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경영학석사학위논문

**Relational Coordination of Workforce  
Diversity and Firm Performance:  
The Moderating Effects of Workgroup  
Autonomy and Multisource Feedback**

인력 다양성의 관계적 조정을 통한 기업 성과 향상:

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이 훈 휘

ABSTRACTS

**Relational Coordination of Workforce  
Diversity and Firm Performance:  
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Autonomy and Multisource Feedback**

Hun Whee Lee

Department of Business Administration

The Graduate School

Seoul National University

Organizations have become increasingly diverse in the composition of their workforce, but we still have a limited understanding of the effects of workforce diversity such as differences in age and education on performance at the firm level. As an important step in revealing the underlying processes and moderators for the effects of diversity, most importantly, relational coordination is proposed as an intervening process at the firm level through which diversity in age and education indirectly affects firm performance. Furthermore, I highlight the

importance of individual HR practices, particularly workgroup autonomy and multisource feedback, as critical contingencies that moderate the effects of diversity on relational coordination. Lastly, relational coordination is suggested to enhance both objective financial performance and subjective performance ratings. I tested my theoretical arguments using data from 189 Korean firms in the manufacturing sector, and my hypotheses were generally supported. The present findings offer novel practical and theoretical insights into the effect of workforce diversity on firm performance.

Keyword: Workforce diversity, relational coordination, firm performance, workgroup autonomy, multisource feedback

Student number: 2013-20520

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## I. INTROCUCTION

Organizations have become increasingly diverse in the composition of their workforce (Van Knippenberg & Schippers, 2007). Accordingly, workforce diversity has gained considerable attention for research and the development of management plans (Jackson, Joshi, & Erhardt, 2003; Kochan et al., 2003). However, the existing studies on workforce diversity have been mostly conducted at the individual or group levels, thereby shedding insufficient light on the precise relationship between diversity and firm performance (Jackson et al., 2003; Van Knippenberg & Schippers, 2007). A few studies directly tested the relationship between firm performance and some dimensions of demographic diversity, such as race and gender (e.g., Frink et al., 2003; Richard, 2000), but little is known about the effects of other types of workforce diversity, such as age and educational differences, on performance at the firm level.

This deficiency is particularly unfortunate, given that managing company-wide diversity in terms of age and education can lead to competitive advantage (Bassett-Jones, 2005; Kossek, Lobel, & Brown, 2006). The retirement age continues to increase all over the world, consequently leading to a steady increase in age heterogeneity along with the average age in the workplace (Fullerton Jr & Toossi, 2001). Firms have also increased their interest in diversifying the educational composition of their workforce as a way to retain a larger pool of informational resources (Chubin, May, & Babco, 2005; Kearney & Gebert, 2009). Fierce competition in the market pressures firms to make the best out of diversity not only within groups but also at the

corporate level, demanding high-quality communication and collaboration company-wide (Grant, 1996). More importantly, once the highly complex nature of interpersonal connections among diverse workers is established, competitors have difficulty copying the complex interactions, which can be a great source of sustained competitive advantage (Barney & Wright, 1998; Richard, 2000).

Findings from previous studies indicate two central challenges in investigating the role of workforce diversity in firms. First, the effects of diversity on performance are likely to be indirect, especially at the firm level (Kochan et al., 2003; Lawrence, 1997). Organizational performance involves various processes, such as collective cooperation, complex problem solving, conflict management, and effective communication, suggesting few direct effects of diversity on organizational performance (Harrison, Price, Gavin, & Florey, 2002; Kochan et al., 2003). Consequently, a growing number of researchers have called for empirical investigation on potential intervening processes that may link diversity to group or organizational performance (Pelled, 1996; Van Knippenberg & Schippers, 2007).

Second, contextual factors matter. Inconsistencies among research findings on diversity suggest that contextual variables should be considered (Joshi & Roh, 2009; Webber & Donahue, 2001). Particularly, the use of human resource (HR) practices (e.g., performance appraisal systems and work designs) can develop a work context that encourages a diverse workforce to exert more effort into interpersonal coordination and to make better use of the benefits of being surrounded by colleagues with different specialties (Ely,

2004; Kochan et al., 2003; Rico, Molleman, Sánchez-Manzanares, & Van der Vegt, 2007). Surprisingly, however, the moderating effects of individual HR practices as situational forces have not been extensively explored in the literature on diversity despite their strong practical implications as well as potential academic contributions (Jackson et al., 2003).

The present study primarily fills this gap. To begin with, I suggest relational coordination as an intervening process at the firm level through which diversity in age and education indirectly affects firm performance. The theory of relational coordination provides a new insight to understand the composite effect of diversity on firm performance by suggesting “a mutually reinforcing process of interaction between communication and relationships [of shared goals, shared knowledge, and mutual respect] carried out for the purpose of task integration” (Gittell, 2002, p. 301). Applying this perspective to the effects of diversity, I proposed that informational and relational aspects of the diversity mutually influence each other and the combined effects will determine the level of relational coordination of a firm, which ultimately leads to higher firm performance. To my knowledge, this study is the first to draw on the theory of relational coordination to provide a model of the effects of diversity on firm performance.

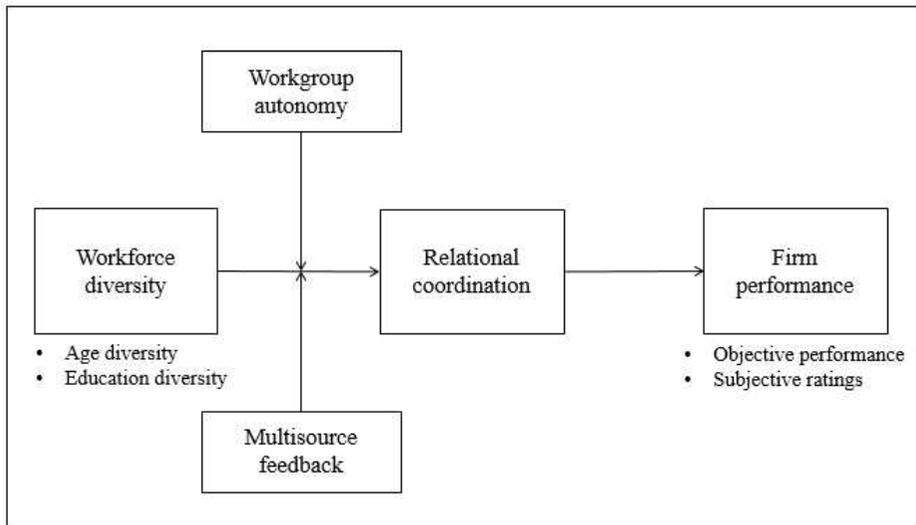
I also argue that the effects of age and educational diversity on relational coordination may differ depending on the use of two individual HR practices. When work is designed for workgroup autonomy, group members make decisions about their operations (Rico et al., 2007). The performance benefits of a diverse workforce should be most evident in such situations that

require different perspectives and consultation processes (Pelled, 1996; Wegge, Roth, Neubach, Schmidt, & Kanfer, 2008). Stimulating the exchange of information and task-relevant communication, workgroup autonomy helps diversity to positively influence relational coordination.

Under multisource feedback (MSF), employees receive feedback from multiple sources as opposed to only receiving supervisory feedback (Bassett-Jones, 2005). MSF motivates organizational members to understand the dynamics of working with diverse colleagues and to change their behaviors in order to reduce the discrepancies between self-perceptions and the ratings of others (London & Smither, 1995; Zemke, Raines, & Filipczak, 2000). Receiving the feedback, diverse members are encouraged to improve their work relationships, resulting in higher levels of relational coordination. Investigating the moderating effects of the two HR practices can contribute to our understanding of contextual factors that enable positive outcomes of diversity.

In summary, I believe that this study offers novel practical and theoretical insights into the effects of workforce diversity on firm performance by revealing the intervening process of relational coordination as well as the moderating effects of HR practices. In the following section, I review relevant literature to develop my hypotheses. Thereafter, I present the research methods and test hypotheses. Theoretical and managerial implications, as well as limitations and future research directions, are lastly proposed.

**Figure 1. Research Model**



## **II. THEORETICAL BACKGROUND AND HYPOTHESES**

### **DEVELOPMENT**

#### **1. Relational Coordination of Workforce Diversity**

To date, conceptualizations and empirical findings on the relationship between workforce diversity and performance outcomes remain contradictory (Joshi & Roh, 2009; Van Knippenberg & Schippers, 2007). Based on similarity–attraction theory by Byrne (1971) and on social identity theory by Tajfel and Turner (1986), some scholars posit negative effects of diversity. Social identity theory holds that individuals categorize self and others into subgroups based on similarities and differences, and the individuals identify themselves with those who are similar in social-category memberships. The similarity–attraction perspective suggests that individuals tend to form

stronger social attachments with a group of people whom they perceive to be similar to them. With regard to these two theories, identity dissimilarity between individuals is argued to engender stereotyping and other interpersonal biases that hamper positive work relationships.

On the contrary, based on information and decision-making theories, positive effects of workforce diversity are predicted by researchers. The heterogeneity of perspectives and the high levels of information found in a diverse workforce should increase task-related discussion, deepen the understanding of work issues, and lead to a mutual interchange of ideas and innovation (Ancona & Caldwell, 1988; Van Knippenberg, De Dreu, & Homan, 2004). In accordance with these arguments, a broad range of cognitive resources are proposed by researchers to enhance problem-solving capability and decision-making quality (Bantel & Jackson, 1989; Williams & O'Reilly, 1998).

A method for scholars to address this contradiction is called diversity typology approach, which distinguishes between the two types of diversity by predicting that the two categories will have differential mechanisms in shaping work processes (Jehn, Northcraft, & Neale, 1999; Joshi & Roh, 2009; Kearney & Gebert, 2009; Milliken & Martins, 1996; Van Knippenberg et al., 2004). The first type of diversity is social category diversity (synonym: relations-oriented diversity), which assesses readily observable demographic attributes that are less job related, such as age, gender, and race (Pelled, 1996; Van Knippenberg et al., 2004). Following social categorization and similarity–attraction perspectives, social category diversity has been proposed

to negatively affect relational aspects such as identification with the entire group, commitment, and cohesion. This diversity also has affective–evaluative reactions to the group and its members (Harrison et al., 2002; Williams & O’Reilly, 1998).

The second category is informational diversity (also called task-oriented diversity), which includes less easily discernible and more job-related attributes, such as education, company tenure, and functional area; these attributes are directly related to the tasks and problems faced by the group (Pelled, 1996). Supported by informational and decision theories, informational diversity is argued to promote elaboration-based processes, which refer to the exchange, discussion, and integration of ideas, knowledge, and insights (Jehn et al., 1999; Simons, Pelled, & Smith, 1999; Van Knippenberg et al., 2004). Associated with the tasks or the work itself, the heterogeneity of these characteristics is considered desirable because of its benefits for informational processing (Jehn, Chadwick, & Thatcher, 1997).

To understand a comprehensive view of the effects of diversity, the categorization–elaboration model (CEM) of Van Knippenberg et al. (2004) was suggested afterwards, arguing that all dimensions of diversity may elicit both relational categorization and informational elaboration, although in varying degrees, and that the negative effects of social categorization may disturb informational processing. Integrating the insights from the traditional theories of the effects of diversity, the diversity typology approach, and most recently the CEM, I draw three conclusions: (1) the effects of diversity are comprehensive, covering both relational and informational processes; (2)

dominant processes may differ according to the characteristics of diversity; and (3) relational and informational aspects may not be independent but instead mutually influence each other. Overall performance, especially at the firm level, is achieved not only from the advancement of informational processes but also from the improvement of the affective and relational processes. Moreover, the two processes are not completely blocked from each other. Therefore, for a deeper understanding on the effects of diversity on firm performance, a comprehensive framework is needed to incorporate the resulting dynamics between the informational and relational outcomes of diversity.

In this regard, the theory of relational coordination has significant potential in integrating the existing perspectives and providing a comprehensive view on the effects of diversity. First, the dimensions of relational coordination consist of two parts: communication and the relationships of shared goals, shared knowledge, and mutual respect. The communication dimension deals more with the informational processes, whereas the relationship dimension deals more with the relational and psychological aspects. The qualities of communication and the relationships equally contribute to successful coordination of work, leading to the enhancement in overall performance.

Second, the relational coordination perspective suggests that relational processes and informational processes influence each other. The core of the theory of relational coordination is the mutual influence between communication and the relationships (Gittell, 2011, August 25). Relationship

quality is already identified as a key determinant of task-relevant communication in the CEM. I further suggest that task-related communication, initiated by the complementarity of diverse informational resources, improves the relationships of shared goals, shared knowledge, and mutual respect (Smidts, Pruyn, & Van Riel, 2001). As organizational members are involved in ongoing communication, they share an understanding of the organization and its task (Pelled, 1996). The distinct “thought worlds” inhabited by diverse members diminish while they develop collective identity, purpose, and knowledge (Muchinsky, 1977; Smidts et al., 2001). Communication is also the basis for trusting and respectful relations because employees better understand one another’s distinct roles and contributions to the group (Gittell, 2011, August 25; Roberts & O’Reilly, 1979). Indeed, studies have found that task-focused interactions tend to lead group members to experience higher levels of cohesion and trust toward each other (Choi & Sy, 2010; Tekleab, Quigley, & Tesluk, 2009).

With all things integrated, novel mechanisms can be drawn to trigger the effects of workforce diversity on firm performance. As suggested in the traditional theories (informational processing/decision-making theories and social identity/similarity–attraction paradigms) and the diversity typology approach, resulting types of dominant processes, either relational categorization or informational communication, may differ depending on diversity type. Following the CEM and relational coordination perspective, all dimensions of diversity types elicit both relational and informational processes, and they affect one another. The resulting effect of the dynamics

between relational and informational processes determines the level of relational coordination that finally affects firm performance. Overall, the relational coordination perspective helps to capture the effects of diversity in a comprehensive manner by suggesting an intermediate mechanism that covers both relational and informational aspects simultaneously. Based on the discussion thus far, diversities in age and education are examined as representatives of the two types of diversity, namely, social category diversity and informational diversity, and my theoretical arguments are hypothesized and tested.

### **1.1. Age Diversity and Relational Coordination**

Defined as the extent to which a group or organization is heterogeneous with respect to the age of its members (Li, Chu, Lam, & Liao, 2011; Williams & O'Reilly, 1998), diversity in age is labeled as social category diversity because it is high in visibility and low in job-relatedness (Pelled, 1996). Although it also has certain informational benefits, these benefits tend to be overridden by dysfunctional relationships caused by the formation of subgroups (Kunze, Böhm, & Bruch, 2011). Age, as a type of phenotypic attribute, is easily observable (Wegge et al., 2008). The similarity–attraction and social identity paradigms suggest that diversity in salient characteristics operate to hinder relational/affective interactions. More specifically, a more visible diversity is apt to activate social categorization, promoting the process through which individuals classify themselves and others into distinct social groups (Williams & O'Reilly, 1998). In addition, humans prefer to build and maintain relationships with individuals believed to

be similar to them. The combined effects are likely to result in stereotyping, interpersonal biases, and prejudices, which lead to negative affective and relational consequences in workgroup dynamics. Likewise, diversity in age arguably diminishes levels of social integration, causing difficulty in sharing a purpose, establishing a common understanding, and trusting one another (Kunze et al., 2011; O'Reilly III, Caldwell, & Barnett, 1989). In summary, social categorization-based processes caused by heterogeneity in age negatively influence employee relationships of shared purpose, shared knowledge, and mutual respect. Under the conditions characterized by such low-quality relationships, employees feel less psychologically linked with other members of their group, and thereby become less willing to participate in communication and discussions (Milliken & Martins, 1996; Zenger & Lawrence, 1989). Poor communication, along with low-quality relationships at work, impairs successful coordination of work (Smith et al., 1994).

*Hypothesis 1: Age diversity is negatively related to relational coordination.*

## **1.2. Education Diversity and Relational Coordination**

Diversity in education is defined as the extent to which a group or organization is heterogeneous with respect to educational levels, backgrounds, or specialization (Williams & O'Reilly, 1998). This factor is low in visibility, high in job-relatedness, and classified as informational diversity (Pelled, 1996). Diversity in education has significantly different effects on

organizational processes compared with diversity in age. Although differences in educational composition might be used to categorize one another (Dougherty, 1992), the positive effects of diversity in education are also identified (Seong, Kristof-Brown, Park, Hong, & Shin, 2012; Van Knippenberg et al., 2004). Different task-related perspectives and information that divergent cohorts bring to the group are suggested to promote new insights and enrich problem-solving processes (Cox & Blake, 1991; De Dreu & West, 2001). Additionally, a workforce with diverse educational attainments enables a firm to operate a broad array of tasks efficiently (Hsieh & Chao, 2004). In this line of thought, Seong et al. (2012) suggested that employees in a group with educational-level diversity develop perceptions of knowledge-based, skills-based, and abilities-based (KSA) complementary fit. More specifically, greater informational resources introduced by educationally diverse members increase the perception of the growing ability of the workgroup to meet the demands of its tasks (Phillips & Loyd, 2006; Seong et al., 2012). Perceptions of complementarity in informational differences motivate employees to appreciate and exchange the multiplicity of the cognitive resource base, leading to mutual learning, stimulating discussions, and task-elaboration processes (Homan, Van Knippenberg, Van Kleef, & De Dreu, 2007; Milliken & Martins, 1996; Van Knippenberg et al., 2004). Therefore, increased diversity in educational composition is expected to increase informational communication (Ancona & Caldwell, 1988; Glick, Miller, & Huber, 1993; Jehn et al., 1999). In addition, informational diversity increases the capabilities of employees to communicate with other

organizational members beyond their own workgroups, thereby facilitating boundary-spanning and inter-departmental communications (Ancona & Caldwell, 1988, 1992; Milliken & Martins, 1996).

As communications continue over time, employees gain a better understanding of the company-wide mission and form a collective identity, leading to the development of shared goals (Katz, 1982). At the same time, differences in knowledge are reduced as increasingly more overlapping knowledge is created (Zenger & Lawrence, 1989). In addition, a deeper level of understanding of the unique contributions of others naturally develops into trust and respect for the value of diversity (Swann, Polzer, Seyle, & Ko, 2004). Thus, employees develop high-quality relationships of shared goals, shared knowledge, and mutual trust and respect, which are conducive to successful coordination.

*Hypothesis 2: Education diversity is positively related to relational coordination.*

## **2. HR Practices as Moderators**

Influenced by contingency theory, contextual factors have been increasingly recognized when studying the relationship between workforce diversity and performance (Kearney & Gebert, 2009; Pelled, 1996; Richard, 2000; Triana, Garcia, & Colella, 2010). Accordingly, scholars have examined organizational contexts, such as organizational culture (Chatman, Polzer, Barsade, & Neale, 1998), industry type (Joshi & Roh, 2009), structure

(Richard, Ford, & Ismail, 2006), and business strategy (Richard, 2000), as well as team-level contingencies, such as team longevity (Pelled, 1996; Schippers, Den Hartog, Koopman, & Wienk, 2003), team interdependence (Van der Vegt & Janssen, 2003), task complexity (Wegge et al., 2008), and transformational leadership (Kearney & Gebert, 2009). Human resource practices also shape the social contexts of firms (Collins & Smith, 2006), and these practices are therefore proposed as a crucial contextual factor that may influence the diversity–performance relationship (Kochan et al., 2003). However, existing studies tend to focus on the effects of specific types of HR practices that are related to affirmative action programs (Heilman, McCullough, & Gilbert, 1996) or have direct diversity-focused objectives such as diversity education program (Ely, 2004) and diversity-oriented HR practices (Jehn & Bezrukova, 2004; Richard & Johnson, 2001). Limited attention has been paid to other general HR practices such as the different types of performance appraisals and work designs (Jackson et al., 2003; Kochan et al., 2003). The productive potential of individual HR practices is fairly strong, given that they are commonly used in organizations and can therefore be easily implemented. By contrast, specific diversity-focused HR practices require more effort to adjust to the distinct needs of organizations facing different issues of workforce diversity.

## **2.1. Workgroup Autonomy**

Organizations can facilitate increased levels of communication and interactions among diverse members by creating a work context in which the

integration of different perspectives is crucial for work completion. Designing work in a way that work groups are allowed to make decisions regarding the goals (what), work methods (how), planning issues (when), and distribution of work among group members, called workgroup autonomy, is one such way (Klein, 1991; Rico et al., 2007). Workgroup autonomy can promote the cross-fertilization of different perspectives by highlighting the informational advantages of diversity. Van Knippenberg et al. (2004) suggested that diversity is likely to lead to task-relevant elaboration processes when tasks require pooling and processing of diverse perspectives and when they motivate employees to exchange them. Workforce diversity recognizably has advantages in the form of a broader set of knowledge, expertise, and insights. The work design for groups to make decisions places demands on the variety of cognitive resources, and therefore diverse employees are invited to draw on different knowledge and viewpoints to enhance decision-making quality (Kearney & Gebert, 2009; Wegge et al., 2008). Thus, employees are likely to actively communicate with one another, pooling and utilizing a broad range of task-relevant resources.

Furthermore, decision-making tasks and outcomes are highly interdependent when work groups are supposed to decide their operational processes. For the best decisions, each work group should listen to the perspectives of its members, relying on diverse cognitive resources. Doing so makes decision-making tasks collective and interdependent. In addition, the final outcomes of the decisions shape their working conditions. Decisions are directly related to the issues of the amount, duration, and efficiency of their

work. Thus, group members share the consequences of their final decisions. This scenario makes decision-making outcomes highly interdependent with decision-making tasks (Wageman, 1995). In the course of seeking better decisions, employees are therefore encouraged to be involved in the communication of information and feedback.

Overall, workforce diversity is more likely to lead to successful coordination when workgroups have greater authority to make decisions regarding their own operations. I suggest that workgroup autonomy is expected to moderate the relationship between relational coordination and the two types of diversity, namely, age diversity and education diversity, in a way that strengthens the positive effect of informational diversity (e.g., diversity in education) as well as weakens the negative effect of social category diversity (e.g., diversity in age). First, a greater mix of age and education in the workplace may be beneficial because it could result in a larger pool of informational resources as a result of different life and job experiences (e.g., age diversity; Skirbekk, 2008; Wegge & Schmidt, 2009), heterogeneous knowledge, and task expertise (e.g., education diversity; Milliken & Martins, 1996; Rico et al., 2007). In addition to the diversity in education, work groups composed of age-diverse members have potential informational advantages because older and younger employees have distinct social experiences, knowledge, and social networks (Bantel & Jackson, 1989; Kearney & Gebert, 2009). Indeed, diversity in age is found to positively influence performance when tasks are complex or depend highly on knowledge-based judgments (Warr, 1994; Wegge et al., 2008). Second, a higher interdependence of tasks

and outcomes can suppress intergroup competition (Schippers et al., 2003). Task interdependence creates more chances for employees to interact with members of different social groups. As suggested in intergroup contact theory (Pettigrew, 1998), intergroup contacts reduce categorization-based processes. Higher outcome interdependence is also likely to unite group members to work together toward a common goal while casting aside their differences (Gaertner & Dovidio, 2010). With all things considered, diverse employees in terms of age and education are expected to collaborate better at higher levels of workgroup autonomy.

*Hypothesis 3-1: Workgroup autonomy moderates the relationship between diversity in age and relational coordination, such that the negative relationship becomes weaker when organizations have a higher level of workgroup autonomy.*

*Hypothesis 3-2: Workgroup autonomy moderates the relationship between diversity in education and relational coordination, such that the positive relationship becomes stronger when organizations have a higher level of workgroup autonomy.*

## **2.2. Multisource Feedback**

Multisource Feedback (MSF), also known as the 360-degree feedback, is feedback provided by multiple sources such as subordinates, peers, supervisors, and customers. Individuals often receive feedback to reflect on themselves and plan for development. It is contrasted with the

traditional appraisal for performance where the employees are evaluated only by their supervisors. Some organizations use the feedback for the evaluation purposes of making administrative decisions such as pay or promotion, but other feedback are only used for development purposes (McEvoy & Buller, 1987). Conflicting opinions with empirical findings for both the negative side (e.g., Pfau, Kay, Nowack, & Ghorpade, 2002; Seifert, Yukl, & McDonald, 2003) and the positive side (e.g., Mabey, 2001; Smither, London, & Reilly, 2005) are suggested regarding whether MSF improves employee performance. Thus, scholars have recognized the complexity of MSF in making generalizations about their effectiveness (e.g., Kluger & DeNisi, 1996) by starting to ask: “Under what conditions and for whom is multisource feedback likely to be beneficial?” (Smither et al., 2005, p. 60). I suggest the context of diversity as one such condition.

MSF can help to create better working relationships among diverse employees. First, it can be used to help employees understand the relational dynamics of working with diverse members (O’Reilly, 1995). MSF directs considerable attention toward work relationships, given that the feedback comes from various sources regarding a broad range of performance domains including interpersonal aspects. Provided with multiple perspectives and opinions about the performance and social skills of an employee, an individual who receives MSF has considerably more information to interpret than an employee who is provided with the assessment of the supervisor alone. A diverse workforce is likely to have different opinions about job responsibilities and expected behaviors because of different lives, job

experiences, or viewpoints (Chubin et al., 2005; Zemke et al., 2000). Accordingly, employees being rated in diverse work groups tend to find greater discrepancies in self-perceptions and other ratings than those found by their homogeneous counterparts. They are likely to engage in spontaneous causal analysis to understand the discrepancies, finally reaching a greater understanding of the dynamics of working with colleagues from different backgrounds.

Second, MSF can motivate individuals to change their behaviors to decrease discrepancies in self-evaluation and evaluations from others (London & Smither, 1995). According to control theory (Carver & Scheier, 1990) and feedback intervention theory (Kluger & DeNisi, 1996), individuals are motivated to change their behavior when they detect a discrepancy between their behavior and a personal standard. A more significant discrepancy results in more motivation to change. As suggested, employees in a diverse workforce encounter larger discrepancies. They tend to be surprised by the things that they hear, calling attention to the development needs and adjusting the efforts to reduce the gap. As a result, they improve in their work relationships (Smither, London et al., 1995).

Third, MSF can also help to uncover and resolve conflict. As employees are able to rate their superiors, subordinates, and colleagues, they have an opportunity to express their perceptions of the skills and behaviors of other members (Garavan, Morley, & Flynn, 1997). In other words, individuals are given a voice to express their opinions, which might otherwise have been suppressed (Smither et al., 1995). Reducing the repression of dissatisfactions,

voicing opportunities prevent the development of potential conflicts (Korsgaard & Roberson, 1995).

All of these effects lead to an enhanced relational coordination of the diverse workforce. I suggest that MSF becomes effective for enhancing relational coordination in the presence of both age diversity and education diversity. Whether heterogeneities are relational or informational, diverse composition creates differences in expected behaviors and performance standards. Thus, the various thought-worlds in diverse worker groups can hinder members from fully understanding one another (Dougherty, 1992; Zemke et al., 2000). In this regard, multisource feedback is conducive to managing workforce diversity, helping to reduce the perceptual gaps and to facilitate efforts toward relational integration.

*Hypothesis 4-1: MSF moderates the relationship between diversity in age and relational coordination such that the negative relationship becomes weaker when organizations implement a higher level of MSF.*

*Hypothesis 4-2: MSF moderates the relationship between diversity in education and relational coordination such that the positive relationship becomes stronger when organizations implement a higher level of MSF.*

### **3. Relational Coordination and Firm Performance**

Originally developed in service settings (Gittell, 2000, 2001), this study is the first to present evidence on the effect of relational coordination in manufacturing contexts. Relational coordination, which is a communication-

and relationship-intensive form of coordination, is expected to lead to high performance, particularly under high levels of task interdependence, uncertainty, and time constraint (Gittell, 2002). Although traditionally low on these characteristics, manufacturing organizations have undertaken massive transformations not only in adopting new technology but also in reshaping the design of their work (Dean & Snell, 1991). The primary tendency is to adopt integrated manufacturing practices that emphasize collective effort, professionalism, and flexibility as well as to increase workgroup autonomy to maximize adaptability in fast-changing work environments while simultaneously attempting to increase workforce commitment and workplace humanization (Klein, 1991; Snell & Dean, 1992). Therefore, coordination is increasingly becoming important in the manufacturing sector (Chung, 2003; Cutcher–Gershenfeld, 1991; MacDuffie, 1995).

I argue that relational coordination improves the performance of manufacturing firms in potentially significant ways. First, shared goals and trusting relationships generate supportive relationships at work, thereby creating a powerful bond among employees. By having common goals, workers engage in collective action rather than categorizing themselves into subgroups. They also become willing to make efforts on behalf of one another without expecting that they will be repaid in the short term because their relationships are based on trust. Therefore, workers spend less time and effort in spreading inter-subgroup prejudices and determining whether their partners are trustworthy. Instead, they come together and engage in concerted action for the success of the larger organization.

Second, a shared understanding of the overall work process may minimize process losses and improve efficiency (Steiner, 2007). By placing the work of an individual in the larger process, employees develop a bird's-eye view of how their tasks are associated with the overall work process and whom they must consult when problems arise (Gittell, Weinberg, Pfefferle, & Bishop, 2008; Moreland, 2006). Sub-optimal combinations of resources can be prevented by aiming for the ultimate benefits of the larger group and by reducing redundant investments (Crowston & Kammerer, 1998). By knowing the tasks of their colleagues, employees also provide better support to one another (Klimoski & Mohammed, 1994). Moreover, the presence of overlapping knowledge allows organizational members to communicate effectively, which facilitates the absorption and spread of new information and perspectives (Gittell, 2002).

Third, increased communication helps employees discuss emerging issues and obtain new, diverse information. Communication activities that are directed toward solving the problem enable those divergent perspectives that are brought up during discussions to be fully addressed (Allen, 1984; Bunderson & Sutcliffe, 2002), thereby creating the basis for elaborated, high-quality decisions (Van Knippenberg et al., 2004). Furthermore, the company-wide communications that are beyond work groups and departments enable workers to access the perspectives of individuals with diverse expertise, which subsequently enhances their problem-solving and decision-making abilities (Ancona & Caldwell, 1988; Clark, Amundson, & Cardy, 2002). Overall, the high quality of communication leads to task-relevant elaboration

process and improves information accessibility (Adler & Kwon, 2002; Kozlowski & Ilgen, 2006; Nahapiet & Ghoshal, 1998).

These implications reveal the importance of forming relational coordination at work. By establishing supportive relationships at work, organizational members feel psychologically satisfied and committed (Gittell et al., 2008) and problematic inter-subgroup relations are diminished (De Dreu & Weingart, 2003; Gaertner, Mann, Dovidio, Murrell, & Pomare, 1990). Understanding the overall work process helps employees to combine scattered resources in an optimal manner to achieve their shared goals (Gittell, 2011, August 25; Moreland, 2006). Furthermore, communication facilitates task-relevant discussions and improves access to new information. The benefits of positive relationships include promoting high-quality communication, which in turn reinforces productive relationships (Gittell, 2001; Smith et al., 1994). By creating a virtuous circle between high-quality relationships and communication, the relational forms of coordination give rise to improved firm performance.

*Hypothesis 5: Relational coordination is positively related to firm performance.*

### **III. METHODS**

#### **1. Data and Sample**

Data were obtained from the Human Capital Corporate Panel (HCCP). The Korea Research Institute for Vocational Education & Training, a government-

funded research agency, collected data in collaboration with the Korea Ministry of Labor. A sample was selected using the stratified random sampling method according to size and ownership types. A total of 367 manufacturing firms participated in the survey (reference year 2010) and the respondent companies were matched to the financial statement data from the Korea Information Services (KIS) Corporate Data, which was the Korean equivalent of COMPUSTAT. The HCCP survey data were completed by multiple sources of respondents. The senior executives or directors for strategy and the top HRM officers completed the survey items within their managerial sphere, such as age and educational composition, multisource feedback, number of total employees, labor/management relationship, level of environmental change, and firm strategy. Managers with supervisory roles answered the questions regarding the level of workgroup autonomy that was given to their work units. The department directors completed the survey items that were related to the perceived competitiveness of their firms. The employees completed the survey items that were related to relational coordination. Only firms that employed more than 100 workers in the database were included because small firms may not operationalize HR functions in a systematic way (Huselid, 1995). After eliminating missing data and single respondents on the focal variables of this study such as relational coordination and workgroup autonomy, I included 189 companies in the manufacturing sector for my final analysis. A total of 6,184 employees participated in the survey, which included an average of 32.72 ( $SD = 15.66$ ) members from each firm. Male respondents comprised 82.1% of the

respondents. In terms of education level, 39.6% of the respondents finished high school or less, 18% finished vocational school, 37% finished a bachelor's degree, 5% finished a master's degree, and .4% finished a doctoral degree. The average age and tenure of the respondents in years were 37.53 ( $SD = 8.51$ ) and 9.61 ( $SD = 8.18$ ), respectively.

## 2. Measures

**Age and education diversity.** Following previous studies (Ancona & Caldwell, 1992; Cady & Valentine, 1999; Jehn et al., 1999), an entropy-based diversity index (Teachman, 1980) was used to measure age and education diversity. This index shows the degree of distribution in selected groups, which is calculated using the mathematical equation  $H = -\sum P_i (\ln P_i)$ , where  $P_i$  represents the proportion of the group that has this demographic characteristic. The HR officers from each firm reported the overall workforce composition of their firms. Age diversity was measured by categorizing the organizational members into four age groups, namely, below 29 years, 30–39 years, 40–49 years, and over 50 years. Education diversity was operationalized as education level (Jehn & Bezrukova, 2004; Kearney & Gebert, 2009; Seong et al., 2012), which was measured using five categories, namely, high school or less, two-year college, bachelor's degree, master's degree, and doctoral degree.

**Relational coordination.** The relational coordination instrument has been validated in service settings (Gittell et al., 2000; Gittell, Seidner, & Wimbush, 2010). In this study, the items in this instrument were substantially altered to meet the needs of the manufacturing settings in Korea. Unless

otherwise indicated, responses were measured with a five-point Likert-type scale ranging from (1) completely disagree (5) to completely agree.

This previously validated instrument was changed in three ways. First, dropping the original communication dimensions, I measured communication at the organization level with the item “In our organization, employees freely talk to their superiors about their opinions.” Given that Korea is highly hierarchical across all levels of society (Bae & Lawler, 2000; Hofstede, 2001), the ability of employees to express their opinions without pressure to their superiors may capture the level of task-relevant communication in their workplaces. In other words, employees who can freely discuss their concerns with their superiors can also communicate their problems with anyone, such as their subordinates and colleagues. Thus, the item may indicate how employees actively bring up their opinions. Moreover, as a measure of company-wide communication between departments, inter-departmental (or inter-work units) communication level was determined with the item “In our organization, we have favorable inter-departmental communications.”

Second, the dimension of shared knowledge was measured with the two items, “In our organization, employees are informed about the overall company issues” and “How much do you understand the overall work process of your firm?” These items show whether organizational members have a shared understanding of the emerging issues faced by a firm and of the overall work process. Although the latter item was four-point scale(1: I roughly understand only the work process of our unit, 4: I understand overall work

process of our firm), different from the scales of the other items that were measured in a five-point scale, I decide to keep this item for its theoretical importance (Gittell, 2006). The latter item had the item-to-total correlation score of .35 ( $p < .01$ ), suggesting that the item is fairly well associated with the composite index of relational coordination (Gittell et al., 2010). I retested all my hypotheses without the four-point item, but the result patterns were exactly the same.

Third, the level of collective identity was measured instead of directly testing the level of shared goal. In the diversity literature, the level of social attachment to the larger group, such as social integration, identification, or cohesion, is heavily examined as a consequence of diversity effects (Van Knippenberg & Schippers, 2007). Shared goal is closely related to collective identity in that both constructs essentially pertain to collective orientation or the willingness to cooperate and engage in collective action (Gittell, 2006). Therefore, the level of collective identity was measured with the item “In our organization, collective efforts that are based on unity and collective identity are important.”

Mutual trust was measured with the item “In our organization, employees trust each other.” The extension of the relational coordination dimensions to mutual trust is discussed by relational coordination theory (Gittell, 2006). Moreover, trust is a focal element of social relationships in the social capital literature (Kramer, Hanna, Su, & Wei, 2001; Nahapiet & Ghoshal, 1998), which establishes the foundation of relational coordination theory.

I believe that the relational coordination instrument captures the essence of the relational coordination construct and it is well-tailored to the manufacturing settings in Korea. An average of 32.72 ( $SD = 15.66$ ) employees from each firm responded to the survey items. The factor analysis based on principal factors method showed that the six items that were loaded onto one factor had an eigenvalue of 3.24. The composite relational coordination index achieved a Cronbach's alpha of .78, which suggested a reasonably high level of construct validity. Therefore, by following the procedures that were used in other relational coordination studies (e.g., Gittell et al., 2000), I standardized all items and created a composite index of relational coordination. I used  $r_{wg(j)}$  and ICC statistics to justify the organizational-level aggregation of the relational coordination index<sup>1</sup>. The average within-organization agreement ( $r_{wg(j)}$ ) coefficient was .91, which was above the usual .70 criterion (e.g., George, 1990). The ICC(1) for relational coordination was .16, which exceeded the cutoff value of .12 that was reported by Glick (1985). The ICC(2) value for the same variable was .87, which was greater than the accepted cutoff of .50 (De Jong, De Ruyter, & Wetzels, 2005). Therefore, I aggregated this index to the organizational level.

**Workgroup autonomy.** Workgroup autonomy was measured by asking the supervisory managers to estimate the extent to which their work units had the authority to make decisions regarding (1) workload, (2) work

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<sup>1</sup> I excluded the item of "How much do you understand the overall work process of your firm?" for these analyses because the four-point scale of the item is different from the five-point scale of the other items. Again, it makes no differences in my final results whether the four-point item is included or not in my composite index of relational coordination.

methods, (3) work pace, (4) working hours, (5) task allocation within the unit, (6) job rotation within the unit, (7) training activities within the unit, and (8) hiring unit members. A four-point response scale was used for these questions (1: almost none, 4: very much). An average of 2.7 managers from each company responded to the survey. For these eight items, the mean  $r_{wg(j)}$  was .84, the ICC(1) was .28, and the ICC(2) was .51, which justified data aggregation. Therefore, I aggregated the data to create an organizational-level variable. The Cronbach's alpha was .91.

**Multisource feedback.** Multisource feedback was measured using two separate items that were answered by HR officers. First, these officers were asked regarding the degree to which a firm actually used multisource feedback (0: not used at all, 4: heavily used). Second, the intensity of utilizing multisource feedback was measured (0: not used at all, 1: used as a reference, 2: used for promotion or compensation). I conducted separate analyses for each item.

**Firm performance.** I employed the objective corporate financial performance as well as the subjective ratings of firm competitiveness. First, I utilized the 2011 operating profit per employee data that were provided by KIS, lagged one-year corporate performance compared to the survey reference year (2010). In presenting the effect of relational coordination on firm performance, I argued that relational coordination is conducive to not only improved labor productivity of employees but also the optimal combination of a firm's resources. Operating profit equals revenue (sales) minus operating expenses, which well reflects both improved labor productivity (revenue) and

an efficient use of a firm's resources (operating expenses) (e.g., Bhattacharya, Gibson, & Doty, 2005). Relevant data were available for 186 firms, but I excluded one firm as an extreme outlier (more than five times the standard deviation from the mean). Therefore, the final sample comprised 185 firms. The raw data were used in the analyses because the distribution of the operating profit was not skewed. Second, the department directors (an average of 5.5 participants from each firm) answered the items regarding how they perceived the extent to which their firms outperformed their competitors. The following five areas were rated based on the performance criteria suggested by Ancona and Caldwell (1992): (1) new product development, (2) efficiency in work procedures and processes, (3) cost savings, (4) product quality, and (5) reduced error rates and increased yields. Each item was rated on a five-point scale (1: much lower than the industry average, 5: much higher than the industry average). To ensure the adequacy of the data aggregation, I calculated the mean  $r_{wg(j)}$ , which was .97. ICC(1) and ICC(2) were .36 and .75, respectively. Therefore, the five ratings were aggregated to create a composite index of firm competitiveness. The Cronbach's alpha was .84.

**Control variables.** I controlled for various firm characteristics. First, the average age and education scores were included as control variables to separate the effects of diversity from the associated levels of age and education. Second, I controlled for the effect of organization size, which was typically known to affect the interaction patterns of employees (Thatcher & Patel, 2011). This variable was measured as the log number of total employees in each firm. Third, environmental change was considered as an

external factor that imposed greater need for coordinated efforts (Hsieh & Chao, 2004). Two items were operationalized to measure the environmental change in the last two years in product and technology (0: not at all, 4: heavily changed) and were then averaged to generate an index of environmental change ( $\alpha = .72$ ). Fourth, I included the chosen competitive strategy of a firm because such variable substantially affected the interdependency in inter-departmental and interpersonal relationships as well as firm growth (Miles, Snow, Meyer, & Coleman, 1978). Firm strategy was included after this variable dummy coded based on whether the firms had a first-mover strategy by heavily investing in new products, a performance-oriented strategy by selectively developing new products, or a relatively stable strategy by trying to maintain the status quo. Finally, the labor/management relationship was also included as a control variable because the nature of such relationship was suggested to affect relational coordination (Gittell, 2000). This variable was measured on a five-point scale (1: very negative, 5: very positive).

## **IV. RESULTS**

### **1. Hypotheses Testing**

The means, standard deviations, and correlations for all variables are presented in Table 1. Table 2 presents the regression results of predicting relational coordination as the dependent variable (Hypotheses 1 to 4). The predictions were tested via hierarchical multiple regression analysis. First, the control variables were entered. Second, the main effects for age and education diversity were entered. Lastly, the interactions of the diversity variables and

moderators were entered. The predictor variables were standardized to analyze the interaction effects, and simple slope analyses were conducted to clarify these interactions (Aiken & West, 1991). Variance inflation factor (VIF) values were examined to identify potential multicollinearity problems. The highest VIF value in all analyses was 1.99, which was far below the conventional threshold value of 10 (Cohen, Cohen, West, & Aiken, 2003).

In Model 1, firm size, labor/management relationship, average age, average education, and workgroup autonomy were identified as significant predictors of relational coordination in predictable ways. In Model 2, age diversity ( $\beta = -.14, p < .05$ ) was significantly related to relational coordination in a negative direction, whereas education diversity ( $\beta = .20, p < .05$ ) was significantly related to relational coordination in a positive direction, which further explained the 4% variance in relational coordination ( $\Delta R^2 = .04, p < .05$ ). Therefore, hypotheses 1 and 2 were supported. In Model 3, I found a significant change in the multiple squared correlation coefficient after adding the four interaction terms ( $\Delta R^2 = .05, p < .01$ ). The interactions between age diversity and work group autonomy ( $\beta = .14, p < .05$ ) as well as between education diversity and work group autonomy ( $\beta = .15, p < .05$ ) were both significant. Figure 1 shows that age diversity is negatively related to relational coordination when the workgroup autonomy is low, but such negative effect disappears when the workgroup autonomy is high. The simple slope analysis results also showed that the relationship between age diversity and workgroup autonomy was significant when the work group autonomy was low ( $t = -3.04, p < .01$ ), but was neutral when the autonomy was high ( $t = -$

.27, *n.s.*). Figure 2 shows that education diversity is positively related to relational coordination when the workgroup autonomy is high. The simple slope analysis results confirmed the significant positive relationship between education diversity and relational coordination only when the workgroup autonomy was high ( $t = 3.68, p < .01$ ), but such relationship became insignificant when the autonomy was low ( $t = .69, n.s.$ ). Therefore, hypotheses 3-1 and 3-2 were supported. However, Hypothesis 4-1 was not supported because the interaction between age diversity and multisource feedback was insignificant ( $\beta = -.05, n.s.$ ). By contrast, the interaction between education diversity and multisource feedback was significant ( $\beta = .14, p < .01$ ). Figure 3 shows that when multisource feedback is high, education diversity is positively related to relational coordination. The simple slope analysis results also confirmed the positive moderating role of multisource feedback, namely, the effect of education diversity on relational coordination is positive at a high level of multisource feedback, but is neutral at a low level of multisource feedback ( $t = 2.96, p < .01$  and  $t = .47, n.s.$ , respectively). Therefore, Hypothesis 4-2 was supported.

Hypothesis 5 refers to the performance benefits of relational coordination. First, Table 3 shows relational coordination was significantly and positively related to the productivity measure of operating profit per employee ( $\beta = .22, p < .05$ ), which further explained 3% of the variance in firm performance. Second, the subjective ratings of firm competitiveness, which were measured by the heads of department, were tested as dependent variables. Relational coordination exerted a positive effect on the subjective

perception of firm competitiveness ( $\beta = .32, p < .01$ ), which explained 6% of the variance in the subjective ratings. When taken together, these results supported Hypothesis 5.

Table 1. Means, Standard Deviations, and Correlations

Variables	Means	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Firm size (log)	5.97	0.92													
2 Labor-management relationship	3.99	0.86	-.21**												
3 Average age	38.69	3.59	-.05	-.05											
4 Average education	13.83	0.80	.08	-.04	-.27**										
5 Environmental change	2.55	0.73	.28**	.05	-.21**	-.24**									
6 First-mover strategy	0.31	0.46	.15**	-.02	-.10	-.16*	.31**								
7 Performance-oriented strategy	0.43	0.50	-.06	.11	.04	.08	.08	-.58**							
8 Workgroup autonomy	2.57	0.52	.13	.09	-.15*	.08	.21**	.11	.01						
9 Multisource feedback	0.81	1.39	.26**	-.10	.02	.05	.16*	.13	-.06	.01					
10 Age diversity	1.20	0.14	.03	-.04	.44**	-.09	-.03	-.05	.08	-.08	.04				
11 Education diversity	1.01	0.20	.17*	-.01	-.25**	.56**	.29**	.12	.11	.05	.09	-.01			
12 Relational coordination	-0.01	0.32	.33**	.10	.06	.23**	.27**	.24**	-.10	.25**	.18*	-.06	.28**		
13 Operating profit per employee	35446.94	65429.87	.18*	.03	-.01	.24**	.02	.05	-.16*	.10	.11	.02	.25**	.31**	
14 Firm competitiveness	3.49	0.42	.34**	.09	-.04	.16*	.24**	.33**	-.21*	.16*	.11	-.07	.15*	.47**	.30**

Notes. n = 189 for all variables, except n = 186 (Operating profit per employee). Operating profit is measured in 1,000 Korean wons.

\*p<.05

\*\*p<.01

Table 2. Hierarchical Regression Results Predicting Relational Coordination

Variables	Relational Coordination		
	$\beta$		
	Model 1	Model 2	Model 3
Step 1 : Control Variables			
Firm size	.27**	.26**	.24**
Labor/management relationship	.18**	.17*	.18**
Average age	.20**	.28**	.28**
Average education	.23**	.13	.14
Environmental change	.11	.10	.09
First-mover strategy	.06	.06	.05
Performance-oriented strategy	-.10	-.11	-.13
Workgroup autonomy	.18**	.18**	.17*
Multisource feedback	.08	.08	.07
Step 2 : Main effects			
Age diversity		-.14*	-.15*
Education diversity		.20*	.20*
Step 3 : Interaction effects			
Age diversity * Workgroup autonomy			.14*
Education diversity * Workgroup autonomy			.15*
Age diversity * Multisource feedback			-.05
Education diversity * Multisource feedback			.14*
$\Delta R^2$	.28**	.04**	.05**
$R^2$	.28**	.32**	.37**

Note.  $n = 189$  (firms). Standardized coefficients ( $\beta$ ) are reported.

\*  $< p = .05$

\*\*  $< p = .01$

Table 3. Hierarchical Regression Results Predicting Firm Performance

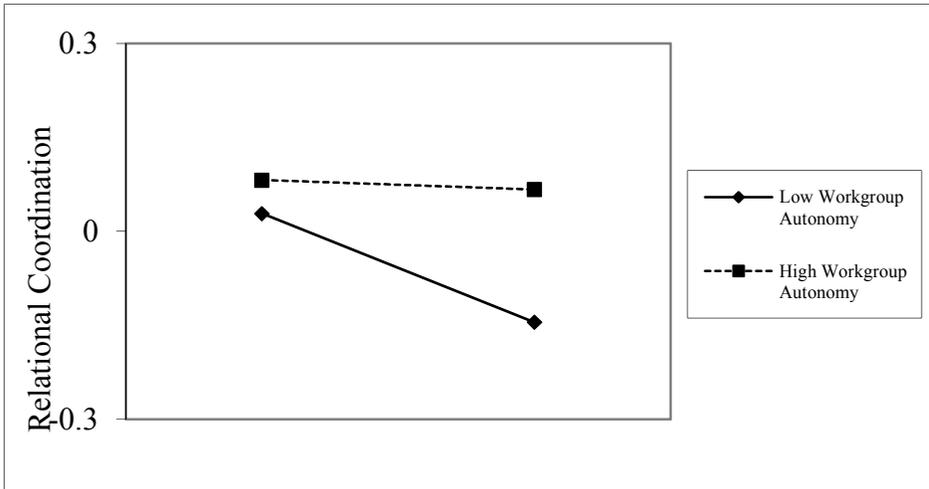
Variables	Firm Performance			
	$\beta$			
	Operating Profit Per Employee		Firm Competitiveness	
	Model 1	Model 2	Model 1	Model 2
Step 1 : Control Variables				
Firm size	.18*	.13	.30**	.23**
Labor/management relationship	.05	.01	.17*	.12
Average age	.10	.03	.11	.02
Average education	.22*	.19*	.09	.05
Environmental change	.05	.03	.07	.04
First-mover strategy	-.16	-.17	.18	.16
Performance-oriented strategy	-.27**	-.25**	-.12	-.09
Workgroup autonomy	.08	.04	.08	.02
Multisource feedback	.02	.01	-.01	-.03
Age diversity	-.02	.02	-.08	-.03
Education diversity	.10	.07	.04	-.02
Step 2 : Main effects				
Relational coordination		.22*		.32**
$\Delta R^2$	.15**	.03*	.26**	.06**
$R^2$	.15**	.18**	.26**	.32**

Note.  $n = 185$  (firms). Standardized coefficients ( $\beta$ ) are reported.

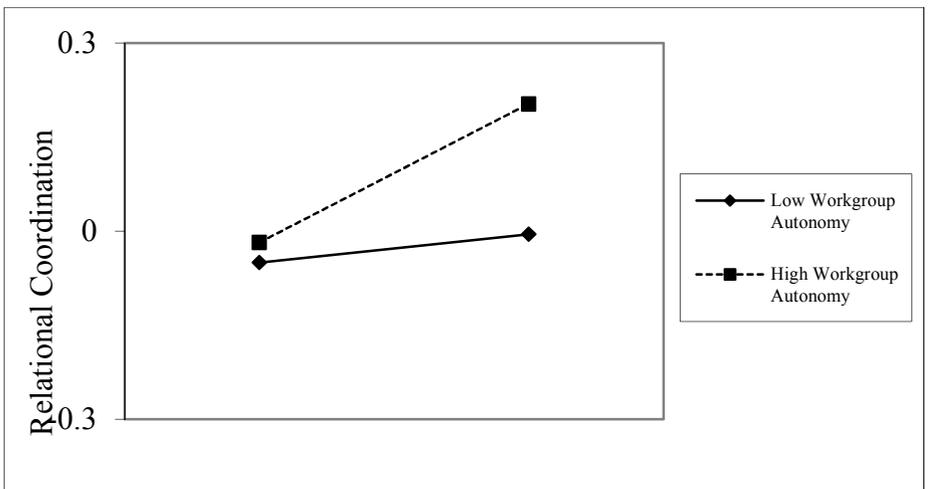
\*  $< p = .05$

\*\*  $< p = .01$

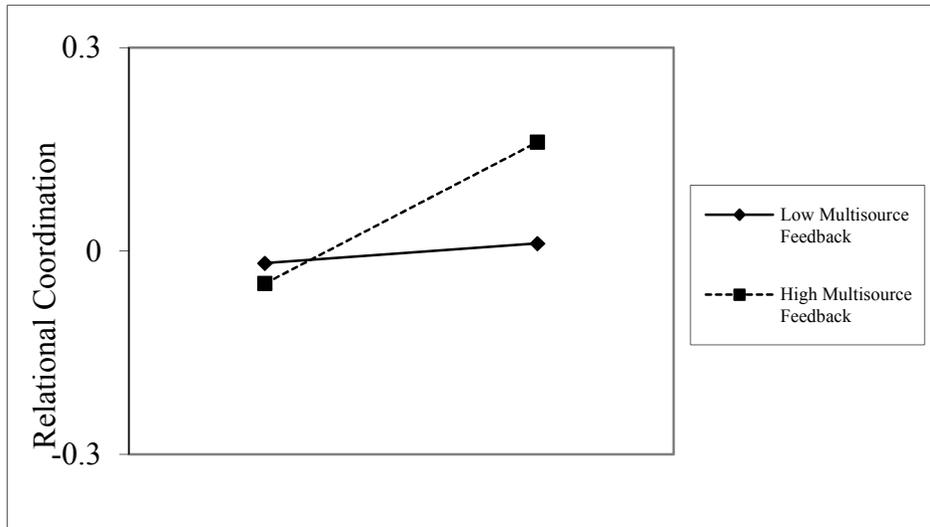
**Figure 2. The Interaction of Age Diversity and Workgroup Autonomy on Relational Coordination**



**Figure 3. The Interaction of Education Diversity and Workgroup Autonomy on Relational Coordination**



**Figure 4. The Interaction of Education Diversity and Multisource Feedback on Relational Coordination**



## 2. Supplemental Analyses

To test the robustness of my findings, I conducted additional analyses by altering original measures and samples. First, I used the Blau (1977) index to test the main effects of age and education diversity on relational coordination (Hypotheses 1 and 2). Second, the moderating effects of workforce autonomy (Hypothesis 3) were tested again with a larger sample of 216 firms, including single responses from the supervisory managers of each firm. Third, I used the single item of multisource feedback in my original analyses to test its moderating effects (Hypothesis 4). To address weak reliability of such a measure, I utilized an alternative instrument to see if the results are similar. The instrument indicated the intensiveness in using multisource feedback (0: not used at all, 1: used as a reference, 2: used for promotion or compensation). Fourth, data on logarithm of the sales per

employee in 2011 were utilized to test the effect of relational coordination on firm performance (Hypothesis 5). Lastly, I retested all my hypotheses only with the five-point scale of relational coordination items. In all my analyses, no essential differences were found in the result patterns. It is noticeable that relational coordination explained 4% of the variance in the sales per employee ( $\beta = .23, p < .01$ ).

For exploratory purposes, I tested potential indirect relationships with bootstrapping analyses (Hayes, 2008; Shrout and Bolger, 2002). I used the bootstrap sampling method (bootstrap sample size = 5,000) to generate asymmetric confidence intervals (CIs) for the indirect relationships as recommended by MacKinnon, Lockwood, Hoffman, West, and Sheets (2002) (e.g., Gong, Kim, Zhu, & Lee, 2013). I first tested the mediated impacts of relational coordination on the associations between diversities in age and education and firm performance. The indirect effect of age diversity on operating profit per employee through relational coordination was significant (95% bias-corrected CI = -6134.52, -94.12, not containing zero). However, the indirect effect of education diversity on operating profit per employee through relational coordination was non-significant (95% bias-corrected CI = -135.59, 6063.38, which included zero). Second, I tested whether individual HR practices (i.e. workgroup autonomy and multisource feedback) moderate the indirect relationships that diversities in age and education have with firm performance via relational coordination. I found two significant moderated indirect relationships. The bootstrapping test based on MacKinnon et al. (2004) showed the significance of the indirect relationship that the interaction term of

age diversity and workgroup autonomy had with operating profit per employee via relational coordination (95% bias-corrected CI = 246.58, 5805.35, not containing zero). The indirect relationship that the interaction term of education diversity and multisource feedback had with operating profit per employee was also found to be significant (95% bias-corrected CI = 472.53, 5866.50, not containing zero). The result patterns were essentially the same when I examined subjective performance ratings of firm competitiveness as a dependent variable, except that the indirect effect of education diversity on the performance through relational coordination was significant (95% bias-corrected CI = .01, .07, not containing zero).

## **V. DISCUSSION**

### **1. Theoretical Contributions**

To reveal the underlying processes and moderators for diversity effects, I propose relational coordination as a promising concept to improve our understanding of how workforce diversity affects firm performance. By extending the insights from existing diversity literature, I identify relational coordination as an intervening process through which workforce diversity indirectly affects firm performance. Prior studies argue that the information/decision-making perspective tends to focus on task/informational processes, whereas the social categorization perspective mainly considers the relational aspects of diversity outcomes (Van Knippenberg & Schippers, 2007). The theory of relational coordination offers a unique way to integrate these distinct perspectives by suggesting that relational aspects and

informational processes mutually reinforce each other and that their combined effects determine the level of relational coordination of a firm, which ultimately leads to a higher firm performance. As argued in this study, social category diversity (e.g., age), which is visible and less related to job attributes, tends to negatively affect the relational aspects that in turn worsen the communication and overall relational coordination level of a firm (Van Knippenberg, 1999; Van Knippenberg et al., 2004). By contrast, informational diversity (e.g., education), which is less visible and highly job-related, tends to facilitate informational communication that in turn improves work relationships and coordination (Roberts & O'Reilly, 1979; Smidts et al., 2001). However, this framework can also explain opposite findings, such as the positive relationship of social category with performance and the negative relationship of informational diversity with performance (Horwitz & Horwitz, 2007; Van Knippenberg & Schippers, 2007; Williams & O'Reilly, 1998). The different typologies of diversity do not necessarily indicate that one type of diversity is purely relational and the other type of diversity is completely task-related. Each dimension of diversity shares some extent of both relational and informational attributes (Van Knippenberg et al., 2004). Depending on various settings or contexts, social category diversity may possibly facilitate informational communication, while informational diversity is considered as a criterion for social categorization. Therefore, those processes that are likely to become dominant need to be determined rather than the types of diversity per se, and the expected results from the interplay between the processes (e.g., high-quality communication overwhelming the relational categorization or

vice versa) should be identified. All in all, as a comprehensive framework of the effects of diversity, the relational coordination perspective opens up new avenues for future research on diversity and firm performance.

Second, one of the primary goals of this study is to develop the contingency approach in diversity literature by identifying the moderating effects of two individual HR practices, namely, the work design for workgroup autonomy and multisource feedback. Workgroup autonomy strengthens the positive effect of education diversity on relational coordination as well as neutralizes the negative effect of age diversity. Multisource feedback can also enhance the positive effect of education diversity, but its moderating role in the relationship between age diversity and relational coordination remains unsupported. This unexpected finding is understandable because employees that evaluate one another may trigger competitive interdependence between different age-based subgroups (Gaertner et al., 1990). When social categorizations are set based on salient characteristics, such as age differences, the evaluation from other subgroup members may be perceived as a threat or challenge to the values of the focal group (Van Knippenberg et al., 2004). Furthermore, given that individuals tend to evaluate the members of their own subgroup more positively than the members of the other subgroups, dysfunctional competitions tend to be promoted among different age groups. Similarly, although I argued and empirically confirmed that workgroup autonomy helps induce the positive sides of age diversity by highlighting its informational benefit and by allowing frequent interactions as a basis for mutual understanding, alternative

explanation can be also suggested. That is, the formation of subgroups because of age diversity may make it difficult to integrate age-based categorized members under highly autonomous conditions. All in all, despite the non-significant finding of the interaction effect of multisource feedback and age diversity as well as some alternative possibilities concerning interpretations of my findings, individual HR practices in general have important roles, such as in facilitating communications (e.g., workgroup autonomy) or enhancing work relationships (e.g., multisource feedback). By identifying such practices as situational enhancers or minimizers of diversity effects, I point to the need for future focus on other relevant HR practices as important contingency factors.

Third, although previous studies have shown the benefits of the relational forms of coordination in service settings (Baggs et al., 1999; Gittell, 2001, 2002; Gittell et al., 2000), the productive potential of relational coordination in manufacturing settings is yet to be examined. As work processes have become increasingly integrated in manufacturing firms, paradigms are shifting in the management of human resources (Snell & Dean, 1994). The ever-increasing trend toward knowledge recognized as the most important resource of organizations accelerates such shift (Nahapiet & Ghoshal, 1998). Employees are increasingly required to exchange knowledge, recombine their existing resources, and develop new understanding and work methods (Drucker, 1993; Grant, 1996). Relational coordination, which is a conceptual tool that incorporates both the relational and informational aspects of human interactions, deserves research attention because it provides a

pathway through which organizations make successful adjustments in fast-changing environments and grow further.

## **2. Practical Implications**

My findings provide several implications for practitioners. Workforce diversity tends to have dual yet interdependent processes. Coordination can be enhanced by improving informational communication, but may also be deteriorated if relational disintegrations continue to prevail. Organizations can use HR practices as a means to maximize informational benefits or minimize relational disadvantages of workforce diversity. One possible way to facilitate informational communication is to allow groups to make decisions regarding their own operations. Such work design can efficiently manage social category (e.g., age diversity) and informational diversity (e.g., education diversity). Moreover, employees given feedback from multiple sources improve work relationships. However, multisource feedback is suggested to be carefully used in managing social category diversity. If subgroup categories are already formed based on salient characteristics, such as age, using multisource feedback may trigger inter-subgroup competition. As organizations continue to face the need to develop management plans for diversity, I believe that my findings on individual HR practices can provide valuable insights that practitioners can use as reference.

## **3. Limitations and Future Research**

This study has several limitations. First, the cultural context of Korea and the characteristics of the sample firms may affect the result patterns of my analyses. For example, age diversity may trigger further social categorization

in Korea, a culture that has a hierarchical character across different levels of age (Bae & Lawler, 2000; Hofstede, 2001). Therefore, the effects that are found in this study may be inflated. Nevertheless, the majority of the diversity studies have been conducted in Western countries (Shore et al., 2009), which enhances the need to examine the diversity effects in non-Western contexts, such as Korea (Choi, 2007). This study has no access to data from different cultures with which to compare my results. Moreover, the firms included in my final analyses tend to have large sizes (more than 100 employees), and therefore the effects of diversity composition on employees' interaction patterns may not be clear. For example, even with the same degree of overall diversity composition between firms, the distribution of the diverse workers may significantly differ across firms. Future research may replicate my findings in other cultural settings and different samples to identify the influences of culture and firm's characteristics (e.g., firm size) on the relationship between workforce diversity and relational coordination.

Second, data were cross-sectional, except for our firm performance variables. In the theory building for the effect of workforce diversity on relational coordination, I argue that social category diversity tends to generate relational categorizations that worsen communication quality, whereas informational diversity tends to facilitate communication that enhances work relationships. Consistent with theory, the detailed process cannot be empirically examined in my cross-sectional research design. Although numerous studies have validated the relational coordination theory and the association between relational and communication quality (see Gittell, 2011,

August 25, pp. 9–13 for a bibliography of related work), this is the first study to apply the relational coordination perspective to diversity research. Future experimental or longitudinal research is necessary to observe empirically the emergence of relational coordination in the diversity context.

Third, I only examined limited measures as indicators of workforce diversity. Specifically, age was the only attribute we used to assess social category diversity, and I only used education to assess informational diversity. Other characteristics, such as race and gender, can also be used to represent social category diversity, while tenure and function can be used to assess informational diversity. Given my limited access to data, I could not investigate such characteristics empirically. Theoretical and empirical questions remain to be answered whether other diversity characteristics will have the similar result patterns in their effects on relational coordination as we find our studies. For example, as a visible demographic characteristic, gender diversity may be argued to degrade relationship quality by promoting subgroup formation and inter-group competitions. However, the opposite explanation can also be suggested. Diversity in gender might be beneficial for integrating organizational members because the willingness to act with interpersonal sensitivity tend to increase in interactions with women (Williams & Polman, 2014). Future studies are encouraged to expand the current framework by employing additional attributes of workforce diversity, including gender.

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요약 (국문초록)

# 인력다양성의 관계적 조정을 통한 기업 성과 향상: 업무그룹자율성과 다면평가제의 조절효과

서울대학교 대학원  
경영학과 경영학전공  
이훈휘

현대 기업의 인력 구성에 있어 다양성이 점증함에 따라 인력 다양성은 실무뿐 아니라 학계에서도 상당한 관심을 받아왔다. 하지만 연령과 교육 이질성과 같은 인력 다양성이 조직 성과에 미치는 영향에 대해서는 아직도 충분한 이해가 부족한 실정이다. 본 연구는 관계적 조정(relational coordination)의 매개효과 및 두 조직 수준 HR 제도의 조절효과를 밝혀냄으로써 인력 다양성이 조직 성과에 미치는 매커니즘을 밝혀내고자 한다. 먼저, 본 연구는 관계적 조정을 연령과 교육 다양성이 조직 성과에 영향을 미치는 과정에서의 조직 수준 매개 변수로서 제시한다. 더불어, 그룹 자율성이나 다면평가제와 같은 HR 제도들은 상황변수로서 인력의 다양성이 관계적 조정에 미치는 긍정적인 영향은 강화하고, 부정적 영향은 약화시킬 것으로 기대한다.

마지막으로, 향상된 관계적 조정 수준은 기업 성과에 긍정적 영향을 미칠 것으로 예측한다. 이 연구에서는 이러한 이론적 주장을 국내 제조 산업에 속한 189개 기업을 대상으로 실증하였고, 가설들은 대체적으로 지지되었다.

주요어: 인력 다양성, 관계적 조정, 기업성과, 업무그룹자율성, 다면  
평가제

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