Employee Knowledge Sharing in Work Teams:
Effects of Team Diversity, Emergent States, and Team Leadership

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ABSTRACT

Knowledge sharing in work teams is one of the critical team processes. Without sharing of knowledge, work teams and organizations may not be able to fully utilize the diverse knowledge brought into work teams by their members. The purpose of this study was to investigate antecedents and underlying mechanisms influencing the extent to which team members share their knowledge with one another. Specifically, this study aimed to examine whether and how team members' team identification, psychological safety mediate the effects of perceived disparity on employee knowledge sharing. In addition, this study seek to investigate the moderating effects of transformational team leadership.

A correlational design was used to collect and analyze survey data. Data were collected from a cross-sectional sample of 240 Korean employees of for-profit organizations in South Korea. The findings of this study indicated that perceived disparity (PD) negatively predicted knowledge sharing behavior (KSB). Also, both team identification (TI) and psychological safety (PS) mediated the relationship between PD and KSB. Furthermore, the strength of the mediated relationships between PD and KSP via TI became weaker or nonsignificant under high transformational team leadership than under low transformational team leadership. However, the strength of the mediated relationships between PD and KSP via PS became stronger and significant under high transformational team leadership than under low transformational team leadership. The findings of this study can provide the conceptual basis for interventions that are designed to promote knowledge sharing within work teams. Theoretical and practical implications are discussed, along with limitations of the study and directions for future research.

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CHAPTER 1

INTRODUCTION

As environmental conditions of organizations have been rapidly shifting, CEOs around the world identify creativity, innovation, and organizational learning among their core competencies for sustainable competitive advantages (IBM Global Business Services, 2008). In an effort to secure these capabilities, organizations have made increased use of team-based organizational structures integrating diverse experiences, expertise, and perspectives of their employees into work groups and teams (Cohen & Bailey, 1997; Kozlowski & Ilgen, 2006; Mathieu, Maynard, Rapp, & Gilson, 2008). In fact, as Goodman (1986, p. 120) stated, "Groups are a pervasive phenomenon in our society. In organizations they are central building blocks for getting work done," work teams in many of today's organizations perform critical tasks such as developing strategies, designing and producing products, delivering services, and executing other key tasks that influence organizational performance (Horwitz, 2005; London & Sessa, 2006).

A central premise of using work teams in organizations has to do with taking advantage of the diverse information, expertise, and perspectives of all members as an important asset for enabling a collective learning, advancing work processes, and enhancing organizations' ability to identify new opportunities (Bunderson & Sutcliffe, 2002; Bunderson & Reagans, 2011; Mesmer-Magnus & DeChurch, 2009; van Knippenberg & Schippers, 2007). For example, Bunderson and Reagans (2011) stated that:

> group or organization members gain a broader and more robust understanding

> of past actions and future possibilities by utilizing the different information, insight, and perspectives of all unit members. … Moreover, differences in perspective and experience make it possible for organizational members to learn from one another through the formal or informal transfer of knowledge and best practices across individuals or units. (p. 1185)

In other words, organizations expect that superior products and greater performance are more likely to happen when they have work teams whose members can draw from different pools of knowledge and experience.

While work teams represent an important managerial vehicle to bring individuals with diverse knowledge to work together, capitalizing on the benefits of this expanded knowledge base in a team can be challenging at least for the following two reasons. First, although a more heterogeneous set of knowledge may be beneficial, the very nature of differences in perspectives and experiences makes it difficult for team members to communicate, collaborate, and coordinate their work (Dahlin, Weingart, & Hinds, 2005; William & O'Reilly, 1998). Moreover, power and authority differences also complicated these team interaction processes, which are inherent in teams and organizations because of their hierarchical nature (Tyler & Lind, 1992; Yang, Mossholder, & Peng, 2007). Second, it is not certain that team members who have a relevant education background, functional experiences, or unique perspectives will share their private knowledge with fellow team members (Bunderson & Reagans, 2011; Egan, 2005; van Ginkel & van Knippenberg, 2008). This seemingly simple and obvious mechanism of sharing knowledge openly turns out to be fraught with difficulty (Cohen & Bailey, 1997; Cronin & Weingart, 2007; Ilgen, Hollenbeck, Johnson, Jundt, 2005).

This might be a very critical problem since without sharing of knowledge, work teams and organizations may not be able to fully utilize the diverse knowledge brought into the teams by their members (Srivastava, Bartol, & Locke, 2006; Zarrage & Bonache, 2003). Therefore, understanding how to facilitate knowledge sharing within a demographically and hierarchically diverse work team so as to fully utilize its expanded knowledge base has become an important research agenda for human resource development (HRD) and knowledge management (KM) scholars and practitioners (Ardichvili, 2002; London & Sessa, 2007; McCarthy & Garavan, 2008). What can ensure that the positive aspect of diversity outweighs the constraints frequently associated with the diversity, and turns it into superior team performance and learning? I address this question by examining the role that team diversity, emergent states, and team leadership can play in work teams setting.

Statement of the Problem

Knowledge sharing, "the act of making knowledge available to others within the organization" (Ipe, 2003, p. 341), is a conscious, voluntary action by an employee who is involved in the process of knowledge exchange (Davenport & Prusak, 1998). The initial research and practices in knowledge sharing have been dominated by technology-driven perspectives (Cabrera et al., 2006; Davenport, De Long, & Beers, 1998; KPMG, 2000). While early technology-driven approaches have made a crucial contribution through the development of numerous information and communication systems supporting knowledge sharing, a number of studies have shown that technology alone cannot guarantee knowledge sharing (Cabrera et al., 2006; Connolly & Thorn, 1990; Cross, Parker, Prusak, & Borgatti, 2001; Davenport & Prusak, 1998; Ipe, 2003).

Building on this prior research, scholars and practitioners in the field of HRD and KM have argued that social and psychological people-related variables constitute key success factors for knowledge sharing and recent studies (e.g., Cabrera et al., 2006; Ipe, 2003) have focused on non-technological, people-related factors influencing employee knowledge sharing such as individual characteristics (e.g., personality, general mental ability, self-efficacy) and organizational context (e.g., organizational structure, culture, HR practices).

Although extant literature on people-related factors influencing employee knowledge sharing offered valuable insights on employees' decisions to share knowledge, there are several important questions unanswered. First, previous studies on antecedents of employee knowledge sharing have revealed a limited interest in the effects of team diversity and team member's emergent states (e.g., team identification, psychological safety) on knowledge sharing behavior (Wang & Noe, 2010). For example, in their review of knowledge sharing literature published since 1999 through early 2008, Wang and Noe (2010) noted that "only a few studies have investigated a small number of team characteristics and processes in relation to knowledge sharing" (p. 119). From a theoretical standpoint, the lack of research on team characteristics and processes of knowledge sharing is problematic, since theories predicting individuals' knowledge sharing behaviors at the organizational level of analysis may not necessarily explain the same behaviors in a work team setting (Klein, Tosi, & Cannella, 1999).

Second, although capitalizing on diversity in team members' experience, expertise, and perspective is a primary reason underlying the pervasive practice of using work teams as a fundamental unit of organizations (Kearney & Gebert, 2009, van

Knippenberg et al., 2004), the effects of team diversity on knowledge sharing are not yet fully understood (Curseu & Schruijer, 2007). Past studies also showed that team diversity has positive effects as well as negative effects on employee behaviors in work teams (e.g., Jackson et al., 2003; Van Knippenberg & Schippers, 2007; Williams & O'Reilly, 1998). For example, as Curseu and Schruijer (2007) stated, "it is generally believed that heterogeneous groups are more creative and reach better decisions, yet experience more difficult group interaction processes (e.g., suboptimal communication, conflict, stereotyping) than homogeneous groups" (p. 190). Given the findings that there seem to be no reliable and generalizable main effects of team diversity, further research is needed to examine when and how differences among team members either benefit or impede employee knowledge sharing in work teams (Kearney & Gebert, 2009; van Knippenberg et al. 2004).

With respect to the underlying mechanisms intermediating the effects of team diversity on employee knowledge sharing, team effectiveness literature has indicated that team emergent states-cognitive, motivational, and affective states of teams-may play a critical role in mediating the members' interactions directed toward achieving collective goals ((Marks, Mathieu, & Zaccaro, 2001). For example, in her study on team learning, Edmondson (1999) showed that psychological safety, defined as "a sense of confidence that the team will not embarrass, reject, or punish someone for speaking up" (p. 354), facilitates the team learning behaviors such as asking a question, seeking feedback, reporting a mistake, or proposing a new idea. In addition, researchers suggest that team identification may have a crucial role in mitigating the negative effects of diversity (e.g., intergroup bias; Williams & O'Reilly, 1998) resulting from social

categorizing processes (Hobman & Bordia, 2006; Jehn & Bezrukova, 2010; Kearney, Gebert, & Voelpel, 2009). Building on these studies on team emergent states, it is therefore reasonable to propose that the degree of team identification and psychological safety of members may mediate the effects of diversity on knowledge sharing in work teams. Yet, few studies have directly examined the mediating effects of these emergent states on knowledge sharing in work teams.

Lastly, team leader's behaviors have been shown to affect the internal dynamics of a team, in particular influencing team process and emergent states, including psychological safety and team identification (Edmondson, 1999; Kaiser, Hogan, & Craig, 2008; Nembhard & Edmondson, 2006). Since team members, as demonstrated by Tyler and Lind (1992), are highly attuned to the behavior of team leaders and examine their actions for information about what is expected and acceptable in team interactions. For example, when team leaders take an authoritarian stance and use their power as a means for advancing their personal interests (e.g., dominance, control, or prestige), team members are more likely to feel that voluntary activities such as asking questions, expressing different perspectives, and discussing errors in the team is risky and unsafe (McClelland, 1975; Nembhard & Edmondson, 2006). In contrast, when a leader shows transformational team leadership by using their authority and power as a means for pursuing collective goals and concerns, team members are likely to feel greater collective team identification and psychological safety in the team and in their interactions with each other (Srivastava et al., 2006). Yet, there is little research that examines the possible link between team leaders' leadership behavior and team diversity, emergent states, and employee knowledge sharing. The influence of employees'

perceptions of their leader's behavior on the likelihood that employees will share knowledge is an important hitherto unexamined research area.

Purpose of the Study and Research Questions

The purpose of this study is to advance the current understanding of knowledge sharing in work teams by examining antecedents and underlying mechanisms influencing the extent to which team members share their knowledge with one another. Specifically, this study aims to examine whether and how team members' emergent states mediate the relationship between team diversity and employee knowledge sharing. In addition, this study seeks to investigate the effects of team leadership on the relationship between team diversity, team emergent states and knowledge sharing. In sum, this study addresses the following research question:

> **Under what conditions do employees within a work team share their knowledge with fellow team members?**

In answering this question, I examine the following aspects of the question:

- What is the relationship between team diversity and knowledge sharing in work teams?
- Is the relationship between team diversity and employee knowledge sharing influenced by emergent states of team members?
- Is the relationship between team diversity, emergent states, knowledge sharing influenced by team leader behaviors?

The hypotheses supporting these research questions are documented at the end of the literature review.

Significance of the Study

This study is linked to existing research and further attempts to extend the literature on knowledge sharing, workplace diversity, team effectiveness, and team leadership. The study findings will offer theoretical and practical insight into the micro-social processes that are the foundation of knowledge sharing, which is the heart of an organization's ability to learn, innovate, and prosper. First of all, the issue of facilitating the knowledge sharing in work teams might be one of central concerns since a growing body of research has consistently shown that work teams play a vital role in organizational learning and innovation as a collaborative work platform, and the ability to share knowledge is a key prerequisite in organizational learning and performance (Ardichvili, 2002; Cabrera & Cabrera, 2002; Egan, 2005; Horwitz, 2005; Knapp, 2010; London & Sessa, 2006; McCarthy & Garavan, 2008; Senge, 1990). In other words, knowledge sharing in work teams is a fundamental performance behavior necessary for achieving, sustaining, or improving organizational effectiveness in a rapidly changing environment (Edmondson et al., 2007; Senge, 1990). Understanding the factors that promote or inhibit knowledge sharing in work teams, therefore, is an important research agenda for scholars and practitioners in HRD and KM (Ardichvili, 2002; London & Sessa, 2007; McCarthy & Garavan, 2008).

Second, the present study seeks to examine the antecedents and underlying mechanisms affecting the extent of team members' knowledge sharing. In the dynamic, global environment, it is the position of many organizations that "diversity contributes to an increased reservoir of experience, expertise, knowledge, perspectives, and skills that, when tapped, can contribute to organizational excellence" (Egan, 2005, p. 207).

Although workplace diversity can provide tremendous opportunities for creativity and innovation in organizations, the challenges of capitalizing on these opportunities are significant (van Knippenberg et al., 2004). One of the main challenges is how to encourage team members to work together to exchange, discuss, and integrate their diverse perspectives and unique ideas toward collective creative results (Ardichvili, Page, & Wentling, 2003; Egan, 2005). By investigating antecedents and underlying mechanism influencing the relationship between team diversity and knowledge sharing, this study highlights the necessity for HRD scholars and practitioners to investigate the contextual conditions necessary for team members to effectively engage in knowledge sharing and thereby fully utilize diverse set of resources brought into the teams by their members.

Third, the present study emphasizes the relationship between organizational learning and knowledge sharing in work teams. In fact, as Song & Chermack (2008) notes, a shift of learning context from individuals and collectives is one of the main concerns in the organizational learning literature. In HRD and KM field, few studies in the past have tried to identify and examine factors affecting the team learning from the team effectiveness framework. Thus, the present study brings a new perspective into the fields.

Lastly, knowledge management has been considered as an important organizational development (OD) intervention intended to improve work effectiveness in knowledge intensive settings (Cross, Parker, Prusak, & Borgatti, 2001). Up until now, a large amount of investment has been made building information and communication infrastructure, databases, and organizational policies to ensure capturing of re-applicable lessons and work experiences (Davenport et al., 1998). By examining people-side

factors facilitating knowledge management, the present study provides complementary perspectives about how to maximize the return on technological initiatives.

Definition of Key Terms

The following terms and definition will be used in this study. A brief description of each term is provided below, with an extended review included in subsequent chapters.

Work Teams

In this study, I draw on Kozlowski and Ilgen's (2007) comprehensive definition of a team as "(a) two or more individuals who (b) socially interact (face-to-face or, increasingly, virtually); (c) possess one or more common goals; (d) are brought together to perform organizationally relevant tasks; (e) exhibit interdependencies with respect to workflow, goals, and outcomes; (f) have different roles and responsibilities; and (g) are together embedded in an encompassing organizational system, with boundaries and linkages to the broader system context and task environment" (p.79).

While several researchers (e.g., Guzzo & Dickson, 1996) regard work groups and work teams as equivalent concepts, I qualify this definition for the purposes of this study by treating as a work team only those units with two or more individuals who interact interdependently to achieve a common objective by performing a particular, specified role. This definition highlights the nature of real work teams (Hackman, 2011) that are characterized by one or more tasks that they are collectively responsible for, co-operation and interaction among team members, differentiated member roles and responsibilities, and that operate within an organizational context.

Knowledge Sharing in Work Teams

Drawing on previous studies on knowledge sharing (Bartol, Liu, Zeng, & Wu, 2009; Srivastava et al., 2006; Nonaka & Takeuchi, 1995), knowledge sharing in work teams is defined as team members' sharing of task-related data, information, experiences, and expertise with each other. Thus, knowledge sharing allows integrating previously unconnected knowledge, which constitutes the foundation for the construction of new knowledge and for innovation (Nahapiet & Ghoshal, 1998).

Team Diversity

Work team diversity refers to differences between individuals on any attributes where individuals have a perception that another person is different from the self (Jackson, 1992; van Knippenberg, De Dreu, & Homan, 2004; Williams & O'Reilly, 1998). The diversity attributes of interest may refer to demographic background (e.g., age, gender, nationality), informational background (e.g. education, tenure, functional expertise), as well as power and status in a social hierarchy (Harrison & Klein, 2007).

Emergent States

Emergent states can be defined as "cognitive, motivational, and affective states in teams . . . dynamic in nature and vary as function of team context, inputs, processes, and outcomes" (Marks et al., 2001, p. 357). Emergent states that have received substantial research focus in knowledge sharing and have a significant relevance to this study include team identification and psychological safety. Team identification refers to the team members' perception of oneness with or belongingness to a work team they are working for (Ashforth & Mael, 1989). Van der Vegt and Bunderson (2005) conceived of this construct as the emotional significance that team members attach to their membership in a team. Psychological safety refers to team member's beliefs about being

able to disclose one's self without excessive concern of negative consequences to self-image, status, or career (Baer, & Frese, 2003 ; Kahn , 1990).

Team Leadership

Team leadership concerns primarily "the influence of a leader who is responsible for, and has authority for, the team's performance" (Mathieu et al., 2008, p. 449). In light of functional perspective of leadership (Hackman & Walton, 1986; Lord, 1977), previous research has focused on identifying team leaders' leadership behaviors that are more conducive to stimulate members' willingness to share knowledge. Transformational leadership is the team leader behavior that many prior studies have focused (Kearney & Gebert, 2009; Srivastava et al., 2006; Xue, Bradley, & Liang, 2011; Zhang & Peterson, 2011). In a review of leadership research, Podsakoff, MacKenzie, Moorman and Fetter (1990) identified six key classes of transformational leadership behaviors: (a) articulating a vision, (b) providing an appropriate model (e.g., leading by example), (c) fostering the acceptance of group goals, (d) having high performance expectations, (f) providing individualized support, and (g) providing intellectual stimulation.

Summary and Overview of Remaining Chapters

Knowledge sharing in work teams refers to team members sharing task-relevant information, experiences, and perspectives with each other. As organizations have made increased use of work teams as fundamental units of organizational structure, one of the main challenges is how to encourage team members to exchange their diverse information, experiences, and expertise toward collective results (Ardichvili, Page, & Wentling, 2003; Egan, 2005). Accordingly, an important question to answer is under

what condition members in a work team share their knowledge with fellow team members. This study seeks to answer this question by investigating the underlying mechanisms and contextual conditions that are necessary for team members to effectively engage in knowledge sharing, and thereby fully utilize diverse sets of resources brought into the teams by their members.

Following this introduction, Chapter 2 presents a comprehensive review of the relevant literature on the constructs examined in this study. Additionally, this chapter will more explicitly draw together previously outlined evidence to build an argument for specific hypotheses. Chapter 3 provides an explanation of the procedures and methods used in this study and Chapter 4 presents the results of the data analysis. Chapter 5 discusses the findings presented in the previous chapter and also provides theoretical and practical implications of the findings, limitations, and future research directions.

CHAPTER 2

LITERATURE REVIEW

The purpose of this chapter is to provide a summary of research and theory related to the present study. The first section of the chapter reviews the theoretical perspectives of knowledge sharing in work teams and presents its effects on team performance. The second section outlines different perspectives on work team diversity and the exiting literature on the effects of work team diversity on knowledge sharing. A discussion on the literature of emergent states (i.e., team identification, psychological safety), and team leadership follows. The literature review concludes with a research model and the formulated hypotheses for this study.

Knowledge Sharing within Work Teams

Knowledge exists at multiple levels within organizations: individual, team, departmental, divisional, and organizational (De Long & Fahey, 2000). Thus, knowledge sharing may occur at these different levels (Ipe, 2003). The present study seeks to understand the employee knowledge sharing behaviors within a work team setting, which requires a different frame of reference comparing with those behaviors within an individual or organizational setting. In the following section, a conceptual clarification about knowledge sharing within teams is provided with key findings of a review of extant literature on nature of knowledge, knowledge sharing in organizations, and the effects of knowledge sharing on team effectiveness and performance.

Nature of Knowledge

The term “knowledge” is a difficult concept to define and measure, and means different things to different researchers and practitioners (Davenport & Prusak, 1998;

Ipe, 2003). However, knowledge is generally distinguished from data and information (Davenport & Prusak, 1998). Researchers proposed that data and information are related to knowledge but are not the same as knowledge (Davenport & Prusak, 1998; Nonaka & Takeuchi, 1995). At the simplest form, data represent "observations or facts out of context, and therefore not directly meaningful" (Zack, 1999, p. 46). Information is organized and analyzed data in a way that is relevant and meaningful to a particular recipient. For example, a survey may yield data but it is the analysis of the data in the form of a report or graphs that provides information (Roberts, 2000).

Although the terms—information and knowledge—are often used interchangeably, many researchers also suggest that there is a clear distinction between the two. For example, Marshall (1997) argued that information becomes knowledge when an individual reads, understands, interprets, and applies information to a specific work situation. Nonaka (1994) offered some further distinctions proposing "in short, information is a flow of messages, while knowledge is created and organized by the very flow of information, anchored on the commitment and beliefs of its holder" (p. 15). To extend the previous example of the relationship between survey data and information, knowledge is generated when the patterns of the graphical information generated from survey data are subsequently interpreted and related to the underlying phenomena. Therefore, while information is organized data, knowledge is "information given meaning by knowledgeable agents" (Fleck, 1997, p. 384), which provides "a framework for evaluating and incorporating new experiences and information" and often refers to experience, heuristics, intuitions, and insights (Davenport & Prusak, 1998, p. 5).

Knowledge also generally characterized on various dimensions such as

articulability (i.e., tacit and explicit), complexity, and teachability (Davenport & Prusak, 1998, p. 5). With respect to sharing knowledge in organizations, the articulability has received most attention. Polanyi's elaboration of the "tacit" and "explicit" dimensions of individual knowledge (Polanyi, 1966) has been particularly influential in HRD and KM studies (Ipe, 2003) as well as management and organizational studies (Davenport & Prusak, 1998). Explicit knowledge refers to knowledge that has been articulated and codified using some formal systematic language or symbols (Choo, 1998). According Choo (1998), explicit knowledge exists independently from the individual human beings in the form of either object-based knowledge such as products, patents, and software code, or rule-based knowledge such as routines or operating procedures. It is generally believed that the more codified something becomes, the easier it is to distribute without loss of meaning or details (Boisot, 2002; Choo, 1998; Nonaka & Takeuchi, 1995). Tacit knowledge, on the other hand, is personal and embodied (Nonaka, 1994; Polanyi, 1966), which makes its codification (formalization) and dissemination very difficult (Nonaka, 1994). Polanyi (1966) explained this by stating "we can know more than we can tell" (p. 4). Choo (2000) proposed that tacit knowledge may be, "revealed through rich modes of discourse that include the use of analogies, metaphors or models, and through the communal sharing of stories" (p. 396). In the work team context, the knowledge that members share formally or informally is relevant to tasks performed and it could be both explicit (e.g., sales data, market information) and tacit (e.g., expertise, perspectives) (Bunderson, 2003; Srivastava et al., 2006).

Knowledge Sharing in Organizations

A review of existing literature reveals four research streams on knowledge the collective

knowledge of employees as a potential source of competitive advantage sharing in organization, as presented in Table 1. The first stream of research has examined the movement of knowledge across individuals within an organization (individual sharing in organizations; e.g., Cabrera, Collins, & Salgado, 2006; Collins, & Smith, 2006). Studies in this stream have focused on how to exploit and capitalize on explicit and tacit knowledge-based resources that already exist within the organization (Davenport & Prusak, 1998). In this research stream, knowledge sharing has been regarded as the fundamental means through which creating and leveraging (Cabrera, Collins, & Salgado, 2006; Collins, & Smith, 2006; Wang & Noe, 2010). Research suggests that knowledge sharing in organizations leads a number of positive results including reducing production costs, enhancing organization's innovative capabilities, and generating new sales revenues from new products (e.g., Collins & Smith, 2006; Cummings, 2004; Hansen, 2002; Mesmer-Magnus & DeChurch, 2009).

In the second stream of research, researchers have studied individuals' sharing task-relevant ideas, information, and suggestions with others in work teams setting. Researchers in this research stream have focused on how work groups take advantage of the perspectives, talents, and ideas of different members (Cummings, 2004) and create a common understanding about their team context through sharing knowledge internally (Hackman, 2002). In this research stream, knowledge sharing is regarded as a behavioral aspect of team performance that is relevant to achieving outcomes that are the consequences or results of this behavior (Beal, Cohen, Burke,& McLendon, 2003). Previous research has shown that knowledge sharing between team members plays a fundamental role in creating a common understanding, thereby enabling better

Table 1

Four Research Streams on Knowledge Sharing in Organizations

Stream	Research Focus	Expected Outcomes of Knowledge Sharing	Studies
Individual sharing in organizations	Movement of knowledge across individual who create, recognize, archive, access, and apply knowledge in carrying out their tasks within an organization.	Creating and leveraging the collective knowledge of employees as a potential source of competitive advantage	Cabrera, Collins, & Salgado (2006). Collins, & Smith (2006). Davenport & Prusak (1998)
Individual sharing in work teams	Team members sharing of task-relevant ideas, information, and suggestions with each other.	Creation of common understanding, thereby enabling better coordination among team members Make decisions and take actions that appropriately address the range of relevant factors	Bunderson & Sutcliffe (2002). Srivastava, Bartol, & Locke (2006)
Inter-units sharing in organizations	Knowledge sharing among organizational units (e.g., teams, business units)	Learn from each other and benefit from new knowledge developed by other unit (e.g., best practices)	Hansen, Mors & Lovas (2005). Tsai, W. P. (2002)
Inter-organizations sharing	Sharing management practices, technology, business model between organizations.	Create credible commitments not to exploit customers and suppliers Develop new technology and market	McEvily, Das, & McCabe, 2000)

coordination among team members and making better decisions that appropriately address the range of relevant factors (e.g., Bunderson & Sutcliffe,2002; Srivastava et al., 2006). Building on this stream of research, present study focuses on individual team members' sharing knowledge with others in work teams setting.

The third stream of research has investigated the knowledge movement across units (i.e., between work teams, departments, or divisions). In this research stream, researchers have examined how an organizational unit gains useful knowledge (e.g., best practices) from other units to enhance its innovation and performance (e.g., Hansen, Mors & Lovas, 2005; Tsai, 2002). Research has shown that knowledge sharing between business units provides mutual learning and collaboration opportunities that facilitate the integration of existing knowledge and lead the creation of new knowledge (e.g., Kogut & Zander, 1992; Tsai & Ghoshal, 1998).

The last stream of research in knowledge sharing examines the transferring knowledge between organizations. Transferring knowledge between organizations brings more complexity because of the multidimensional nature of the organizational cultures, processes, and boundaries involved (McEvily, Das, & McCabe, 2000). Organizations exchanging knowledge with each other can simultaneously be suppliers, competitors, and customers for each other, which increases many problems, including leakage of intellectual properties and erosion of competitive advantages in the market (Easterby-Smith, Lyles, & Tsang, 2008). Past research suggests, however, that when organizations understand the knowledge transfer process and the variables that affect it, the organizations' capabilities can be enhanced, and thereby increased knowledge sharing contributes to the organizations' performance and/or innovativeness (Easterby-Smith et

al., 2008).

As far as specific employee behaviors of knowledge sharing within work teams are concerned, a review of existing literature on the taxonomy of knowledge management systems (e.g., Bartol et al., 2009; Earl, 2001; Nonaka & Takeuchi, 1995) reveals three major types of behaviors for individuals to share their knowledge in work teams, as presented in Table 2: provision, socialization, and externalization. The first type of knowledge sharing behavior is provision in which team members transmit task relevant data and information. This behavior of sharing can happen through written or verbal communication (Chen, 2011; Bock, Zmud, Kim, & Lee, 2005; Cummings, 2004; Bartol et al., 2009). Team members also keep others informed of the emerging developments that may increase their work effectiveness (Bartol et al., 2009).

The second type of knowledge sharing behavior is socialization in which team members share their know-how or expertise by directly working with team members through helping, advising, and co-working in a common task (Faraj & Sproull, 2000; Bartol et al., 2009; Nonaka & Takeuchi, 1995). In their conceptualization of tacit knowledge sharing, Nonaka and Takeuchi (1995) suggested that the recipient could gain tacit knowledge from the source through personal interactions between individuals, observation, and apprenticeship. The socializing behavior could take place within teams through team members' behaviors of sharing their expertise to help other team members to resolve work team problems by giving advice others in the team whose work efforts could benefit from their expertise (Bartol et al., 2009).

The last behavior of knowledge sharing is externalization wherein individuals within a work team communicate about their know-how and expertise by articulating

Table 2

Behaviors of Knowledge Sharing in Work Teams

Behaviors	Description	Examples	Studies
Provision	Transmitting and distributing task relevant data and information through written or verbal communication	Employees pass along information that may be helpful to the work of the team. Employees keep others informed of emerging developments that may increase their work effectiveness.	Chen (2011) Bock, Zmud, Kim, & Lee (2005) Cummings (2004) Bartol et al. (2009)
Socialization	Sharing know-how or expertise by directly working with team members through observation, imitation, and practice	Employees readily share his/her expertise to help other team members to resolve work team problems. Employees willingly give advice to others in the team whose work efforts could benefit from his/her expertise.	Faraj & Sproull (2000) Bartol et al. (2009) Nonaka & Takeuchi (1995)
Externalization	Sharing know-how or expertise by articulating and communicating through concepts, models, or stories	Employees offer innovative ideas or work processes in his/her area of expertise that can benefit the group's work. Employees frequently share his/her expertise by making suggestions that benefit the work team.	Bartol et al. (2009) Nonaka & Takeuchi (1995)

Note. Adapted and modified from "Social exchange and knowledge sharing among knowledge workers: The moderating role of perceived job security." By Bartol, K. M., Liu, W., Zeng, X., & Wu, K. (2009). *Management and Organization Review, 5*(2), 223-240. And "A dynamic theory of organizational knowledge creation." By Nonaka, I. (1994). *Organization science, 5*(1), 14-37.

their tacit knowledge into explicit knowledge (Bartol et al., 2009; Earl, 2001; Nonaka &Takeuchi, 1995). Nonaka (1994, p. 20) suggested that "the externalization mode is triggered by successive rounds of meaningful dialogue. In this dialogue, the sophisticated use of metaphors can be used to enable team members to articulate their own perspectives, and thereby reveal hidden tacit knowledge that is otherwise hard to communicate." In a work team setting, this may happen through team members' behaviors of offering innovative ideas or work processes in their area of expertise that can benefit the work team's performance, or sharing their expertise by making suggestions that benefit the work team.

These knowledge sharing behaviors are consistent with Hansen, Nohria, and Tierney's (1999) argument that organizations emphasize either a codification strategy (i.e., knowledge is carefully documented and stored in computer system) or a personalization strategy (i.e., knowledge is closely tied to the person who creates it and shared mainly direct personal contact) for knowledge sharing in organizations. In the classification of knowledge sharing behaviors described before, whereas the provision of explicit data and information would fall under the codification strategy, the other two mechanisms are variants of the personalization strategy. It is important to note that these knowledge sharing behaviors are not mutually exclusive (Nonaka & Takeuchi, 1995). Even though work teams may emphasize one over the other, all of these behaviors are important for the teams in tapping individual knowledge for collective use (Bartol et al., 2009).

Work Teams

There are number of definitions of work groups and teams**.** In this study, I draw

on Kozlowski and Ilgen's (2006) comprehensive definition of a team as "(a) two or more individuals who (b) socially interact (face-to-face or, increasingly, virtually); (c) possess one or more common goals; (d) are brought together to perform organizationally relevant tasks; (e) exhibit interdependencies with respect to workflow, goals, and outcomes; (f) have different roles and responsibilities; and (g) are together embedded in an encompassing organizational system, with boundaries and linkages to the broader system context and task environment" (p.79). I qualify this definition for the purposes of this study by treating as a team only those units with two or more individuals who interact interdependently to achieve a common objective. This definition highlights the nature of real work teams (Hackman, 2011) that are characterized by one or more tasks that they are collectively responsible for, co-operation and interaction among team members, differentiated member roles and responsibilities, and that operate within an organizational context.

When it comes to the effects of knowledge sharing on team effectiveness, **r**esearch has shown that knowledge sharing leads to better team performance because of its beneficial effect on the development of shared team mental model and team transactive memory, and thereby enabling better team coordination among team members (Mesmer-Magnus & DeChurch, 2009; Srivastava et al., 2006; van Ginkel & van Knippenberg, 2008). Shared team mental model refers to an organized understanding among team members about their team's task environment (Klimoski & Mohammed, 1994; Mathieu et al., 2008). Kozlowski and Ilgen (2006, p. 83) stated that "the concept of a mental model developed in the human-factors literature as an expert's cognitive representation of a system that could be used for predicting system states and

for generating inferences about system behavior."

Such common understanding about the team environment helps team members to anticipate other members' needs and actions and thereby to coordinate their behaviors (Kozlowski & Ilgen, 2006). According to Okhuysen and Waller (2002), if members share, discuss, and integrate knowledge over time, they can develop an ability to capture and elaborate knowledge in patterns or blocks rather than discrete units. Thus, knowledge sharing over time can lead to the development of "collective intuition" (Isenberg, 1988). Through this knowledge sharing, the team develops shared team mental models that allow team members to be on the same page while performing team tasks and achieving higher team performance (Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000).

Knowledge sharing can also enable the coordination among team members through the development of transactive memory, which is defined as the common understanding of who knows what within a team (Wegner, 1986). Wegner (1986) argued that when each team members have a basic understanding of other members' areas of expertise, the team can draw on the full knowledge distributed across team members. The formation of transactive memory involves the tracking and updating about other members' unique knowledge and expertise via communication and knowledge sharing. (Mohammed & Dumville, 2001; Wegner 1986, 1995). With the development of transactive memory, coordination is likely to improve because workers can anticipate each other's behavior (Wittenbaum, Stasser, & Merry, 1996). In summary, knowledge sharing can help team members build shared common understanding and collective

knowledge base as a form of team mental model and transactive memory, and thereby facilitating effective team coordination and performance (Kozlowski & Ilgen, 2006).

Work Team Diversity

Work team diversity refers to differences between individuals on any attributes where individuals have a perception that another person is different from the self (van Knippenberg et al., 2004; Williams & O'Reilly, 1998). The diversity attributes of interest may refer to demographic characteristics (e.g., age, gender, nationality), informational characteristics (e.g. education, tenure, functional expertise), as well as power and status in a social hierarchy.

Team Diversity Research.

Prior research on team diversity has shown that differences in team members' attributes can be related to team processes and performance both positively and negatively (e.g., van Knippenberg et al., 2004; Williams & O'Reilly, 1998). Reviews of literature (Harrison & Klein, 2007; Roberg & van Dick, 2010) as well as meta-analyses (Bell, Villado, Lukasic, Belau, & Briggs, 2011; Webber & Donahue, 2001), could not establish consistent main effects of diversity on team processes and performance.

The notion that team diversity improves team performance is based on the information/decision-making perspective (Hinsz, Tindale, & Vollrath, 1997; Williams & O'Reilly, 1998), which suggests that diversity in highly job-related attributes (e.g., educational and functional background) can serve as indicators of enriching the supply of task-related resources. According to the information/decision-making perspective, heterogeneous teams may be more successful than homogeneous teams because the former teams can draw on a broader task-relevant knowledge and perspectives. In other

words, informational diversity gives diverse teams an expanded pool of resources that lead "the group-level exchange, processing, and integration of diverse information and perspectives" (Kearney & Gebert, 2009, p. 78).

On the other hand, several theories and studies suggest that diversity in less job-related attributes such as demographics, work values, or social status can lead to decreased collaboration, communication, and cohesion among team members, and ultimately, decreased team processes and performance (Milliken & Martins, 1996). For example, the similarity–attraction theory (Byrne, 1971) suggests that homogeneous teams could be more effective than diverse teams because team members with similar characteristics or background are more likely to develop a mutual attraction. This mutual attraction can result in more productive team interpersonal dynamics, such as smooth coordination and frequent communication, thereby leading homogeneous teams to outperform diverse teams (Wiersema & Bantel, 1992).

Similarly, social categorization perspective (Tajfel & Turner, 1986; Williams & O'Reilly, 1998) suggests that "differences are used as a basis for categorizing self and others into groups, with ensuing categorizations distinguishing between one's own in-group and one or more out-groups" (van Knippenberg & Schippers,2007). This social categorization process, in turn, leads more liking and trusting, and favoring ingroup members over outgroup members (i.e., intergroup biases; Brewer, 1979), and results in increased conflicts and decreased communication between in-group and out-group team members (DiTomaso, Post, & Parks-Yancy, 2007). As such, team members with similar characteristics, as opposed to differing characteristics, may be more attracted to and may collaborate more with one another, which implies that homogeneous teams should

exceed diverse teams (Harrison & Klein, 2007).

While the notion that the effects of team diversity are dependent on the characteristics of team members (i.e., highly job-related vs. less job-related) seems sound, there is insufficient empirical support for this proposition (van Knippenberg & Schippers, 2007). Some studies (e.g., Jehn et al., 1997) have provided supporting findings for this proposition, whereas others (Simons & Peterson, 2000; Webber & Donahue, 2001) have showed that neither diversity on highly job-related characteristics, nor diversity on less job-related attributes could be consistently linked to team processes and performance. Facing such inconsistent results, researchers have begun to search for mediators or moderators (e.g., Kearney & Gebert, 2009). In addition, Harrison and Klein (2007) argued that "the very construct of diversity requires closer examination and refinement and research must be conducted in conjunction with a more nuanced approach to diversity" (p. 1199).

Conceptualization of Team Diversity.

Harrison and Klein (2007) proposed a set of diversity constructs consisting of "three things" such as separation, variety, and disparity, which vary in terms of their substance, pattern, and operationalization and, and their consequences. Table 3 shows a summary of three types of team diversity.

Separation. Separation as a type of team diversity refers to differences in position or opinion among team members, and represents disagreement or opposition in work-related attitudes regarding team goals and directions (Harrison & Klein, 2007). With separation, according to Harrison and Klein (2007), diversity effects are thought to be symmetrical, in that similarity on a diversity characteristic is often expected to be

favorable whether all members are high on this characteristic or all members are low. On the basis of the similarity and attraction perspective (Byrne, 1971), social identity and self-categorization perspective (Tajfel & Turner, 1986), researchers conceptualizing team diversity as separation hypothesize that greater similarity yields higher levels of collaboration, trust, and integration. For example, McGrath, Berdahl, and Arrow (1995, p. 25) stated that diversity in work values may influence ‘‘the level of attraction and respect among members, ease of communication, and degree of overt conflict in the group.’’ Jehn and her colleagues (Jehn, Chadwick, & Thatcher, 1997; Jehn & Mannix, 2001) also demonstrated that diversity in values leads to tension and conflict and thus poor coordination within a team.

Variety. Variety refers to “differences in kind or category, primarily of information, knowledge, or experience among unit members” (Harrison & Klein, 2007, p.1200). In this conceptualization of team diversity, team members are different qualitatively on categorical diversity attributes such as functional background, content of education, which has no high or low value. Researchers defining team diversity as variety posit that greater variety potentially translates into greater breadth and depth of information potentially available to the team that can be leveraged to improve planning and decision-making, and to stimulate innovation (Harrison & Klein, 2007). This proposition is directly related to the primary reason for the existence of teams in organizations, which is to integrate the distributed expertise and experience of individual members into relevant and actionable collective knowledge (Cohen & Bailey, 1997). However, as discussed earlier, research has shown that harnessing the variety represented by team members’ distinct information caches is challenging partially

Table 3

Conceptualization of Team Diversity

Diversity Type	Meaning / Synonyms	Attribute Examples	Predicted Outcomes	Foundational Theories
Separation (on attribute S)	Composition of differences in position or opinion among unit members, primarily of value, belief, or attitude; Disagreement or opposition	Attitudes, values, and opinions, especially regarding team goals and directions	Reduced cohesiveness, more interpersonal conflict, distrust, decreased task performance	Similarity attraction; social categorization
Variety (on attribute V)	Composition of differences in kind, source, or category of relevant knowledge or experience among unit members; Unique or distinctive information	Content expertise, functional background, nonredundant network ties, industry experience	Greater creativity, innovation, higher decision quality, more task conflict, increased unit flexibility; knowledge sharing. team learning	Information processing; law of requisite variety; variation, selection, and retention (VSR)
Disparity (on attribute D)	Composition of (vertical) differences in proportion of socially valued assets or resources held among unit members; Inequality or relative concentration	Pay, income, prestige, status, decision making authority, social power	More within-unit competition, resentful deviance, reduced member input, withdrawal	Distributive (in)justice and (in)equity; status hierarchy; tournament; social stratification

Note. Adapted and modified from "What's the difference? Diversity constructs as separation, variety, or disparity in organizations." By Harrison, D. A., & Klein, K. J. (2007). *Academy of Management Review, 32*(4), 1199-1228.

because of separation and disparity resulting from the same diversity attributes (Harrison & Klein, 2007).

Disparity. Disparity exists when inequality or relative concentration among team members in terms of socially valued or desired resource (e.g., power, status, and prestige) is present in a work team (Harrison & Klein, 2007). With disparity, diversity effects are thought to be asymmetrical in contrast to the symmetrical effects of separation diversity, because disparity describes the relative distribution of a valued asset or resource (Harrison & Klein, 2007). The construct of disparity shares substantive similarities with the concept of group power distance orientation (e.g., Yang, Mossholder, & Peng, 2007), represents individual's attributes about the power and authority differences in work teams. In Hofstede's (1980, p. 65) study, the construct of power distance captures "perceptions of the superior's style of decision-making and of colleagues' fear to disagree with superiors" at the nation or societal level. In later application, researchers used this construct examining the effects of power and authority differences on individuals' attitude and perception at work groups and teams level (e.g., Yang, et al., 2007).

Researchers defining team diversity as disparity posit that differences in power and status among team members may have differential impacts on the patterns of interaction and communication, influence attempts, and resource allocation of a low power vs. high power members (Keltner, Gruenfeld, & Anderson, 2003). For lower power member, disparity is commonly viewed as fostering behavioral inhibition in the form self-censoring, in being passive or silent and uninvolved in team meetings because of their concerns of threat and punishment from high power members (Eisenhardt &

Bourgeois, 1988; Keltner et al., 2003; Tucker & Edmondson, 2003). In contrast, for high power team members, high status team members are more likely to be seen as influential, and, therefore, to be given more opportunities to participate in team discussions (Bales, 1950; Ridgeway, 1982). They are also more likely to have other members address them more often relative to low status members, and have their ideas evaluated more favorably (Berger, Rosenholtz, & Zelditch, 1980)).

In addition, the knowledge and ideas of high status members is likely to be attended to, positively viewed, and integrated to a greater degree by team members relative to those shared by low status members (Ridgeway, 1982). As a result, high status individuals are likely to dominate meetings and conversations, and low status individuals may be unable to voice their knowledge and ideas. As Keltner, Gruenfeld, and Anderson summarize, "High power individuals talk more, interrupt more, are more likely to speak out of turn, and are more directive of others' verbal contributions than are lower-power individuals" (2003, p. 277). To the extent that the status differentials are steep, these discrepancies in the opportunity for inputs are large (Keltner et al., 2003). In the team diversity literature, as Harrison and Klein (2007, p. 1206) noted, "conceptual and empirical treatments of diversity as separation or as variety are relatively common. Treatments of diversity as disparity are not." Consistent with team diversity research that calls for more research addressing disparity as team diversity, the present study focuses on the disparity as a focal variable, which are the most relevant to this study of knowledge sharing in the South Korean context.

Perceived Team Diversity

Perceived team diversity captures members' beliefs about diversity within their

team (Hentschel, Shemla, Wegge, & Kearney, 2013), which can be assessed by asking individuals how they perceive diversity variables to be exhibited within their team (Dooley, Fryxell, & Judge, 2000; Harrison et al., 1998; Harrison et al., 2002; Jehn et al., 1999; Miller, Burke, & Glick, 1998; Turban & Jones, 1988). It is distinct from actual team diversity, which is usually operationalized as a compositional distribution of diversity attributes using such numerical indices as standard deviation, Euclidean distance, and coefficient of variance (e.g., Harrison & Klein, 2007). While most diversity research has focused on actual team diversity (Hentschel et al., 2013; van Knippenberg, & Schippers, 2007), a stream of research has shown that individuals' perceptions of their social environment have stronger, more direct influences on behavior than does the actual environment itself (e.g., Eisenberger, Huntington, Hutchison, & Sowa, 1986; Krackhardt, 1990). In that sense, as noted by Harrison and Klein (2007, p. 1216), "perceived diversity within a team may have unique and more proximal explanatory power than actual team diversity."

Moreover, the importance of perceived diversity has thus been documented both theoretically and empirically (Hentschel et al., 2013). In particular, as discussed above, the social categorization perspective states that people categorize themselves and others into in-groups and out-groups based on perceived similarities and differences (Tajfel & Turner, 1986; Williams & O'Reilly, 1998). Several studies have acknowledged the importance of measuring such perceptions at the individual level. For example, Turban and Jones (1988) showed that the perception of attitudinal similarity between supervisors and subordinates, and not so much attitudinal similarity itself, was positively related to subordinates' satisfaction, performance ratings, and pay ratings. In another

study, employee perceptions of diversity at the senior management and non-manager levels were strongly related to overall performance (Allen, Dawson, Wheatley, & White, 2008). At the team level, several researchers have found that actual diversity in work teams has only an indirect influence on team outcomes, an effect mediated by perceptions of diversity (Harrison et al., 2002; Ries, Diestel, Wegge, & Schmidt, 2010). Consistent with this line of reasoning and research, in the present study, I focus on perceived diversity.

Emergent States

Emergent states can be defined as "cognitive, motivational, and affective states of teams . . . dynamic in nature and vary as function of team context, inputs, processes, and outcomes" (Marks et al., 2001, p. 357). Emergent states that have received substantial research focus in knowledge sharing and have a significant relevance to this study include team identification and psychological safety.

Team Identification

Team identification refers to the team members' perception of oneness with or belongingness to a work team they are working for (Ashforth & Mael, 1989). The social identity perspective of group processes and intergroup relations provides a theoretical foundation for explaining the effects of team identification on knowledge sharing in work teams. According to social identity perspective (e.g., Ashforth & Mael, 1989; Tajfel, 1982), one's self-identity is derived not only from one's salient unique personal characteristics but also from collective attributes of a group they belong to. When a team member perceives the collective attributes of a team as salient, central, and enduring, the person is more like to incorporate the team attributes into his/her self-concept, and

thereby develop a high level of team identification (Ashforth & Mael, 1989; Dutton, Dukerich, & Harquail, 1994).

The social identity perspective further suggests that the more people define the self in terms of the team attributes, the more individuals subsume the team's aims and goals as their own (Ashforth & Mael, 1989). Thus, when team members strongly identify with their team, the team identification creates a powerful and personal motivation to work towards achieving the team's goals and successes (Ashforth & Mael, 1989; Dutton et al., 1994;; van Dick, 2001).

Consistent with this line of theoretical argument, research has demonstrated that individual's identification with a work team is related to cooperative behaviors (Dukerich, Golden, & Shortell, 2002) and citizenship behaviors (e.g., Carmeli, 2005). For example, in their study on antecedents of top management team (TMT) behavioral integration, Carmeli and Shteigman (2010) found that team identification assists team members to develop a high level of behavioral integration (e.g., information exchange, collaborative behavior, joint decision making). Similarly, Bezrukova, Jehn, Zanutto, and Thatcher (2009) found that not all differences are necessarily deleterious for team performance, especially when a high level of team identification among team members is in place. Therefore, when work teams have a high level of team identification, it may help these teams "in avoiding potential performance losses by preserving group integrity via the united group feeling toward a common goal" (Bezrukova et al., 2009, p. 46) . Table 4 shows a summary of studies examining the effects of team identification on team processes and outcomes.

Table 4

A Summary of Studies Examining the Effects of Team Identification on Team Processes and Outcomes

Study	Independent Variables	Dependent Variables	Effect of TI [a]	Key Findings
Bezrukova, Jehn, Zanutto, & Thatcher (2009)	Social category and information-based fault lines	Group performance outcomes	MO	Team identification served as a moderator enhancing performance of groups with information-based faultlines
Carmeli, & Shteigman (2010)	Perceived organizational & top management team (TMT) prestige	TMT behavioral integration (e.g., information exchange, collaborative behavior)	ME	Perceived prestige had a greater effect on collective team identification, which, in turn, resulted in TMT behavioral integration
Hobman, & Bordia (2006)	Demographics; value dissimilarity (VD)	Task and relationship conflict (TRC)	MO	VD was positively associated with TRC. Its effects on relationship conflict were moderated by team identification.
Kearney, Gebert, & Voelpel. (2009)	Age educational specialization diversity	Team performance	ME	Collective team identification mediated a moderating effect of need for cognition on the relationship between diversity and team performance
Van Der Vegt, G. S. And J. S. Bunderson (2005).	Expertise diversity	Collective team identification	MO	In teams with low collective identification, expertise diversity was negatively related to team learning and performance;

Note. [a] Effect of team identification (TI) in the study: MO - Moderator, ME - Mediator

Psychological Safety

Psychological safety refers to team member's beliefs about being able to show and employ one's self without fear of damaging self-image, status, or career (Baer, & Frese, 2003; Kahn, 1990). It describes individuals' perception of openness of which no one in the team will not embarrass, reject, or punish for asking questions, expressing disagreement, or proposing new ideas (Edmondson, 2004). According to Edmondson (2004) psychological safety does not imply a comfortable environment where people are close friends, nor does it suggest a lack of problems or pressure. Rather, it refers to a climate in which team members are easily expressing their differences and also engage in productive conversation (Edmondson, 2004).

Research suggests that psychological safety is distinct from other commonly studied psychological constructs, including cohesion and trust (e.g., Bradley, Postlethwaite, Klotz, Hamdani, & Brown, 2012; Carmeli, & Gittell, 2009; Edmondson, 2004). It differs from cohesion, defined as team members' commitment to the team task and to each other (Beal, Cohen, Burke, & McLendon, 2003), in that it facilitates, rather than discourages, constructive disagreement interpersonal consequences. Psychological safety is also distinct from trust: while trust pertains to anticipated consequences across a wide temporal range, psychological safety concerns relatively short-term interpersonal consequences (Edmondson, 2004).

Researchers examining the antecedents and consequences of psychological safety have shown that when team members experience a high level of psychological safety, it can alleviate the excessive concern about others' response to action that have potential to cause embarrassment or be perceived as a threat (Brueller, & Carmeli, 2011).

Table 5

A Summary of Studies Examining the Effects of Psychological Safety (PS) on Team Processes and Outcomes

Study	Diversity Attributes(s)	Dependent Variable(s)	Effect of TI [a]	Key Findings
Edmondson (2002)	Team members' perceptions of power and interpersonal risk	Quality of team reflection; organization's ability to change	ME	Team members' perceptions of power and interpersonal risk affect the quality of team reflection, which has implications for their team's and their organization's ability to change
Lau, & Murnighan (2005)	Demographic Faultlines;	Team learning, psychological safety, satisfaction, and expected performance	ME	Groups with strong faultlines experience more intragroup conflict and poorer group outcomes (group learning, psychological safety, satisfaction and expected group performance) than do groups with weak faultlines.
Nembhard, & Edmondson (2006)	Status differences in professional hierarchy	Speaking up and learning behavior; engagement in quality improvement work	MO	Team leader’s leadership behavior helps teams overcome the inhibiting effects of status differences, allowing members to collaborate in process improvement
Post (2012)	Deep-level team composition (i.e., cognitive style: sequential, connective)	Team innovation	ME	Sequential thinking contributes to decreases in team innovation by inhibiting psychological safety.

Note. [a] Effect of psychological safety (PS) in the study: MO - Moderator, ME - Mediator

This diminishing concern for negative interpersonal consequences, in turn, encourage tem members to engage in constructive learning behaviors such as sharing knowledge, asking for feedback, or speaking up about errors and concerns (Carmeli, Brueller, & Dutton, 2009). Table 5 shows a summary of studies examining the effects of psychological safety on team processes and outcomes

Team Leadership

Team leadership concerns primarily "the influence of a leader who is responsible for, and has authority for, the team's performance" (Mathieu et al., 2008, p. 449). One approach to understanding leadership in team settings is the functional perspective of leadership (Hackman & Walton, 1986; Lord, 1977). The functional perspective conceptualizes leadership as social problem solving in which leaders do whatever needed to be done for the team to succeed and survive (Hackman & Walton, 1986; ; Lord, 1977; McGrath, 1962), as indicated by Hackman and Walton (1986, p. 75) as follows:

> The key assertion in the functional approach to leadership is that '[the leader's] main job is to do, or get done, whatever is not being adequately handled for group needs' (McGrath, 1962, p. 5). If a leader manages, by whatever means, to ensure that all functions critical to both task accomplishment and group maintenance are adequately taken care of, then the leader has done his or her job well.

In line with the functional perspective, Zaccaro, Rittman, and Marks (2001, p. 454) indicated that a team leader's main job lies in fulfilling those functions, including "(a) diagnosing any problems that could potentially impede group and organizational

goal attainment, (b) generating and planning appropriate solutions, and (c) implementing solutions within typically complex social domains." In research of examining the relationship between team diversity and knowledge sharing, a number of leadership behaviors have been studied, among which transformational leadership is the team leader behaviors that prior studies have focused on (Kearney & Gebert, 2009; Zhang & Peterson, 2011).

Transformational Team Leadership

Transformational leadership behaviors refer to "those leader behaviors that influence followers' values and aspirations, activate their higher-order needs, and arouse them to transcend their own self-interests for the sake of the organization" (Podsakoff, MacKenzie, & Bommer, 1996, p. 259). Similarly, Kaiser, Hogan, and Craig (2008, p. 104) noted that "the concept of transformational leadership describes how leaders persuade followers to set aside selfish pursuits and work toward a collective purpose." In their review of transformational leadership research (e.g., Avolio & Bass, 1987; Bums, 1978; Conger & Kanungo, 1987; House, Spangler & Woycke, 1991; Shamir, House & Arthur, 1993; Tichy & DeVanna, 1986), Podsakoff, MacKenzie, Moorman and Fetter (1990) concluded:

> while each of these approaches differs somewhat in the specific behaviors they associate with transformational leadership, all of them share the common perspective that effective leaders transform or change the basic values, beliefs, and attitudes of followers so that they are willing to perform beyond the minimum levels specified by the organization (p. 108).

Building on their work, Podsakoff et al. (1990) argued that the majority of

transformational leadership behaviors share the following six dimensions: (a) articulating a vision of the future of the organization, (b) providing a model that is consistent with that vision, (c) fostering the acceptance of group goals, (d) having high performance expectations, (e) providing individualized support, and (f) providing intellectual stimulation. Past research suggests that through a combination of these behaviors, transformational team leaders are believed to keep teams together by ensuring clear channels of communication, clarifying misunderstandings, and facilitating group interaction and discussion (Burke et al., 2006). Transformational team leaders also facilitate goal achievement by providing vision, identifying roles, clarifying performance expectations, and coordinating collective action (Burke et al., 2006)

With respect to the relationship between team diversity and team processes, past research has shown that transformational leadership obviates adverse effects of diversity (e.g., Kearney & Gebert, 2009). For example, Ling, Simsek, Lubatkin, and Veiga (2008) found that the leader's transformational leadership has positive influence on the team member's mutual and collective interactions such as collaborative behavior, information exchange, and joint decision making. Additionally, research that examined the relationship between positive emotions and advice taking (Chua, Ingram, & Morris, 2008; Gino & Schweitzer, 2008; Hofmann, Lei, Grant, 2009) supports that followers of transformational leaders are more likely to seek advice from each other.

Research Model and Hypotheses

The following section, the hypotheses are formulated based on the literature review. Also, theoretical and empirical rationale for the hypothesized relationship between constructs is provided.

Perceived Disparity and Knowledge Sharing in Teams

Teams represent important vehicles for bringing together individuals with diverse backgrounds and complementary expertise, skills and resources to perform work that may be too big, and too complex for a single individual to undertake (Cohen & Bailey, 1997; Marks, Mathieu & Zaccaro, 2001). For teams to be effective, members have to share their diverse knowledge, ideas, and experience relevant for the conduct of collective tasks. That is, knowledge sharing among team members is critical for team performance (e.g., Faraj & Sproull, 2000, Lewis, 2004; Cummings, 2004). However, this seemingly simple mechanism for team performance turns out to be fraught with difficulty (Cohen & Bailey, 1997; Cronin & Weingart, 2007; Ilgen, Hollenbeck, Johnson, Jundt, 2005).

On the basis of theories and research addressing power and status hierarchies in organizations (e.g., Deutsch, 1985; Grusky, 1994; Hofstede, 1980), I expect that knowledge sharing in teams can be stymied by perceived disparity in power and status among members because this perceived power asymmetry may provoke conformity, silence, and suppression of different perspectives of low power team members (Bales, 1950; Tucker & Edmondson, 2003). In addition, more powerful members may ignore the information provided by other less influential members, or inadvertently limit opportunities for articulating such information (Cohen & Zhou, 1991). Despite the relevance of perceived disparity for knowledge sharing, the idea that the perceived disparity in power and status may have detrimental effects on employee knowledge sharing behavior has not been fully demonstrated (Van de Vegt et al., 2010).

Bunderson and Reagans' (2011) research on the role of a social hierarchy in

collective learning processes and outcomes could, however, provide insights on how perceived power hierarchies in work teams are associated with knowledge sharing. In their review of studies on power, status, and team learning, Bunderson and Reagans (2011) found that when a member's power of control over resources needed or valued by others far exceeded that of other team members, the power difference can affect low-power individuals' perception and cognition in such ways of (a) increasing concern for the conformity to the behaviors of the powerful (e.g., bosses, supervisors), (b) making them not feel safe engaging in key behaviors (e.g., expressing disagreement, asking questions), and (c) decreasing the open sharing and equal consideration of different members' knowledge and insight.

Studies examining differential effects of power differences on the patterns of interaction and influence attempts (e.g., Cohen & Zhou, 1991; Keltner et al., 2003) also provide empirical supports on the proposition that perceived disparity could lead to behavioral inhibition in the form self-censoring, in being passive or silent in team meetings. Moreover, such conformity and self-censoring by low status members translates into the reduced willingness, opportunity, and motivation to share unique knowledge (Eisenhardt & Bourgeois, 1988). For example, Eisenhardt and Bourgeois (1988) found that low status team members were not willing to share their knowledge of which they perceive it as opposite to that of dominant members. Similarly, in their study on the effects of CEO dominance, Haleblian & Finkelstein (1993) found that team members trying to fathom the preferences of the dominant leader, and in attempting to tailor their ideas to match the leader's preferences rather than sharing their different opinion. On the basis of the above theoretical and empirical research findings, I propose

the following:

Hypothesis 1: Perceived disparity of team members is negatively associated with knowledge sharing in work teams.

Mediating Role of Team Identification

Of the greatest interest in the present study is the mediating role of team identification in explaining the negative influence of perceived disparity on knowledge sharing in teams. Consistent with the social identity perspective, I expect that by negatively affecting the sense of team identification, perceived disparity can act as an impediment factor for knowledge sharing in teams. According to the social identity perspective, team identification is a sense of oneness that binds members together into a powerful psychologically and behaviorally integrated entity (Van der Vegt and Bunderson 2005). Thus, when members in a work team develop strong attachment to the group, they redefine the self as "we" rather than "I" and share common ground.

When a strong sense of team identification exists, the group is not merely a collection of individuals but rather a cohesive entity that acts together and displays helping and joint activities (Ashforth & Mael, 1989; Hogg, 2001). On the basis of this perspective, research has shown that when team members develop strong identification toward their team and become closely identified with enduring characteristics of the team, they were likely to make individual efforts on behalf of the whole such as perceiving the team's goals, interests, and norms as their own, sharing information and expertise, and striving actively to collaborate and reach agreement. (e.g., Bezrukova et al., 2009; Carmeli, 2008; Kearney et al., 2009). While team identification has positive effects on team processes and performance, this team identification can be scattered by

the presence of perceived disparity among team members. The previous theoretical discussion on the effects of team diversity implies that members in a team prefer to work with similar rather than dissimilar others (Byrne, 1971). In addition, dissimilarity in power and status can lead to socially categorizing team members either high-power or low-power members and to treat out-group less favorably than in-group members (Milliken & Martins, 1996; Williams & O'Reilly, 1998). On the basis of the above theoretical and empirical research findings, I propose the following:

Hypothesis 2: Team identification mediates the relationship between perceived disparity of team members and knowledge sharing in work teams.

Mediating Role of Psychological Safety

Psychological safety captures team members' perception of openness where no one in their team will not negatively respond to actions that have the potential for embarrassment or threat (Edmondson, 1999; 2004). Past research suggests that psychological safety facilitates learning behavior—sharing different perspectives and unique knowledge, asking for feedback, or expressing disagreement—in work teams because it can alleviate the excessive concern about others' response to these behaviors (Brueller & Carmeli, 2011; Edmondson, 1999; Siemsen, Roth, Balasubramanian, & Anand, 2009).

For example, Edmondson (1999) found that team psychological safety is positively related to learning behavior and team performance. Similarly, Brueller and Carmeli (2011) found that psychological safety mediates the link between high-quality relationships among team members and team learning and performance. Siemsen, Roth, Balasubramanian, and Anand (2009) also found that psychological safety is a team

members' positive states that can overcome obstacles associated with a low level of confidence in their own knowledge, and thus stimulate knowledge sharing. Taken together, these existing empirical findings suggest that when teams have a high level of psychological safety, the full range of members' knowledge and perspectives could be exchanged and integrated.

Despite the necessity for psychological safety in knowledge sharing, perceived disparity in power and status can weaken team members' beliefs of which their team is safe for interpersonal risk (Kahn, 1990; Nembhard & Edmondson, 2006; Tucker & Edmondson, 2003). For members with low power and authority, the perceived power asymmetry makes them more sensitive to threat and punishment from high power members and feel greater accountability for the knowledge and ideas shared (Keltner et al., 2003). That is, low power members' concerns for other members' discontentment or unpleasant personal consequences as a results may constrain the state of psychological safety (Nembhard & Edmondson, 2006). Kahn's (1990) qualitative study provides an evidence of the detrimental effect of perceived disparity on psychological safety. In Kahn's study, lower status individuals perceived their interaction with higher status individual as stifling and threatening because they had a concern that higher status individuals would embarrass or reject them for sharing contradictory thoughts.

In contrast, research suggests that those with high power and authority may be less likely to feel the need for social validation or evaluation apprehension, and thus may have autonomy of self-expression in front of others (Keltner et al., 2003). Research on politeness provides a support for this argument (Nembhard & Edmondson , 2006). As Brown and Levinson (1987) noted, with increased status people have less concern about

damaging others' face, opinions can be freely voiced, and requests can be made of others without verbal compensation to convey apology, humility, or deference. Drawing this line of reasoning, Nembhard and Edmondson (2006, p. 945) argued that "this well-documented inverse relationship between status and politeness suggests corresponding differences in psychological safety across different status groups." In summary, for low power members, power disparity could lead to behavioral inhibition in the form self-censoring, in being passive or silent and uninvolved in team meetings. In the context of teams involved in knowledge work, such conformity and self-censoring by low status members translates into the reduced willingness, opportunity, and motivation to share unique knowledge. Drawing on these established empirical findings, I proposed the following:

> *Hypothesis 3*: Psychological safety mediates the relationship between perceived disparity of team members and knowledge sharing in work teams.

Moderating Role of Transformational Leadership

Drawing on established theories and empirical findings, I have proposed that perceived disparity in power and status can complicate the affective and cognitive processes of individuals in work teams and therefore, perceived power differences in the team can present obstacles and impediments to knowledge sharing in work teams. Given these existing findings, it seems a logically sound conclusion that power and status differences should be minimized or even eliminated when knowledge sharing or collective learning is the goal (Brooks 1994, Harrison and Klein 2007). However, it is difficult to imagine any group or organization where power and status differences do not exist (Magee & Galinsky, 2008), and knowledge sharing and collective learning have

been taking place in organizations despite the power and status differences exit (Bunderson & Reagans, 2011). In line with this reasoning, I propose that the stifling effects of power differences on knowledge sharing in work teams can be mitigated by team leader's transformational behaviors.

Consistent with the functional perspective of leadership (Hackman & Walton, 1986; Lord, 1977), it is an established argument that team leaders are pivotal for eliminating the barriers that often discourage team members from expressing their concerns and other ideas (e.g., Kearney & Gebert, 2009; Walumbwa & Schaubroek, 2009). Particularly, diverse teams composed of demographically and hierarchically deferent members may benefit from a leader's guidance (Walumbwa & Schaubroek, 2009). For example, transformational team leaders can attenuate the negative effects of perceived disparity by shifting team members' attention from the difficulties entailed by the need to accommodate inequalities in power and status to the shared goals and the potential advantages of these differences (Walumbwa & Schaubroek, 2009).

With respect to knowledge sharing in teams, prior research (e.g., Kearney & Gebert, 2009; Zhang & Peterson, 2011) has shown that transformational leadership behaviors foster the exchange knowledge in diverse teams through the following ways. First, by articulating common vision and fostering the acceptance of group goals, transformational leadership behaviors promote the internalization of the goals and values that establish a unifying superordinate social identity that underlie the collective cause (Bass & Riggio, 2006). Second, modeling toward meeting the common objectives that is consistent with the vision becomes a means for a follower to enhance his or her self-concept (Shamir, House, & Arthur, 1993). Third, by having high performance

expectations, transformational leaders foster collective enthusiasm, optimism, and efficacy (Shin & Zhou, 2007). Fourth, by providing individualized support, the transformational leader's behavior ensures that all team members feel acknowledged and appreciated in their uniqueness and are positively reinforced for the input they provide (Kearney & Gebert, 2009). Lastly, by providing intellectual stimulation, team leaders encourage their team members to welcome and take advantage of diverse knowledge bases and perspectives (Bass & Riggio, 2006).

In line with these arguments, Ling, Simsek, Lubatkin, and Veiga (2008) found that the leader's transformational leadership has positive influence on the management team member's mutual and collective interactions such as collaborative behavior, information exchange, and joint decision making. Additionally, research that examined the relationship between positive emotions and advice taking (Chua, Ingram, & Morris, 2008; Gino & Schweitzer, 2008; Hofmann, Lei, Grant, 2009) supported that followers of transformational leaders are more likely to seek advice from each other. Therefore, I proposed the following:

> *Hypothesis 4*: Transformational team leadership moderates the relationship between perceived disparity and knowledge sharing such that the negative relationship between perceived disparity and knowledge sharing become weaken or nonsignificant when transformational team leadership is high.

Collectively, considered aforementioned hypothesis together, the proposed pattern of interrelationship among key variables implies moderated mediation (Preacher, Rucker, & Hayes, 2007) whereby mediation effect of perceived disparity on knowledge sharing through team identification and psychological safety depends on team leaders'

transformational leadership behavior. For example, research on the effects of transformational leaders on followers' self-concepts suggests that transformational leadership can prevent adverse effects such as low levels of team identification resulting from perceived disparity (e.g., Lord & Brown, 2004; Shamir, House, & Arthur, 1993; van Knippenberg, van Knippenberg, De Cremer, & Hogg, 2004).

According to the social identity approach to leadership, transformational team leaders influence team processes and performance by persuading team members to identify with their team and to internalize teams' vision and goals (Shamir et al., 1993; van Knippenberg et al., 2004). That is, the transformational team leaders make team members see themselves not the isolated individuals, but the members of a larger team. As the transformational leadership theory suggests, transformational leaders do this by reinforcing collective goals, shared values, modeling collective commitment, and emphasizing common interests (Shamir et al., 1993; van Knippenberg, et al., 2004). Thus, when team members see themselves as members of a team, they tend to accept team values and goals as their own, and this motivates team members to share their knowledge, and thereby to contribute to the greater common purpose (Lord & Brown, 2004). Building on this line of reasoning, I proposed the following:

> *Hypothesis 5*: Transformational team leadership moderates the strength of the mediated relationships between perceived disparity and knowledge sharing via team identification, such that the mediated relationship become weaker or nonsignificant under high transformational team leadership than under low transformational team leadership.

Additionally, research suggests that transformational team leaders may create a

psychologically safe context and thereby alleviates excessive concerns of threat and punishment from high power members which incurred when team members perceive differences in power and status among team members (Nemanich & Vera, 2009). Although there is not much empirical research to support this proposition, a small but growing body of empirical work in a learning team culture is beginning to study the assumption that transformational leadership may lessen the low power members' excessive concerns for other members' reaction (e.g., Hannah & Lester, 2009; Nemanich & Vera, 2009; Shin & Zhou, 2003). For example, Hannah and Lester (2009) showed that transformational leadership promotes such team learning climate by employing greater levels of individual consideration. Similarly, Bass (1998) showed that through intellectual stimulation and individualized consideration, transformational leaders create a team culture that is open to diverse ideas by valuing team members' divergent views, creating open exchanges of information, and resolving conflicts effectively. Finally, Nembhard and Edmondson (2006) found that when leaders invited and appreciated others' contributions, lower status members were more likely to perceive that their leaders saw them as valuable contributors to the team, and as a result they reported high psychological safety. Drawing on these exiting empirical findings, I expected the following:

> *Hypothesis 6*: Transformational team leadership moderates the strength of the mediated relationships between perceived disparity and knowledge sharing via psychological safety, such that the mediated relationship become weaker or nonsignificant under high transformational team leadership than under low transformational team leadership.

Summary

This chapter provided an overview of the theory and constructs related to this study, including knowledge sharing in work teams, team diversity, emergent states, and team leadership. Knowledge sharing in work teams was reviewed as a conscious, voluntarily behavior. As contextual factors affecting knowledge sharing, work team diversity was reviewed on the basis of Harrison and Klein's (2007) conceptualization. Based on a review of existing literature on team effectiveness, two emergent states—team identification and psychological safety—were examined. In addition, team leadership focusing on transformational leader behavior defined as moderating factors for knowledge sharing in teams were discussed. In summary, this chapter laid the foundation for examining the relationship between knowledge sharing and perceived disparity as team diversity, emergent states, and transformational team leadership. Drawing on a comprehensive literature review, six hypotheses are presented. Figure 1 depicts the hypothesized research model.

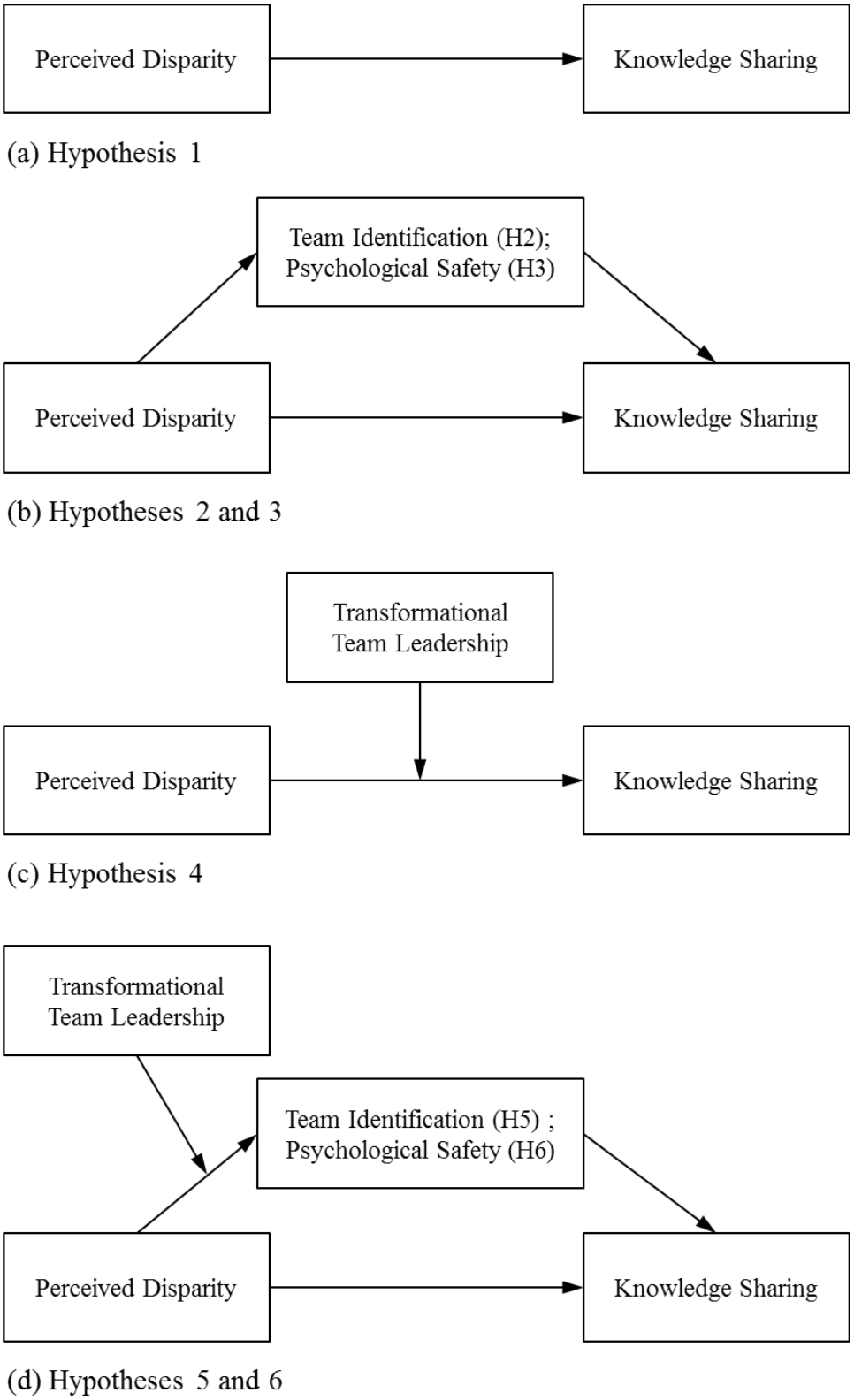


Figure 1. Hypothesized research model

CHAPTER 3

METHODS

The purpose of this study is to advance the current understanding of knowledge sharing in work teams by examining antecedents and underlying mechanisms influencing the extent to which team members share their knowledge with one another. Specifically, this study seeks to understand the effects of perceived disparity diversity on team members' knowledge sharing behaviors and examine how the psychological safety and team identification mediate the relationship between perceived disparity and knowledge sharing. Further, this study investigates how transformational team leaderships influence the strength and direction of the indirect effects of perceived disparity on knowledge sharing through psychological safety and team identification. In the current study, a correlational design was used to collect and analyze data. Hypotheses were tested by using hierarchical multiple regression analysis (Preacher, Rucker, & Hayes, 2007). This chapter describes the participants, data collection procedures, instruments, and data analysis techniques used in the present study.

Participants and Procedures

Four leading Korean companies in petrochemicals, electronic materials, and consumer electronics industry, the largest and leading industry sector in the Korean economy, provided the research site for this study. All participating companies are headquartered in Seoul, South Korea, and have between 2,000 and 5,000 employees. Work teams in these companies were implemented in mid 90s to promote employee participation and cross-functional collaboration, and consist of three types: on-going functional teams, self-managed teams in manufacturing, and time-limited cross-

functional project teams. The self-managed teams were excluded from the present study population because one of the main objectives of this study was to examine the role of team leaders' leadership behavior on knowledge sharing. In addition, time-limited project teams with less than six months of team longevity were also excluded from the target population. Accordingly, respondents of this study were working in the work teams which consisted of a leader (with the title of team leader) and two or more members (with the title of team member). By and large, each member had a functional specialty (e.g., operations, marketing, finance, technology, research and development, administration). Within the teams, team leader, temporary employees, and new employees with less than six months of working experiences were excluded from the study population.

The primary contact at the participating companies was a manager in an internal human resource development (HRD) or organization development (OD) team who worked closely with me to facilitate data collection. The HRD or OD managers of the target organizations were provided with information on the research topic, research procedures, and potential risks and benefits. If they agreed to participate in this study, the research support consent form was signed by managers. Once the study participation decision was made, the HRD or OD managers sent me a list of participants with team information (e.g., team name, team size, team members' email address, and team members' demographics). The initial pool of survey participants was composed of 459 individuals from 81 work teams. To check the actual level of team diversity, the team demographic information was analyzed (Appendix D). The results show that the teams in the initial study pool were informationally (e.g., educational level, tenure) and

hierarchically diverse (e.g., organizational rank).

Prior to the data collection, this study was approved by the Institutional Review Board (IRB) at the University of Minnesota for review of the research (Study Number: 1302E28041). IRB approved this research with an email confirmation notifying that this research was categorized as exempt from full committee review.

Data Collection and Response Rates

Participants completed the questionnaire via an online survey. Google Docs was used as an online data collection tool, which offered by Google within its Google Drive service. Prior to the survey, participants were briefly informed that the study pertained to their perceptions of their teams, colleagues, overall team climates, their immediate supervisors, and the organizations they worked for. In accordance with the IRB's protocol, written assurances were provided that individual responses would be kept confidential and that employees were free to decide not to participate in the study or to terminate their participation at any time without questions. Respondents were asked to assess their team context in terms of perceived disparity in power and status, and to rate their immediate supervisor's leadership behavior, their sense of psychological safety, team identification, and knowledge sharing. In the last section in the survey, respondents were asked to include their demographic information, including age, gender, education, rank (hierarchical level), organizational tenure, and job type. To ensure anonymity of responses, the information collected in the survey did not identify a respondent. No identifying information (e. g., including the participant's name and contact information) was collected to protect privacy.

In total, 459 surveys were distributed to 81 work teams. Out of distributed

questionnaires, 285 were submitted. This represents response rates of 62.1 percent. Yet, 45 cases were eliminated from the sample due to incomplete surveys or suspect responses (e.g., participants responding all 1's or all 5's across all items). Therefore, the effective sample size used to test the hypotheses was 240. Table 6 provides a summary of the demographic characteristics of the participants. In the sample of 240 participants, as presented Table 6, 86.7% were male, and 90.3% held at least a university degree. In terms of age, 16.3% of the sample were younger than 30 years old, 68.4% were between the ages of 30 and 44, and 15.4% were older than 45 years old. The average age of the participants was 36.52 years, ranging from 21 to 64 years (*SD* = 7.52). All participants had been employed by their organizations for at least six months. On average, participants had been employed in their company for 7.85 years (*SD* = 7.32).

Instrumentation

All items used a Likert-type five-point scale with anchors of 1 (strongly disagree) to 5 (strongly agree). Respondents reported the degree to which they agreed with the items. The questionnaire was administered in Korean following a back-translation procedure (Brislin, 1980). The questionnaire items were originally compiled in English. Thus, the measurement items were translated to Korean and back-translated into English. To initiate the back-translation process, one bilingual translator translated the questionnaire from English into Korean. The resulting Korean version then was back-translated into English by another bilingual translator who had not seen the original instrument in English. After the back-translation, all items of the back-translated instrument with the original version of the instrument compared and assured that the original meaning of the items was retained. After a repetition of the back-translation

Table 6

Demographic Information

Demographics	Category	Frequency	Percentage
Gender	Male	208	86.7
	Female	32	13.3
Age	Less than 24	5	2.1
	25-29	34	14.2
	30-34	71	29.6
	35-39	58	24.2
	40-44	35	14.6
	45-50	19	7.9
	51 or over	18	7.5
Highest level of education completed	High school completed	9	3.9
	Associate degree	14	5.8
	Bachelor’s degree	170	70.9
	Master’s degree	42	17.5
	Doctoral degree	5	1.9
Rank	Clerk	73	30.4
	Assistant Manager	54	22.5
	Manager	57	23.8
	Senior Manager	40	16.7
	General Manager	16	6.7

Tenure	Less than 1	3	1.3
	1-5	131	54.6
	6-10	36	15.0
	11-15	27	11.3
	16-20	22	9.2
	21-25	16	6.7
	25 or over	5	2.1
Functional Background	Production/Operation	53	21.9
	Research & Development	44	18.3
	Marketing/Sales	29	12.0
	Finance/Accounting	10	4.0
	HRM/HRD	54	22.3
	Purchasing	17	7.2
	Construction	15	6.4
	Administration	8	3.2
	Others	12	4.8
Industry	Petrochemicals	93	38.7
	Electronics materials	67	27.9
	Home electronics	80	33.3

Note. N=240.

process to correct errors in translation, several items were reworded or retranslated for a valid translation of the instrument. Consequently, no further instances were found where

an item's meaning had significantly changed due to the translation. The items for primary measures are provided in Appendix B.

Knowledge Sharing Behaviors (DV)

In the literature, a number of scales have been used to measure knowledge sharing in work teams (e.g., Cummings, 2004, Faraj & Sproull, 2000; Hansen, 2002, Szulenski, 1996). Given the lack of consensus on agreed upon measures (Golden & Raghuram, 2010), knowledge sharing behavior was assessed based on the eight-item scale developed by Bartol, Liu, Zeng, and Wu (2009), which best fits the three types of knowledge sharing behaviors (i.e., provision, socialization, externalization) outlined earlier in the literature review section. In addition, on the basis of the argument that knowledge shared in work teams could be both explicit and tacit (Bunderson, 2003; Srivastava et al., 2006), this scale was developed to reflect the sharing of both types of knowledge (Bartol et al., 2009).

In the present study, the scale measured knowledge sharing behavior by asking individual respondents to indicate the extent to which colleagues in their own team have shared knowledge through transmitting task relevant information, helping others to resolve problems, or offering innovative ideas and helpful suggestions in their area of expertise. Internal consistency for the knowledge sharing behavior measure was $\alpha = .85$. Sample items include the following: "Members in my team readily pass along information that may be helpful to the work of the group (provision).", "Members in my team readily share his/her expertise to help resolve work group problems (socialization).", and "Members in my team offer innovative ideas in his/her area of expertise that can benefit the group's work (externalization)." An exploratory factor

analysis (EFA) for the eight-item scale indicated a single factor solution explaining 59.65% of total variance.

Perceived Disparity (IV)

Perceived disparity refers to the team members' perception that power and status in a team are distributed unequally. This construct was measured using four-item power distance orientation scale developed by Brockner et al. (2001), and applied to Korean organizations by Kim and Leung (2007). . In Hofstede's (1980, p. 65) study, the construct of power distance captures "perceptions of the superior's style of decision-making and of colleagues' fear to disagree with superiors" at the national or societal level. In later application, researchers used this construct examining the effects of power and authority differences on individuals' attitude and perception at the work group and team level (e.g., Yang, Mossholder, & Peng, 2007). The sample items of the scale include "Subordinates should not express disagreements with their supervisors.", "The highest ranking manager in a team should take the lead.", and "In work-related matters, supervisors have a right to expect obedience from their subordinates." An exploratory factor analysis (EFA) on this scale revealed the one-factor model explaining 58.31% of variance. Cronbach's alpha for the scale was .72.

Team Identification (IV, Mediator)

Team identification was measured with a five-item scale developed by Mael and Ashfort (1992), and used in work team settings by van Knippenberg and van Schie (2000). Respondents were asked to indicate the degree to which the members of their team feel a strong sense of belongingness to their team. Sample items were "When someone criticizes my work team, it feels like a personal insult" and "When someone

praises my work team, it feels like a personal compliment.” An exploratory factor analysis (EFA) on this scale revealed the one-factor model explaining 50.11 % of variance. Cronbach's alpha for the scale was .86.

Psychological Safety (IV, Mediator)

Psychological safety assesses the extent to which members of a work team feel psychologically safe to take risks, speak up, discuss issues openly. I used the seven-item scale developed by Edmondson (1999) based on Kahn’s (1990) work. Example items are: “Members of this team are able to bring up problems and tough issues.”, “It is safe to take a risk on this team.”, and “No one on this team would deliberately act in a way that undermines other members’ efforts.” An exploratory factor analysis (EFA) on this scale revealed the one-factor model explained 47.61 % of variance. Cronbach's alpha for the scale was .91.

Transformational Team Leadership ((IV, Moderator)

Transformational team leadership behavior was measured with Podsakoff et al.’s (1990) the fourteen-item transformational leadership behavior inventory (TLI). This scale is designed to measure six key dimensions of transformational leadership that have been identified in the research literature, including articulating a vision, providing an appropriate model, fostering the acceptance of group goals, high performance expectations, providing individualized support, and intellectual stimulation.

Hypothesized factor structure, internal consistency reliability, and concurrent and discriminant validity of the scale have been confirmed by previous research (Podsakoff, MacKenzie, & Bommer 1996; Podsakoff et al. 1990). However, three dimensions such articulating a vision, providing an appropriate model, and fostering the

acceptance of group goals were found to be highly intercorrelated, and Podsakoff et al. (1990) identifies these three dimensions as indicators of a second-order construct called core transformational leader behavior. Thus, following MacKenzie, Podsakoff, and Rich's (2001) recommendation, this measure consists of four dimensions: (a) core transformational leader behavior, (b) high performance expectations, (c) providing individualized support, and (d) intellectual stimulation.

The result of confirmatory factor analysis (CFA) to assess the validity of this measure confirmed the fit indexes for four first-order factors plus one second-order factor fell within an acceptable range ($\chi 2[50] = 217.02$, $p < .001$; GFI = .92, CFI = .98, NFI = .05, RMSEA = .09), indicating that the dimensions reflected the overall construct. In the current study, internal consistency for transformational leadership was $\alpha = .93$. A sample item and internal consistency for each subscale was "My team leader articulates a vision" (core transformational leader behavior, $\alpha = .92$); "My team leader will not settle for second best (high performance expectations, $\alpha = .88$); "My team leader considers my personal feelings before acting" (supportive leader behavior, $\alpha = .88$); and "My team leader has ideas that have challenged me to reexamine some of my basic assumptions about my work" (intellectual stimulation, $\alpha = .84$).

Control Variables.

A set of variables were controlled to eliminate spurious relationships in this study because prior research found that individual differences (e.g., participant age, rank, tenure,), task interdependence, and organizational support influenced knowledge sharing behavior (LePine & Van Dyne, 2001; Stamper & Van Dyne, 2001). Age and tenure were coded in number of years. Rank data were collected in ordinal form and coded as 1

(clerk/senior clerk), 2 (assistant manager), 3(manager), 4(senior manager), and 5(general manager). However, there was a high correlation (r = .82) between age and rank potentially due to seniority-based promotions in South Korea. Task interdependence and organizational support were also controlled because personality factors may influence individual knowledge sharing. The present study assessed task interdependence and organizational support using the team diagnostic inventory (TDI) scale developed by Wageman and Hackman's (2005). In TDI, task interdependence scale was composed of three items, and a sample item and internal consistency was "Generating the outcome or product of this team requires a great deal of communication and coordination among members" (α = .84). Organizational support scale was composed of seven items, sample items and internal consistency was "Excellent team performance pays off in this organization.", and "When something comes up that team members do not know how to handle, it is easy for them to obtain the training or technical advice they need" (α = .86).

Data Analysis and Statistical Methods

I tested the study hypotheses in three interlinked steps. First, prior to hypothesis tests, preliminary data screening was conducted. Second, I examined a simple mediation model (Hypotheses 1–3). Third, I integrated the proposed moderator variable into the model (Hypothesis 4) and I empirically tested the overall moderated mediation hypothesis (Hypothesis 5 and 6).

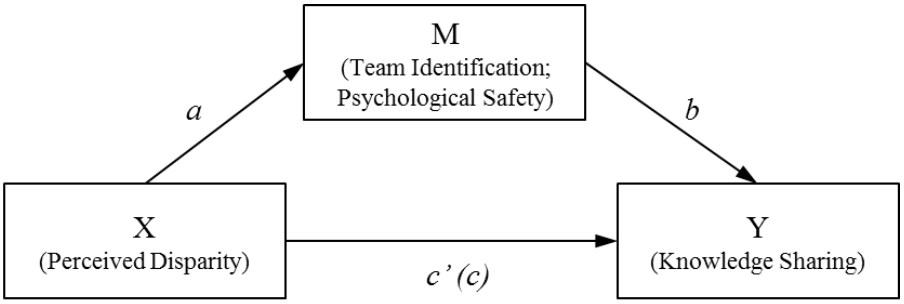
Preliminary Analysis.

Following Orr, Sackett, and Dubois's (1991) recommendation, I examined the studentized residual, scatterplots, and Mahalanobis distance to detect univariate and multivariate outliers. According to Belsley, Kuh, and Welsch (1980), inflated variances

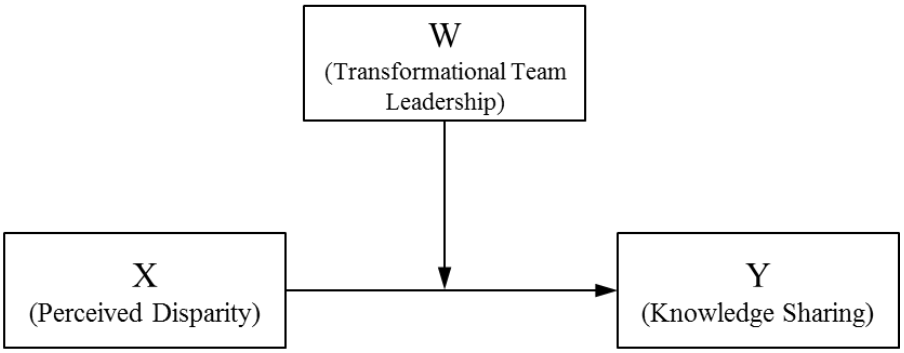
arising from multicollinearity among the independent variables are problematic since it may not give valid results about any individual predictor, or about which predictors are redundant with respect to others. Thus, the variance inflation factor (VIF), a statistical index quantifying the severity of multicollinearity, was examined to detect the degree of multicollinearity. In addition, in order to test the assumptions of normality, linearity, and homoscedasticity of residuals, normal probability plots, histograms, and scatterplots of standardized residuals were examined (Tabachnick & Fidell, 2007). Lastly, for the preliminary analyses to assess the discriminative and construct validity of the measurement model, a series of confirmatory factor analysis (CFA) were conducted.

Testing Simple Mediation with Regression Analysis.

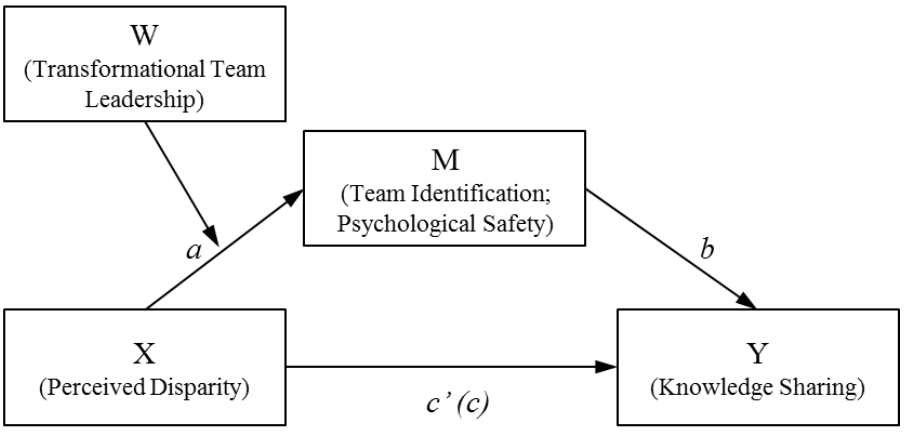
The research design employed, as well as the research question explored in this study, required several different data analytic techniques. Collectively, Hypotheses 1, 2, and 3 suggest a mediation effect or an indirect effect (often used interchangeably, as they are here) model examining by what means perceived disparity exerts its effect on knowledge sharing. In the present study, I hypothesized the relationship between perceived disparity and knowledge sharing is transmitted by psychological safety (Hypothesis 2) and team identification variable, *M*=Mediator, *W*=Moderator (Hypothesis 3). The regression and mediation techniques are well established and are employed in a majority of social science research (Summers, Humphrey, & Ferris, 2012). Tests of such mediation hypotheses are guided by the multistep approach proposed by Baron and Kenny (1986). Model (a) in figure 2 shows conceptual path diagram of mediation. In this model, the total effect of independent variable (X*;* perceived disparity) on the dependent variable (Y; knowledge sharing) is the sum of the direct effect (*c'*) and



(a) Simple mediation or indirect model



(b) Simple moderation model



(c) Moderated mediation model

Figure 2. Path diagrams of direct, mediation, and moderated mediation. Adapted and modified from "Addressing moderated mediation hypotheses: Theory, methods, and prescriptions." by K. J. Preacher, D. D. Rucker, and A. F. Hayes, 2007, *Multivariate behavioral research, 42*(1), 185-227. *Note. X*=independent variable, *Y*=dependent

the indirect effect of *X* on Y through the mediator (M; team identification, psychological safety), which is equal to the product of the *a* and *b* path (i.e., *ab*). It is said that mediation effect exists when the direct effect, X → Y, become nonsignificant, after mediator is taken into account. Appendix E shows the regression equations estimated to test Hypothesis 1 through 3.

Testing Simple Moderation with Regression Analysis.

In the present study, it is of critical interest to determine whether or not transformational leadership moderates the relationship between perceived disparity and knowledge sharing within teams (dependent variable described in literature review).To test theses hypotheses (Hypothesis 4), I performed hierarchical multiple regression analyses in which the control variables were entered in the first step followed by the inclusion of the main effects variables of perceived disparity in the second. In the third step, three interaction terms (perceived disparity × transformational team leadership) were additionally entered. Model (b) in figure 2 shows conceptual path diagram of mediation.

To probe the nature of this moderation effect, I plotted the interactions following Aiken and West's (1991) procedures and conducted simple slopes tests. In addition, I calculated the bias-corrected bootstrap conditional effects using the procedure proposed by Preacher, Rucker, and Hayes (2007) using the PROCESS computational program for SPSS developed by Hayes (2012). PROCESS provides a flexible computation tool that integrates contemporary techniques for testing relationships involving multiple mediating and moderating variables (e.g., Edwards & Lambert, 2007; Hayes & Preacher, 2012; MacKinnon, Fairchild, & Fritz, 2007; Muller, Judd, & Yzerbyt, 2005; Preacher et

al., 2007).The program calculates the bias-corrected bootstrap conditional effects, sampling error(*SE*), *t* score, and *p* level of the moderation on the basis of 1,000 – 5,000 bootstrap samples.The bootstrapping technique is recommended because the products of interaction terms and regression coefficients are rarely normally distributed (Edwards & Lambert, 2007). Bootstrapping is the nonparametric statistical method of estimating properties of an statistics (e.g., variance of means) by constructing a number of resamples of the observed dataset, each of which is obtained by random sampling with replacement from the original dataset (Efron & Tibishirani, 1998; Mooney & Duval, 1993).. Appendix E show the regression equations estimated to test Hypothesis 4.

Testing Moderated Mediation with Regression Analysis.

In addition to the simple moderation analysis, it is also of critical interest to determine whether or not the indirect effect of X (i.e., perceived disparity) on Y (i.e., knowledge sharing) through M (i.e., team identification, psychological safety) remains constant across different team contexts—W (i.e., moderator; transformational team leadership). For example, as hypothesized in this study, perhaps team identification (M) mediates the perceived disparity (X) → knowledge sharing (Y) relationship for high transformational team leadership but not for low transformational team leadership (W). More generally, the strength and/or direction of an indirect effect may depend linearly upon the level of a moderator (W; transformational team leadership).

Various sources refer to this effect as moderated mediation (e.g., Baron & Kenny, 1986; Edwards, & Lambert, 2007; Morgan-Lopez, & MacKinnon, 2006; Muller et al., 2005; Ng, Ang, & Chan, 2008) or conditional indirect effects (Preacher et al., 2007). Preacher et al. (2007, p. 186) define a conditional indirect effect as “the

magnitude of an indirect effect at a particular value of a moderator." In summary, moderated mediation models represent attempts to explain both how and when a given effect occurs (Frone, 1999). Model (c) in Figure 2 shows conceptual path diagram of moderated mediation or conditional indirect effects.

Hypothesis 5 and 6 suggest two moderated mediation model, which propose that the indirect effects of perceived disparity on knowledge sharing via psychological safety (Hypotheses 5) and team identification (Hypotheses 6) are dependent on the level of transformational team leaderships. To test the moderated mediation hypotheses, I relied on the PROCESS computational program for SPSS developed by Hayes (2012). This routine estimates the mediated path of the independent variable(X) on the dependent variable (Y) through the mediator variable (M) at different values of the moderator variables (W). Appendix E shows the regression equations estimated to test Hypothesis 5 and 6.

Summary

This chapter reviewed the data collection, measures, and data analysis approaches, as well as target population and sample of this study. The target population was non-managing role Korean employees of for-profit organizations in South Korea. Data were collected from four major companies in petrochemical, electronics materials, and home electronics industry, which are all headquartered in South Korea. With cooperation of HR or HRD managers of these organizations, 459 survey questionnaires were distributed and 285 usable questionnaires were returned. Prior to the data collection, this research was approved by the IRB at the University of Minnesota.

For the survey questionnaire, validated measurement scales were used to assess

knowledge sharing, perceived disparity, psychological safety, team identification, and transformational team leadership. All of the measures used in this study were previously developed and validated. The questionnaire was administered in Korean following a back-translation procedure. A series of confirmatory factor analyses were conducted to test the construct validity of the measurements. Consistent with accepted practice in CFA, several different fit indices were used to assess the fit of the model. Hierarchical multiple regression analyses were used to test the main effect of perceived disparity on knowledge sharing, the simple mediation effects of psychological safety and team identification on the relationship between perceived disparity and knowledge sharing guided by the multistep approach proposed by Baron and Kenny (1986). The moderated mediation effects of perceived disparity on knowledge sharing via psychological safety and team identification were tested using SPSS statistical routines developed by Preacher et al. (2007).

CHAPTER 4

RESULTS

This chapter presents the results of the data analysis. First, preliminary analyses including descriptive statistics, correlation matrix, and CFA are presented. Second, results of the hierarchical multiple regression analyses for testing the hypotheses on the main and simple mediation are provided. Lastly, results of moderated mediation for testing the hypotheses on the conditional indirect effects are presented.

Preliminary Analyses

Prior to analyses, to check for univariate outliers and multivariate outliers, I examined the z scores of each of the overall scales and Mahalanobis distances among the variables (Tabachnick & Fidell, 2007). No extreme outliers were found. I also conducted a preliminary analysis to access differences on the substantive variables among four organizations in the present study. One-way analysis of variance (ANOVA) suggests no mean differences for perceived disparity, $F(3, 236) = 0.28$, $p = .84$, team identification, $F(3, 236) = 1.28$, $p = .31$, psychological safety, $F(3, 236) = 1.52$, $p = .26$, transformational team leadership, $F(3, 236) = 1.12$, $p = .34$, and knowledge sharing, $F(3, 236) = 1.90$, $p = .13$.

Table 7 presents the means, standard deviations, and intercorrelations of the study variables. An inspection of the correlations indicated that perceived disparity was negatively and significantly related to team identification ($r = -.30$, $p < .01$),

Table 7

Descriptive Statistics and Bivariate Correlations

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. Age	36.52	7.52									
2. Rank	2.47	1.26	.81**								
3. Tenure	7.85	7.32	.76**	.65**							
4. Task Interdependence	3.49	0.78	-.12**	-.12**	-.09**						
5. Org. support	3.35	0.72	-.17**	-.08**	-.16**	.18**					
6. PD	2.71	0.78	.06**	.05**	-.01**	-.09**	-.28**				
7. TI	3.96	0.81	-.17**	-.21**	-.13**	.41**	.38**	-.30**			
8. PS	3.67	0.73	-.12**	-.14*	-.06**	.36**	.40**	-.44**	.73**		
9. TTL	3.80	0.78	-.10**	-.13**	-.06**	.27**	.42**	-.35**	.64**	.60**	
10. KS	3.77	0.72	-.12**	-.13**	-.12**	.38**	.52**	-.35**	.64**	.62**	.64**

Note. N=240. PD = Perceived disparity; PS = Psychological safety; TI = Team identification; TTL = Transformational team leadership; KS = Knowledge sharing. * $p < 05$, ** $p < .01$

psychological safety (r = -.44, p < .01), transformational team leadership (r=-.35, p<.01), and knowledge sharing (r = -.35, p < .01). Transformational team leadership was significantly correlated with team identification (r = .64, p < .01), psychological safety (r = .60, p < .01), and knowledge sharing (r = .64, p < .01). Among the demographic variables, rank (r = -.13, p < .05) was negatively and significantly related to knowledge sharing, whereas age and tenure was not significantly correlated with knowledge sharing. Correlation matrix also showed that task interdependence (r = .38, p < .01) and organizational support (r = .52, p < .01) were significantly related to knowledge sharing.

Confirmatory Factor Analysis

Before forming the scales for hierarchical multiple regression analyses, a series of confirmatory factor analysis (CFA) using SPSS AMOS version 20.0 was performed. SPSS AMOS is a comprehensive text- and graphics-based structural equation modeling and CFA program similar in design to LISREL and EQS (Anderson & West, 1998). The overall model's chi-square, goodness fit index (GFI), comparative fit index (CFI), normed fit index (NFI), and root mean square error of approximation (RMSEA) were used to assess model fit. For transformational team leadership, which is a four-dimension construct, I reduced the number of items by creating four indicators, with each indicator being represented by the dimension score. I did not reduce the number of items of psychological safety, team identification, knowledge sharing, and two control variables.

Results in Table 8 showed that the proposed five-factor structure (perceived disparity, psychological safety, team identification, transformational team leadership,

Table 8

Confirmatory Factor Analysis Results for the Study Variables

Model	$\chi 2$	*df*	$\Delta\chi 2$	GFI	CFI	NFI	RMSEA
Five-factor model [a]	707.29	340		.92	.90	.92	.069
Four-factor model [b]	746.45	344	39.16	.88	.89	.87	.072
Three-factor model [c]	899.84	347	153.39	.77	.84	.77	.084
Single-factor model [d]	1121.15	350	221.31	.72	.78	.71	.105

Note. $N = 240$. All $\chi 2$ *and* $\Delta\chi^2$ values are $p < .001$.
[a] Five-factor model includes perceived disparity, team identification, psychological safety, transformational team leadership, and knowledge sharing. [b] Four- factor model includes perceived disparity, transformational team leadership, knowledge sharing, and a factor combining team identification and psychological safety. [c] Three-factor model includes perceived disparity, knowledge sharing, and a factor combining team identification, psychological safety, and transformational team leadership. [d] Single-factor model includes one factor combining all five constructs.

knowledge sharing) demonstrated good fit with the data ($\chi^2[340] = 707.29$; GFI = .92; CFI =.90; NFI = .92; RMSEA = .069). To test for the discriminant validity of the constructs, I compared the five-factor model with three alternative models with fewer factors: a four-factor model that combined psychological safety and team identification into one factor, a three factor model that combined psychological safety, team identification, and transformational team leadership into one factor, and a single-factor model in which all items were specified to load on a single latent variable. Nested model comparisons demonstrated that the five-factor model was superior to the alternative models; results showed a significantly worse fit for the four-factor model (GFI = .88; CFI =.89; NFI = .87; RMSEA = .07), the three-factor model (GFI = .77; CFI =.84; NFI

= .77; RMSEA = .08), and the single-factor model (GFI = .72; CFI =.78; NFI = .71; RMSEA = .12). Taken together, the fit indices of the nested models showed that psychological safety, team identification, transformational team leadership were distinct constructs. I computed the various constructs by taking the average of their respective items.

Hypothesis Tests

Testing the Main and Mediation Effects

Collectively, Hypothesis 1, 2, and 3 proposed that psychological safety and team identification mediates the relationship for perceived disparity with knowledge sharing. According to Baron and Kenny (1986), four conditions are necessary to establish mediation:

1. the independent (i.e., perceived disparity) and dependent (i.e., knowledge sharing) variables must be significantly related;
2. the independent variable and mediator (i.e., team identification and psychological safety) must be significantly related;
3. the mediator and dependent variable must be significantly related; and
4. the relationship between the independent variable and dependent variable should be nonsignificant or weaker when the mediator is added.

The regression results for testing mediation are reported in Table 9 and 10.

Results in the third column of Table 9 and 10 showed that, after controlling for age, tenure, rank, task interdependence, and organizational support, perceived disparity is negatively related (β= -.21, $p < .01$) to knowledge sharing, which supported

Table 9

Regression Results for Testing Main and Mediation (Team Identification) Effects

			Knowledge Sharing			
Factor and statistic	Team Identification		Step 1		Step 2	
Step 1. Control variables						
Age	.08**		.14**		.10**	
Tenure	-.20**		-.12**		-.03**	
Rank	.01**		-.06**		-.06**	
Task interdependence	.33**		.29**		.15**	
Organizational support	.27**		.41**		.29**	
Step 2. Main effect						
Perceived disparity	-.19**	C2[b]	-.21**	C1[a]	-.13**	C3[c]
Step 3. Mediation effect						
Team identification					.43**	C4[d]
R^2	.32**		.41**		.53**	
ΔR^2	.03**		.04**		.17**	
Adjusted R^2	.31**		.35**		.52**	

Note .Standardized coefficients reported. $\Delta R^2 = R^2_{Model} - R^2_{Control}$.
[a] Conditions 1 for mediation (C1): the independent (i.e., perceived disparity)and dependent variables (i.e., knowledge sharing) must be significantly related; [b] Conditions 2 for mediation (C2): independent variable (i.e., perceived disparity) and mediator (i.e., team identification) must be significantly related; [c] Condition 3 (C3): mediator and dependent variable must be significantly related; [d] Condition 4 (C4): relationship between the independent variable and dependent variable should be nonsignificant or weaker when the mediator is added.
* $p < .05$, ** $p < .01$.

Table 10

Regression Results for Testing Main Effect Mediation (Psychological Safety) Effects

			Knowledge Sharing			
Factor and statistic	Psychological Safety		Step 1		Step 2	
Step 1. Control variables						
Age	.07**		.14**		.11**	
Tenure	-.16**		-.12**		-.05**	
Rank	.05**		-.06**		-.08**	
Task interdependence	.27**		.29**		.17**	
Organizational support	.26**		.41**		.30**	
Step 2. Main effect						
Perceived disparity	-.34**	C2[b]	-.21**	C1[a]	-.07	C3[c]
Step 3. Mediation effect						
PS					.41**	C4[d]
R^2	.37**		.41**		.51**	
ΔR^2	.10**		.04**		.15**	
Adjusted R^2	.35**		.39**		.50**	

Note .PS = Psychological Safety. Standardized coefficients reported. $\Delta R^2 = R^2_{Model} - R^2_{Control}$.

[a] Conditions 1 for mediation (C1): the independent (i.e., perceived disparity)and dependent variables (i.e., knowledge sharing) must be significantly related; [b] Conditions 2 for mediation (C2): independent variable (i.e., perceived disparity) and mediator (i.e., team identification) must be significantly related; [c] Condition 3 (C3): mediator and dependent variable must be significantly related; [d] Condition 4 (C4): relationship between the independent variable and dependent variable should be nonsignificant or weaker when the mediator is added.

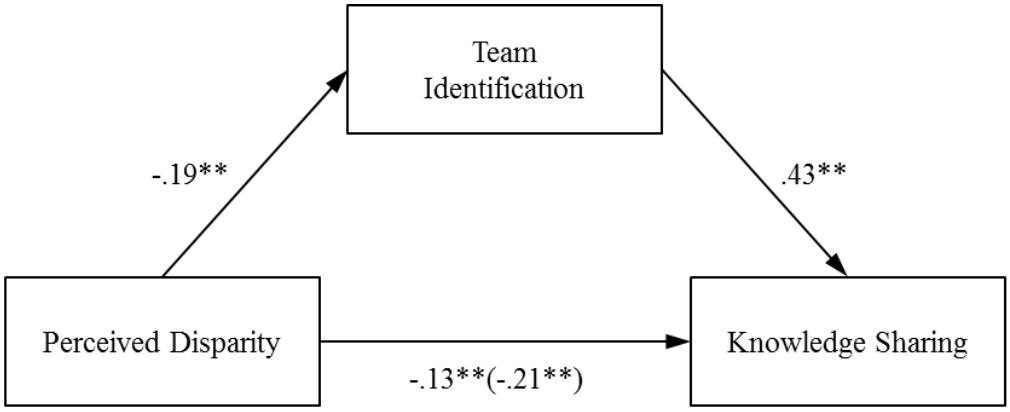
† $p < .10$, * $p < .05$, ** $p < .01$.

Hypothesis 1. Since Condition 1 was supported for both mediators, I tested for mediation separately for each of two mediators. For team identification, results in the second column of Table 9 and 10 show that perceived disparity was significantly related to team identification (β = -.19, $p < .01$), and psychological safety (β = -.34, $p < .01$), thus, support Condition 2 for mediation.

Results in the fourth column in Table 9 demonstrated that team identification was positively related to knowledge sharing (β = .43, $p < .01$) and, thus, support Condition 3. Further, results showed that after team identification was taken into account, the effects of perceived disparity (β = -.13, $p < .01$) became weaker, albeit still significant, which suggests partial mediation; whereas after psychological safety was taken into account, the effect of perceived (β = -.07, *ns*).became nonsignificant, which suggests complete mediation. Taken together, Hypotheses 2 and 3were supported. Figure 3 shows path diagram of mediational regression results.

Teasing the Moderating Effect of Transformational Leadership

Hypothesis 4 predicted that transformational leadership moderated the relationship between perceived disparity and knowledge sharing. To test Hypotheses 5, hierarchical moderated regression analysis was performed. In step 1, all of the control variables were entered. In step 2, main effect variables, power disparity and transformational team leadership were added. In step 3, interaction by entering the product of power disparity and transformational team leadership (power disparity × transformational team leadership) was tested. Of the control variables, task interdependence (β = .30, $p < .01$), organizational support (β = .47, $p < .01$) were significantly related to knowledge sharing in teams. Yet, age (β = .12, *ns*),



(a) Mediation effect of team identification on the relationship between perceived disparity and knowledge sharing

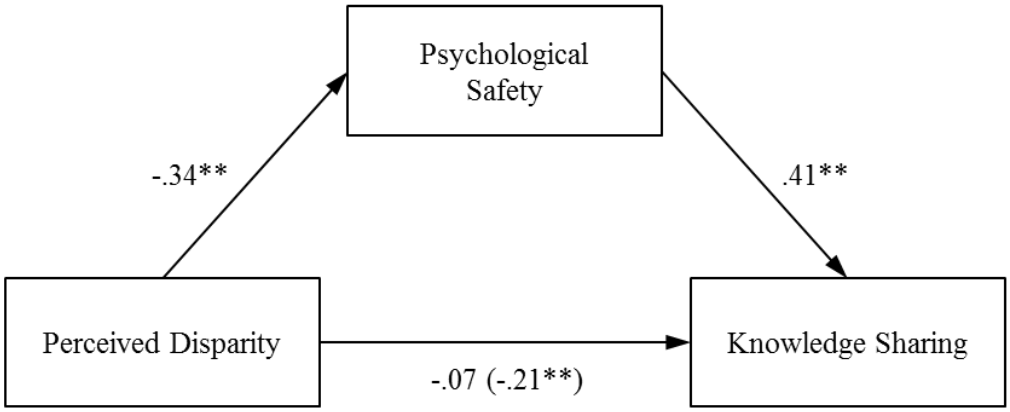


Figure 3. Path diagrams of mediation

rank (β = -.14, *ns*), and tenure (β = -.03, *ns*) were not significantly related to knowledge sharing. Results in the fourth column of Table 11 showed that, after controlling for age, tenure, rank, task interdependence, and organizational support, the interaction between perceived disparity and transformational team leadership (β= .01, *ns*) was not significant to predict knowledge sharing.

To probe the nature of the effects, I plotted the interactions following Aiken and West's (1991) procedures and conducted simple slopes tests. The relationship

Table 11

Regression Results for Testing Main Effect in Hypothesis 1 and Mediation in Hypothesis 3

Factor and statistic	Step 1	Step 2	Step 3
Step 1. Control variables			
Age	.12**	.09**	.09**
Tenure	-.14**	-.04**	-.04**
Rank	-.03**	-.08**	-.08**
Task interdependence	.30**	.21**	.21**
Organizational support	.47**	.27**	.27**
Step 2. Main effect			
Perceived Disparity (PD)		-.11**	-.12**
Transformational Team Leadership (TTL)		.43**	.42*
Step 3. Moderation effect			
PD × TTL			.01**
R^2	.366**	.539**	.539**
ΔR^2		.17**	.00**
Adjusted R^2	.35**	.54**	.54**

Note .PS = Psychological Safety. Standardized coefficients reported. $\Delta R^2 = R^2_{Model} - R^2_{Control}$.

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

between perceived disparity × knowledge sharing was plotted using conditional

values for transformational team leadership that were calculated to be 1 standard deviation above and 1 standard deviation below the mean (Aiken & West, 1991). Figure 4 shows that the relationship between perceived disparity and knowledge sharing is negative for both high and low transformational team leadership, but the relationship is stronger for low transformational team leadership (dashed line) than high transformational team leadership (solid line). Furthermore, I conducted a simple slopes test, which is the method for testing "the statistical significance of the slopes of the simple regression lines representing relations between

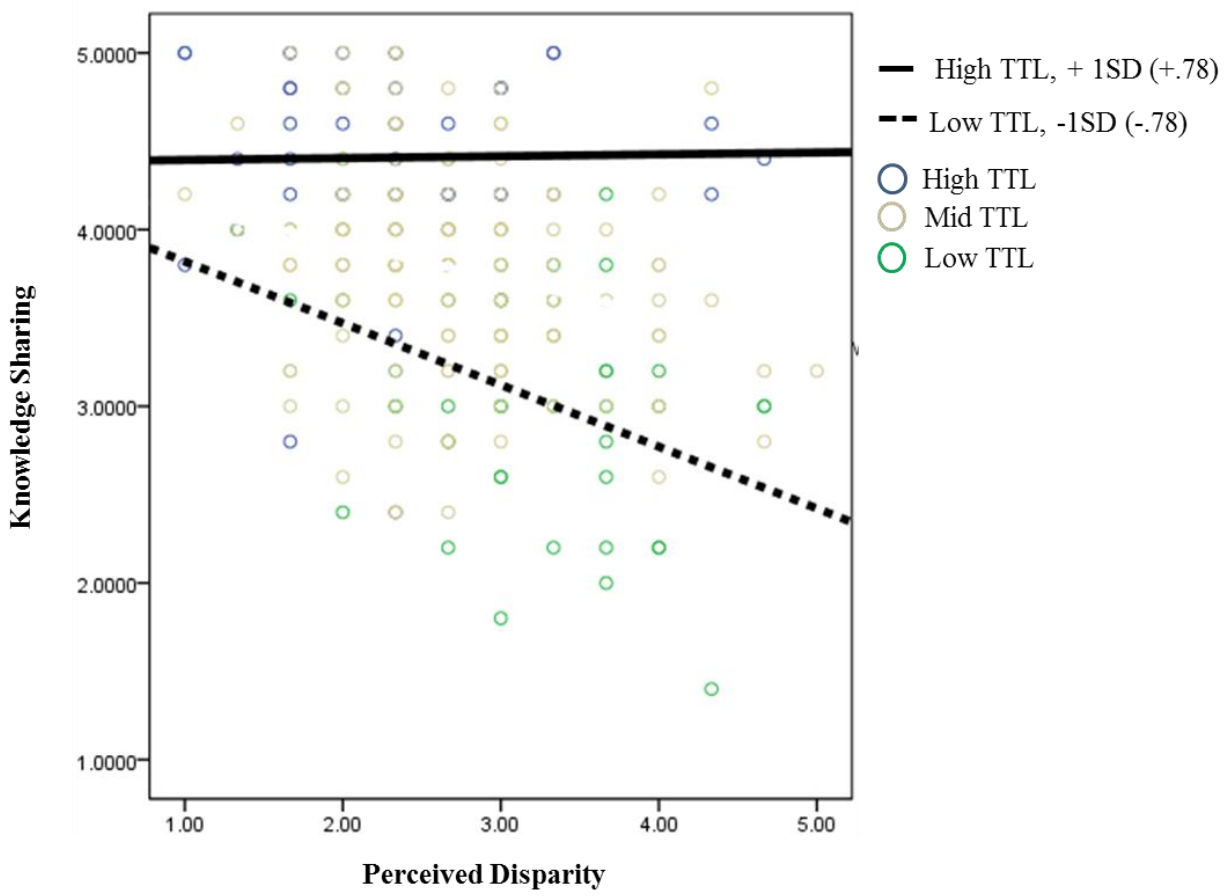


Figure 4. Interaction effect of perceived disparity and transformational leadership on knowledge sharing. TTL = Transformational team leadership.

the predictor and the outcome at specific values of the moderator variable" (Frazier, Tix, & Barron,2004, p. 122). Frazier et al. (2004) further point out that testing the simple slopes can give information about the significance of the relationships between the independent and dependent variable at different levels of the moderator. In the present study, simple slope tests indicated that perceived disparity has a stronger negative effect on knowledge sharing within teams when transformational team leadership was low (β = -.17, t = 2.55, p < .01) than when transformational team leadership was low (β = -.01, *ns*).

To further probe the nature of the moderation effects of transformational team leaderships, I conducted additional analyses to assess an overall moderation model with the procedure proposed by Preacher et al. (2007) using the PROCESS computational program for SPSS developed by Hayes (2012). I calculated the bias-corrected bootstrap conditional effects, sampling error(*SE*), t score, and p level of the moderation on the basis of 5,000 bootstrap samples. The results in Table 12 shows that perceived disparity (-.155, p <.05) was significantly and negatively related to knowledge sharing when transformational leadership behavior was low, whereas the effect (-.107, *ns*) was nonsignificant when transformational leadership behavior was high. Taken together, Hypothesis 4 was supported.

Testing the Moderated Mediation Effects

Hypotheses 5 and 6 predicted that the mediating effect of team identification and psychological safety for the negative relationship between perceived disparity and knowledge sharing would be weakened or become nonsignificant when high transformational team leadership is high.

:

Table 12

Moderating Effects of Transformational Team Leadership in Predicting Knowledge Sharing

Moderator value	Boot indirect effect	*Boot SE*	*Boot t*	*Boot p*
Moderating (conditional) effect at TTL = *M* ±*1 SD*				
Low TTL, -1SD (-.78)	-.155	.063	-2.44	.02
Average TTL	-.131	.048	-2.71	.01
High TTL, + 1SD (+.78)	-.107	.067	-1.60	.11

Note. N=240. TTL = Transformational team leadership. Unstandardized coefficients are reported. Bootstrap size = 5,000.

To assess moderated mediation (Muller et al., 2005; Preacher et al., 2007), I examined four conditions following Preacher et al., (2007) recommendation

1. significant effect of the independent (i.e., perceived disparity) and dependent (i.e., knowledge sharing) variables;
2. significant effect of mediator (i.e., team identification; psychological safety) on dependent variable;
3. significant interactions between independent variable and moderator (i.e., transformational team leadership) in predicting mediator; and significant interaction between moderator and mediator in predicting dependent variable;
4. different conditional indirect effect of independent variable on dependent variable, via mediator across different (i.e., low and high levels) of moderator.

The last condition, which is the essence of moderated mediation (Preacher et al., 2007).

Moderated mediation is demonstrated when the conditional indirect effect of perceived disparity on knowledge sharing, via team identification and psychological safety, differs in strength across low and high levels of transformational team leadership.

The results for Hypothesis 1, which demonstrated that perceived disparity was significantly related to knowledge sharing, supported Condition 1 for moderated mediation. Condition 2 was also supported by the results for Hypothesis 1, in which team identification and psychological safety was positively related to knowledge sharing.

To test for Condition 3, I first examined whether the interaction of perceived disparity with transformational team leadership was significant in predicting team identification and psychological safety. Results of the moderated regressions of transformational team leadership on team identification and psychological safety and knowledge sharing are presented in Table 13 and 14. Results shows that in predicting team identification, the interaction terms for perceived disparity with transformational team leadership ($\beta = .01$, *ns*) was not significant, and in predicting psychological safety, the interaction terms for perceived disparity with transformational team leadership ($\beta = -.22$, $p < .05$) was significant.

I next examined whether the interactions for transformational team leadership with team identification and psychological safety were significant in predicting knowledge sharing. Results presented in the last column of Table 13 and 14 show that both team identification ($\beta = .72$, $p < .05$) and psychological safety ($\beta = .79$, $p < .05$) interacted with transformational team leadership in predicting knowledge sharing.

Table 13

Regression Results for Testing Moderation for Transformational Leadership and Team Identification and Knowledge Sharing

Factor and statistic	Team Identification	Knowledge Sharing
Step 1. Control variables		
Age	.03**	.07**
Tenure	-.11**	-.01**
Rank	-.01**	-.06**
Task Interdependence	.23**	.15**
Organizational Support	.11**	.23**
Step 2. Main effect		
Perceived disparity (PD)	-.08**	-.08**
Step 3. MODMED effect		
Transformational Team Leadership (TTL)	.49**	-.09†*
PD ×TTL	.01**	
Team Identification (TI)		-.12†*
TI ×TTL		.72**
R^2	.50**	.58**
ΔR^2	.21**	.22**
Adjusted R^2	.49**	.57**

Note .MODMED = Moderated mediation. Standardized coefficients reported.
$\Delta R^2 = R^2_{Model} - R^2_{Control}$.
† $p < .10$, * $p < .05$, ** $p < .01$.

Table 14
Regression Results for Testing Moderation for Transformational Leadership and Psychological Safety and Knowledge Sharing

Factor and statistic	Psychological Safety	Knowledge Sharing
Step 1. Control variables		
Age	.02**	.07**
Tenure	-.09**	-.01**
Rank	.03**	-.08**
Task Interdependence	.20**	.17**
Organizational Support	.13**	.23**
Step 2. Main effect		
Perceived disparity (PD)	-.03**	-.04**
Step 3. MODMED effect		
Transformational Team Leadership (TTL)	.56**	-.08**
PD ×TTL	-.22**	
Psychological Safety (PS)		-.18**
PS ×TTL		.76**
R^2	.48**	.59**
ΔR^2	.22**	.22**
Adjusted R^2	.47**	.59**

Note .MODMED = Moderated mediation. Standardized coefficients reported.

$\Delta R^2 = R^2_{Model} - R^2_{Control}$.

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

As noted by Preacher et al. (2007), several methodologists have defined or discussed moderated mediation, sometimes with conflicting definitions. Wegener and Fabrigar (2000) share James and Brett's (1984) definition: "Moderated mediation could occur when a moderator × IV interaction is observed (because of differences in IV to mediator and/or mediator to DV paths) or when no moderator × IV interaction is observed (because different mediators create the same magnitude of effect or a mediator operates at some levels of the moderator but direct effects occur at other levels)" (p. 437).

To further validate findings of moderated mediation relationships for psychological safety, I examined Condition 4, which requires the magnitude of the conditional indirect effect of the perceived disparity via team identification and psychological safety to be different for knowledge sharing across high and low levels of transformational team leadership. I used Preacher et al.'s (2007) statistical significant test. Following Preacher et al.'s (2007) recommendation, I operationalized high and low levels of transformational team leadership as one standard deviation above and below the mean score of the leadership behavior.

Table 15 and 16 presents the estimates, standard errors, *t* statistics, and significance value of the conditional indirect effects for perceived disparity across low and high levels of transformational team leadership. Results show in Table 15 shows that the conditional indirect effects of perceived disparity through team identification was stronger and significant in low transformational team leadership (-.036, $p < .05$) but were weaker and nonsignificant in the high transformational team leadership (-.022, *ns*). Thus, Hypotheses 5 was supported..

Table 15

Conditional Indirect Effects via Team Identification in Predicting Knowledge Sharing

Moderator value	Boot indirect effect	*Boot SE*	*Boot t*	*Boot p*
Conditional indirect effect at TTL = *M ± 1 SD*				
Low TTL, -1SD (-.78)	-.036	.019	-1.89	.012
Average TTL	-.029	.025	-1.15	.062
High TTL, + 1SD (+.78)	-.022	.026	-0.85	.098

Note. N=240. TTL = Transformational team leadership. Unstandardized coefficients are reported. Bootstrap size = 5,000.

Table 16

Conditional Indirect Effects via Psychological Safety in Predicting Knowledge Sharing

Moderator value	Boot indirect effect	*Boot SE*	*Boot t*	*Boot p*
Conditional indirect effect at TTL = *M ± 1 SD*				
Low TTL, -1SD (-.78)	-.068	.026	-2.96	. 0031
Average TTL	-.087	.023	-3.83	.0001
High TTL, + 1SD (+.78)	-.098	.030	-3.31	.0009

Note. N=240. TTL = Transformational team leadership. Unstandardized coefficients are reported. Bootstrap size = 5,000.

In contrast, for psychological safety, results show in Table 16 shows that the conditional indirect effects of perceived disparity were stronger and significant in high transformational team leadership (-.098, $p < .01$) but were weaker and significant in the low transformational team leadership (-.068, $p < .01$). Thus, Hypotheses 6 was not supported

Summary

This chapter presents the results of data analyses. First, hierarchical multiple regression analyses were conducted to test the main and mediation effects. The results of regression analyses showed that perceived disparity was significantly and negatively associated with knowledge sharing, supporting Hypotheses 1. In support of Hypothesis 2 and 3, team identification and psychological safety mediated the relationship between perceived disparity and knowledge sharing behaviors. In addition, transformational team leadership moderated the relationship between perceived disparity and knowledge sharing, supporting Hypothesis 4. Furthermore, the conditional indirect effect of perceived disparity on knowledge sharing via team identification was weaker and nonsignificant when transformational team leadership was high, supporting Hypothesis 5. However, for psychological safety, the conditional indirect effect of perceived disparity on knowledge sharing was stronger and significant when transformation team leadership was. Thus Hypothesis 6 was not supported.

CHAPTER 5

DISCUSSION AND CONCLUSION

This chapter discusses the findings presented in the previous chapter. First, a summary of the results and discussion are presented. Theoretical and practical implications of the findings are discussed. Next, then limitations of this study are addressed. Finally, the chapter concludes by outlining future research directions.

Summary of Results and Discussion

A central intuition guiding the present study is that work teams in many organizations perform a number of important tasks under the central premise that when organizations integrate individuals with a different knowledge base into a team-based structure, a superior performance is more likely to happen. This study also notes that knowledge sharing is a crucial team process, without which, work teams may not be able to meet this fundamental expectation. Under what conditions do employees within a work team share their knowledge with fellow team members? The present study addresses this question by examining the interrelationships between perceived disparity, team identification, psychological safety, and transformational team leadership through the investigation of the following hypotheses.

Hypothesis 1: Perceived Disparity and Knowledge Sharing in Work Teams

Hypothesis 1 predicted that perceived disparity would be negatively related to knowledge sharing in work teams. This hypothesis was confirmed, indicating that team members who perceived a high level of disparity in power and status were less likely to engage in knowledge sharing behaviors. There has been increasing interest in the effects of social hierarchy—differences in power and status among

individuals—on team processes and collective learning in organizations and teams (Bunderson & Reagans, 2011). However, despite the relevance of perceived disparity for knowledge sharing, the idea that the power disparity may have detrimental effects on employee knowledge sharing behavior has not been fully demonstrated (e.g., Van de Vegt et al., 2010). This finding supports the argument that the power and status differences among team members could stifle and constrain team members' knowledge sharing which is viewed as critical for team performance and learning (e.g., Brooks 1994, Edmondson 2002).

Hypotheses 2-3: Team Identification, Psychological Safety, and Knowledge Sharing

Hypothesis 2 predicted that team identification would mediate the negative relationship between perceived disparity and knowledge sharing behavior. This hypothesis was also confirmed with negative and indirect effects of perceived disparity on knowledge sharing via team identification. More specifically, team identification was negatively related to perceived disparity, yet this team identification was positively associated with knowledge sharing.

The results from Hypothesis 2 provide evidence for the notion that team members with a high perceived disparity are less likely to engage in knowledge sharing behavior because dissimilarities in power and status may lead to socially categorizing team members either high-power or low-power members and to decrease the extent to which dissimilar individuals identify with other team members (Milliken & Martins, 1996; Williams & O'Reilly, 1998). This finding supports Chattopadhyay and George's (2001) argument that power differences in work teams may heighten intragroup fractures and thereby undermine the team processes

including knowledge sharing.

Hypothesis 3 predicted that psychological safety would mediate the negative relationship between perceived disparity and knowledge sharing behavior. The result of mediation analysis provides support for hypothesis 3, indicating that the indirect effects of perceived disparity on knowledge sharing through team identification is negative and significant. This result supports the argument that perceived disparity negatively affect the extent to which team members perceive their team as psychologically safe for proposing different perspectives, expressing disagreements, or suggesting innovative ideas (Kahn, 1990). This decreased level of psychological safety, in turn, may dampen the team members' motivation to share their knowledge within the team (Kahn, 1990; Nembhard & Edmondson, 2006; Tucker & Edmondson, 2003). This finding is consistent with the argument that while the psychological safety is an important prerequisite for facilitating the sharing and integrating the knowledge in work teams, yet differences in power and status can weaken the team members' beliefs of which their team is safe for interpersonal risk (Kahn, 1990; Nembhard & Edmondson, 2006; Tucker & Edmondson, 2003).

Hypotheses 4-6: Transformational Team Leadership, Perceived Disparity, and Knowledge Sharing

Hypothesis 4 predicted that transformational team leadership would moderate the negative effects of perceived disparity on knowledge sharing. This hypothesis was confirmed; indicating that the negative relationship between perceived disparity and knowledge sharing become nonsignificant when transformational team leadership is high. This result is in line with the argument that

team leaders are crucial for eliminating the barriers that often discourage team members from voicing their concerns and other ideas (Kearney & Gebert, 2009; Walumbwa & Schaubroek, 2009). Particularly, transformational team leaders can attenuate the negative effects of perceived disparity by shifting attention from difficulties to potential advantages of diversity (Walumbwa & Schaubroek, 2009).

Hypothesis 5 and 6 further investigated how transformational team leadership moderate the effects of perceived disparity on knowledge sharing. More specifically, Hypothesis 5 and 6 predicted that transformational team leadership would moderate the strength of the mediated relationships between perceived disparity and knowledge sharing via team identification (Hypothesis 5) or psychological safety (Hypothesis 6), such that the mediated relationships would be weaker or nonsignificant under high transformational team leadership than under low transformational team leadership.

For the team identification, the result of moderated mediation analysis provides support for Hypothesis 5, indicating that mediated relationships was weaker and nonsignificant under high transformational team leadership than under low transformational team leadership. By contrast, the results do not provide support for Hypothesis 6, indicating that for psychological safety, the conditional indirect effects of perceived disparity was stronger and significant in high transformational team leadership but were weaker and significant in low transformational team leadership. Thus, the findings partially support the proposition that the indirect effects of perceived disparity on knowledge sharing through emergent states (i.e., team identification, psychological safety) depending on contextual circumstances such as

transformational team leadership.

The results suggest that transformational team leadership itself is not always sufficient to build a psychologically safe climate in a team. Although more research is needed to explore the relationship among perceived disparity, psychological safety, and transformational team leadership, the findings imply that team leaders may need to also engage in behaviors other than transformational team leadership to promote psychological safety in their teams. For example, while this study does not give direction here, team leaders of followers perceiving high power disparity may need to also exhibit more inclusive leadership style (i.e., making themselves available and approachable; Nembhard & Edmondson, 2006), such as the servant leadership style (i.e., team leaders' behaviors emphasizes serving others, nurturing positive relationships between team members, and sharing power; Schaubroeck, Lam, & Peng, 2011).

Theoretical Implications

The present study provides four significant theoretical contributions to the existing literature on knowledge sharing. First, this study sought to contribute to the body of knowledge on team diversity, team identification, psychological safety, transformational team leadership, and knowledge sharing behavior by uniquely integrating five streams of research that have not been connected previously in HRD and KM literature. Knowledge sharing in work teams is one approach for an organization to take advantage of diverse information, expertise, and perspectives of all members as an important asset for collective learning, innovation, and performance (Bunderson & Sutcliffe, 2002; Bunderson & Reagans, 2011; Mesmer-

Magnus & DeChurch, 2009; van Knippenberg & Schippers, 2007). However, little research has examined the relationship between team diversity and knowledge sharing behavior.

Particularly, limited research has examined the role of perceived disparity in predicting knowledge sharing in work team settings, even though implicit or explicit rank orders in a team hierarchy plays an important role in determining team members' willingness to share knowledge (Bunderson & Reagans, 2011). More importantly, limited research has investigated the important mediating role of team identification and psychological safety in facilitating knowledge sharing in work teams and the moderating role of transformational team leadership. The findings of the present study suggest that team identification, psychological safety, and transformational team leadership are significant determinants of knowledge sharing in work teams. To the best of my knowledge, the present study is the first to jointly examine the effects of these variables on knowledge sharing in the HRD and KM literature.

Second, another theoretical contribution is that this study identified team identification and psychological safety as mediators in the relationship between perceived disparity and knowledge sharing. The results of this study suggest that team members' identification with their team significantly mediated the effects of perceived disparity on knowledge sharing such that while team identification had positive effects on knowledge sharing (Bezrukova et al., 2009; Carmeli, 2008; Kearney et al., 2009), yet this sense of oneness can be scattered by the presence of perceived disparity among team members.

In addition, the findings of the present study also suggest that team members'

perception of psychological safety—no one on the team will negatively response to actions that have the potential for embarrassment or threat—significantly mediated the effects of perceived disparity on knowledge sharing. Despite the necessity for psychological safety in knowledge sharing (Kahn, 1990; Nembhard & Edmondson, 2006; Tucker & Edmondson, 2003), perceived disparity in power and status weakened team members' beliefs of which their team is safe for interpersonal risk. Thus, a key contribution of this study is the importance of identifying team member emergent states which supports improving social and psychological context, since both are critical for knowledge sharing within demographically and hierarchically diverse teams.

Third, another key finding of this study is that transformational team leadership operates as a condition that moderates the relationship between perceived disparity and knowledge sharing in work teams such that transformational team leadership weakens the negative relationship between perceived disparity and knowledge sharing behavior. This finding demonstrates that knowledge sharing in work teams is likely to be facilitated when team leaders' transformational leadership—words and deeds by persuading team members to set aside self-interest concerns and work toward mutual goals (Kaiser et al., 2008)—mitigates the stifling effects of perceived disparity on knowledge sharing. This is a very interesting finding suggesting that knowledge sharing could take place in organizations despite power and status differences (Bunderson & Reagans, 2011). Consistent with the functional perspective of leadership (Hackman & Walton, 1986; Lord, 1977), this result suggests that team leaders are critical for removing the constraints that often

discourage team members from sharing unique perspectives and expressing different opinions (Kearney & Gebert, 2009; Walumbwa & Schaubroek, 2009). In this respect, the present study supports Walumbwa and Schaubroek's (2009) argument that diverse teams composed of demographically and hierarchically deferent members may benefit from a leader's transformational leadership behavior.

Finally, the present study also contributes to the team diversity and knowledge sharing literature by exploring whether or not the mediation effect of perceived disparity on knowledge sharing via team identification or psychological safety remains constant across different levels of transformational team leadership. For the team identification, the findings of this study suggest that the mediated negative effects of perceived disparity was weaker and nonsignificant under high transformational team leadership, indicating high transformation team leaders alleviated the negative effects of perceived disparity on team identification, and thereby enhanced knowledge sharing in work teams. In contrast, for psychological safety, the findings of this study suggest that the mediated negative effects of perceived disparity was stronger and significant when transformational team leadership was high. This result suggests that transformational team leadership itself is not always sufficient to build a psychologically safe climate in teams.

Implication for Practice

This study sheds light on one of the potential reasons why some team members are willing to share their knowledge while others remain silent, and consequently, why an expanded pool of perspectives and expertise does not inevitably improve team processes and performance. The findings of the present

study can provide important insights from different angles for HRD practitioners, managers, and organizations on how to effectively promote knowledge sharing in work teams. The most fundamental implication of this study is that the findings provide the conceptual basis for HRD and KM interventions that are designed to promote knowledge sharing in teams.

Because team diversity is likely to further increase in the future (Kearney & Gerbert, 2009), the importance of knowledge sharing—as a way of actualizing the potential benefits inherent in diverse work teams—is likewise inevitable to increase. However, this implies that it would be the first step for line managers and HRD professionals to help team leaders understand and anticipate the potential challenges diverse teams may face (e.g., less social integration, greater communication problems; Williams & O'Reilly, 1998). Additionally, appropriate learning and development interventions for team leaders should be provided so that these challenges can be overcome with effective team leadership. That is, organizations must take active and informed steps to fully utilize diverse resources in work teams, and to avoid the stifling effects of perceived disparity among team members.

In particular, this study suggests that although perceive differences in power and status present obstacles or impediments to knowledge sharing, these stifling effects of perceived disparity among team members can be mitigated by building a positive social and psychological team context which is characterized as a high level of team identification and psychological safety, under the guidance of team leaders. Considering the practical implication of the findings of the present study, a central HRD challenge in knowledge sharing research would be how to create this positive

social and psychological team context. A review of extant literature on team identification, psychological safety, and transformational team leadership presents several key tasks HRD practitioners need to perform with appropriate HRD and OD interventions, as shown in Table 17.

Table 17

A summary of Key Tasks of Line Manager and HRD Practitioners

Motivating and Enabling Factors	Key Tasks of Line Managers and HRD Practitioners	HRD and OD Interventions
Team Identification: Perception of a shared 'ONENESS.'	Setting common compelling goals that work teams should strive to achieve and consolidating team members around these mutual goals (e.g., Bezrukova et al., 2009; Hackman, 2002; Kearney & Gerbert, 2009)	Leading teams; team leadership behavior Work team design: Creating enabling structure
	Creating the right mix of interdependence among team members (e.g., Van de Vegt et al., 2003; Van de Vegt & Bunderson, 2005)	
Psychological Safety: Perception of a shared 'OPENNESS.'	Creating a respectful interpersonal relationships (Baker & Dutton, 2007; Brueller & Carmeli, 2011; Edmondson, 2004)	HRM practices (e.g., recruitment, appraisal systems, and rewards)
	Training and coaching team members on how to handle interpersonal risk taking by others in an open and respectful manner (Bradley et al., 2012)	Training and development
Team Leadership	Training and coaching leadership competencies to establish and maintain a climate of team identification and psychological safety (Detert & Burris, 2007)	Team leadership competency assessment, feedback, development

Creating Team Conditions that Promote Team Identification

The findings of the current study underscore the role of team identification in the knowledge sharing in work teams. To encourage team members to sharing their knowledge in diverse teams, it is important for line managers and HRD professionals to take steps to foster team identification. As a way of creating team conditions that promote team identification, research suggests following key tasks, including setting common compelling goals that work teams should strive to achieve and consolidate team members around these mutual goals (e.g., Bezrukova et al., 2009; Hackman, 2002; Kearney & Gerbert, 2009), and creating the right mix of interdependence among team members (e.g., Van de Vegt et al., 2003; Van de Vegt & Bunderson, 2005).

Compelling directions. Compelling directions may consolidate team members around common goals that work teams should strive to achieve, and eventually promote overall team identification and team performance (Bezrukova et al., 2009; Hackman, 2002; Kearney & Gerbert, 2009). According to Hackman (2002), compelling team direction has three characteristics, including (a) a challenging direction which motivates team members; (b) a clear direction which aligns team members' efforts toward common goals; and (c) a consequential direction which has a significant impact on the team, organization, and customer, and thereby motivates team members to fully utilize their talents. In order to have a good team direction, team leaders should first clearly articulate the mission, vision, and values for their team, which are aligned to those of organizations. They should also take into account the needs and expectations of team members and key stakeholders and develop a strong focus on creating and enabling team conditions that are conducive to high

team performance, individual development and initiative, and collective team learning (Wageman & Hackman, 2005). From a practical perspective, the findings of the present study indicate that creating the perception of a shared identity within a group is an effective strategy for promoting knowledge sharing, which can be promoted by setting compelling goals that work teams should strive to achieve, and uniting team members around these mutual goals.

Interdependence among team members. Line managers and HRD professionals can encourage team identification among team members by creating the right mix of task and goal interdependence among team members (e.g., Van der Vegt et al., 2003). According to Gully, Incalcaterra, Joshi, and Beaubien (2005), the chances for team effectiveness are higher when team members are interdependent in terms of (a) the levels of task-relevant interaction necessary for effective task performance (i.e., task interdependence); (b) the levels of interconnections among team members' goal (e.g., individual or team; goal interdependence), and (c) rewards, punishments, and feedback that are shared by team members (i.e., outcome interdependence).

Gully et al. (2005) also suggest that team leaders could promote interdependence in several ways, including altering workflow from independent to more reciprocal task structure, employing team goals that may facilitate the development of cooperative strategies, and rewarding collective outcomes that encourage team members to collaborate and assist in the performance of other members. In addition, Van der Vegt and Van de Vliert's (2002) four-step decision tree also provides a practical tool that team leaders can use to choose the most appropriate

intervention strategy within a team. According to these authors, team leaders can facilitate the task interdependence by changing the distribution of individual tasks and responsibilities within the team. Perceptions of goal interdependence could be altered by either formulating joint team objectives or providing team feedback (Van der Vegt et al., 2003). In summary, by creating the right mix of task, goal, and outcome interdependence, team leaders may not only reduce the deleterious effects of team diversity, but also may stimulate cooperation that is important for the effective functioning of work teams.

Creating Team Conditions that Promote Psychological Safety

The results of the current study highlight the effects of psychological safety on knowledge sharing in work teams. To create enabling conditions for psychological safety among team members, research suggests following key tasks, including creating trusting and respectful interpersonal relationships (Brueller & Carmeli, 2011; Edmondson, 2004), and training and coaching team members on how to handle interpersonal risk taking by others in an open and respectful manner (Bradley et al., 2012).

Respectful interpersonal relationships. The research on high-quality relationships—conducted by Carmeli and colleagues (e.g. Brueller & Carmeli, 2011; Carmeli, Brueller, & Dutton, 2009; Carmeli & Gittell, 2009)—suggest that organizations may promote psychological safety within a work team by helping team leaders encourage the development of high-quality interpersonal relationships among team members. Carmeli and Gittell (2009) argued that the concept of a high-quality relationship—characterized as a respectful interpersonal interaction and engagement—is

the "underpinnings of psychological safety" (p. 713). As ways of facilitating the building of high-quality relationships, Baker and Dutton (2007) identify several clusters of HR practices, including (a) employee selection practices (e.g., selecting employees on the basis of relational skills), (b) socialization practices focusing on building relational connections among employees, (c) rewarding practices for appreciating relational skills, and (d) relational meeting practices. While these practices may not make high-quality relationships spontaneously happen, work practices in day-to-day environments can enable or disable the building of this kind of respectful relationship which is conducive to a sense of psychological safety (Baker & Dutton, 2007; Carmeli & Gittell, 2009). In this regard, team development programs aimed at fostering psychological safety can benefit from focusing on creating respectful interpersonal relationships among team members.

Diversity training interventions. The present study suggests that organizations should pay special attention to create a positive social and psychological team context that embrace and leverage all the differences of team members to benefit the work teams and ultimately organizations. Research on the organization's diversity management initiatives suggest that diversity training might be a unique HRD intervention to train and coach team members on how to handle interpersonal risk taking by others in an open and respectful manner (Bradley et al., 2012). That is, diversity training interventions may create a positive link between diversity and performance by designing, delivering and evaluating the organization's efforts aimed at embracing all differences within organizations (Curtis & Dreachslin, 2008; Jayne & Dipboye, 2004). In their review of organizational initiatives for

managing diversity, Jayne and Dipboye (2004) also argued that without effective training and development to support valid selection processes, increased diversity does not necessarily improve the talent pool.

However, as shown in Table 18, a literature review of diversity training literature (Curtis & Dreachs, 2008) and an industry survey of diversity training practices (Bendick, Egan, & Lofhjelm, 2001) show that the majority of researchers and practitioners have focused on the compliance aspects of workplace diversity,

Table 18

Diversity Training Interventions: Focus / Content

Focus / Content [a]	Academic Research [a]	Industry Practices [b]
Increasing participants' sensitivity or awareness of discrimination and stereotype (or reducing bias or prejudice)	16	71 [c]
Improving skills such as conflict management to address these discrimination and stereotype; changing participants' behavior	7	75 [c]
Framing/changing the participants' perceptions of training effectiveness	3	
	N=26 Studies	*N*=108 Firms

Note. [a] Adapted and modified from "Integrative literature review: diversity management interventions and organizational performance: a synthesis of current literature," by E. F. Curtis & J. L. Dreachslin, 2008, *Human Resource Development Review, 7*(1), 107-134. [b] Adapted and modified from "Workforce diversity training: From antidiscrimination compliance to organizational development," by M. Bendick, M. L. Egan, & S. M. Lofhjelm, 2001, *Human Resource Planning, 24*(2), 10-25. [c] Respondents could select more than one response.

including problems of discrimination in the workplace, the role of stereotypes in

discrimination, and the content of stereotypes about different groups. While this kind of diversity training for building awareness may have remedial or preventive effects avoiding negative effects of diversity, shifts in training contents from reducing compliance issues to promoting more positive states of employees may be more effective for work teams to ensure that different perspectives and experiences are actually used to improve task performance (Jayne & Dipboye, 2004). Because, as Jayne and Dipboye (2004) indicated, capitalizing on the strengths that individual members bring to the team requires a deeper-level of interpersonal understanding--beyond just avoiding discrimination, prejudices, and stereotypes in work teams.

Team Leadership Assessment, Feedback, and Development

The findings of this study suggest that team leadership behaviors and processes contribute to the building and sustaining of team identification and psychological safety among team members, which in turn, contribute to knowledge sharing in work teams. The findings about the value of transformational team leadership behaviors have important action implications. First, transformational team leadership behaviors should be assessed, developed, and rewarded. For example, team leadership behaviors found to influence team identification and psychological safety could be incorporated into multi-source leadership assessment instruments and subsequent leadership coaching and training programs. Such team leadership assessment instruments would help organizations identify leadership training needs, and develop training and development interventions. Additionally, when hiring new team leaders internally or externally, an examination of the leadership competencies to establish and maintain a climate of team identification and psychological safety

should be included in the selection process.

Second, transformational leadership should be part of leadership programs. This study provides evidence that knowledge sharing is strongly influenced by transformational team leadership through team identification. Podsakoff et al. (1996, p. 259) stated "transformational leaders focus on influencing followers' values and aspirations, activate their higher-order needs, and arouse them to transcend their own self-interests for the sake of the organization." They further identified six dimensions of transformational leadership behaviors, including (a) articulating a vision of the future of the organization, (b) providing a model that is consistent with that vision, (c) fostering the acceptance of group goals, (d) having high performance expectations, (e) providing individualized support, and (f) providing intellectual stimulation. These transformational leader behaviors can be used as a guide for developing HRD interventions—team leaders' leadership training program— that directly affect the relationship between perceived disparity and team identification.

Third, as noted above, team leaders may need to also engage in behaviors other than transformational team leadership to promote psychological safety in their teams. Although future research could examine more closely the relationship of psychological safety and transformational team leadership, past research has also shown that leaders of work teams may have to be open and coaching oriented to create an atmosphere of psychological safety (Edmondson, 2004). Schaubroeck et al.'s (2011) study also provides practical implications for how leaders may develop more psychologically safe teams. In their study examining the effects of servant leadership on psychological safety, Schaubroeck et al. found that the servant

team leadership behavior “can be useful for leaders to break down the barriers between members and to build a climate of psychological safety” (p. 870). Consistent with the core argument of situational leadership theory, they further argued that the effects of servant leadership on team performance are not redundant with those of transformational leadership, and team leaders can engage in each type of behavior as the situation warrants. In line with the argument of Schaubroeck et al. (2011), therefore, tem leadership development initiatives may be improved by seeking to promote team leader’s behavioral flexibility in this way. In summary, in order to maximize the benefits of team diversity, team leaders with behavioral indicators associated with team identification and psychological safety should be selected, developed, and retained.

Limitations

The present study has several limitations that should be acknowledged and addressed in future research. First, the mediation model of the present study implies causal relationships between perceived disparity, team identification, psychological safety, and knowledge sharing. However, the current research design does not allow us to conclude definitively that perceived disparity leads to lower team identification or psychological safety since the data for this study were collected at a single point in time. Thus, the cross-sectional nature of the study design precludes definitive claims on the causality of the relationships between the variables.

For example, this study confirmed that team members who reported having higher levels of team identification were more likely to engage in knowledge sharing, but the alternative explanation cannot be ruled out that higher levels of knowledge

sharing might influence team identification. Although this study did not investigate this possibility, the theoretical rationale for the proposed relationships was provided, and the results show that the proposed model was a reasonable representation of the hypothesized relationships among the constructs. Nonetheless, to provide more conclusive evidence about causal relationships of the model, a longitudinal research design is necessary for future research.

A second potential limitation relates to the fact that the present study operationalized team diversity by asking team members to indicate how they perceive the differences in power and status among team members. However, some researchers (e.g., Harrison & Klein, 2007) have pointed out that such perceived diversity measures may not be construct-valid measures of actual diversity for the following reasons: (a) individuals within a team may not have necessary information to correctly evaluate the differences among their team members; (b) comparing with actual diversity, perceived ratings of team diversity are likely to be biased; and (c) reported correlation between perceived diversity measures and outcome variables may be overestimated by some methodological problems, including perceptual error and common method bias. While this study did not examine this possibility, a stream of organizational research has shown that individuals' perceptions of their social environment have stronger, more direct influences on behavior than does the actual environment itself (e.g., Eisenberger et al., 1986; Krackhardt, 1990). Moreover, the importance of perceived diversity has thus been documented both theoretically and empirically (Hentschel et al., 2013). However, to provide more conclusive evidence about operationalization of team diversity, perceived diversity should be incorporated

into future research.

Finally, another limitation of this study stems from the characteristics of the sample. This study was conducted in mid- to large-sized, for-profit companies in South Korea with mostly educated male participants. The nature of the sample composed of South Korean employees may limit the generalizability of the findings of this study to other cultural contexts or other types of organizational settings. This limitation provides an opportunity for future research to examine the present findings in other types of organizations with more heterogeneous or culturally diverse samples.

Future Research Directions

The present study demonstrates that team identification and psychological safety are the central social and psychological mechanisms that link perceived disparity to knowledge sharing in diverse teams and therefore suggests that these mechanisms are fruitful mediators. Future research should examine other motivational mechanisms that can further understanding of the process through which team diversity affects knowledge sharing in work teams. For instance, research suggests that team members with a high need for cognition—a stable intrinsic motivation to process a broad range of knowledge—naturally enjoy thinking, but persons low in need for cognition engage in cognitive endeavors mostly when there is some incentive or reason to do so (Kearney et al., 2009; Petty, Brinol, Loersch, & McCaslin, 2009). Thus, future studies could examine whether the team diversity affects the level of team members' need for cognition and whether this need explains the relationships between team diversity and subsequent knowledge sharing behaviors. To better understand unique relationships between team diversity and the different mechanisms in predicting knowledge sharing

in work teams, research could build upon findings from this study and examine multiple mediators, such as team identification, psychological safety, and need for cognition, simultaneously.

The results of the moderated mediation of this study have underscored the importance of incorporating the role of team leaders when research examines the link between team diversity, emergent psychological states of team members, and knowledge sharing in work teams. The focus on transformational team leadership is in line with van Knippenberg et al's (2004) request for future team diversity research to take into account the moderators and mediators influencing the relationship between team diversity and team processes and performance. To further understanding of the intermediating mechanisms, future research could expand on the types of contextual factors that are relevant to team diversity and knowledge sharing. For example, researchers might hypothesize that team-based incentives, organizational culture, or availability of virtual communication system could also encourage a collective orientation within a demographically and hierarchically diverse team and therefore encourage knowledge sharing behaviors. Investigating these various contextual elements offers one promising direction for future research.

Finally, the linkage between transformational team leadership and psychological safety provides a perspective for further insights. As noted above, the present study did not demonstrate the moderating effect of transformational team leadership for the psychological safety, thus this study could not provide a complete understanding about the nature of the relationship between perceived disparity, psychological safety, and transformational team leadership. Therefore, future research

might explore what social and psychological mechanisms underlie the relationship between transformational team leadership and team members' sense of psychological safety.

Conclusion

Given the rapidly shifting environmental conditions of organizations, work teams in many of today's organizations perform critical tasks which are directly related to the core competencies for sustainable competitive advantages (Cohen & Bailey, 1997; Kozlowski & Ilgen, 2006; Mathieu, Maynard, Rapp, & Gilson, 2008). A fundamental assumption underlying the use of team-based organizational structures as a basic building block is to capitalize on diverse experiences, expertise, and perspectives of their employees into work groups and teams as an important asset for enhancing team effectiveness and organizational performance (Bunderson & Sutcliffe, 2002; Bunderson & Reagans, 2011; Mesmer-Magnus & DeChurch, 2009; van Knippenberg & Schippers, 2007).

In this organizational context, facilitating knowledge sharing in work teams is one of critical concerns of HRD scholars and practitioners alike, since without sharing of knowledge, work teams and organizations may not be able to fully utilize the diverse knowledge brought into work teams by their members (Ardichvili, 2002; London & Sessa, 2007; McCarthy & Garavan, 2008; Srivastava et al., 2006; Zarrage & Bonache, 2003). Nonetheless, the topic of knowledge sharing in work teams has not been sufficiently explored among HRD professionals. This study tested a model of antecedents of knowledge sharing in order to investigate specific hypotheses while generating new insight into the mechanisms related to knowledge sharing. Along

with providing new insights into the literature on knowledge sharing, this study serves as a foundation for further inquiry into related research questions.

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APPENDIX A

Research Support Consent Form

Research Support Consent Form

My name is Jae Hang Noh. I am a Ph.D. student majoring in Human Resource Development in the Department of Organizational Leadership, Policy, and Development at the University of Minnesota. I am conducting a study on 'Employee Knowledge Sharing in Work Teams: Effects of Work Team Diversity, Team Climates, and Team Leadership.' You were selected for this study because the Director of Human Resource Development in your company has recommended you as a possible participant.

Background Information

As environmental conditions of organizations have been rapidly shifting, CEOs around the world identify creativity, innovation, and organizational learning as among their core competencies for sustainable competitive advantages. In an effort to secure these capabilities, organizations have made increased use of team-based organizational structures integrating diverse knowledge, expertise, and perspectives of employees into work groups and teams. A central premise of using work teams in organizations has to do with taking advantage of the diverse information, experiences, and perspectives of all members as an important asset for enabling a collective learning, advancing work processes, and enhancing their ability to identify new opportunities. Consequently, facilitating employee knowledge sharing behavior in work teams is one of the biggest challenges modern organizations have faced.

However, as many studies have illustrated, it is not certain that team members who have relevant education, experiences, or networks will share their private resources with fellow team members, even though they are working together for the common goals in the same team. In this context, the purpose of this study is to advance the current understanding of knowledge sharing in organizations by examining the antecedents and underlying mechanisms influencing the extent of employee knowledge sharing in the work team setting. Specifically, this study aims to examine whether team emergent states (e.g., collective team identification, team psychological safety) moderate the relationship between team diversity (i.e., separation, variety, disparity) and employee knowledge sharing. In addition, this study seeks to investigate the effects of empowering team leadership as a team-level input variable moderating the relationship team diversity and team emergent states. In sum, this study addresses the following research question: Under what conditions employees in a work team are willing to share their knowledge with fellow team members?

Procedures

If you agree to be in this study, I would ask you to respond to a multi-item questionnaire that measures variables related to team diversity, team climate, team leadership, and

knowledge sharing in work teams. Also, there are items which collect information on your role, gender, age, level of education, job title, type of job, years of study, etc. However, the collected information will be used neither by the researcher nor your employer to identify you. In addition, private information, such as your name, address or phone number will not be collected. The expected time to complete this questionnaire is 15-20 minutes.

Confidentiality

The records of this study will be kept private. In any sort of report the researcher might publish, the researcher will not include any information that will make it possible to identify a subject. Research records will be stored securely and only the researcher will have access to the records. After survey responses are collected, university names will be coded appropriately. All data of this study will be maintained anonymously. Since only the aggregated results will be reported, individual results will remain confidential.

Voluntary Nature of the Study

Participation in the procedure of this research is voluntary. Your decision whether or not to participate will not affect your current or future relations with your employer. Any participants are free to withdraw at any time without affecting those relationships.

Contacts and Questions

The researcher conducting this study is Jae Hang Noh. If you have any comments or questions about the survey, you can contact me at nohxx021@umn.edu or 612-743-6402 (USA) / 070-7518-2448 (Korea).

Or you may contact my adviser, Dr. Christesen, at chri1614@umn.edu. If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, you are encouraged to contact the Research Subjects' Advocate line at the University of Minnesota, D528 Mayo, 420 Delaware Street. Southeast, Minneapolis, MN 55455; telephone 612- 625-1650

You may keep a copy of this form for your records.

Statement of Consent

I have read the above information. I have asked questions and received answers. I give consent for participation in this study.

Company: _____
Department: _____
Title / Name: _____
Signature: _____ Date: _____

APPENDIX B

Survey Questionnaire

Survey Questionnaire

Section # 1. Employee Knowledge Sharing (Bartol, Liu, Zeng, & Wu, 2009).

The following items assess knowledge sharing behavior in your team members. Please indicate the extent to which you agree or disagree with each statement.

1	2	3	4	5
Strongly disagree	Moderately disagree	Slightly disagree	Neither agree nor disagree	Slightly agree

1. Members in my team readily pass along information that may be helpful to the work of the team.
2. Members in my team keep others in the work team informed of emerging developments that may increase their work effectiveness.
3. Members in my team actively seek helpful information to share with the team.
4. Members in my team share information that he/she has when it can be beneficial to others in the work team.
5. Members in my team share his/her expertise to help resolve work team problems.
6. Members in my team willingly aid others in the team whose work efforts could benefit from his/her expertise.
7. Members in my team offer innovative ideas in his/her area of expertise that can benefit the team's work.
8. Members in my team frequently share his/her expertise by making helpful suggestions that benefit the work team.

Section # 2. Perceived disparity (Brockner et al., 2001; Kim & Leung, 2007).

The following items assess knowledge sharing behavior in your team members. Please indicate the extent to which you agree or disagree with each statement.

1	2	3	4	5
Strongly disagree	Moderately disagree	Slightly disagree	Neither agree nor disagree	Slightly agree

1. In my work team, subordinates should not express disagreements with their supervisors.
2. In my work team, the highest ranking manager in a team should take the lead.
3. In my work team, subordinates should carry out the requests of supervisors without question.

4. In my work team, supervisors have a right to expect obedience from their subordinates in work-related matters,.

Section # 3. Team Identification: (van Knippenberg & van Schieff, 2000).

The following items assess overall climate in your team. Please indicate the extent to which you agree or disagree with each statement.

1	2	3	4	5
Strongly disagree	Moderately disagree	Slightly disagree	Neither agree nor disagree	Slightly agree

1. In my work team, when someone criticizes my work team, it feels like a personal insult.
2. In my work team, my team members are very interested in what others think about my work team.
3. In my work team, when team members talk about my work team, we usually say "we" rather than "they.
4. In my work team, team members regards team success as their successes.
5. In my work team, when someone praises my work team, team members think like a their personal compliment.

Section # 4. Psychological Safety (Edmondson, 1999)

The following items assess overall climate in your team. Please indicate the extent to which you agree or disagree with each statement.

1	2	3	4	5
Strongly disagree	Moderately disagree	Slightly disagree	Neither agree nor disagree	Slightly agree

1. In my team, if I make a mistake on this team, it is often held against me.
2. Members of my team are able to bring up problems and tough issues.
3. Members of my team sometimes reject others for being different.
4. It is safe to take a risk on my team.
5. It is difficult to ask other members of my team for help.
6. No one on my team would deliberately act in a way that undermines my efforts.
7. Working with members of this team, my unique skills and talents are valued and utilized.

Section # 5. Transformational Leadership (MacKenzie, Podsakoff, & Rich, 2001)

The following items assess your team leader's behavior. Please indicate the extent to

which you agree or disagree with each statement.

1	2	3	4	5
Strongly disagree	Moderately disagree	Slightly disagree	Neither agree nor disagree	Slightly agree

1. My team leader articulates a vision
2. My team leader provides an appropriate model.
3. My team leader facilitates the acceptance of group goals
4. My team leader makes it clear to me that she or he expects me to give 110 percent all of the time
5. My team leader insists on only the best performance
6. My team leader will not settle for second best
7. My team leader acts without considering my feelings (R)
8. My team leader considers my personal feelings before acting
9. My team leader shows respect for my personal feelings
10. My team leader treats me without considering my personal feelings
11. My team leader challenges me to think about old problems in new ways
12. My team leader asks questions that prompt me to think about the way I do things
13. My team leader has stimulated me to rethink the way I do some things
14. My team leader has ideas that have challenged me to reexamine some of my basic assumptions about my work

Section # 7. Demographics

The following questions are to obtain demographic information about you. The information is being collected to explore basic characteristics of the respondents and will

not be used to identify you. Please answer the following questions.

1. Put an "X" in the blank below that best describes your team.

____ This is a temporary or project team that will disband once its work is finished.

____ This is an ongoing team that will keep operating indefinitely into the future.

2. What is your age? _____ (in years)

3. What is your gender? a) Male b) Female

4. What is your highest level of education?

   a) High school diploma

   b) Associate degree

   c) Bachelor's degree

   d) Master's degree

   e) Doctoral degree

5. How long have you worked in your current organization? _____ (year & month)

6. How long have you worked in your current team? _____ (year & month)

7. What is your current position?

   a) Clerk/Senior Clerk

   b) Assistant Manager

   c) Manager

   d) Senior Manager

   e) General Manager

   f) Other _____ (Please fill in)

8. What is your job function in the organization?

   a) Finance/Accounting

   b) Marketing/Sales

   c) Administration/Management

   d) Training and Development

   e) Research and Development

   f) Production g) Others _____ (Please fill in)

APPENDIX C

Letter of Approval from Institutional Review Board

irb@umn.edu
Feb 15
TO : chri1614@umn.edu, nohxx021@umn.edu,

The IRB: Human Subjects Committee determined that the referenced study is exempt from review under federal guidelines 45 CFR Part 46.101(b) category #2 SURVEYS/INTERVIEWS; STANDARDIZED EDUCATIONAL TESTS; OBSERVATION OF PUBLIC BEHAVIOR.

Study Number: 1302E28041

Principal Investigator: Jae Hang Noh

Title(s):

Employee Knowledge Sharing in Work Teams: Effects of Work Team Diversity, Team Climates, and Team Leadership

This e-mail confirmation is your official University of Minnesota HRPP notification of exemption from full committee review. You will not receive a hard copy or letter.

This secure electronic notification between password protected authentications has been deemed by the University of Minnesota to constitute a legal signature.

The study number above is assigned to your research. That number and the title of your study must be used in all communication with the IRB office.

Research that involves observation can be approved under this category without obtaining consent.

SURVEY OR INTERVIEW RESEARCH APPROVED AS EXEMPT UNDER THIS CATEGORY IS LIMITED TO ADULT SUBJECTS.

This exemption is valid for five years from the date of this correspondence and will be filed inactive at that time. You will receive a notification prior to inactivation. If this research will extend beyond five years, you must submit a new application to the IRB before the study's expiration date.

Upon receipt of this email, you may begin your research. If you have questions, please call the IRB office at (612) 626-5654. You may go to the View Completed section of eResearch Central at http://eresearch.umn.edu/ to view further details on your study.

The IRB wishes you success with this research.

APPENDIX D

A Summary of Demographic Information of Work Teams in the Research Sample

ORGANIZATIONAL RANK

TEAM ID	TEAM SIZE	ORGANIZATIONAL RANK				
		GENERAL MANAGER	SENIOR MANAGER	MANAGER	ASSISTANT MANAGER	CLERK
1	4		1	1		2
2	5	1			2	2
3	6	1		2	2	1
4	7	2	3	2		
5	3	2		1		
6	3	1	1			
7	7	2	3	2		
8	5		3	1		1
9	6	2	4			
10	7	3	3	1		
11	4				1	3
12	5		1	1	1	2
13	4		1		2	1
14	5			2	3	
15	2	1	1			
16	3	1	1			1
17	3	1	2			
18	3		1	1		
19	3	2				
20	4	4				
21	4	1		1	1	1
22	5	1	1		3	
23	6	1	2		1	2
24	4	2		1		1
25	9	4	2		3	
26	7	3	1	1	2	
27	6	3	2	1		
28	6	1	4	1		
29	10	6	1	2	1	
30	9	5	2	1	1	
31	8	6	1		1	
32	7		1	2	4	

33	8			2	4	2
34	8	1	1	1	5	
35	6	1		4		1
36	4		1	2		1
37	8	2	4	1	1	
38	6	1		1	2	2
39	7	1	3	1	2	
40	6		1	1	2	2
41	9	3	2		3	1
42	7	3	3	1		
43	6	5	1			
44	10	5	3	1	1	
45	8	2	3	1	1	1
46	7	2	2	2	1	
47	4			1	2	1
48	5				2	3
49	4		1		1	2
50	3		1		1	1
51	4	1		1	1	1
52	6	1	2		1	2
53	5		2	2	1	
54	3		1	1		1
55	2	1			1	
56	3	2				
57	2	1			1	
58	9	2	3	3	1	
59	5	2	1	2		
60	4				3	1
61	6	2	1	1	1	1
62	12	2	2	5	1	2
63	4	3			1	
64	3	1			1	1
65	7	1		1	3	2
66	6	1			2	3
67	6	1	1	1		3
68	5			1	2	2
69	7	1	2	2	1	1

70	4			2	2	
71	6		1	2	2	1
72	7		3	3		1
73	10	4	6	1		1
74	2	1	1			
75	2	1	1			
76	5	1	1		1	2
77	3	1			2	
78	7	1	1	2	1	2
79	9	3	1	1	2	2
80	5			1	2	2
81	14		1	3	4	6
TOTAL	81 TEAM	116	99	78	93	71

N=459

AGE

TEAM ID	TEAM SIZE	AGE GROUP					
		<24	25-29	30-34	33-39	40-44	45-50
1	4		2		1	1	
2	5		1	1		3	
3	6		1	2	2	1	
4	7				3	3	1
5	3				1		1
6	3				2		1
7	7				2	1	4
8	5			1	1	1	2
9	6	1	1				1
10	7			1		4	2
11	4		1	2		1	
12	5		2	1	1	1	
13	4	1		2	1		
14	5		1	2	1		1
15	2				1		
16	3		1			1	1
17	3			1		1	
18	3			1		1	

19	3			1			1
20	4					1	1
21	4		1	1			1
22	5			2	1	1	
23	6		2	1		1	2
24	4		1		1	1	1
25	9		1			5	3
26	7			1		2	4
27	6					2	3
28	6				2	2	2
29	10			1	2	2	3
30	9				2	4	3
31	8		1	1	1	3	2
32	7		1	2	2		1
33	8		2	4	2		
34	8			1	4	1	
35	6		1	1	2	1	1
36	4			1	2	1	
37	8				2	1	5
38	6		2	1	1		2
39	7			2	3	2	
40	6		2	2	1	1	
41	9		2	1	1	2	3
42	7				4	1	2
43	6					4	2
44	10				2	3	5
45	8		2	1		3	2
46	7			2	2	2	
47	4			1	1	1	1
48	5		3	1		1	
49	4		1	1	1	1	
50	3	1		1		1	
51	4		1	2		1	1
52	6			3	1		1
53	5		1	2	2		
54	3		1			2	
55	2			1		1	

56	3				1	1	
57	2		1		1		
58	9		1	1	2		3
59	5				1	2	2
60	4	1	1	2			
61	6			1	2	2	1
62	12	1	1	1	2		4
63	4		1			1	2
64	3		1	1			1
65	7		2	3		1	1
66	6		2	1	1	1	
67	6		2	1		2	1
68	5		1	2	1	1	
69	7		1	2	2	1	1
70	4			2	1	1	
71	6		1	1	2	2	
72	7			2	2	3	
73	10		2	2		2	3
74	2				1	1	
75	2				1	1	
76	5		3			2	
77	3			2		1	
78	7	1	1		2	2	
79	9	1	2	1	1	1	1
80	5	1	1	2	1		
81	14	1	5	5		2	1
TOTAL	81 TEAM	9	64	84	82	103	87

N=459

ECUCATION LEVEL

TEAM ID	TEAM SIZE	EDUCATION LEVEL				
		HIGH	ASSOCIATE	BACHALOR	MASTER	OTHER
1	4			4		
2	5	1		3	1	
3	6			6		

4	7			3	3	2
5	3	1		1	1	
6	3				2	1
7	7			7		
8	5			5		
9	6			5		1
10	7	1		6		
11	4			3	1	
12	5			5		
13	4			3		1
14	5			2	3	
15	2	1		1		
16	3			3		
17	3			3		
18	3	1	1		1	
19	3			2		
20	4			4		
21	4		1	3		
22	5			2	3	
23	6			6		
24	4			4		
25	9	1		8		
26	7	1		5	1	
27	6			6		
28	6			6		
29	10	3		7		
30	9	3	1	5		
31	8	1		7		
32	7			5	1	1
33	8			8		
34	8			6	1	1
35	6	3		3		

36	4			2	2	
37	8	2		6		
38	6			5	1	
39	7			1	5	1
40	6			2	4	
41	9	2	1	6		
42	7			6	1	
43	6			6		
44	10	2		8		
45	8			3	2	3
46	7			7		
47	4			4		
48	5			3	1	1
49	4			3	1	
50	3			1	2	
51	4			2	2	
52	6			3	1	2
53	5			1	3	1
54	3			3		
55	2				1	1
56	3		2		1	
57	2			2		
58	9	4		5		
59	5			5		
60	4			4		
61	6			6		
62	12		2	9		1
63	4			4		
64	3			2	1	
65	7			7		
66	6	1		5		
67	6			6		

68	5			4	1	
69	7			3	3	1
70	4	1		2	1	
71	6			4	1	1
72	7			2	4	1
73	10	4		7	1	
74	2			1	1	
75	2			1	1	
76	5			5		
77	3			2	1	
78	7		2	2	3	
79	9			8	1	
80	5			4	1	
81	14	1		11	2	
TOTAL	81 TEAM	34	10	330	67	20

N=459

APPENDIX E

Estimation of Regression Equation for Hypothesis Tests

Mediation, Direct, and Indirect Effects

The direct (Hypothesis 1) and indirect effects (Hypothesis 2 and 3) of perceived disparity (*X*) are derived from two linear models, one estimating *M* from *X*

$$M = i_M + a_1 X + e_M \quad (1)$$

and a second estimating *Y* from both *X* and *M*:

$$Y = i_Y + c_1' X + b_1 M + e_Y \quad (2)$$

where *M* is team identification and psychological safety, and *Y* is knowledge sharing. The *direct effect* of *X* on *Y* is estimated with *c'*1 in equation 2. The *indirect effect* of *X* on *Y* through *M* is estimated as *a*1*b*1, meaning the product of the effect of *X* on *M* (*a*1 in equation 1) and the effect of *M* on *Y* controlling for *X* (*b*1 in equation 2).

Moderation and Conditional Effects

The Equation 3 and 4 estimate the moderation effect (Hypothesis 4) of transformational team leadership on the relationship between perceived disparity and knowledge sharing. The statistical model of moderation takes the form of a linear equation (Aiken & West, 1991) in which *Y* is estimated as a weighted function of *X*, *M*, and, most typically, the product of *X* and *M* (*XM*), as in equation 3:

$$Y = i + c_1 X + c_2 M + c_3 XM + e_Y \quad (3)$$

where *X* is perceived disparity, *Y* is knowledge sharing, and *M* is transformational team leadership. By grouping terms in equation 3 involving *X* and then factoring out *X*, equation 3 can be written as

$$Y = i + (c_1 + c_3 M) X + c_2 M + e_Y \quad (4)$$

which makes it apparent that the effect of *X* on *Y* is not a single number but, rather, a function of *M* ? This function, *c1 + c3M*, is the conditional effect of *X* on *Y* or simple slope for *X*. This expression for the conditional effect of *X* also clarifies the interpretation of *c1* and *c3* in equations 3 and 4; *c1* estimates the effect of *X* on *Y* when *M* = 0, and *c3* estimates how much the effect of *X* on *Y* changes as *M* changes by one unit.

Moderated Mediation: Conditional Direct and Indirect Effects

When there is evidence of the moderation of the effect of *X* on *M*, the effect of *M* on *Y*, or both, estimation of and inference about what Preacher, Rucker, and Hayes (2007) coined the *conditional indirect effect* of *X* gives the analyst insight into the contingent nature of the independent variable's effect on the dependent variable through the mediator(s), depending on the moderator.

The Equation 5 and 6 estimate the conditional indirect effects of perceived disparity on knowledge sharing via team identification (Hypothesis 5) and psychological safety (Hypothesis 6) at the different level of transformational team leadership.
In statistical form, this model is represented with two linear models, one with *M* as outcome and one with *Y* as outcome:

$$M = i_M + a_1X + a_2W + a_3XW + e_M \quad (5)$$

$$Y = i_Y + c'_1X + c'_2W + c'_3XW + b_1M + e_Y \quad (6)$$

where *X* is perceived disparity, *Y* is knowledge sharing, *M* is team identification or psychological safety, and *W* is transformational team leadership. Because *X*'s effect on *M* is modeled as contingent on *W*, then so too is the indirect effect of *X* on *Y*, because the indirect effect is the product of conditional effect of *X* on *M* and the unconditional effect of *M* on *Y*. Using the same logic as described earlier, the conditional effect of *X* on *M* is derived from equation 5 by grouping terms involving *X* and factoring out *X*, which yields $a1 + a3W$. The effect of *M* on *Y* is $b1$ in equation 6. The *conditional indirect effect* of *X* on *Y* through *M* is the product of these two effects: $(a1 + a3W)b1$ (see Edwards & Lambert, 2007, and Preacher et al., 2007).