경영학 석사학위논문

We Share, Hide, and Manipulate:

How Group Knowledge Exchanging Behaviors Contribute to Transactive Memory System and Group Effectiveness

거래적 기억체계 형성 및 집단 효과성에 대한 집단적 지식 교환 행동의 영향

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Abstract

We Share, Hide, and Manipulate:

How Group Knowledge Exchanging Behaviors Contribute to Transactive Memory System and Group Effectiveness

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Previous research on team knowledge exchange behavior (KEB) has primarily examined the extent to which team members share their knowledge. This study deviates from the currently dominant framing of team KEB by examining the capacity of organizational teams to demonstrate three types of KEBs (i.e., sharing, hiding, and manipulating) to provide more sophisticated explanations on complex team knowledge exchange dynamics. The study also explores the relationship between KEBs and transactive memory system (TMS; i.e., collective memory system for group knowledge). Specifically, by diverging from the extant research

that regards TMS as a unitary construct, this study focuses on the idiosyncratic roles of the three dimensions of TMS (i.e., specialization, credibility, and coordination) to investigate more specific relationships with adjacent constructs. Knowledge sharing is hypothesized to be positively related to specialization, knowledge hiding is expected to be negatively related to credibility, and knowledge manipulating is hypothesized to be negatively related to coordination.

Three types of team performances, namely, routine performance, incremental creativity, and radical creativity, are examined as a consequence of each sub-dimension of TMS. Specialization and credibility are expected to facilitate incremental and radical creativity, whereas coordination is expected to enhance routine performance. Moreover, knowledge transforming mechanism (KTM) is drawn as a moderator that intervenes with the relationship between TMS and team performances. In particular, KTM is hypothesized to magnify the creativity benefits that accrue from specialization and credibility; meanwhile, KTM is expected to perform a compensatory role between coordination and routine performance.

The aforementioned hypotheses were tested with the data based on 49 organizational teams from Korean organizations. Results indicated that (a) knowledge sharing enhanced specialization, credibility, and coordination; (b) knowledge hiding decreased specialization; and (c) knowledge manipulating decreased coordination. Specialization was positively related to the radical

creativity of teams, and negatively related to incremental creativity, especially for those undertaking a low level of KTM. Coordination was positively related to the routine performance of teams, and demonstrated a compensatory relationship with KTM in predicting incremental creativity.

Based on the empirical results, this study contributes to the literature on team knowledge exchange, TMS, and creativity. It also offers profound managerial implications by demonstrating the practical roles of KTM and conflicting dynamics between team and individual knowledge exchanges. In sum, this study validates a theoretical framework that reveals the complex knowledge exchange dynamics among team members, and its implications on the collective system of knowledge and consequent team performances.

Keywords: knowledge exchange behavior, transactive memory system, team effectiveness, knowledge transforming mechanism, team-level analysis

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Ⅰ. INTRODUCTION

The successful management of knowledge has been one of the most important research subjects in the organization literature (Griffith & Sawyer, 2010; Sung & Choi, 2012). The reason is that the effective pooling and use of knowledge generates excellent organizational outcomes, such as the efficient accomplishment of tasks, idea generation, and innovative performance (Mesmer–Magnus & Dechurch, 2009; Sung & Choi, 2012). Therefore, scholars and practitioners have further examined the possible organizational efforts that are required to coordinate the knowledge of employees (Brodbeck, Kerschreiter, Mojzisch, & Schulz–Hardt, 2007; Ipe, 2003). Accordingly, the organization literature explored various research frameworks (i.e., knowledge management system, group cognitions, and organizational learning) to explain the effective process of coordinating and utilizing individual knowledge that is distributed throughout an organization (Flatten, Engelen, Zahra, & Brettel, 2011; Mohammed & Dumville, 2001).

The growing attention to the issue of knowledge management has prompted researchers to largely rely on the theoretical orientation of the *consensus framework*. This theoretical assumption posits the unsanctioned mutual trust and positive interactions among organizational members, which accordingly regards knowledge as an inexhaustible source of desirable organizational outcomes (Nonaka & Peltokorpi, 2006; Schultze & Stabell, 2004). However, this assumption is unrealistic, such that ignoring the potential motivational conflicts embedded in

the process of pooling and coordinating individual knowledge, which may ultimately undermine organizational performance (Cabrera & Cabrera, 2002).

Scholars have acknowledged the limitations in such theoretical inclination and have consequently shifted their attention to the *dissensus framework* of knowledge management; this framework assumes the process of managing knowledge as a political process that involves intensive negotiation among organizational members (Bettis–Outland, 1999; Foucault, 1980; Marshall & Rollinson, 2004). This theoretical assumption recognizes the ongoing struggle of employees to resist the knowledge pooling attempts of the organization, which originates from their desire to define their unique value in the organization (Marshall & Rollinson, 2004). Therefore, dissensus discourse acknowledges that knowledge can be the source of organizational conflicts, which potentially undermines the overall organizational performance.

Accordingly, scholars have conceptualized the issue of how some employees influence the knowledge absorption and exploitation of other employees to gain personal benefit (Pfeffer, 1981). In particular, researchers have deviated from dominant research streams that merely examine the amount of knowledge that employees share by conceptualizing various types of employee knowledge management behaviors with inherent political motivations (Bettis–Outland, 1999; Connelly, Zweig, Webster, & Trougakos, 2012; Steinel, Utz, & Koning, 2010). For example, Connelly et al. (2012) proposed various types of individual knowledge

hiding behaviors, including evasive hiding, playing dumb, and rationalized hiding. Ford and Staple (2010) distinguished partial knowledge sharing (i.e., restricting the knowledge and information to be shared) from full knowledge sharing (i.e., informers share all of the knowledge and information that they consider to be relevant to knowledge recipients); Ford and Staple grounded this distinction on the notion of the qualitative differences among the knowledge sharing behaviors of employees. Rhee and Choi (2014) explained the knowledge exchange dynamics of individual employees by developing a holistic framework of knowledge exchange behavior (KEB) that incorporates knowledge sharing, knowledge hiding, and knowledge manipulating.

Nevertheless, compared with recent endeavors in conceptualizing the various types of individual KEBs, we have limited information about the KEBs undertaken by the team as a whole (Rhee & Choi, 2014). Only the studies on knowledge sharing from an experimental paradigm (i.e., hidden profile approach) have provided limited insights into how the knowledge pooling attempts of a group can stimulate its decision-making performances (Mesmer–Magnus & Dechurch, 2009).

However, various types of group KEBs merit further investigation, recognizing their potential implications on organizational performance (Kozlowski & Ilgen, 2006). Each team member possesses different types of talent, expertise, and knowledge (Han, Han & Brass, 2014; Joshi & Roh, 2009); thus, organizational

team has potential intellectual resources that may bolster team performance, and ultimately, organizational effectiveness (Gilson, Lim, Luciano, & Choi, 2013; Hu & Randel, 2014). Without a proper understanding of team-level knowledge exchange dynamics, however, organizations may fail to coordinate individual resources by inciting undesirable conflicts among team members (Groysberg, Polzer, & Elfenbein, 2011; Nakata & Im, 2010). Therefore, a comprehensive understanding of group knowledge exchange dynamics will yield significant insights into the successful coordination and acquisition of group resources to achieve excellent organizational performance.

In this regard, this study aims to bridge current disconnections in the literature by conceptualizing different types of group KEBs. This study specifically adopts and expands the individual knowledge exchange framework developed by Rhee and Choi (2014), which consists of knowledge sharing, hiding, and manipulating. The current study also answers how each KEB influences intra-group informational flow and subsequent team performance. More specifically, this study draws upon the transactive memory system, which refers to the collective memory system for group knowledge (Lewis, 2003), to address the relationship between knowledge exchange and team performance. The current study considers knowledge exchanges as representative methods of communicating knowledge, which affect knowledge flow and consequent group knowledge system among team members, thereby influencing the collective performance (Hollingshead &

Brandon, 2003).

The present study deviates from previous research that examined the link only between TMS and routine performance (Austin, 2003; Lewis, 2003; Lewis, Lange, & Gillis, 2005) and contributes to the field by examining how TMS affects different types of team performances, such as routine performance, incremental creativity, and radical creativity. Moreover, this study explains the process mechanisms of how TMS bolsters team effectiveness by adopting the moderating function of *knowledge transforming mechanism* (KTM), which pertains to a strategic team-level cognitive effort to apply and utilize group knowledge (Ohlsson, 2011). Specifically, if improperly utilized, transactive memory merely functions as potential knowledge stock that has no relevance to desirable team performance (Austin, 2003). Accordingly, the consideration of KTM clarifies the performance benefit that accrues from TMS (De Luca & Atuahence–Gima, 2007).

In sum, the present study develops a research framework that incorporates team KEB, TMS, team performance, and KTM. The current theoretical framework is empirically examined using field data from 49 teams from Korean organizations, which perform knowledge-intensive tasks.

Ⅱ. CONCEPTUAL BACKGROUND

1. Group Knowledge Exchange Behavior

Knowledge exchange behavior (KEB) refers to the strategic attempts of employees to handle their knowledge in the organization. This study expands previous research on knowledge exchange by considering it to be a group-level phenomenon. This deviation is theoretically important because most organizational phenomena are "inherently multilevel as opposed to occurring at a single level or in a level vacuum" (Chan, 1998, p. 234). Thus, KEBs can be regarded as collective phenomena, which are conceived as a normative characteristic of the team as a whole. Accordingly, group knowledge exchange is a conceptually distinguishable construct from individual knowledge exchange. The present distinction is important because individual and team KEBs may display different relationships with adjacent constructs. For example, although knowledge manipulation is revealed to be individually an adaptive strategy in terms of the achievement of a strong performance (Rhee & Choi, 2014), team-level relationships between knowledge manipulation and performance may manifest a different empirical pattern. Therefore, this level-shift in constructs is expected to yield significant insights into organizational knowledge dynamics. The following paragraphs describe the types of group KEBs.

First, knowledge sharing refers to the mutual processes of exchanging and evaluating knowledge, which enhance the expansion of the collective knowledge

(Boland & Tenkasi, 1995). From the initial introduction of information pooling paradigm by Stasser and Titus (1985), various antecedents and consequences of knowledge sharing have been extensively examined in the organization literature (Wang & Noe, 2010). For example, organizational environments (e.g., organizational context, interpersonal and team characteristics, and cultural characteristics), employee motivations (e.g., justice, trust, and cohesion), and individual characteristics (e.g., personality and demographics) have been revealed to significantly influence knowledge sharing. The performance implications of knowledge sharing have been exhaustively investigated as well. In particular, previous research has indicated that knowledge sharing develops emotional trust among team members (Flynn, 2003), which helps achieve collective performance. Knowledge sharing also functions as a learning opportunity that further enhances the ability of employees to fulfill knowledge-intensive tasks (Toppino & Cohen, 2009). Researchers have also identified several flaws of engaging in knowledge sharing. For instance, knowledge sharing sometimes decreases the rated performance of employees and diminishes their image as a professional (Kimmerle, Wodzicki, Jarodzka, & Cress, 2011).

Second, knowledge hiding pertains to an "intentional attempt by an individual to withhold or conceal knowledge that has been requested by another person" (Connelly et al., 2012). Based on the notion that the deliberate intention to confine the readily available knowledge is different from low-level knowledge

sharing (Dyne, Ang, & Botero, 2003; Schlosser & Zolin, 2012), previous studies have explored various types of knowledge hiding behaviors. For example, Connelly et al. (2012) reported that knowledge complexity, task-relatedness, interpersonal distrust, and knowledge sharing climate are significant predictors of rationalized hiding, playing dumb, and evasive hiding. Psychological ownership on knowledge is also revealed to be a significant predictor of knowledge hiding (Peng, 2013). Researchers also investigated the performance implications of engaging in knowledge hiding. For example, Bolino (1999) reported that selfish behaviors such as knowledge hiding may induce disadvantageous social isolation and negative impressions, such as being a free rider on the contribution of others. Černe, Nerstad, Dysvik, and Skerlavaj (2014) adopted the "loop of distrust" to explain how knowledge hiding can undermine desirable individual performances. Knowledge hiding disconnects the person from the collective knowledge network among organizational members, depriving the knowledge hider of further opportunities to assimilate unique knowledge and to collaborate with other organizational members (Schuller & Field, 1998). Interestingly, researchers have also revealed the potential performance benefits that accrue from undertaking knowledge hiding. For instance, employees may undertake better time management and develop free-cognitive resources (Anseel, Lievens, & Schollaert, 2009) by engaging in knowledge hiding.

Finally, knowledge manipulation refers to the intentional attempts of employees to shrewdly influence and manage the values and contents of

knowledge by introducing unnecessary noise to it (Rhee & Choi, 2014). The specific forms of knowledge manipulation include overstatement in the potential strength of the knowledge and downplaying of the potential weaknesses of the knowledge (Hislop, 2013; Steinel et al., 2010). Such attempts may be used by employees as an adaptive strategy to accomplish their goals, such as achieving strong individual performance or leading positions in intra-firm competitions. Rhee and Choi (2014) identified a positive relationship between knowledge manipulation and individual creativity, especially with employees with a high social status. Studies on intentional voice similarly support this premise. Dutton, Ashford, O'Neill, and Lawrence (2001) indicated that the successful selling and repackaging of ideas in organization helps employees advance their social position in the organization. However, unsanctioned involvement in knowledge manipulation may penalize knowledge manipulators as well. For instance, the realized value of manipulated knowledge may belie its initially promised value declared by the knowledge manipulator. This aspect may deprive focal employees of the accumulated social reputation and informational power (Marr & Thau, 2014).

2. Transactive Memory System (TMS)

Transactive memory system (TMS) pertains to a set of information and knowledge owned by each member of a group, which is accompanied by a shared awareness of "who knows what" among members of the group (Peltokorpi, 2008).

This emergent psychological status of group-mind first was introduced to explain the information processing capacity of a dyadic relationship (Wegner, 1987). A series of subsequent experimental studies has indicated that a cooperative group of people may form a collective mind to rely on each other in acquiring, processing, and coordinating information for solving group problems (Wegner, 1987; Peltokorpi, 2008). In other words, when TMS is established among group members, memory becomes a social phenomenon in which people use other members as an external memory depository to assist the limited basis of the individual stock of knowledge (Mohammed & Dumville, 2001). Therefore, TMS helps a team develop a well-defined division of mental labor and highly specialized expertise among team members.

A recent research stream further delves into TMS by perceiving it as a multi-dimensional construct. Specifically, Lewis (2003) conceptualized three sub-dimensions of TMS, namely, (1) specialization (i.e., shared agreement on "who knows what"), (2) credibility (i.e., shared belief in the validity of each other's expertise), and (3) coordination (i.e., harmonious utilization of each other's knowledge in solving problems). This multi-dimensional conceptualization of TMS has contributed to its detailed understanding and has facilitated its investigation (Marques–Quinteiro, Curral, Passos & Lewis, 2013).

Zhang, Hempel, Han, and Tjosvold (2007) identified the potential antecedents that help develop TMS among organizational teams. Specifically, task

interdependence, goal interdependence, and support for innovation were determined to be positive predictors of TMS. Moreover, previous studies have addressed the mechanisms of how TMS translates team informational resources into enhanced performance. For instance, Austin (2003) demonstrated how distinct types of TMS, such as TMS of task knowledge and TMS of external relationship knowledge, affect team effectiveness differently. The results revealed that knowledge stock, transactive memory consensus, knowledge specialization, and transactive memory accuracy of different types of TMS distinctly influence team outcomes, such as goal attainment, external performance evaluation, and internal performance evaluation. Deviating from the mere presence of TMS, its structural components have drawn scholarly attention as well (Mell, van Knippenberg, & van Ginkel, 2014). Mell at al. (2014) indicated that together with knowledge distribution among team members, the TMS configuration may sometimes support group problem solving, and at other times undermine team performance.

Although previous research attempts helped expand the understanding of TMS, knowledge on the organizational antecedents and performance implications of each sub-dimension of this system remains scarce (Chiang, Shih, & Hsu, 2014). The reason is that previous research has largely advanced analyses that considered TMS as a unitary construct rather than a multidimensional one (Zhang et al., 2007). Therefore, the present study addresses the gap in the literature by demonstrating the relationship between each sub-dimension of TMS and KEBs. It also theorizes

the links between each TMS sub-dimension and various team performance measures, such as team performance, incremental creativity, and radical creativity.

Ⅲ. HYPOTHESES DEVELOPMENT

1. Relationships between Group Knowledge Exchange Behaviors and TMS

The hypotheses of this study focus on the team-level relationships among knowledge exchanging behaviors (KEBs), transactive memory system (TMS), and team effectiveness. The current theoretical framework also considers the moderating function of knowledge transforming mechanism (KTM) between TMS and team effectiveness. The theoretical model of this research is presented in Figure 1. Hypothesizing all of the possible relationships is possible. However, to retain the parsimony of research model, this study considers the hypothetical relationships only between the dimensions with the strongest theoretical connection.

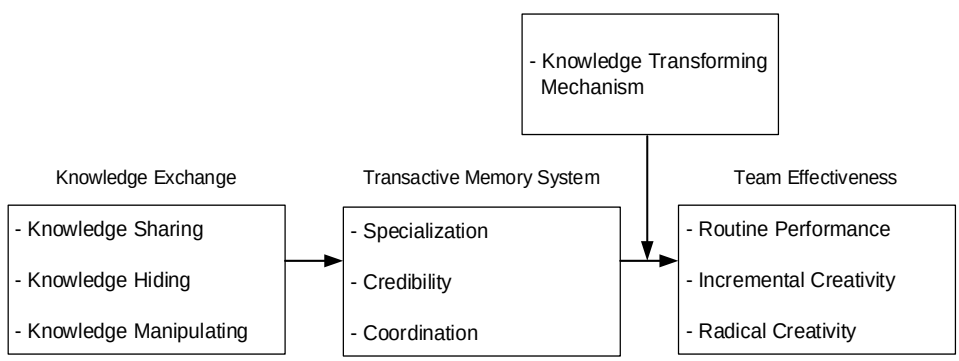

Figure 1. Research model

Knowledge exchange behavior pertains to knowledge-based communication among team members, which potentially contributes to the development of TMS (Neff, Fulk, & Yuan, 2014). The knowledge communication of group members may function as a process mechanism that translates individual knowledge into a collective system of knowledge through cognitive and affective dynamics among team members (Hollingshead & Brandon, 2003; Marks, Mathieu, & Zaccaro, 2001). Each KEB (i.e., knowledge sharing, hiding, and manipulating possess) has distinct characteristics and engenders different implications. Thus, this study proposes that each knowledge exchange may distinctly influence the development of TMS.

First, knowledge sharing among team members may contribute to the emergence of an interdependent knowledge network through mutual exchange and cross-validation of knowledge of each team member (Hislop, 2002). The emergence of such network may help employees signal the possession of knowledge, thereby enabling other members to detect the required knowledge. Harmonious knowledge sharing consequently allows team members to comprehend the exact locus of the distributed expertise throughout the team (Ipe, 2003). The collective engagement in knowledge sharing provides the fundamental ground for establishing meta-knowledge on team expertise. Such shared understanding in "who knows what" also helps team members develop both mutually non-redundant and highly sophisticated knowledge. Accordingly, I posit the following hypothesis:

Hypothesis 1: Group knowledge sharing has a positive relationship with specialization.

Second, the intentional hiding of knowledge may represent the calculative and selfish mind of the knowledge hider (Rhee & Choi, 2014). Such explicit manifestation of selfish intention may stimulate employees who requested knowledge to experience negative social and emotional reaction, which may facilitate the development of negative impressions toward the knowledge hider. This negative impression may foster the belief that the expertise of the team member to be futile because the knowledge requester may attribute the hiding of knowledge to the ignorance of such team member (Wang & Noe, 2010). This negative affective status may also enhance fundamental suspicions in the team knowledge system (Neff et al., 2014). Consequently, a *loop of distrust* can emerge as a shared cognition, which can diminish the trustworthiness of team expertise (Černe et al., 2014). Such prediction is integrated into Hypothesis 2 as follows:

Hypothesis 2: Group knowledge hiding has a negative relationship with credibility.

Finally, manipulated knowledge may often fail to realize its promised benefits (Bettis–Outland, 1999). This failure may reveal the initial deceptive motivation of undertaking such behavior, which may aggravate the relational

cacophony among team members (Baas, de Dreu, & Nijstad, 2008; Empson, 2001). The collective engagement in such a deceptive and political behavior may further intensify undesirable status conflicts among team members (Bendersky & Hays, 2012). Overall, such relationship and status-related struggles can prevent group members from reaching common decisions in terms of work-related issues, such as the assignment of tasks to members who have sufficient knowledge on the required tasks (Groysberg et al., 2011; Jehn & Mannix, 2001). Consequently, such disharmonious interactions can aggravate the inefficiencies in organizing team resources to solve group problems. The hypothesis based on such prediction is as follows:

Hypothesis 3: Group knowledge manipulation has a negative relationship with coordination.

2. Relationship between TMS and Team Effectiveness

Collective informational flow induces a broad range of implications on organizational performance (Sung & Choi, 2012). Hence, to establish an in-depth understanding of the role of TMS in collective performance, the present study adopts three types of team performances that vary in their radicalness (Madjar, Greenberg, & Chen, 2011), namely, routine performance, incremental creativity, and radical creativity. The following section further explains the different types of team performances and their relationships with the sub-dimensions of TMS, which

are expected to reveal significant insights into how the different facets of team knowledge induce various types of team performances.

Routine performance refers to "the effectiveness with which employees perform activities that contributes to the organization's technical core" (Borman & Motowidlo, 1997, p. 99), which bolsters the fundamentals of organizational performance. Notwithstanding such benefits, the recent literature focused more on the qualitatively different types of organizational performance such as creativity (Amabile, 1996). Creativity, which denotes the generation of novel and original ideas, provides further ground for accomplishing excellent organizational performance beyond the effective and efficient completion of core tasks (Sung & Choi, 2012). Moreover, recent scholarly endeavors aimed to deepen the understanding on creativity. Researchers specifically explored how different types of creative initiatives emerge, how they are distinctly related to adjacent constructs, and how they differently influence subsequent organizational performances (Unsworth, 2001).

Among the suggested categorizations of creativity, the distinction between incremental and radical creativity has drawn the most intensive scholarly attention. Originated from literature on the incremental and radical types of innovation, organization scholars indicated that different types of innovation may emanate from distinct creative initiatives that vary in their radicalness of idea (Gilson, Lim, D'Innocenzo, & Moye, 2012). Previous studies have reported that different types

of creativity have various forms of social and cognitive antecedents. For example, radical creativity is predicted by resources for creativity and willingness to take risks, whereas incremental creativity is predicted by organizational identification and presence of creative coworkers (Madjar et al., 2011). Moreover, different problem-solving orientations engender various types of creative performance. For instance, problem-driven orientation enhances radical creativity, whereas solution-driven orientation promotes incremental creativity (Gilson & Madjar, 2011). Although previous research has revealed such insights into individual creativity, knowledge on the specific processes that assist the collective emergence of incremental and radical creativity among organizational teams remains scarce. To the best of my knowledge, the present work is the first study to address the relationships among team knowledge structure and incremental/radical creativity as a team-level phenomenon.

The relationship between TMS and task performance is one of the traditional research subjects that has been continuously demonstrated in previous studies (Austin, 2003). However, the question on the specific sub-dimension of TMS that directly encourages the efficient completion of core tasks remains unanswered. This study proposes that coordination directly contributes to team routine performance. TMS–coordination implies the successful division of mental labor, which facilitates the efficient assignment of tasks to qualified employees (Lewis, 2003). Thus, when teams have agreed on such division of mental labor,

employees who are knowledgeable in a specific category of expertise become responsible for a specific category of the task or facet of the team project (Miller, Choi, & Pentland, 2014). Consequently, such harmonious collaborations and routines in solving group problems enhance the completion of core group tasks. Thus, I propose the following hypothesis:

Hypothesis 4: Coordination has a positive relationship with task performance.

Compared with the prevailing research that examined the relationship between TMS and routine performance, only a few empirical studies have explained the theoretical connection between TMS and creative performance (Gino, Argote, Miron-Spektor, & Todorova, 2010). Creativity is the outcome of the recombination and transformation of knowledge (Madjar et al., 2011; Ohlsson, 2011); thus, TMS, which implies the collective memory system for group knowledge, may engender the broad implications of knowledge-intensive performances such as creativity. Specifically, the present study proposes that specialization and credibility may have a significant relationship with group creative performance. The reason is that specialization and credibility are the core attributes of group knowledge structure, which are relevant to knowledge-intensive performances (Han et al., 2014).

Specialization refers to the meta-cognitive repository of expertise and knowledge among team members (Lewis, 2003). Such a well-developed division of

mental labor helps team members develop a highly sophisticated expertise. Moreover, it enables employees to recourse to the knowledge that other team members require (Wegner, 1987). Therefore, each team member can develop knowledge that is uniquely different from that of other team members because employees do not have to waste cognitive resources in assimilating redundant information and knowledge. Such specialization consequently assists teams in expanding group knowledge, which is a core resource in terms of developing creative ideas (Sung & Choi, 2012). Accomplishing both incremental and radical creativity requires such divergent pools of knowledge (Madjar et al., 2011); hence, the present study proposes that specialization helps team members develop both radical and incremental types of original ideas (Gino, Todorova, Miron-Spektor, & Argote, 2009).

Credibility, which refers to the trustworthiness of team knowledge structure, is also an important determinant of team creativity (Akgün, Byrne, Keskin, Lynn, & Imamoglu, 2005). Such credible characteristic of team knowledge structure may facilitate creativity by generating an informationally safe climate (Tesluk, Farr, & Klein, 1997; Zohar & Luria, 2005). Specifically, when team members perceive the overall team knowledge and expertise of each other to be reliable, they can utilize the expertise of other members and the collective group knowledge without any suspicion or emotional hesitancy (Ekvall, 1996). Consequently, such a climate engendered by the credibility of team knowledge

motivationally supports the generation of creative ideas by easing the anxiety of employees in undertaking risky behaviors, such as utilizing the knowledge of other employees in developing creative initiatives (Hill, 2014). Therefore, Hypotheses 5 and 6 are proposed as follows:

Hypothesis 5: Specialization has a positive relationship with (a) incremental creativity and (b) radical creativity.

Hypothesis 6: Credibility has a positive relationship with (a) incremental creativity and (b) radical creativity.

Finally, this study proposes different strengths in the linear relationship between specialization and radical creativity, and that between specialization and incremental creativity. Although the emergence of both radical and incremental creativity requires highly specialized team knowledge structures, radical creativity is more dependent on such qualitative characteristic of knowledge resources (Madjar et al., 2011). The reason is that engagements in radical breakthrough, rather than minor adaptation, require more non-overlapping cognitive resources to allow further deviation from current products or practices (Paulus & Yang, 2000). Theories of novelty generation support such expectation as well. To generate radical insights, people should introduce diverse inputs to recombine ideas, broaden the pool of perceptual resources to explore solutions more thoroughly, or analyze different types of knowledge to further reinterpret the problem structures

(Ohlsson, 2011). Compared with conducting new experiments and radical breakthroughs, diversifying specialized knowledge is a relatively unimportant determinant in terms of undertaking minor adaptations in former practices. Such highly sophisticated knowledge may inhibit the basic compliance to existing practices, which will potentially hinder the generation of incrementally creative ideas. The foregoing predictions are integrated into Hypothesis 7.

Hypothesis 7: The relationship between specialization and radical creativity is stronger than that between specialization and incremental credibility.

3. Moderating Role of Knowledge Transforming Mechanism (KTM)

To methodically address the relationships between the sub-dimensions of TMS and various team performances, this study proposes the intervening role of KTM between such relationships. Knowledge transforming mechanism refers to team-level strategic cognitive efforts to effectively integrate and utilize the knowledge distributed among team members (De Luca & Atuahene–Gima, 2007). Transactive memory system refers to the shared cognitive system of collective knowledge (Peltokotpi, 2008); the performance implication of such knowledge management system may depend on how the team as a whole strategically uses such knowledge system in transforming the cognitive resources of team members into tangible team performances.

Specifically, this research regards KTM as a multi-dimensional construct

that incorporates three types of creative processes, namely, recombination, accumulation, and restructuring (Finke et al., 1992; Newell & Simon, 1972; Simonton, 1988). Recombination pertains to the cognitive efforts to cut across the different categories of knowledge to undertake change in perception (de Bono 1988). Accumulation denotes the intentional amassment of problem-relevant perceptual resources to explore solutions more thoroughly (Sternberg & Lubart, 1993). Restructuring refers to the exploration of the deep-level structure of a solution in a manner that allows the application of certain solutions to other types of problems (Dahl & Moreau, 2002). Overall, KTM represents team-level strategic initiatives to creatively address group problems by effectively utilizing the knowledge held by team members.

This study expects KTM to differently moderate the relationships between specialization and two types of creativity, as well as the relationship between coordination and routine performance. This differentiation originates from the distinct implications held by each TMS sub-dimension. Specifically, compared with specialization that is characteristic of group knowledge structure itself, coordination can be illustrated as a relational byproduct of a well-developed team knowledge system that facilitates collaborative team efforts (Duan, Li, Yu, & Zhang, 2014). Therefore, KTM will differently intervene with the aforementioned relationship in a way that exerts different functions on the knowledge itself and accompanies team collaboration.

First, KTM would positively moderate the relationship between specialization and each type of creativity. Specialization indicates the team knowledge structure of the specific team members who have highly specialized knowledge (Lewis, 2003). Such specialized knowledge structure also helps team members develop mutually redundant knowledge, thereby facilitating teams to establish a large stock of group knowledge (Duan et al., 2014). Previous studies have explored the relationship between knowledge stock, knowledge utilization, and creativity (Sung & Choi, 2012); hence, KTM is assumed to strengthen such positive relationship between specialization and each type of creativity. The reason is that various views and frameworks enabled by such abundant cognitive resources will be more beneficial in idea-generating activities that are accompanied by the intentional transforming of knowledge (Ohlsson, 2011). Moreover, when not properly transformed or combined into further creative ideas, the mutually redundant expertise may simply confuse team members in further accomplishing knowledge-intensive performances, thereby weakening the relationship between specialized group knowledge and knowledge-intensive performances. Therefore, I posit the following hypothesis:

Hypothesis 8: The greater the degree of knowledge transforming mechanism is, the stronger the positive relationship between specialization and (a) radical creativity and (b) incremental creativity.

This study proposes the compensatory role between KTM and coordination in predicting team routine performance. Based on the well-developed specialized knowledge structure, coordination facilitates the effective assigning of a group task to the eligible team member. Although such coordination among team members is beneficial in achieving team performance, previous studies have warned that such performance implications may be overshadowed by other group activities (i.e., group decision making, implicit coordination, and other knowledge practices) (Griffith & Sawyer, 2010). Therefore, in terms of collaborative team efforts, the additional introduction of KTM may potentially confuse team members in efficiently assigning a group task to the member with the appropriate knowledge. Thus, the co-existence of coordination and KTM may not hold such a large different influence in the efficient completion of core routine tasks. Nevertheless, a deficiency in either factor may also hinder the completion of core tasks. Accordingly, the following moderation hypothesis is posited:

Hypothesis 9: The greater the degree of knowledge transforming mechanism is, the weaker the positive relationship between the coordination and team performance becomes.

Ⅳ. METHODS

1. Data Collection

To validate the current research model, data were collected from work teams in Korean organizations; these teams perform various functions, such as general administration, operation, marketing, and research and development. Two types of questionnaire were used to preclude potential common method variances (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Specifically, three types of KEBs and three dimensions of TMS were measured from team members, whereas measures for team performance, radical/incremental creativity, and KTM were drawn from the questionnaires for team leaders.

Of the initial sample of 60 team leaders and 450 members, 56 team leaders and 360 members completed and returned their survey forms. After removing questionnaires with incomplete responses, team misidentification, and low within-team response rates, 49 questionnaires from leaders and 302 questionnaires from members were used for analysis. Thus, the final response rates of team leaders and team members were 81.67% and 67.11%, respectively. On average, each team in this final sample, including the leader, comprised 7 members (SD = 2.83), ranging from 3 to 16.

The final sample of team members included 24.20% females with an average age of 33.49 years (SD = 6.83) and an average organizational tenure of 5.80 years (SD = 6.39). They occupied different ranks, including rank-and-file

employees (43.1%), associates (27.7%), managers (18.6%), associate senior managers (6.2%), and senior managers or higher (4.4%). The educational levels of the respondents were high school or lower (2.1%), two-year college (8.7%), undergraduate degree (69.8%), and graduate degree (19.4%). The data also incorporated responses from 49 supervisors. Up to 94.1% of the supervisors were males with an average age of 44.31 years (SD = 5.87) and an average organizational tenure of 13.73 years (SD = 8.16). The hierarchical rank of supervisors varied from associates (3.9%), managers (19.6%), and associate managers (19.6%) to senior managers or higher (56.9%). In addition, the educational levels of the team leaders were two-year college (15.7%), undergraduate degree (41.2%), and graduate degree (43.1%).

2. Measures

As previously described, the variables for KEBs and TMS sub-dimensions were measured from the responses of team members, whereas the variables for team performance, incremental/radical creativity, and KTM were reported by team leaders. All of the variables were rated on a five-point Likert type scale ranging from 1 ("*strongly disagree*") to 5 ("*strongly agree*"). The responses of the group members were aggregated to the group level for analyses. All of the scales demonstrated acceptable levels of (a) scale reliability, (b) within-group agreement among team members, and (c) intraclass correlations that reflected the between-

group variations in member ratings along with the significant group-level effect.

Group Knowledge Exchange Behaviors. The KEB measures validated by Rhee and Choi (2014) were employed with a slight modification in their wording. Given that KEBs were measured as a collective phenomenon in the current study, the referent of the questionnaires was shifted from "I" to "My team" for the responses of the team members to represent the collective KEBs of their teams. Specifically, this scale comprises three types of KEBs, namely, knowledge sharing, knowledge hiding, and knowledge manipulating. The employees rated the 10 items of KEBs presented in Table 1, which were preceded by the following instruction: *"Knowledge refers to a certain fact, experience, information, and technology that can be earned through education, learning, mastery, and experience. Please think of recent interactions among team members in which some members requested knowledge from other members and how others responded to such requests"* (adapted from Connelly et al., 2012).

In particular, knowledge sharing [$\alpha = .89$, $r_{wg(j)} = .89$, ICC(1) = .08, ICC(2) = .35, $F = 1.53$, $p < .05$] comprises three items that are adapted from Connelly et al. (2012). This scale measures the extent to which the team members fully share their knowledge with other members. Three items for measuring knowledge hiding are also adapted from Connelly et al. (2012). Specifically, this measure integrates two types of knowledge hiding [$\alpha = .86$, $r_{wg(j)} = .85$, ICC(1) = .06, ICC(2) = .29, $F = 1.40$, $p = .05$], namely, "evasive hiding" and "playing dumb." Four items for

measuring knowledge manipulation are constructed based on the conceptual papers on motivated information exchange and distorted communication (Hislop, 2013; Empson, 2001). Knowledge manipulation scales [$\alpha = .86$, $r_{wg(j)} = .89$, ICC(1) = .07, ICC(2) = .32, $F = 1.46$, $p < .05$] assess the extent to which employees exaggerate the value of their knowledge by promoting the importance and downplaying the potential shortcomings of the knowledge and information that they possess. Specific items are presented in Table 1.

To confirm whether the factor structure of the modified scale of group KEB is congruent with the initially validated factor structures, exploratory factor analysis (EFA) was performed using CEFA 3.04. Maximum likelihood estimation and CF-Varimax oblique rotation were adopted to produce a plausible factor structure by precluding the potential factor collapse (Crawford & Ferguson, 1970; Browne, 2001). The EFA result indicated the reasonable fit of the hypothesized three-factor structure of the group KEB items ($\chi^2 = 27.44$, $df = 18$, RMSEA = .04). The rotated factor matrix of the three KEB scales is presented in Table 1.

Transactive Memory System. The TMS items developed by Lewis (2003) were adopted with a slight modification in their wording and composition. Specifically, the reverse-worded items were altered into straight-worded items because these items "introduce a statistically significant amount of error in the TMS measurement model" (Lewis, 2003, p. 601). Some mutually redundant items were also modified to simplify the composition of the questionnaires. These

modifications were supported by previous studies that demonstrated the statistical validity of employing the shortened measures of TMS (Marques–Quinteiro et al., 2013). The 10-item measure of TMS, which consists of the TMS sub-dimensions of specialization [$\alpha = .85$, $r_{wg(j)} = .91$, ICC(1) = .07, ICC(2) = .33, $F = 1.48$, $p < .05$], credibility [$\alpha = .78$, $r_{wg(j)} = .90$, ICC(1) = .07, ICC(2) = .32, $F = 1.48$, $p < .05$], and coordination [$\alpha = .89$, $r_{wg(j)} = .89$, ICC(1) = .16, ICC(2) = .53, $F = 2.15$, $p < .001$], was eventually validated. Specific items are presented in Table 2.

To verify the factor structure of the modified TMS measures, EFA was performed through maximum likelihood estimation and CF-Varimax oblique rotation. The EFA result indicated the reasonable fit of the hypothesized three-factor structure of TMS items ($\chi^2 = 82.09$, $df = 33$, RMSEA = .07). The rotated factor matrix of the TMS scales is presented in Table 2.

Table 1

Exploratory factor analysis results of the three types of KEBs

Items	Factor 1	Factor 2	Factor 3
Knowledge Sharing			
My team members looked into the request to ensure the accuracy of their answers.	.03	**.82**	.01
My team members explained everything thoroughly.	-.05	**.78**	-.04
My team members told the other members exactly what they needed to know.	-.06	**.79**	-.07
Knowledge Hiding			
My team members agreed to help others, but never really intended to help.	-.11	.06	**.75**
My team members pretended that they did not know the information.	.12	-.09	**.79**
My team members said that they did not know, even though they were aware of such information.	.18	-.05	**.65**
Knowledge Manipulation			
My team members padded their knowledge to make themselves seem more knowledgeable.	**.65**	.06	.16
My team members omitted potential problems that could be inherited from their knowledge.	**.80**	-.02	.01
My team members emphasized that the uncertainties in their knowledge had limited significance.	**.70**	-.08	.15
My team members equivocated with the core information while explaining their knowledge.	**.63**	-.19	.18

Table 2

Exploratory factor analysis results of TMS

Items	Factor 1	Factor 2	Factor 3
Specialization			
Each team member has a specialized knowledge on certain aspects of our project.	.08	.19	**.64**
The team members have knowledge about an aspect of the project that no other team member knows about.	.03	.01	**.88**
The specialized knowledge of several different team members was required to complete the project deliverables.	.03	.15	**.66**
Credibility			
My team members accept procedural suggestions from other team members.	.28	**.55**	-.04
My team members trust that the knowledge of the other members about the project is credible.	-.08	**.79**	.09
My team members have faith in the expertise of the other members.	-.03	**.67**	.24
Coordination			
Our team worked together in a well-coordinated fashion.	**.58**	.33	-.01
Our team had very few misunderstandings regarding our tasks.	**.79**	-.06	.15
We accomplished the task smoothly and efficiently.	**.77**	.10	.09
Our team did not encounter any confusion regarding how the task should be accomplished.	**.84**	.05	.07

Knowledge Transforming Mechanism. The lateral thinking, analogical thinking, and selective encoding and comparison items developed by Hanke (2006) were adopted and modified to measure KTM (α = .87). During the scale construction, a comprehensive review of literature on the theories of novelty generation was conducted to form an exhaustive set of KTM items that comprised representative knowledge practices that were undertaken by the team members of the organization. In the subsequent stage, experts in organizational behavior and cognitive psychology were involved to guarantee the content validity of the current measure. Sample items include the following: "*My team members attended to every piece of information that came our way,"* "*My team members spent considerable time deciding on whether we could adopt previous solutions to our current problems*," and "*My team members intentionally formed ideas that were radically different from those of the other team members*."

Routine Performance. Four items of task performance were adopted from Williams and Anderson (1991) to assess team routine performance (α = .91). The referent was shifted from "These employees" to "My team members" to conceptualize the team-level emergence of task performance. Sample items include "*My team members adequately complete their assigned duties*" and "*My team members perform the tasks that are expected of them*."

Incremental/Radical Creativity. The modified measures of radical/incremental creativity from Gilson and Madjar (2011) were adopted. Given

that team leaders are reliable sources of team dynamics, both radical creativity and incremental creativity were reported by team leaders. These leaders rated the radical/incremental creativity items that were preceded by the following instruction: "*When you think of ideas while working on this project, to what extent would you characterize these ideas?"* Sample items of radical creativity (α = .84) include "*Departure from what is currently performed/offered at the company*" and "*Discovery of new processes/products that are not currently being offered by the company.*" Sample items of incremental creativity (α = .88) include "*Extensions that are built on what is currently performed by the organization*" and "*Adaptation to existing processes/products that are being used in the company.*"

3. Analytic Strategies

The hypotheses were tested by two sets of hierarchical regression analyses. Team size and task type were included in the regression models as control variables. The relationships between KEBs and TMS sub-dimensions were examined in the first set of regression analyses, whereas the relationships between TMS sub-dimensions and (a) routine performance, (b) incremental creativity, and (c) radical creativity were tested in the second set. The moderating function of KTM was also examined in the second set by entering the interaction terms between TMS and KTM.

Ⅴ. RESULTS

1. Descriptive Statistics

Table 3 reports the means, standard deviations, and inter-correlations among the variables. Given that the main analysis investigates team-level relationships, all of the statistics that are presented in the table are based on the variables that are aggregated to the team level or are measured at the team level by team leaders.

Table 3

Descriptive statistics and inter-correlations

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Team Size	8.45	3.92	--											
2. Task Type	.10	.30	.05	--										
3. Knowledge Sharing	3.62	.29	-.01	.24	--									
4. Knowledge Hiding	2.23	.29	.11	-.25	-.50**	--								
5. Knowledge Manipulation	2.30	.29	.29*	-.22	-.46**	.63**	--							
6. Specialization	3.70	.29	-.05	.23	.59**	-.54**	-.35*	--						
7. Credibility	3.68	.24	-.14	.35*	.57**	-.51**	-.52**	.66**	--					
8. Coordination	3.50	.41	.08	.35*	.60**	-.31*	-.50**	.50**	.49**	--				
9. KTM	3.56	.66	.02	.04	.22	-.06	-.04	.05	.06	.19	--			
10. Routine Performance	3.69	.79	-.06	.10	.46**	-.15	-.23	.23	.19	.40**	.74**	--		
11. Incremental Creativity	3.63	.63	.22	-.05	.22	-.09	-.15	.04	.06	.15	.59**	.46**	--	
12. Radical Creativity	2.83	.62	-.17	.20	.40*	-.40**	-.31*	.38**	.31*	.20	.59**	.53**	.29*	--

Note: n = 49

* $p < .05$, ** $p < .01$

2. Hypothesis Testing

Table 4 presents the results from the hierarchical regression analyses for the relationships between the knowledge sharing, knowledge hiding, and knowledge manipulating behaviors of team members and the TMS sub-dimensions of specialization, credibility, and coordination. Hypothesis 1 proposed that knowledge sharing was positively related to specialization (b = .43, p < .01). Knowledge sharing was also significantly related to credibility (b = .29, p < .05) and coordination (b = .65, p < .001). Contradictory to Hypothesis 2, knowledge hiding was not a significant predictor of credibility (b = -.12, *ns*) and was a negative and significant predictor of specialization (b = -.37, p < .05). These results also supported Hypothesis 3, which posited that coordination was negatively predicted by knowledge manipulation (b = -.61, p < .01).

The relationships between the TMS sub-dimensions and the three constructs of team effectiveness, namely, radical creativity, incremental creativity, and routine performance, were tested by conducting a series of regression analyses. As reported in Model 2 of Table 5, specialization was positively yet marginally related to radical creativity (b = .72, p < .10). Although limited, these results provided empirical support for Hypothesis 5b. However, credibility did not manifest any statistically significant relationship with radical creativity, thereby contradicting Hypothesis 6b. Model 5 of Table 5 reveals no significant relationships between TMS sub-dimensions and incremental creativity, thereby

contradicting Hypotheses 5a and 6a. Model 8 of Table 5 showed a positive and significant relationship between coordination and team performance ($b = .79$, $p < .05$), which confirmed Hypothesis 4.

Hypothesis 7 posited that specialization was more strongly associated with radical creativity rather than with incremental creativity. Contrary to our expectation, the difference in their coefficients that was associated with radical creativity and incremental creativity did not manifest a statistically significant difference ($F = .68$, *ns*), thereby contradicting Hypothesis 7.

Table 4

Hierarchical regression analysis results: Relationships between KEBs and TMS

Variables	Outcome: Specialization		Outcome: Credibility		Outcome: Coordination	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Step 1: Controls						
Team Size	-.01 (.01)	-.01 (.01)	-.01 (.01)	-.01 (.01)	.01 (.01)	.02 (.01)
Task Type	.22 (.13)	.05 (.11)	.29 (.10)**	.15 (.09)†	.47 (.17)*	.26 (.14) †
Step 2: Main effects						
Knowledge Sharing		.43 (.13)**		.29 (.11)*		.65 (.17)***
Knowledge Hiding		-.37 (.15)*		-.12 (.12)		.31 (.20)
Knowledge Manipulating		.12 (.15)		-.16 (.12)		-.61 (.20)**
F	1.43	6.79***	4.22*	7.51***	3.41*	9.12***
R^2	.06	.44	.15	.46	.13	.51

Note: n = 49. Values in parentheses are standard errors.

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 5
Hierarchical regression analysis results: Relationships between TMS and team effectiveness variables

Variables	Outcome: Radical Creativity			Outcome: Incremental Creativity			Outcome: Team Performance		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Step 1: Controls									
Team Size	-.03 (.02)	-.02 (.02)	-.02 (.02)	.03 (.02)	.04 (.02)	.03 (.02) †	-.01 (.03)	-.02 (.02)	-.02 (.02)
Task Type	.43 (.29)	.25 (.31)	.30 (.24)	-.12 (.29)	-.28 (.33)	-.30 (.25)	.28 (.37)	-.07 (.39)	.02 (.25)
Step 2: Main effects									
Specialization		.72 (.41) †	1.67 (2.42)		-.12 (.43)	-5.71 (2.53)*		.15 (.52)	3.70 (2.48)
Credibility		.06 (.50)	1.19 (2.30)†		.24 (.27)	3.44 (2.40)		-.17 (.64)	-4.30 (2.35)†
Coordination		-.01 (.25)	-.64 (1.08)		.25 (.54)	2.90 (1.13)*		.79 (.32)*	2.28 (1.10)*
Step 3: Moderator									
KTM			.44 (.40)			.20 (.42)			.40 (.41)
Spec * KTM			-.05 (.12)			.30 (.13)*			.18 (.13)
Cred * KTM			.02 (.06)			-.17 (.13)			-.11 (.05) †
Coor * KTM			-.06 (.13)†			-.15 (.06)*			.23 (.13) †
F	1.82	1.99†	5.29***	1.26	.79	4.64***	.39	1.84	10.25***
R^2	.07	.19	.54	.05	.08	.51	.02	.18	.70

Note: n = 49. Values in parentheses are standard errors.
† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

After testing the main effect hypotheses, the moderating effect of KTM was subsequently tested by entering the interaction terms between the TMS sub-dimensions and KTM. First, the interaction between specialization and KTM was revealed to be a significant predictor of incremental creativity ($b = .30$, $p < .05$). To prove the specific pattern of interaction, a simple slope analysis was performed (Aiken & West, 1991). As shown in Figure 2, specialization was a significant negative predictor of incremental creativity for teams with low KTM ($b = -1.39$, $p < .05$). Therefore, Hypothesis 8 was partially supported. Hypothesis 9 posited that KTM had a complementary role between coordination and team performance. The simple slope analysis results in Figure 3 indicated that coordination was positively related to incremental creativity, especially for teams with low KTM ($b = .66$, $p < .05$), thereby contradicting Hypothesis 9.

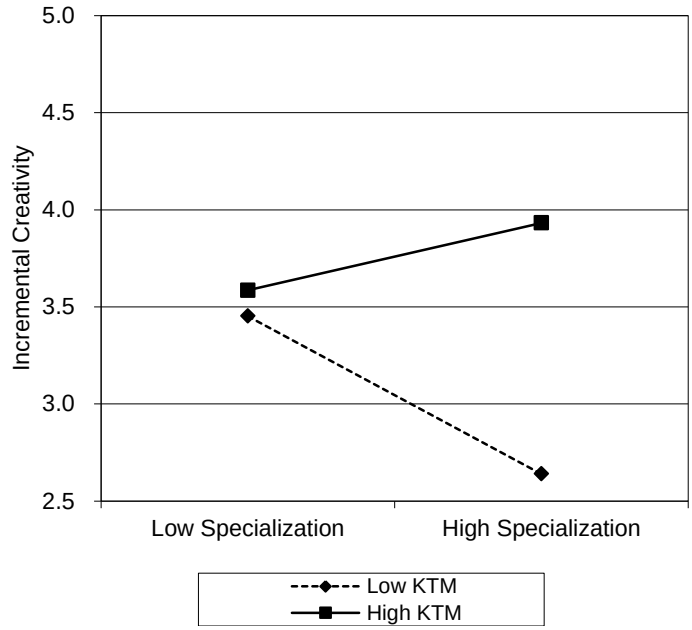

Figure 2. Interaction between specialization and KTM in predicting incremental creativity

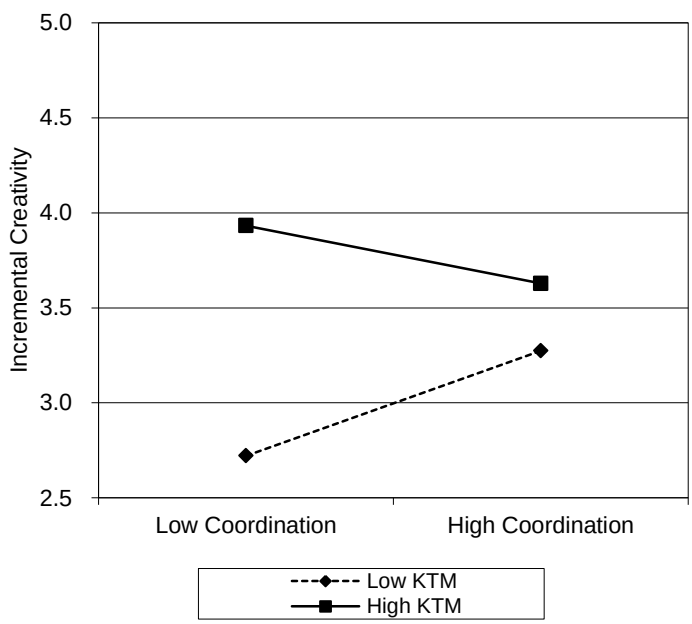

Figure 3. Interaction between coordination and KTM in predicting incremental creativity

Ⅵ. DISCUSSION

1. Summary of the Findings

The knowledge exchange dynamics among team members can be an antecedent of the collective knowledge system and the subsequent performance of a team (Mesmer–Magnus & Dechurch, 2009). The present study provides critical insights into the formative processes of the transactive memory system (TMS) by examining the different types of team knowledge exchange behaviors (KEBs) (i.e., knowledge sharing, hiding, and manipulating) as anteceding variables. This study also demonstrates how the sub-dimensions of TMS engender distinct implications on the different types of team performance constructs, namely, routine performance, incremental creativity, and radical creativity. In the current theoretical framework, the moderating function of KTM on the relationship between TMS and each team performance variable is also investigated.

Each KEB has a unique relational pattern with each TMS sub-dimension, which indicates the distinct role of each KEB in the emergence of a collective group knowledge system (Hollingshead & Brandon, 2003). Moreover, deviating from the previous research that examined TMS as a unitary factor and neglected its multi-dimensional structures (Duan et al., 2014), the present study reveals the empirical benefits of utilizing each TMS sub-dimension.

The positive relationships between knowledge sharing and the three sub-dimensions of TMS, namely, specialization, credibility, and coordination, are all

verified in the analyses. Empirical patterns support the critical role of knowledge sharing as a representative method of communication that facilitates the emergence of TMS. By honestly communicating the knowledge, teams can specify those members who possess the required knowledge and then develop specialized knowledge among their members (Lewis, 2003). The effectiveness of knowledge sharing invigorates the trustworthiness of the team knowledge structure as well. When the entire group shares knowledge effectively and efficiently, effective and efficient collaborations are also formed among team members without any relational cacophony.

Although not hypothesized, this paper illustrates the negative relationship between knowledge hiding and specialization. Based on the definition of knowledge hiding, such relationship is theoretically plausible and has been strongly supported by previous studies. According to Černe et al. (2014), knowledge hiding interrupts collective informational flows and subsequently prevents team members from identifying the specific member who possesses the required specific category of knowledge and expertise. Therefore, collective engagement in knowledge hiding can increase confusion among team members, which will then interrupt them from developing a unique expertise. One of the flaws in this study is the nonsignificant relationship between knowledge hiding and credibility. However, two variables show high statistics in the zero-order correlation analysis (r = -.51, p < .01, respectively). Given the relatively high correlations among KEBs, we may assume

that a nonsignificant relationship between two variables can be partially attributed to the statistical suppression among the study variables (Lewis–Beck, Bryman, & Liao, 2003).

As expected, knowledge manipulation was negatively related to coordination among team members. Catastrophic results may emerge when team members mutually manipulate their knowledge with deceptive motivation. Specifically, when team members collectively engage in deceptive behavior, unnecessary informational noise becomes prevalent within the team, and then the collective knowledge system becomes ineffective and subsequently interrupts effective group collaboration (Steinel et al., 2010). Although team members can confront their problems, they may experience difficulties in assigning the task to a capable employee because meta-cognition in team knowledge is contaminated by informational noise (Marques–Quinteiro et al., 2013). Previous studies also suggested that undertaking such selfish behavior could induce conflicts within the team, which would interrupt coordination among team members (Bendersky & Hays, 2012).

The second half of the theoretical model proposed the hypothetical relationships between the sub-dimensions of TMS and the different types of team performances, including incremental creativity, radical creativity, and routine performance. Among all of the hypothesized main effect relationships, specialization was positively yet marginally related with radical creativity, which

emphasized the importance of the qualitative characteristics of the collective knowledge system in initiating radical breakthroughs (Madjar et al., 2011). Specifically, if the team knowledge structure is highly specialized in the various types of expertise of each member, such group knowledge stock provides a fundamental ground for further developing highly radical ideas (Paulus & Yang, 2000). However, contrary to our expectation, specialization did not have a significant relationship with incremental creativity, which indicated that highly specialized knowledge might prohibit the compliance of team members to existing practices, subsequently interrupting them from undertaking minor adaptations.

Coordination is also positively and significantly related with team performance, especially with the efficient completion of core organizational tasks (Marques–Quinteiro, 2013). Such relationship reveals the importance of the harmonious collaboration that is induced by TMS, rather than by the qualitative characteristic of knowledge, in completing core routine jobs. Specifically, this result implies that assigning the jobs to the most eligible employee who is most knowledgeable about a specific topic may be a core preceding factor that enables the effective completion of routine tasks. Together with the previously discussed relationship between specialization and radical creativity, this study explains the importance of the qualitative aspect of knowledge system in idea-generating performance as well as the importance of the relational aspect of the knowledge system in completing routine tasks.

This study also revealed several meaningful patterns in moderation analyses. The interactions between KTM and TMS were only significantly related with incremental creativity, which in turn had no meaningful direct relationship with TMS. This finding could be attributed to the mixed characteristics of incremental creativity between routine performance and radical creativity. Therefore, to detect a meaningful pattern between knowledge system and incremental creativity, the problem-solving orientation of the team, rather than the direct relationship between radical creativity and routine performance, must be considered.

With regard to specific interaction patterns, first, specialization was negatively related to incremental creativity when a team poured less effort in adopting KTM. Therefore, when team members do not strategically utilize highly specialized team knowledge, various types of expertise can adversely interrupt the generation of creative ideas with minor adaptation. Specifically, specialized knowledge may induce conflicting views among team members, which will inhibit their fundamental reliance on existing practices. Second, the interaction between coordination and KTM also had a significant relationship with incremental creativity. Specifically, coordination and KTM had a complemental role in predicting incremental creativity in such a way that the presence of either one of these variables could sufficiently enhance incremental creativity.

2. Theoretical and Practical Implications

Group knowledge exchange is one of the important drivers that facilitate the development of TMS, which in turn influences various types of team performances. By conceptualizing various types of KEBs as a group phenomenon, this study provides a fundamental ground for investigating how organizational teams manage their knowledge beyond the amount of knowledge that they share.

This study also reveals the distinct performance implications of each TMS sub-dimension. Specifically, coordination, which refers to the "effective, orchestrated knowledge processing" (Lewis, 2003, p. 589), has a meaningful relationship with routine performance, whereas specialization, which pertains to the "differentiated structure of members' knowledge" (Lewis, 2003, p. 589), has a meaningful relationship with radical creativity. Overall, each social and cognitive aspect of TMS engenders idiosyncratic performance implications.

Together with previous research on individual knowledge exchange, this study provides a practically significant insight into how to effectively coordinate and utilize individual resources for accomplishing collective organizational goals. According to Rhee and Choi (2014), knowledge manipulation is an effective strategy for achieving an excellent performance. However, the present research reveals that knowledge manipulation negatively affects team performance via coordination (estimates = -.50, $p < .05$). These results indicate the dilemmatic structure of knowledge exchange, in which following the private benefits will

decrease the collective benefits. Therefore, further solutions for the misalignment between individual and collective outcomes of undertaking KEBs must be proposed to establish an effective organizational functioning.

3. Study Limitations

The findings must be interpreted in consideration of the limitations of this paper. First, all of the variables were collected at an identical period. Therefore, the causal relationship among the study variables could not be justified easily (Cook & Campbell, 1979). Although theoretically less plausible, TMS may influence group KEBs and subsequent team performances. To eliminate such reverse causality issues, future studies must retest the conceptual framework by adopting a longitudinal panel design or a controlled experimental research design.

Second, the scores of routine performance, incremental creativity, and radical creativity that were used in this study were subjectively reported. Such practice might induce spurious relationships or high correlations among the study variables because team leaders might become confused regarding the differences among various types of positive team performances. However, the operationalization of the subjective scores of creativity has been frequently employed in previous research, thereby partially supporting the adoption of subjective scores in creativity in this study (Å stebro & Koehler, 2007). Future research must reexamine the proposed relationships using the objective measures

of team performances, such as financial performance and tangible creative output.

Third, only acceptable levels of agreement among team-level variables, such as TMS and KEBs, were revealed in this study, which could be attributed to the limitation of the adopted scale or of the participants. Based on the measurement statistics, future research must replicate the present ideas with more refined scale items.

Finally, this study recruited participants from Korean organizations with relatively high levels of collectivism (Hofstede, 1983). Given the different individual and workplace characteristics that were embedded in the practices of such organizations, the empirical relationships among the employees of these organizations could differ from those among the employees of a Western company. Therefore, to generalize the present findings, future research must further validate the current research framework using samples from various cultural contexts.

Ⅶ. CONCLUSION

Every person is unique, and no two individuals have exactly the same knowledge. In this regard, each person has a unique role in exchanging knowledge within a team. Accordingly, an organizational team, which consists of several employees, needs to utilize its resources to achieve effective organizational functioning. Consistent with the findings from the present study, an organizational team does not merely share knowledge, but also hides and manipulates knowledge. Such knowledge exchange dynamics are significant preceding factors of the team knowledge system, which in turn influence the effective problem-solving skills of a group according to the degree of KTM that is adopted by the team.

By investigating the mediating mechanisms that connect group knowledge exchange and team performance, such as group cognition or emotion, future studies may reveal deeper implications of team knowledge exchange in the workplace. The antecedents of group knowledge exchange are similarly an important subject that merits further investigation. Expanding the present understanding on the conflicts between individual and group knowledge exchange dynamics may enable corporates to pool and coordinate their organizational resources throughout their companies and enhance their effective functioning. In sum, as one of the timeliest and emerging fields in organization literature, group knowledge exchange still has numerous unanswered questions to be addressed.

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APPENDIX

Survey Instrument

Knowledge Sharing

1. My team members looked into the request to ensure the accuracy of their answers.
2. My team members explained everything thoroughly.
3. My team members told the other members exactly what they needed to know.

Knowledge Hiding

1. My team members agreed to help others, but never really intended to help.
2. My team members pretended that they did not know the information.
3. My team members said that they did not know, even though they were aware of such information.

Knowledge Manipulating

1. My team members padded their knowledge to make themselves seem more knowledgeable.
2. My team members omitted potential problems that could be inherited from their knowledge.
3. My team members emphasized that uncertainties in their knowledge had limited significance.
4. My team members equivocated with the core information while explaining their knowledge.

TMS – Specialization

1. Each team member has a specialized knowledge on certain aspects of our project.
2. The team members have knowledge about an aspect of the project that no other team member knows about.
3. The specialized knowledge of several different team members was required to complete the project deliverables.

TMS – Credibility

1. My team members accept procedural suggestions from other team members.
2. My team members trust that the knowledge of the other members about the project is credible.
3. My team members have faith in the expertise of the other members.

TMS – Coordination

1. Our team worked together in a well-coordinated fashion.
2. Our team had very few misunderstandings regarding our tasks.
3. We accomplished the task smoothly and efficiently.
4. Our team did not encounter any confusion regarding how the task should be accomplished.

Knowledge Transforming Mechanism

1. My team members attended to every piece of information that came our way.
2. My team members attempted to explore and understand the various pieces of information that pertains to our project.
3. My team members spend considerable time deciding whether we can adopt our previous solutions to our current problems.
4. My team members often view the problems from different perspectives.
5. My team members intentionally form ideas that are radically different from those of the other members.

Routine Performance

1. Adequately completes the assigned duties
2. Fulfills the responsibilities that are specified in the job description
3. Performs the tasks that are expected of him/her
4. Meets the formal performance requirement of the job

Incremental Creativity

- When you think about the ideas that you came up with while working on this project, to what extent would you characterize them?

1. Extensions that are built on what is currently performed by the organization
2. Adaptations to existing processes/products that are being used in the company
3. Refinements of how things are currently performed/what is currently done in the company

Radical Creativity

-When you think about the ideas you came up with while working on this project, and to what extent would you characterize them?

1. Departure from what is currently performed/offered in the company.
2. Discovery of new processes/products that are currently not being offered by the company
3. Radical inventions that are beyond existing processes/products

요약 (국문초록)

거래적 기억체계 형성 및 집단 효과성에 대한 집단적 지식 교환 행동의 영향

서울대학교 대학원

경영학과 경영학전공

이 영 원

팀의 지식 교환 행동에 대한 기존 연구들은 주로 팀원들이 얼마나 자신들의 지식을 공유하는지에 초점을 맞춰 진행되어 왔다. 이러한 기존 연구들의 흐름에서 벗어나며, 팀의 지식 교환 행동의 복잡한 역동에 대해 보다 정교한 설명을 제시하기 위해 본 연구에서는 조직 내 업무 집단들이 보다 다양한 지식 교환 행동, 즉, 지식 공유, 지식 숨김, 그리고 지식 조작 행동을 보일 수 있는 지를 검증한다.

본 연구는 또한 각각의 지식 공유 행동과 거래적 기억 체계, 즉, 팀 지식에 대한 집단적 기억 체계의 관계를 검증한다. 특히, 거래적 기억

체계를 단일 구성 개념으로 가정하고 검증하였던 기존 연구들에서 탈피하여 본 연구는 집단적 기억 체계 하위 요소(전문화, 신뢰성, 협조)들에 주목한다. 특히, 지식 공유는 전문화와 정의 관계를 가질 것으로 예측되며, 지식 숨김은 신뢰성과 음의 관계를 가질 것으로 예측되며, 지식 조작은 협조와 음의 관계를 가질 것으로 예측된다.

집단적 기억 체계에 대응되는 성과변수로는 일상적 업무 성과, 점진적 창의성, 급진적 창의성이 고려된다. 전문화 및 신뢰성은 점진적 창의성 및 급진적 창의성과 정의 관계를 가질 것으로 예측되며, 팀원 간의 협조는 일상적 업무 성과와 정의 관계를 가질 것으로 예측된다. 또한, 본 연구에서는 지식 변환 기제가 조절 변인으로서 고려된다. 특히, 지식 변환 기제는 전문화와 창의성의 정적 관계를 더욱 강화시킬 것으로 예측되며, 팀원 간의 협조와는 보완적 관계를 나타낼 것이라 예측된다.

본 연구의 가설들은 한국 조직의 49 개 팀에서 수집된 데이터를 기반으로 검증되었다. 지식 공유는 전문화, 신뢰, 그리고 협조 모두와 정의 관계를 갖는 것으로 나타났다. 지식 숨김은 전문화와 부적 관계를 갖고 있으며, 지식 조작은 협조와 부적 관계를 맺고 있는 것으로 나타났다. 전문화는 급진적 창의성과 정적 관계를 갖고 있는 것으로 드러났으며, 지식 변환 기제를 적게 도입한 팀에 한해 점진적 창의성과 부적 관계를 갖고 있는 것으로 나타났다. 팀원 간의 협조는 일상적 업무 성과와 정의

관계를 갖는 것으로 나타났으며, 점진적 창의성에 대해 지식 변환 기제와 보완적 관계를 갖는 것으로 드러났다.

경험적 결과들을 바탕으로, 본 연구는 지식 교환, 거래적 기억체계, 그리고 창의성 연구들에 이론적인 공헌을 한다. 또한, 지식 변환 기제의 실용적 역할 및 복잡한 개인 및 지식 교환 행동의 역동을 증명함으로 본 연구는 실무적인 함의를 갖는다. 결론적으로 본 연구는 조직 내 업무 집단의 복잡한 지식 교환 역동을 검증하고, 집단적 지식 체계 및 다양한 집단 성과에 대해 각각의 지식 교환 행동이 미치는 영향을 경험적으로 타당화한다.

주요어: 지식 교환 행동, 거래적 기억 체계, 팀 효과성, 지식 변환 기제, 팀수준 분석

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