guided them to have the freedom to withdraw from the survey at any time to avoid ethical issues. We pursued generalization by collecting samples from various industries. Distribution and collection of questionnaire was conducted by both off-line and on-line methods.

Specifically, this study is a multi-level analysis in which individual and team levels are considered, so team characteristics should be considered. Accordingly, an investigation was conducted to select a corporate team where collaboration within the team is important. In this process, the structure and characteristics of the team were reviewed with the team leader to confirm whether active communication and creativity were

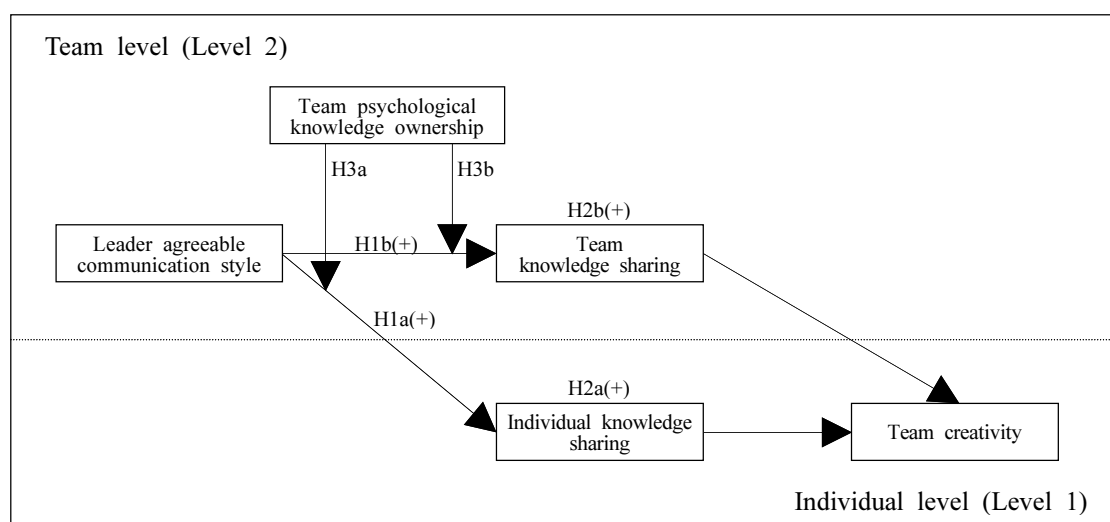


Figure 1. Research Model

required within the team. Since then, 19 companies have been selected based on the human network. 2 companies from information and communication industries, 5 from financial industry, 7 from service industries, and 5 from manufacturing industries. Among the 19 selected companies, companies that can conduct door-to-door surveys were scheduled in advance with the team leader, distributed and collected individually, and classified and sealed by team. Companies that were unable to visit or conduct face-to-face surveys due to the specificity of the company's circumstances conducted a survey on-line through the team leader. Each leader's contact information was secured in advance, and online links were provided through SNS and email to be delivered

to team members. On-line surveys have the advantage of enhancing the accuracy by being free from the attention of the boss, eliminating the possible missing questions as well as reducing time. In the off-line method, 390 copies of the questionnaire were distributed, and 324 (83.0%) of the 63 teams were received. The questionnaire collected on-line was 97 (80.8%) from 21 teams. Since there were many cases using data from less than 20 organizations in previous studies (Lee et al., 2017; Morganson, Major, & Litano, 2017; Shin et al., 2012), this study also used data 324 employees of 71 teams from 19 companies for final analysis. The number of members in final 71 teams was from 3 to 9. The average number of members in a team was

**Table 1.** Demographic Characteristics

	Classification	Frequency	Percent	Valid Percent
Gender	Male	196	60.5	60.5
	Female	128	39.5	100.0
Age	Younger than 30	49	15.1	15.1
	30~39	112	34.6	49.7
	40~49	95	29.3	79.0
	50~59	64	19.8	98.8
	Older than 60	4	1.2	100.0
Education	High school	51	15.7	15.7
	college	90	27.8	43.5
	University	150	46.3	89.8
	Master	31	9.6	99.4
	Doctor	2	0.6	100.0
Working period	1~5 years	167	51.5	51.5
	6~10	53	16.4	67.9
	11~15	36	11.1	79.0
	Over than 15 years	68	21.0	100.0
Position	Staff	140	43.2	43.2
	Administrative manager	52	16.0	59.2
	Chief	60	18.5	77.7
	Team leader	72	22.2	100.0
Departments	Administrative position	170	52.5	52.5
	Sales(marketing/service)	53	16.4	68.9
	Production	45	13.9	82.8
	R&D	36	11.1	93.9
	Others	20	6.2	100.0

N=324



4.56(SD=1.60).

The demographic characteristics are as follows (see Table 1). Gender distribution was 60.5% and 39.5% for men and women, respectively. Regarding age, the 30s were the largest group with 34.6%, followed by 29.3% in their 40s, 19.8% in their 50s, and 1.2% in their 60s or older. Regarding education, the university graduates was the highest with 46.3%, followed by 27.8% of college graduates, 15.7% of high school graduates or lower, 9.6% of masters and 0.6% of Ph.D. Average working period in current team was 6.96 years (SD=7.62) ranging from 0.5 year to 32 years. Regarding rank, the staff was the highest with 43.2%, administrative manager was 16.0%, section chief was 18.5%, and team leader or higher was 22.2%. By task, administrative position was the highest with 52.5% followed by sales (marketing/service) with 16.4%, production with 13.9%, R&D with 11.1%, and others with 6.2%.

The data used in this study were collected by off-line and on-line survey. Therefore, a T-test was conducted to test the average difference between the two groups. The test results were found to be  $t=0.524$  and  $p=0.601$ , indicating that there was no difference between the two groups. Therefore, this study integrated data collected through two methods and used it for analysis.

## B. Measures

All variables, unless otherwise reported, were measured using 5-point Likert-type scales (strongly disagree to strongly agree). The sources of the questionnaires were used in previous studies and some revised and translated to fit the nature of the study. Brislin (1980) Translation - following to the reverse translation procedure, two languages, English and Korean, performed bidirectional translations to ensure semantic similarity. Questionnaires were written in Korean.

### 1. Agreeable leader's communication styles (ALCS)

The ALCS measured how much ALCS was used by team members and leaders during work activities.

The measurement method was based on the adjective vocabulary of the seven dimensions (De Vries, 2005; De Vries, Van den Hooff, & de Ridder, 2006; De Vries, Bakker-Pieper, & Oostenveld, 2010) used to measure the leader's communication style. There are 12 adjective vocabularies used, positive (patient, kind, sympathetic, friendly, energetic, extraverted) and negative (hot-headed, rock-hard, vicious, obstinate, stubborn, reproachful). The team leader led him to evaluate himself, and the team members were asked to evaluate the leader's ALCS. Sample items are "My leader is friendly when talking to team members.", "My leader is usually stubborn in conversation." Leaders and team members responses were averaged out to calculate the mean score for a group-level construct of ALCS. Cronbach's alpha was 0.86 in this study.

### 2. Team's psychological knowledge ownership (TPKO)

Team's psychological knowledge ownership measured the sense of ownership I felt about the knowledge I produced or participated.) The questionnaire used questions that the Van Dyne and Pierce (2004) used to measure ownership of the organization. And the organizational sense of ownership was modified to knowledge ownership. Sample items are "This is my knowledge", "I feel a very high degree of personal ownership for this knowledge", "I sense that this knowledge is my things", and "It is hard for me to think about this knowledge as mine (reversed)." Cronbach's alpha was 0.67 in this study.

### 3. Knowledge sharing (KS)

The measures individual perceptions of the extent of knowledge sharing by team members. We measured 7 items used by Srivastava et al. (2006). Sample items are "Managers in our team share their special knowledge and expertise with one another", and "Managers in our team share lot of information with one another." We used an average of seven items for use as a team level variable. Cronbach's alpha was 0.91 in this study.

#### 4. Perceived team's creativity (PTC)

Perceived team's creativity defined it as the team's ability to create new and valuable things. Therefore, we measured the perception that level of the team ability. The questionnaire items were developed by George and Zhou (2001) and used by 8 items used by Janssen and Huangz (2008). The questions were revised from the individual level to the team level. Sample items are "Our team suggests new ways to achieve goals", and "Our team comes up with new and practical ideas to improve performance." We used an average of seven items for use as a team level variable. Cronbach's alpha was 0.94 in this study.

#### 5. Control variables

We controlled gender, age, and educational level on an individual level. These variables can have a significant impact on the emotional feelings and team climate that are formed by team members' interactions. At the team level, team size and team tenure were controlled. These variables can have a significant impact on the emotional feelings and team climate that are formed by team members' interactions (Pirola-Merlo & Mann, 2004). The team size was measured by the number of team members, and the team tenure was used as average the length of time the members worked in the team. Team tenure is often argued that the creativity of teams decreases with their age. For instance, Lovelace (1986) contends that the creativity of research scientists decreases with the time they are part of a group. The main argument is that with team age, problem solving and cognitive processes become more established, reinforced, and habitual through uncertainty reduction by team members. Since it is not the age of the team per se, but the time its current members have been part of the team, we measured team tenure as the logged average number of years that team members had been member of the team (Leenders, Van Engelen, & Kratzer, 2003).

### C. Data Analysis

We conducted a multi-level analysis to confirm the effect of the control variables on the relationship between the group level and the individual level, which affects team creativity. Analytical methods were HLM (Hierarchical Linear and Nonlinear Modeling) 7.01 (Choi, 2007; Kwak & Kim, 2015).

In this study, Common method bias is likely to occur because independent variables and dependent variables are obtained from the same point in time and same source (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). therefore, As a follow-up, we confirmed that certain factors account for a large portion of the total variance. As a result of analysis, there were 4 factors with an eigen value of 1.00 or more, and the highest factor was 22.7%. Therefore, it is confirmed that the possibility of common method bias is low.

We conducted a confirmatory factor analysis (CFA) on the measures of the study variables to verify their factor structure and construct validity. Specifically, we modeled four correlated factors: correspondence to ALCS, TPKE, KS and PTC. This theoretical 4-factor model provided a reasonable fit to the data ( $\chi^2(df) = 454.37(289)$ , CFI = 0.96, TLI = 0.96, IFI = 0.96, RMR = 0.03, RMSEA = 0.04). Also, a series of  $\chi^2$  (chi square) difference tests revealed that the 4-factor model fits the data significantly better than several alternative measurement models (Table 2). In all comparisons, alternative models yielded a significantly poorer fit. Taken together, these results favor the theoretical 4-factor model, thus supporting discriminant validity among the measures. Also, Intra-class correlation coefficients (ICC) and the within-group inter-rater agreement measure,  $r_{wg}$  were used to support aggregation of ALCS, PKO and TKS to the team level (Pirola-Merlo & Mann, 2004). If the value of  $r_{wg}$ , the confidence coefficient of the group, is more than .70, it can be justified to use the lower level data as group level data, in the case of ICC (1), the values of .05 to .20 are typical, and a level of .30 or better is a very good level (Bliese, 2000). In the case of ICC (2), the value of .50 to .70 can be partially accepted, and if it is

**Table 2.** Comparison of Measurement Models

Model	$\chi^2(df)$	CFI	TLI	IFI	RMR	RMSEA
Theoretical 4-factor model (ALCS, TPKE, KS, PTC)	454.37 (289)	0.96	0.96	0.96	0.03	0.04
3-factor model (ALCS & TPKE merged, KS, PTC)	757.40 (296)	0.90	0.89	0.90	0.04	0.06
2-factor model (ALCS & TPKE merged, KS & PTC)	1748.99 (298)	0.70	0.67	0.70	0.08	0.12
1-factor model	2555.28 (299)	0.53	0.49	0.54	0.12	0.15

ALCS: agreeable leader's communication styles, TPKE: team's psychological knowledge ownership, KS: knowledge sharing, PTC: perceived team's Creativity.

**Table 3.** Aggregation Test Results for Group-Level Variables

Variables	$r_{wg(j)}$	ICC(1)	ICC(2)	F(p-value)
ALCS	.90	.07	.46	1.35(p<0.05)
TKS	.93	.11	.55	1.55(p<0.01)
TPKE	.84	.08	.48	1.38(p<0.05)

ICC=Interclass correlation coefficient.

ALCS: agreeable leader's communication styles, TPKE: team's psychological knowledge ownership, KS: knowledge sharing, PTC: perceived team's Creativity.

.70 or higher, it can be evaluated as a good level (Klein et al., 2000).

The results are presented in Table 3. The values of  $r_{wg(j)}$  and ICC(1) both exceeded the appropriate standards. However, the ICC (2) value did not meet the criterion but could be partially accepted (Bliese, 2000; James, Demaree, & Wolf, 1984; James, Demaree, & Wolf, 1993; D'Innocenzo et al., 2016). F-test also showed a significant value ( $p<.05$ ), indicating that the ALCS, TKS and TPKE can be analyzed as a group variable. These results support the validity of the discriminant validity of the group variable measures of the multilevel analysis.

## IV. Results

### A. Descriptive Statistics and Correlations

Table 4 provides the means, standard deviations, reliabilities and correlations of the measures and variables used in the study. The statistics in the upper portion of the table pertain to the individual level of analysis. The data in the lower portion pertain to the correlations among team-level variables. Correlations were appeared to be consistent with predictions in

this study model.

### B. Hypothesis Tests

This study used HLM 7.01 for data analysis considering multilevel characteristics of data (Kwak & Kim, 2015; Choi, 2007). Table 5, Table 6 and Table 7 summarizes the results from hierarchical linear modeling (HLM) analyses. H1a is a multi-level analysis between ALCS a team-level independent variable and IKS a individual level dependent variable. Our hypotheses imply that the significant variance in PTC can be explained at both team and individual levels. To test our hypotheses, we first had to ensure that significant team variance in ALCS existed. The basic model(Null model) in Table 5 shows the information on the within-group variance and the between-group variance. As a result of analysis, the variable of individual level ( $\sigma^2 = 0.46$ ,  $p<.001$ ) can not be explained in the total variance of dependency variable, and the part that can be explained by the variable of group level ( $\tau = 0.30$ ,  $p<.001$ ) was 39.4% [ $0.30/(0.46+0.30)$ ]. These results show that multilevel analysis is meaningful. Therefore, the hypothesis was verified by conducting multi - level analysis considering group and individual level. The hypotheses of H1a and H1b are shown

**Table 4.** Descriptive Statistics and Correlations

(a) Individual variables(Level 1)	Mean	SD	1	2	3	4	5
1. Gender	1.40	.49	-				
2. Age	2.57	1.01	-.37**	-			
3. Education	2.52	.89	.20**	-.15**	-		
4. knowledge sharing	4.01	.64	.07	-.03	.09	(.91)	
5. Perceived team's creativity	3.53	.72	.01	-.08	.10	.45**	(.94)
(b) Team variables(Level 2)	Mean	SD	1	2	3	4	5
1. Team size	4.56	1.60	-				
2. Team tenure	6.95	5.40	.00	-			
3. Agreeable leader's communication styles	3.31	.43	-.10	.49	(.90)		
4. Team's knowledge sharing	4.02	.41	-.07	-.03	.44**	(.93)	
5. Team's psychological knowledge ownership	3.31	.33	.11	.13	-.34**	-.31**	(.84)

N=324 for level 1 variables and 71 for level 2 variables. Values in parentheses in the upper portion and the first number in parentheses in the lower portion are alpha coefficients.

\*\* p < .01, Gender: 1=male, 2=female

**Table 5.** Hierarchical Linear Model Predicting: Direct Effects

Variables	IKS		TKS
	Model 1	Model 2	Model 3
Fixed effect	Estimates	Estimates	Estimates
<b>Individual Level</b>			
Intercept	4.02***	4.02***	
Gender		0.09	
Age		0.00	
Education		-0.00	
<b>Group Level</b>			
Intercept			2.66***
Team size		-0.00	-0.00
Team tenure		-0.00	-0.00
ALCS		0.40***	0.42***
Random effect	Variance Component	Variance component	Variance component
Group-level variance( $\tau$ )	0.3043***	0.2610***	0.1614
Individual-level variance( $\sigma^2$ )	0.4675	0.5720	0.3398
Deviance	614.00	626.59	76.95
$\chi^2$	153.29	129.38	82.11

ALCS: agreeable leader's communication styles, TKS: team's knowledge sharing, IKS: individual knowledge sharing.

\*\*\*p<0.001

in Table 5.

We predicted that ALCS will have a significant impact on IKS in H1a. The results are shown in Table 5, Model 2. Sex, age, and education were controlled and results were significant ( $\gamma = 0.40$ ,  $p < 0.001$ ), confirming the significant effect of ALCS

on IKS. Therefore, H1a was supported. In addition, the analysis results ( $\gamma = 0.42$ ,  $p < 0.001$ ) showed a positive effect when the team size and team tenure in the team were controlled in order to verify H1b with independent and dependent variables (Table 5, Model 3). Therefore, H1b was also supported.

H2a and H2b verify that individual and team level knowledge sharing is mediated between team level ALCS and individual level PTC. The Null model of Table 6 shows that the multivariate analysis was necessary because of the significance of the inter-group variance (intercept) in the random effects part (inter-group variance  $\tau = 0.31$ ,  $p < 0.001$ ). The ICC of the null model is 32.2% [ $0.31 / (0.65 + 0.31)$ ]. This is not explained by individual level variables in the overall variance of the dependent variable, which means that 32.2% is explained by variables at the group level. Thus, 67.8% of the factors affecting PTC can be explained by individual level factors, while the remaining 32.2% are explained by factors at the group level. The analysis results are shown in Table 6. In Model 2, the group level variable ALCS showed a positive (+) effect on the individual level variable PTC ( $\gamma = 0.40$ ,  $p < 0.01$ ). In Model 2 and Model 4, ALCS showed a positive (+) effect on IKS and TKS ( $\gamma = 0.42$ ,  $p < 0.001$ ;  $\gamma = 0.57$ ,  $p < 0.001$ ),

respectively. Thus, IKS appeared to be partially mediated and TKS was found to be mediated completely. This result supports H2a and H2b that IKS and TKS mediate between ALCS and PTC.

H3a and H3b predicted that the interaction terms of ALCS and TPKO will be significant for the dependent variables TKS and IKS (Table 7). As a result, the interaction term between ALCS and TPKO was negatively related to IKS ( $\gamma = -0.59$ ,  $p < 0.05$ ). However, TKS showed no significant results ( $\gamma = -0.51$ , ns). Therefore, H3a was supported and H3b was rejected.

To facilitate an interpretation of H3a interaction pattern, we plotted two simple slopes at one SD above and below the mean value of TPKO (Aiken & West, 1991). As shown in Figure 2, the negative relationship between ALCS and IKS was stronger when TPKO was high than when it was low.

**Table 6.** Hierarchical Linear Model for Predicting Creativity: Mediating Effect of Knowledge Sharing

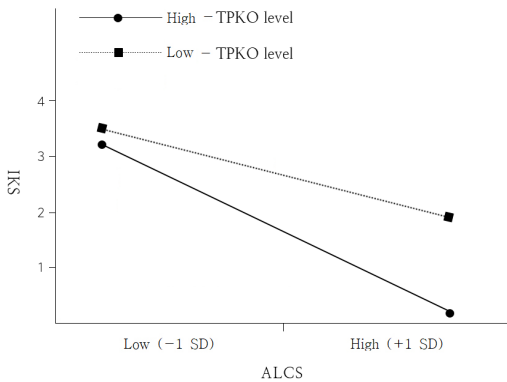
Variables	PTC(Perceived team's creativity)				
	Null model	Model 1	Model 2	Model 3	Model 4
Fixed effect	Estimates	Estimates	Estimates	Estimates	Estimates
<b>Individual Level</b>					
Intercept	3.53***	3.53***	3.54***	3.54***	3.54***
Gender		-0.24*	-0.28*	-0.26*	-0.26*
Age		-0.04	-0.03	-0.02	-0.02
Education		-0.02	0.01	0.00	0.01
IKS		0.40***	0.42***		
<b>Group Level</b>					
Team size			-0.00	-0.00	-0.00
Team tenure			-0.02***	0.02***	0.02***
ALCS			0.40**	0.39**	0.15
TKS					0.57***
Random effect	Variance component	Variance component	Variance component	Variance component	Variance component
Group-level variance( $\tau$ )	0.3189***	0.3657***	0.3002***	0.2800***	0.1780***
Individual-level variance( $\sigma^2$ )	0.6512	0.5389	0.5669	0.6127	0.6135
Deviance	694.22	653.36	657.94	692.23	474.56
$\chi^2$	145.43	51.17	46.74	39.95	26.64

ALCS: agreeable leader's communication styles, TKS: team's knowledge sharing, IKS: Individual knowledge sharing.  
\* $p < 0.01$ ; \*\*\* $p < 0.001$

**Table 7.** Moderating Effects of Psychological Knowledge Ownership

Variables	IKS			TKS		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Fixed effect	Estimates	Estimates	Estimates	Estimates	Estimates	Estimates
<b>Individual Level</b>						
Intercept	4.23***	4.02***	4.02***			
Gender	0.09	0.08	0.09			
Age	0.01	0.01	0.01			
Education	-0.00	-0.00	-0.00			
<b>Group Level</b>						
Intercept				4.11***	3.58***	-2.43
Team size	-0.01	-0.01	-0.01	-0.01	-0.00	-0.00
ALCS		0.35**	0.34**		0.36**	2.09*
TPKO		-0.16	1.86		-0.22	1.55
<b>Group Level interaction</b>						
ALCS × TPKO			-0.59*			-0.51
Random effect	Variance component	Variance component	Variance component	Variance component	Variance component	Variance component
Group-level variance( $\tau$ )	0.3045***	0.2656***	0.2472***	0.0325	0.2519***	0.0239
Individual-level variance( $\sigma^2$ )	0.5591	0.5576	0.5586	0.1393	0.1115	0.1081
Deviance	624.89	615.72	614.23	81.90	68.93	68.19
$\chi^2$	58.69	42.24	41.18	85.09	82.11	80.64

ALCS: agreeable leader's communication styles, TKS: team's Knowledge sharing, IKS: individual knowledge sharing, TPKO: team's psychological knowledge ownership.  
 p<0.05; \*\*p<0.01; \*\*\*p<0.001

**Figure 2.** Moderating Effect of TPKO on the Relationship between ALCS and IKS

## V. Conclusion

This study revealed that an agreeable leader's communication style has a significant effect on individual and team knowledge sharing. This finding suggests that an agreeable leader's communication style creates and promotes a positive atmosphere for individual and team knowledge sharing because it actively supports communication necessary for knowledge sharing (Nohria, 1991). An agreeable leader's communication style was also found to exert a significant effect on team creativity through the mediation of individual and team level knowledge sharing. These findings indicate that an agreeable leader's communication style does not only have a positive effect on team creativity, but also promotes communication among team members to enhance trust and thereby promote

knowledge sharing. This study also investigated the moderating effect of a team's psychological knowledge ownership in the relationship between an agreeable leader's communication style and individual and team level knowledge sharing. The significant outcome regarding the individual-level knowledge sharing shows that the higher the team's psychological knowledge ownership, the lower the positive effect of an agreeable leader's communication style on knowledge sharing. It highlights the need to pay attention to knowledge management when the level of team members' psychological ownership is high because it acts as an interfering factor for communication between leader and team member and among team members.

On the other hand, the insignificant outcome regarding the team-level knowledge ownership may be ascribed to the structural characteristics of a team-unit working group. A team structure requires plenty of communication and active interactions among team members when executing the assigned task to reach the same goal (Amabile, 1988; Woodman, Sawyer, & Griffin, 1993). Therefore, it can be interpreted as an offset mechanism that lowers psychological knowledge ownership in order to increase the team's sharing of psychological knowledge. Another reason can be found in the characteristics of sample groups collected in this study. The average number of employment years of the sampled team was 6.96 years and the average age was also high, with the team's practical working conditions, structural dynamics, and the relationships among the team members well-settled and stable, which could offset the negative effect of the team's psychological knowledge ownership. This result highlights the importance of conditional effect of knowledge ownership in the positive effect of an agreeable leader's communication style on team knowledge sharing. The theoretical implications of this study are as follows. The first theoretical implications is that although there have been many studies on team creativity (Barczak, Lask, & Mulki, 2010; Lee, Choi, & Kim, 2018; Leenders, Van Engelen, & Kratzer, 2003), a leader's communication style in relation to team creativity has attracted little research interest. This study expanded the understanding of source of team creativity by developing

theoretical framework of the relationship between an agreeable leader's communication style and individual and team knowledge sharing and team creativity.

Second, research on knowledge sharing has been conducted predominantly at the individual level. However, compared with the multilevel analysis of knowledge sharing among individuals belonging to an organization, that of a working group has been studied to a very limited scope. Therefore, the multilevel analysis was performed in this study, whereby knowledge sharing was divided into individual and team level. Therefore, theoretical expansion was attempted by determining the differences in the knowledge sharing effect between individual and team levels. Third, the moderating effect of the team's psychological knowledge ownership was verified in the relationship between an agreeable leader's communication style and individual and team knowledge sharing. Despite much research on knowledge sharing, most studies have revolved around positive factors for knowledge sharing. However, our study extended the negative conditions hindering the effects of an agreeable leader's communication style on knowledge sharing. Finally, this study provided an integrative model that presents the mechanism by which an agreeable leader's communication style and team's psychological knowledge ownership influence knowledge sharing and eventually team creativity from multi level perspectives.

The practical implications of this study are as follows. First, this study revealed that the effect of a friendly leader's communication style is important in enabling horizontal leader-member communication and positive relationships and further improving knowledge sharing. Therefore, companies should pay attention to developing and applying friendly communication styles of organizational managers. Second, in this study, the importance of sharing team knowledge was confirmed to play a role in completely mediating the relationship between the friendly leader's communication method and team creativity. This supports the findings that the team effect is greater than the individual effect (De Vries, Van den Hooff, & de Ridder, 2006). Therefore, in order to actively share knowledge within the team, various organizational systems and incentives must be prepared. Third, it was found that team-level psycho-

logical knowledge ownership did not significantly affect the effectiveness of agreed leadership on team-level knowledge sharing, while negatively affecting individual-level knowledge sharing. This emphasizes the need to pay attention to intrinsic motivation to alleviate personal-level psychological knowledge ownership. Therefore, it is necessary to operate regular educational programs to provide a correct understanding of the knowledge created within the organization and to help understand the need and grounds for knowledge sharing for organizational development.

Although this study provides theoretical and practical implications, it has some limitations. These limitations are presented below along with related future research directions. First, although this study presented the communication style that has a positive effect on team creativity, no style-related comparison could be made because an agreeable leader's communication style was the only communication style used in this paper. Therefore, future research will have to expand the relationship between team leader's communication style and team creativity by developing various communication styles and comparing their outcomes. Second, since team's psychological knowledge ownership is a factor triggered by intrinsic motivation, it is subject to time-dependent variation and influence of organizational culture and climate. However, no comprehensive modeling was carried out to encompass these relationship factors. Therefore, future research will have to develop a research model considering these relationship factors and to conduct empirical analysis. Third, if the level of team's psychological knowledge is appropriate, it may have a positive effect on teamwork and be positive for team creativity. Therefore, in future studies, efforts to find various effects on team psychological knowledge ownership are needed. The final limitation of this study is that it was a cross-sectional study using response variables based on individual perceptions as design variables. Thus, there is a need to conduct a follow-up study with a longitudinal study design, using a variety of measurement sources.

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**Appendix 1.** Previous key literatures related to this study

Main issues	Research Samples	Main findings	Key Literatures
1. Leader agreeable communication style and knowledge sharing	240 employees from 9 US firms	leader's communication style showing a supportive leadership positively affects team members in sharing knowledge.	De Vries, Bakker-Pieper, & Oostenveld (2010)
2. Quality of the leader-member relationship	537 undergraduate business students ranging in age from 17 to 49.	The leader's positive expressed emotion led to higher member ratings of the leader's negotiating latitude.	De Vries (2005)
3. Team communication styles and knowledge sharing	424 members of different work-related teams	In terms of team communication styles, an agreeable style is positively related to team members' willingness to share their knowledge.	De Vries, Van den Hooff, & de Ridder (2006)
4. Knowledge sharing and team creativity	43 team(171) employees from 8 China firms	The team-focused TFL impacted team creativity partially through its influence on team knowledge sharing.	Dong et al. (2017)
5. Ethical leadership and team creativity	50 team(186) employees from 8 China firms	The teams exhibited more creativity when there was a moderate level of ethical leadership than when there were very low or very high levels.	Mo, Ling, & Xie(2017)
6. Individual creativity and group creativity	94 groups(480) undergraduate business students from Canada	Specific behavioral measures of the components of creativity were found to relate in predicted ways to standard individual differences.	Taggar (2002)
7. CEO leadership and fosters creativity	500 organizations CEO from Israel	Data collected from senior executive teams indicate that CEO ideational facilitation leadership is positively related to team knowledge sharing, which in turn results in enhanced team exploratory behaviors.	Carmeli & Paulus(2015)
8. Psychological safety and team creativity	84 leaders and 659 members from Korean	The offered initial evidence for the indirect association of status conflict with team creativity through team psychological safety with gender diversity as a boundary condition of this relationship.	Lee, Choi, & Kim(2018)
9. Team creativity and team social capital	36 teams of MBA students	Knowledge variety and knowledge disparity had a joint effect on team-bridging social capital, and knowledge separation was negatively related to team-bonding social capital.	Han, Han, & Brass(2014)
10. Informal social network ties and team creativity	82 long-term MBA project teams	Both outside ties with nationality-heterogeneous individuals and weak outside ties independently facilitate team creativity.	Perry-Smith, & Shalley(2014)
11. Knowledge ownership of organizations and individuals	Australian university, 4,253 employees	Beliefs about property rights affect information and knowledge sharing.	Jarvenpaa & Staples(2001)
12. Psychological ownership with work attitudes and work behaviors	184 employees from 9 US firms	Results demonstrate positive links between psychological ownership for the organization and employee attitudes (organizational commitment, job satisfaction, organization-based self-esteem), and work behavior (performance and organizational citizenship).	Van Dyne & Pierce(2004)