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# KOREAN KNOWLEDGE WORKERS' JOB AUTONOMY AND WORKPLACE OUTCOMES: THE ROLE OF JOB CRAFTING AND LEADER-MEMBER EXCHANGE QUALITY

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#### ABSTRACT

The primary purpose of this study is to better understand the relationship between knowledge workers' job autonomy and their work outcomes in the context of large Korean for-profit organizations. The research framework utilized identified job autonomy as an independent variable and work engagement and performance as dependent variables. Job crafting was proposed to mediate the main relationships, and the quality of leader-member exchange (LMX) was hypothesized to moderate the relationship between job autonomy and job crafting. A survey method was used to collect data from 14 large for-profit Korean organizations, and 562 valid responses comprised the final dataset. The collected data were analyzed using structural equation modeling (SEM). The findings of this study revealed that job autonomy increased job crafting behaviors, which subsequently translated into greater engagement and better performance. From a bootstrapping, it was found that the indirect effects were statistically significant. In addition, the relationship between job autonomy and job crafting was stronger under high LMX quality conditions than under low LMX conditions. These results expand our understanding of the process and conditions governing the relationship between job autonomy and performance. The findings of this study are expected to enrich theoretical discussions about the research variables and contribute to practices in the human resource development (HRD) field.

Keywords: job autonomy, LMX, job crafting, work engagement, performance

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## Chapter 1

### **INTRODUCTION**

In the knowledge information society, knowledge workers have become a significant driving force of organizations' growth and development (Drucker, 1999; Ram frez & Nembhard, 2004). According to Davenport (2016), knowledge workers are the people who create, distribute, and apply knowledge to their work. Usually, knowledge workers are highly educated and have expertise in their jobs. They use their cognitive abilities to solve complex problems, make important decisions, and produce significant intangible outcomes (e.g., business plans, new product designs, and marketing strategies) by thinking. Although many organizations' success has increasingly depended on knowledge workers' productivity, little is known about how to improve knowledge workers' work outcomes, such as performance and work engagement (Davenport, 2016; Jacobs, 2017).

Autonomy—freedom to determine how one's work is done (Hackman & Oldham, 1975)—has conventionally been regarded as a significant antecedent of positive employee work outcomes based on job characteristics theory (JCT; Hackman & Oldham, 1975) and job demands-resources (JD-R) theory (Bakker & Demerouti, 2007; 2008). Autonomy is also a salient aspect of knowledge workers' work (Parker, Wall, & Cordery, 2001) because their work is context-dependent and the results of it are challenging to specify before the work is done. Therefore, many organizations allow autonomous work environments for employees, hoping that this job autonomy will enhance positive work outcomes. For example, companies such as Google and 3M allow their employees to spend 15-20% of their work hours on projects that the employees personally think are interesting and important for their companies. Although it is widely believed that job autonomy enhances positive work outcomes, those relationships are more elusive in practice than they are in theoretical models (Langfred & Moye, 2004). Some researchers have found positive relationships between autonomy and engagement (Breevaart, Bakker, Demerouti, & van den Heuvel, 2015; van den Broeck, van Ruysseveldt, Smulders, & de Witte, 2011) and performance (Bizzi & Soda, 2011; Kuvaas, Buch, & Dysvik, 2016; Wenjing, Wei, & Shuliang, 2013). Others, however, have found statistically nonsignificant relationships between job autonomy and work engagement (van de Voorde, Veld, & van Veldhoven, 2016) and performance (DeVaro, 2006). These inconsistent results call for extended research on such direct relationships, recognizing that there may be an underlying mechanism that leads to the formation of the relationships.

In this regard, the purpose of this study is to find pathways that underpin the relationship between knowledge workers' job autonomy and their work engagement and performance. To do so, this study develops a conceptual model that includes job crafting as a mediator between job autonomy and engagement and performance and leader-member exchange (LMX) quality as a moderator between job autonomy and job crafting. Job crafting refers to the cognitive and behavioral changes that employees make to their task or relational boundaries (Wrzesniewski & Dutton, 2001), and LMX refers to the quality of relationships between leaders and their employees (Northouse, 2016). Since little is known about the process and the conditions by which job autonomy might influence employees' work engagement and performance, examining the mediator and the moderator will help managers and human resource development (HRD) practitioners guide employees' engagement and stimulate stronger performances.

In summary, this study examines the influence of knowledge workers' job

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autonomy on work engagement and performance via job crafting. In addition, LMX quality is proposed as a moderator of the relationship between job autonomy and job crafting.

## **Statement of the Problem**

While offering useful insights to the field of HRD, previous studies about the relationships between job autonomy and work engagement and performance have suffered from important limitations. First of all, the studies have paid insufficient attention to the mediators that link job characteristics and personal and work outcomes. Some researchers have examined mediators, but these have been limited to testing a set of motivational factors based on JCT, such as enjoyment (Hofmans, Gelens, & Theuns, 2014), intrinsic motivation (Joo, Jeung, & Yoon, 2010; Nie, Chua, Yeung, Ryan, & Chan, 2015), and empowerment (Liden, Wayne, & Sparrowe, 2000). Since scholars' understanding of how job autonomy influences individuals' psychological and behavioral aspects is lacking, a more comprehensive explanation is required (Parker et al., 2001). Therefore, this study proposes an alternative mediator, job crafting, to explain how job autonomy influences work engagement and performance from both the cognitive and behavioral aspects.

Second, HRD researchers have largely neglected work design even though it is a theoretical foundation (Swanson, 2001) and intervention (Jacobs, 1990; Wilmoth, Prigmore, & Bray, 2002) of the HRD field. Since work design affects employees' behaviors and attitudes at work and their psychological wellbeing, HRD researchers and practitioners need to pay more attention to work design. One of the recent work design theories, job crafting has been considered a critical antecedent of work engagement (Brenninkmeijer & Hekkert-Koning, 2015; Vogt, Hakanen, Brauchli, Jenny, & Bauer, 2016) and performance (Tims, Bakker, & Derks, 2015). Unlike the

previous top-down job design approach, job crafting emphasizes employees' voluntary participation. In this regard, this study proposes job crafting as a mediator to explain the mechanism underlying the relationship between job autonomy and work engagement and performance. In doing so, the study extends current job design research and offers theoretical and practical implications to researchers and practitioners in the HRD field.

Third, there is a lack of concerted research about the relationship between job crafting and leadership (Kim & Beehr, 2017). This might be due to Wrzesniewski and Dutton's (2001) argument that job crafting is largely hidden from managers. Recognizing that the role of managers has been neglected in existing job crafting studies, this study proposes LMX as a moderator in the relationship between job autonomy and job crafting. This is based on the premise that leaders develop different relationships with their employees, and the quality of these relationships predicts individual outcomes (Gerstner & Day, 1997).

Fourth, despite their important presence in the workforce, knowledge workers have been largely neglected in the HRD field (Jacob, 2017) and work design research (Parker et al., 2001). Given knowledge workers' contributions to organizational success in the modern era, it is necessary to increase scholarly understanding of how to improve workers' engagement and performance. Unlike the tasks of manual workers, knowledge workers' tasks are not obvious and should be defined by asking the workers themselves. This would allow different approaches to be applied to their performance improvement. However, only recently have researchers moved away from job design theories that were developed in the 1970s when the workforce had a different composition. In this respect, this study sheds new light on work design research from knowledge workers' perspectives. Fifth, the generalizability of previous studies regarding job crafting is limited because many of the job crafting studies have been primarily conducted in select Western countries in Europe or North America. Therefore, it is necessary to explore the job crafting variable in other cultural settings. Since the job crafting construct is relatively nascent in Korea, this study promotes better knowledge of job crafting by investigating job crafting's relationships with other variables in Korean business organizations.

Taken together, this lack of empirical evidence regarding the relationship between job autonomy and work engagement and performance via knowledge workers' job crafting as it relates to the quality of LMX constitutes the major impetus for this study.

#### **Research Questions**

Based on the aforementioned research challenges, the following research questions were proposed:

- 1. How does knowledge workers' job autonomy influence their psychological and behavioral outcomes?
- 2. What are the relationships among job autonomy, LMX quality, job crafting, work engagement, and performance?
- 3. How can the findings of this study contribute to the HRD field to enhance knowledge workers' work engagement and performance?

## **Definition of Terms**

Although researchers have variously defined the following terms, this study adopts specific definitions that reflect its purpose. The following definitions provide an understanding of the significant terms that are used in this study. More detailed definitions and explanations are presented in the literature review section.

## **Knowledge Worker**

Knowledge workers are employees who "have high degrees of expertise, education, or experience, and the primary purpose of their jobs involves the creation, distribution, or application of knowledge" (Davenport, 2005, p. 10).

## Job Design

Job design is "a top-down process in which the organization creates jobs and in turn selects people with the right knowledge, skills and abilities for the jobs" (Tims & Bakker, 2010, p. 1).

## Job Redesign

Job redesign is "a strategy for attempting to improve simultaneously the productivity and the quality of the work experience of employees in contemporary organizations" (Hackman & Oldham, 1976, p. 250).

## **Job Crafting**

Job crafting refers to "the physical and cognitive changes individuals make in the task or relational boundaries of their work...Changing task boundaries means altering the form or number of activities one engages in while doing the job, whereas changing cognitive task boundaries refers to altering how one sees the job (e.g., as a set of discrete parts or as an integrated whole), and changing relational boundaries means exercising discretion over with whom one interacts while doing the job." (Wrzesniewski & Dutton, 2001, p. 179).

#### **Job Autonomy**

Job autonomy is "the extent to which a job allows freedom, independence, and discretion to schedule work, make decisions, and choose the methods used to perform tasks" (Morgeson & Humphrey, 2006, p. 1323).

## Leader-member Exchange (LMX) Quality

LMX quality is "the quality of the dyadic relationships between supervisors and employees" (Klein & Kim, 1998, p. 89).

## Work Engagement

Work engagement is "a positive, fulfilling work-related state of mind that is characterized by vigor, dedication, and absorption" (Schaufeli, Bakker, & Salanova, 2006, p. 702).

## Performance

Performance refers to "the officially required outcomes and behaviors that directly serve the goals of the organization" (Demerouti, Bakker, & Halbesleben, 2015, p. 457).

#### Chapter 2

## **REVIEW OF THE LITERATURE**

The purpose of this study was to investigate the relationship among autonomy, LMX quality, job crafting, work engagement, and performance for Korean knowledge workers who work at representative large for-profit companies. Accordingly, this chapter comprehensively reviews the related literature. This chapter consists of the following sections: (a) job autonomy at work, (b) knowledge workers' job crafting, (c) the moderating effects of LMX, and (d) work engagement and performance as consequences of autonomy and job crafting.

## Job Autonomy at Work

Job autonomy is one of the most frequently studied job characteristics in work design research. According to JCT, job autonomy promotes employees' responsibility for the results of their work and, in turn, creates positive work outcomes (Hackman & Oldham, 1975). In this section, the concept and the measurement of job autonomy and its linkages to job crafting, work engagement, and performance are reviewed.

## **Concept of Job Autonomy**

Job autonomy is a key work characteristic that affects employees' work behaviors and attitudes. In the job characteristics model, job autonomy is defined as "the degree to which the job provides substantial freedom, independence, and discretion to the employee in scheduling the work and in determining the procedures to be used in carrying it out" (Hackman & Oldham, 1975, p. 162). Morgeson and Humphrey (2006) later specified the concept as freedom and discretion regarding work scheduling, decision-making, and work methods.

Job autonomy is one of the most distinguishable work characteristics of

knowledge workers. In the past, manual workers had little job autonomy because their work was tightly controlled and managed by managers, but today's knowledge workers need more autonomy to do their work (Niessen & Vomer, 2010). Knowledge workers' jobs are ambiguous and complex, so they need the flexibility to generate productivity. Knowledge workers define their work and take responsibility for the results of their work (Davenport, 2005; Drucker, 1999). Because they have specialized expertise, they value autonomy. They do not like to be told what, when, or how they should do their work (Davenport, 2005).

## **Measuring Job Autonomy**

Recognizing the importance of the job autonomy construct, many researchers have developed instruments to measure it. One of the most widely used instruments to date is Hackman and Oldham's (1980) Job Diagnostic Survey (JDS). The JDS determines job autonomy using three items that are measured using a 7-point Likert scale. Although many researchers use this instrument, several limitations exist. Some researchers have expressed concerns about its unclear construct validity and poor internal consistency (Breaugh, 1985; Farh & Scott, 1983; Kiggundu, 1983). They have argued that the independence component should be distinguished from autonomy and that job autonomy is not a single-factor construct (Breaugh, 1985). They have also argued that the JDS measurement questionnaire results in poor Cronbach's coefficient alphas. There is no clear cutoff for Cronbach's coefficient alphas, but .7 is generally considered acceptable. Since Hackman and Oldham's initial study resulted in .66, Breaugh (1985) argued that the JDS job autonomy measurement is marginal in terms of reliability.

Based on these limitations of the JDS, Breaugh (1985) developed a work autonomy instrument that includes three distinct factors—method, scheduling, and criteria autonomy. He then validated the instrument through a series of studies (Breaugh, 1985, 1989, 1998, 1999). These consecutive studies confirmed that job autonomy has three factors and that the instrument to measure it is reliable, with satisfactory Cronbach's coefficient alphas ranging from .85 to .89. However, Brady, Judd, and Javian (1990) found that when the measurement was applied to highly skilled professionals, the three factors blended into one factor. The researchers interpreted this result as suggesting that highly skilled professionals already enjoy a great deal of autonomy at work, so the uniqueness of the factors is blurred.

Spector and Fox (2003) developed the Factual Autonomy Scale (FAS), criticizing the existing measures as too subjective. They argued that all instruments should include "fact-based items" (p. 417) to reduce subjectivity. Spector and Fox argued that their FAS measurement shows better convergent validity and discriminant validity than the existing JDS scales. Although their decision to include fact-based items was well-founded, the instrument remains underutilized and does not easily translate to the Korean organizational context. For example, items such as "How often do you have to ask permission to take a lunch break?" (p. 423) or "How often do you have to ask permission to leave early for the day?" (p. 423) are not suitable for measuring job autonomy in Korea because almost every Korean company has an appointed lunch break, and most Korean employees are required to ask permission when they need to leave early due to Korean social norms.

Recently a job autonomy instrument development study was conducted by Morgeson and Humphrey (2006). By integrating and supplementing existing studies regarding work characteristics, the researchers developed the Work Design Questionnaire (WDQ). The WDQ includes nine job autonomy items that fall under three factors—scheduling, decision-making, and work methods. Each factor is

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measured using three items, and the average of the nine items' Cronbach's coefficient alphas has been reported as .86. The present study employs Morgeson and Humphrey's WDQ with its nine job autonomy items because this measurement has been consistently shown stable factor analysis results (three factors) and high level of reliability (Cronbach's coefficient alphas > .70; e.g., Chung-Yan, 2010; Dysvik & Kuvaas, 2011). Moreover, it does not have any negatively worded items that may affect factor structure problems. The specific job autonomy items of the WDQ are presented in Chapter 3.

## The Relationship Between Job Autonomy and Work Engagement and Performance

There is growing evidence that job autonomy has a positive impact on work outcomes such as organizational citizenship behavior (Chen & Chin, 2009), job satisfaction (DeCarlo & Agarwal, 1999; Humphrey, Nahrgang, & Morgeson, 2007; Finn, 2001; Nie et al., 2015), proactivity in taking on larger roles (Morgeson, Delaney-Klinger, & Hemingway., 2005), work engagement (Breevaart et al., 2015; Van den Broeck et al., 2011), and performance (Gagné & Bhave, 2011). Although these are all important, this study focuses on two major work outcomes in the HRD field: work engagement and performance.

Work engagement is positive, fulfilling, work-related well-being that is characterized by vigor, dedication, and absorption (Schaufeli, Salanova, González-Romá, & Bakker, 2002). Unlike employee engagement, the boundaries of work engagement are limited to the relationship between an employee and his or her work. As an antipode of burnout, work engagement is closely related to employees' psychological well-being (Schaufeli, Taris, & van Rhenen, 2008). Performance is one of the major end goals of HRD. Although there are numerous performance definitions, this study is interested specifically in in-role performance. In-role performance refers to officially required outcomes that are directly related to organizational goals.

Based on JD-R theory and JCT, researchers have argued that autonomy, as a job characteristic, positively influences work engagement and performance. Examples of studies that have examined the relationship between job autonomy and work engagement and performance are presented in Table 2-1. Although many studies have found a positive relationship between job autonomy and work engagement (e.g., Bakker & Bal, 2010, de Lange, De Witte, & Notelaers, 2008; Van den Broeck et al., 2010) and performance (e.g., Bizzi & Soda, 2011; Kalbers & Cenker, 2008; Pettijohn, Schaefer, & Burnett, 2014), some studies have shown contradictory results. For example, by studying Norwegian employees, Spiegelaere, Gyes, and Hootegem (2016) found that not all the factors of job autonomy were related to work engagement. Similarly, in a cross-sectional study, Van de Voorde et al. (2016) found that the job autonomy of employees at a Dutch hospital was not associated with work engagement. Using British secondary data, DeVaro (2006) found that autonomous teams did not perform better than closely supervised or non-autonomous teams. Joo et al. (2010) and Morgeson et al. (2005) found that intrinsic motivation and role breadth fully mediated the relationship between job autonomy and performance; however, no direct relationship was found.

## **Table 2-1.**

Summary of Studies Examining the Relationship Between Job Autonomy and Work Engagement and Performance

Authors	Sample	Methodologies	Key Findings
Relationship between job autonomy and work engagement			

Bakker & Bal (2010)	54 Dutch teachers	Longitudinal study Survey Multilevel analysis	Week-level of autonomy predicts weekly work engagement. Weekly work engagement predicts weekly work performance.
De Lange, De Witte, & Notelaers (2008)	871 Belgian employees	Two-wave panel study Survey Structural equation modeling	Among stayers, promotion-makers (employees who were promoted), and external job movers, only stayers experience job autonomy as affecting work engagement. However, a reverse causal effect was also found.
Mauno, Kinnunen, & Ruokolainen (2007)	409 Finnish healthcare personnel	Longitudinal study Survey Hierarchical regression	Job control was a predictor of the three dimensions (vigor, dedication, and absorption) of work engagement.
Spiegelaere et al. (2016)	154 employees from a municipality in Norway	Data were from two sources (employees and managers) at three different time points Survey Structural equation modeling	Work method autonomy was positively related to work engagement, but work schedule, work time, and location autonomy were not associated with work engagement.
Van den Broeck et al. (2010)	4,009 Dutch employees in various sectors	Cross-sectional study Survey Multiple regression	Task autonomy was positively related to work engagement. Autonomy was particularly predictive of work engagement under high workloads.
Van De Voorde et al. (2016)	311 employees at a general hospital in the Netherlands	Cross-sectional study Survey Multilevel analysis	As job resources, job variety was positively related to work engagement, but job autonomy was not associated with work engagement.
Vera, Martínez, Lorente, & Chambel (2016)	313 Portuguese nurses	Cross-sectional study Survey Hierarchical linear analysis	Job autonomy was positively associated with work engagement, and team-level social support moderated the relationship.
Relationship betw	een job autonomy an	d performance	
Bizzi & Soda (2011)	116 supervisor- subordinate dyads from four companies in Italy	Cross-sectional study Survey Hierarchical regression	Job autonomy explained 43% of the variance in contextual performance when controlling for age, gender, position, tenure, and organization.
DeVaro (2006)	2,191 responses from the British Workplace Employee Relations Survey	Cross-sectional study Secondary data Structural model	An autonomous team's performance was no better than the performance of a closely supervised or non- autonomous team.
Joo et al. (2010)	283 employees in a Fortune Global 100 company in Korea	Cross-sectional study Survey Structural equation modeling	The direct relationship between job autonomy and in-role performance was statistically nonsignificant. Intrinsic motivation fully mediated the relationship between job autonomy and in-role performance.

Kalbers & Cenker (2008)	334 partners at ten accounting firms in the United States	Cross-sectional study Survey Structural equation modeling	Job autonomy positively predicted performance.
Morgeson et al. (2005)	132 employee- manager dyads from a large international company in the United States	Data are from two sources (employees and managers) at three different time points Survey Multiple regression	Role breadth fully mediated the relationship between job autonomy and job performance. Therefore, the direct relationship between job autonomy and performance was statistically nonsignificant.
Pettijohn et al. (2014)	245 salespeople at large real estate companies in the United States	Cross-sectional study Survey Multiple regression	Salespeople's job autonomy was positively related to performance, customer orientation, and the quality of customer service.
Wenjing et al. (2013)	267 knowledge workers (managers and engineers)	Cross-sectional study Survey Moderated multiple regression	When higher autonomy was given, higher creative performance was observed.

## **Knowledge Workers' Job Crafting**

The number of knowledge workers has grown over the last three decades (Zumbrun, 2016), and their work has become a significant part of the global economy (Drucker, 1999; Sørensen & Holman, 2010). Knowledge work is highly ambiguous because it involves "the creation, manipulation, and communication of symbols (language, numbers, etc.) and ideas" (Sørensen & Holman, 2010, p. 112). This ambiguity provides employees with opportunities to craft their jobs as they see fit. The productivity of knowledge workers is evaluated by the quality of the employees' work, meaning that how they craft their work directly affects their productivity.

Wrzesniewski and Dutton (2001) argued that job crafting can occur in any job, and indeed, evidence of job crafting has been found in various job categories. Studies have shown that hairdressers, engineers, salespeople, and hospital janitors, for example, all engage in job crafting (Lyons, 2008; Petrou, Demerouti, Peeters, Schaufeli, & Hetland, 2012; Wrzesniewski & Dutton, 2001), but their job crafting tends to be limited to cognitive changes. Meanwhile, knowledge workers have many more opportunities to craft their jobs, whether this job crafting takes the form of cognitive, task-based, or relational changes. The impact of knowledge workers' job crafting may also be greater than that of other workers. For instance, knowledge workers make important decisions such as those about product design and business strategies, and the consequences of these decisions affect other employees and even the members of their society for a long time. For this reason, this study focuses on knowledge workers' job crafting.

## **Theoretical Background of Job Crafting**

Globalization, automation, and advancements in technology have forced organizations to undergo fundamental changes to survive. Automation has quickly replaced manpower, and globalization has resulted in offshoring for cost reduction purposes. Cutting-edge technology has increased employees' access to information that was once shared among a limited number of managers. Due to these changes, the structures of organizations have been flattened, and the boundaries of traditional business units have become blurred. These rapidly changing business environments have increased the uncertainty of work and the dynamics of relationships in the workplace, meaning that employees are expected to take the initiative and change how they conduct their work. In this regard, the nature and design of jobs have also changed because jobs are "tightly woven into the structure and function of organizations" (Torraco, 2005, p. 85).

**Job design.** Job design means how an organization conceives of and structures a job (Grant & Parker, 2009; Torraco, 2005). In the past, the nature of a job was stable and labor-oriented. Managers tended to design employees' jobs by simplifying tasks and managing efficiency and productivity based on the influence of Frederick

Taylor's *The Principles of Scientific Management* (Pierce & Dunham, 1976). Taylor (1991) argued that managers should simplify tasks, hire people who can perform the tasks, and train them based on job design. Owing to this approach, productivity dramatically increased in the short term, but it decreased in the long term and created feelings of alienation among workers in relation to their jobs (Taneja, Pryor, & Toombs, 2011). Many organizations have turned to *job redesign* to solve these problems.

Job redesign. Job redesign (or work redesign) has become popular because it simultaneously considers productivity and human factors such as motivation (Hackman & Oldham, 1976). Based on Herzberg's two-factor theory, organizations have begun to redesign jobs to increase employees' satisfaction. According to Herzberg (1959), there are two factors that influence employees' satisfaction. One factor is the presence of *employee motivators* such as recognition, responsibility, and personal growth. The other is the existence of *hygiene factors* such as company policies, work conditions, and salary. These hygiene factors cause dissatisfaction when they are lacking, but they do not generate satisfaction by themselves. While job redesign theory has attended to human factors that had been previously overlooked in job design theory, job redesign has continued to take a formal top-down approach that ignores employees' initiative and discrete events (Hornung, Rousseau, Glaser, Angerer, & Weigl, 2010).

Job crafting. One distinction between job redesign and job crafting is willingness. Whereas job redesign reflects a top-down approach, job crafting is a bottom-up approach based on employees' proactive and spontaneous behaviors (Grant & Parker, 2009). Wrzesniewski and Dutton (2001) introduced the job crafting concept, in doing so shifting the locus of control for job design from managers to employees. This approach has drawn many researchers and practitioners' attention as uncertainty in the workplace has increased. According to this bottom-up approach, employees craft their jobs to improve the jobs' designs (Demerouti, 2014). In the past, related concepts such as *task revision* or *personal initiative* were used, but the locus of control over behaviors remained with managers or organizations.

#### **Conceptualizations of Job Crafting**

Since Wrzesniewski and Dutton's (2001) introduction of the concept of job crafting, many researchers have variously operationalized it. As a result, there are different perspectives regarding the meaning of job crafting and the concept's boundaries. Job crafting has been conceptualized based on two perspectives: (1) Wrzesniewski and Dutton's job crafting model and (2) a job crafting model derived from JD-R theory (Tims & Bakker, 2010).

Wrzesniewski and Dutton's job crafting model. Job crafting was originally conceptualized according to Wrzesniewski and Dutton's job crafting model (see Figure 2-1). Wrzesniewski and Dutton defined job crafting as "the physical and cognitive changes individuals make in the task or relational boundaries of their work" (p. 179). They argued that job crafting consists of the following three practices: (1) "changing task boundaries," (2) "changing cognitive task boundaries," and (3) "changing relational boundaries" (p. 182). Put differently, job crafting refers to the unprompted decisions and actions that employees undertake in defining their jobs, their tasks, and their interactions with colleagues. Drawing on social constructionism, Wrzesniewski and Dutton argued that there is no objective job because employees can redefine and renegotiate the meanings and boundaries of their jobs.

According to Wrzesniewski and Dutton's (2001) model, there are three individual needs that lead to job crafting, and perceived opportunity moderates the relationship

between job crafting motivation and job crafting practices. First, employees craft their jobs to strengthen their positions. Wrzesniewski and Dutton argued that employees engage in job crafting because of the need to have "control over their jobs" and to "avoid alienation from the work" (p. 181). Second, employees seek to create positive self-images through job crafting. Third, job crafting satisfies employees' need to be connected to others.



*Figure 2-1.* Wrzesniewski and Dutton's job crafting model. Adapted from "Crafting a job: Revisioning employees as active crafters of their work," by A. Wrzesniewski and J. E. Dutton, 2001, *The Academy of Management Review, 26*(2), p. 182. Copyright 2001 by the Academy of Management.

Based on Wrzesniewski and Dutton's model, others have argued that when employees feel that they have the opportunities or freedom necessary to craft their jobs, they are motivated to engage in job crafting behaviors. Lyons (2008) argued that job crafting activities are largely hidden from managerial sight, meaning that the activities do not always reflect managerial preferences. In this vein, Lyons defined job crafting as "spontaneous changes made by individuals to satisfy their own personal needs and not necessarily the needs of the organization" (p. 25). Wrzesniewski and Dutton (2001) pointed out that if jobs are tightly monitored by managers, employees may have fewer opportunities to craft their jobs. However, studies have shown that employees actively look for job crafting opportunities by contacting managers and attempting to access other resources that help them to stay engaged and perform better at their workplaces (e.g., Bakker et al., 2012; Wrzesniewski, Berg, & Dutton, 2010). A job crafting model derived from JD-R theory. Although Wrzesniewski and Dutton's (2001) study has proven very influential, researchers remain conflicted about how to define and measure job crafting. Pointing out several problems with measuring job crafting in previous studies, Tims and Bakker (2010) explored job crafting at the individual level using JD-R theory. JD-R theory was originally developed to conceptualize *burnout*, which refers to emotional exhaustion at work (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). Tims and Bakker (2010) argued that JD-R theory is also suitable for investigating job crafting because the theory divides work characteristics into job demands and job resources, thereby providing information about "what specific aspects employees change in their job design" (p. 3). Based on JD-R theory, Tims et al. (2012) defined job crafting as "self-initiated changes that employees make in their own job demands and job resources to attain and/or optimize their personal (work) goals" (p. 173).

Tims and Bakker (2010) proposed a job crafting model based on JD-R theory (see Figure 2-2). They argued that two sets of working conditions—job demands and job resources—are related to person-job fit, and if there is a misfit, this misfit facilitates job crafting behaviors. Work characteristics and individual differences have moderate effects on this relationship. Job demands, such as job pressure, require employees' physical or mental efforts in the workplace. Job resources, on the other hand, refer to physical, social, or organizational factors that reduce job demands and increase personal development, such as job control and support from co-workers. Based on this JD-R model, Tims and Bakker (2010) defined job crafting as the act of shifting job demands and job resources to meet employees' abilities and preferences. In other words, employees craft their jobs by increasing and decreasing their job demands, while increasing their available job resources.



*Figure 2-2.* Tims and Bakker's job crafting model. Adapted from "Job crafting: Towards a new model of individual job redesign," by M. Tims and A. B. Bakker, 2010, *SA Journal of Industrial Psychology, 36*(2), p. 5. Copyright 2010 by Tims and Bakker.

Many researchers have conceptualized job crafting using JD-R theory (e.g., Kanten, 2014; Petrou et al., 2012; Tims et al., 2012; Tims et al., 2013; Vogt et al., 2016). For instance, Petrou et al. (2012) conceptualized job crafting as seeking resources, seeking challenges, and reducing demands. Based on Hobfoll (1989)'s conservation of resources theory, Petrou and his colleagues argued that employees do not reduce resources on purpose. Examples of behaviors that demonstrate seeking resources include asking for support from coworkers, requesting feedback from managers, and engaging in other proactive behaviors to accumulate resources. Seeking challenges includes looking for new tasks and asking for more responsibilities at work. Reducing demands includes minimizing emotionally and physically demanding workloads and reducing psychological pressure.

## **Measuring Job Crafting**

Several measurements have been developed based on the two conceptualizations of job crafting. Leana, Appelbaum, and Shevchuk (2009), for instance, developed 12 items to measure individual and collaborative job crafting based on Wrzesniewski and Dutton's (2001) job crafting model. The measurement has not been used widely, though. This is because the items were optimized for the particular study for which the measurement was created, which focused on childcare center teachers. For instance, one of the items was "rearrange equipment or furniture in the play areas of your classroom on your own" (p. 1192). This has limited the measurement's usefulness for other studies.

Tims et al. (2012) subsequently developed the Job Crafting Scale (JCS) based on JD-R theory. Inclusive of 21 items, this measurement is that which is most frequently used in job crafting studies. Tims and her colleagues argued that Wrzesniewski and Dutton's job crafting theory does not capture all of the aspects of job crafting because the theory limits job crafting to tasks, relationships, and cognition. Since there are many other job characteristics that employees can alter, Tims and her colleagues argued that JD-R theory, which categorizes job characteristics into job demands or job resources, better explains job crafting behaviors.

Based on JD-R theory, Tims et al. (2012) hypothesized that there are three dimensions of job crafting: increasing job resources, increasing challenging job demands, and decreasing hindering job demands. However, after conducting an exploratory factor analysis (EFA) using principal factor analysis with oblique rotation, Tims and her colleagues identified four dimensions—increasing structural job resources, decreasing hindering job demands, increasing social job resources and increasing challenging job demands. Confirmatory factor analysis (CFA) was subsequently conducted to observe whether the four dimensions would be replicated in a new sample. The researchers hypothesized that the four-factor model would fit the data better than alternative models (one-factor and three-factor). The results showed that the four-factor model ( $\chi^2 = 792.62$ , df = 366, CFI = .90, TLI = .88, RMSEA = .04) was a significantly better fit than the one-factor ( $\chi^2 = 2193.24$ , df = 378, CFI = .56, TLI = .51, RMSEA = .09) and the three-factor models ( $\chi^2$  = 1271.49, df = 372, CFI = .78, TLI = .75, RMSEA = .06). The range of each dimension's reliability (Chronbach's alpha) was from .75 to .82.

The JCS is the most frequently used instrument, but it, too, has several limitations. One of its major limitations is its inconsistent reliability. Previous studies have revealed that the reliability of the measurement is acceptable, ranging from .73 to .80 (Brenninkmeijer & Hekkert-Koning, 2015; Kanten, 2014; Tims et al., 2012). However, a few studies have reported less-than-recommended levels of reliability. For instance, Brenninkmeijer and Hekkert-Koning (2015) reported that according to their factor analyses, two items of the scale should be removed; after removing the items, however, the measurement's reliability decreased to .66. Generalizability is another limitation of this measurement. The samples that were used to develop and validate the JCS were biased, as the majority of them were comprised of highly educated women and all of the participants were Dutch (Tims et al., 2012). Nielsen and Abildgaard (2012) also pointed out that some items used in the JCS "referred primarily to mental work" and "were complicated in their wording" (p. 366).

Based on the limitations of the JCS, Nielsen and Abildgaard (2012) developed and validated a job crafting measurement for blue-collar workers. They argued that the job crafting concept is important not only for knowledge workers, but also for blue-collar workers who labor under poor working conditions and generally have lower levels of well-being. After interviewing 54 Danish postal-service workers, Nielsen and Abildgaard developed 15 items and tested the validity and reliability of the items in a longitudinal study. The results of their study showed that job crafting has five distinct factors: increasing challenging demands, decreasing social demands, increasing social job resources, increasing quantitative demands, and decreasing hindering demands.

The reliabilities of these factors were .85, .76, .75, .74, and .51, respectively. Nielsen and Abildgaard's measurement for blue-collar workers is meaningful as it extends and validates questionnaires on job crafting in a blue-collar context. However, the researchers took samples from only one profession and performed EFA and CFA using the same sample.

Slemp and Vella-Brodrick (2013) developed an alternative to these measurements, the Job Crafting Questionnaire (JCQ). One of the most distinctive strengths of this measurement is that it is aligned with Wrzesniewski and Dutton's (2001) original job crafting study, and it measures cognitive change as an important component of job crafting. Wrzesniewski and Dutton argued that job crafting is primarily an individuallevel activity that includes altering cognitive, task-based, and relational boundaries. None of the previously developed instruments measures cognitive changes. Yet according to Wrzesniewski and Dutton, changing cognitive task boundaries fundamentally changes how employees approach their jobs, which may then influence employees' work identities. Slemp and Vella-Brodrick argued that measuring the cognitive component of job crafting is important because:

> [i]ndividuals can shape their work experience (Wrzesniewski & Dutton, 2001). It also permits another avenue from which to exert some influence over one's job and may suit particular types of jobs or employees. Moreover, it allows employees to appreciate the broader effects of their work and to recognize the value that their job may hold in their life. (Slemp & Vella-Brodrick, 2013, p. 128)

Another advantage of this measurement is that it has only a short list of items, yet it still retains notable convergent validity and reliability. The brevity of the measurement helps the researcher to conduct efficient research and increases the response rate. To develop the JCQ, the following process was used. Slemp and Vella-Brodrick (2013) initially developed 27 job crafting items based on a literature review and administered these items to 23 employees. Based on the employees' feedback, the researchers reworded the questionnaire and narrowed the items down to 21, with seven items for each component—the task-based, relational, and cognitive changes of job crafting.

Slemp and Vella-Brodrick (2013) then conducted EFA and CFA using 334 employees from various industries, including education, banking and financial services, and healthcare. The EFA results revealed that the three factors explain 56.23% of the variance, while the two items that were loaded on the wrong factor were deleted. CFA was performed with 19 items, but the model indices indicated poor fit. The researchers eliminated four more items, based on the modification indices, and then the model fit was improved,  $\chi^2/df = 1.71$ , CFI = .96, NNFI = .95, IFI = .96, RMSEA = .06.

The overall scale reliability for the 15 items was .91, and the reliability values of the task-based, cognitive, and relational job crafting items were .87, .89, and .83, respectively. Furthermore, the convergent validity of the scale was examined, and the results showed that job crafting exhibits positive correlations with similar constructs such as intrinsic goal setting at work, job satisfaction, work contentment, and work enthusiasm.

The JCQ, however, has limitations as well. First of all, Slemp and Vella-Brodrick (2013) deleted four items. Byrne (2010) argued that "once a hypothesized CFA model, for example, has been rejected, this spells the end of the confirmatory factor analytic approach, in its truest sense" (p. 89). Moreover, the sample was homogenous even though the employees who were surveyed work in various industries. The employees

were all Australian, and their levels of education and income were higher than average.

Most recently, Bizzi (2017) and Niessen, Weseler, and Kostova (2016) have introduced new job crafting measurements. Based on Leana et al.'s (2009) measurement and Wrzesniewski and Dutton's (2001) conceptualization, Bizzi (2017) developed eight items. Since he focused on a behavioral aspect of job crafting, the measurement is unidimensional measuring only task crafting. The reliability of the measurement was .89. On the other hand, Niessen et al. (2016) developed a threefactor measurement based on Wrzesniewski and Dutton's (2001) definition of job crafting. After conducting EFA and CFA (n = 233), nine items were selected for the final measurement. Each factor had three items, and the three factors explained 65.5% of the study's variance. The three-dimensional second-order factor model showed a better fit than the one-factor and two-factor models, and the reliability was .72. Since these two measurements were developed for the authors' empirical study, limited information is available (e.g., developing process and validity).

The present study adopts Slemp and Vella-Brodrick's (2013) JCQ because it measures the balanced components of job crafting and has been validated in the Korean context. Lim, Ha, Oh, and Sohn (2014) validated the JCQ in the Korean work context using 259 employees from various vocations. Applying translation and the back-translation method based on Brislin's (1986) suggestion, the researchers translated each item to create the JCQ-K. The results of their study are summarized and presented in comparison to the results of Slemp and Vella-Brodrick's original study in Table 2-2.

## **Table 2-2.**

Comparison Between JCQ and JCQ-K

Scale	Sample	Factors (Cronbach's α)	$\chi^2$	df	CFI	RMSEA
JCQ 253 Australian employees		Task Crafting (.87)				
	253 Australian	Cognitive Crafting (.89)	149.01	87	.96	.06
	employees	Relational Crafting (.83)				
JCQ-K 259 K emplo		Task Crafting (.81)				
	259 Korean	Cognitive Crafting (.85)	297.42	87	.88	.10
	employees	Relational Crafting (.81)				

## The Moderating Effect of Leader-Member Exchange

Originally called vertical dyad linkage (VDL) theory, LMX theory (Dansereau, Graen, & Haga, 1975; Graen & Uhl-Bien, 1995) assumes that a leader has a unique relationship with each of his or her employees. In other words, a leader builds "separate dyadic relationships" (Dulebon, Bommer, Liden, Brouer, & Ferris, 2012, p. 1716). Each of these dyadic relationships reflects the quality of the interactions between the leader and the given employee. A low-quality LMX relationship is an agreed-upon formal relationship in which a leader and an employee fulfill only the obligatory role requirements. Therefore, the relationship can be characterized as one of low trust and respect. In contrast, a high-quality LMX relationship is a partnership that includes mutual obligations and reciprocity (Dulebohn, Bommer, Liden, Brouer, & Ferris, 2012). A leader and an employee who have a high-quality LMX relationship trust, support, and benefit from each other.

LMX is based on social exchange theory. Each party provides something, whether social support, valuable information, or material resources, that is valuable to the other, and these exchanges are ideally perceived as reasonable and fair to both parties. For instance, when an employee perceives positive support from his or her leader, he or she tries to perform better, sometimes going above and beyond the job description. Then the leader becomes trust the employee and rewards him or her in some way, whether by giving the employee a promotion, valuable information, or development opportunities. Wayne, Shore, and Liden (1997) argued that "the greater the perceived value of the tangible and intangible commodities exchanged, the higher the quality of the LMX relationship" (p. 84).

Some researchers have argued that job crafting may be largely hidden from managers (e.g., Lyons, 2008; Wrzesniewski & Dutton, 2001). They assume that if managers sense employees' job crafting behaviors, the managers will try to control these behaviors; this micro-management will accordingly result in fewer job crafting opportunities. However, this argument is based on an idea of management that carried more weight prior to the emergence of a knowledge information society.

In the past, it was assumed that managers perform better than employees and that managers have the responsibility to instruct and oversee the performance of employees. In today's knowledge information society, since work is both complex and specialized, managers are unable to familiarize themselves with the details of all of their employees' work, meaning that sometimes employees have better knowledge than their managers. Therefore, the role of managers has shifted from supervising employees to supporting them and facilitating new ideas. In this regard, job crafting should not be hidden from managers but should be shared with them to gain their support. Graen and Uhl-Bien (1995) argued that when the relationships between leaders and employees are strong and trusting, the employees are willing to work harder and they "[grow] beyond their job descriptions" (p. 227). Studies have shown that high-quality leader-member relationships are positively related to performance (DeConinck, 2011; Martin, Guillaume, Thomas, Lee, & Epitropaki, 2016) and organizational citizenship behavior (Zhong, Lam, & Chen, 2011).

Managers are those individuals who have legitimate power and make decisions

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about managing and distributing organizational resources. Hence, close communication and effective interaction with managers are critical to avoid causing confusion and to create positive outcomes within organizations. In other words, a high-quality relationship with a manager may provide more opportunities for an employee to access organizational resources or to reframe his or her work. Given the literature review and reasoning presented above, it is expected that the relationship between job autonomy and job crafting may be different depending on the quality of LMX.

LMX has been measured using various instruments, such as 2-item, 4-item, 5item, 7-item, 10-item, and 14-item scales. To date, there has been controversy over which instrument is the most efficient and effective. Among these instruments, one of the most frequently used is the LMX 7 (Gerstner & Day, 1997; Graen & Uhl-Bien, 1995). The LMX 7 was originally developed by Graen, Novak, and Sommerkamp (1982), and it measures the effectiveness of the working relationship between a leader and his or her employee. After conducting a meta-analysis, Gerstner and Day (1997) argued that the LMX 7 is the soundest instrument for measuring LMX. The instrument has high reliability and treats LMX as consisting of a single dimension. Others have argued that LMX is a multi-dimensional construct that includes respect, trust, and obligations, but Gerstner and Day argued that these dimensions are so highly correlated they can be tapped into with the single measure of LMX.

This study employed Graen and Uhl-Bien's (1995) recommended instrument, the LMX 7, to measure LMX quality. Previous studies have shown the reliability of the LMX 7 to be stable, ranging from .78 to .90 (Fisher, Strider, & Kelso, 2016; Hooper & Martin, 2008; Yukl, O'Donnell, & Taber, 2009).

Work Engagement and Performance as Outcomes of Job Crafting

Engagement and performance are significant constructs in organizational studies. Performance is one of the end goals in the HRD field (Swanson & Holton, 2009), and there is compelling evidence to suggest that engagement increases profitability, performance, customer satisfaction, employee retention, job satisfaction, and organizational citizenship behavior (Harter, Schmidt, & Hayes, 2002; Kim, Kolb, & Kim, 2012; Rana, Ardichvili, & Tkachenko, 2014; Saks, 2006; Schaufeli & Bakker, 2010). Employees who craft their jobs proactively find meaning and significance in their work and adjust their work and relational boundaries. Therefore, it is expected that their job crafting behaviors may lead them to be more engaged and productive.

#### **Conceptualizations and Measurement of Engagement**

Work engagement, as a psychological outcome, contributes to employees' psychological wellbeing and the creation of a positive work environment. It is especially significant for knowledge workers because the nature of their work requires mental and emotional commitment (Davenport, 2005). Engagement connotes involvement, passion, absorption, and energy, and it is conceptually distinct from other related constructs such as organizational commitment and job satisfaction (Schaufeli & Bakker, 2010). Engagement is typically called personal engagement (Kahn, 1990); work (or job) engagement (Bakker & Demerouti, 2008; Banihani, Lewis, & Syed, 2013; Maslach, Schaufeli, & Leiter, 2001); or employee engagement (Crawford, LePine, & Rich, 2010; Harter et al., 2002; Macey & Schneider, 2008; Saks, 2006; Shuck & Wollard, 2010).

Personal engagement refers to the original concept of engagement that was introduced in Kahn's (1990) seminal study. Kahn defined personal engagement as the "harnessing of organization members' selves to their work roles" (p. 694) and argued that engaged employees "employ and express themselves physically, cognitively, and
emotionally during role performance" (p. 694). From his observations and interviews with 16 counselors at a six-week summer camp and 45 employees at an architectural firm, Kahn found three psychological conditions—meaningfulness, safety, and availability—that lead to engagement. Kahn also found that employees' levels of engagement vary depending on the existence of these conditions at work. Put differently, when an employee thinks that he or she is valuable at work; when his or her work situation is consistent or predictable; and when the employee has physical, emotional, or psychological resources, he or she will experience engagement.

Work engagement (or job engagement) has been proposed as the antipode of burnout. Burnout is a form of job stress that has three components—exhaustion, cynicism, and ineffectiveness (Maslach et al., 2001). As interest in positive psychology has grown, researchers have shifted their attention to the opposite of burnout. Maslach and her colleagues argued that "engagement is characterized by energy, involvement, and efficacy—the direct opposites" (p. 416) of burnout's characteristics. Taking a different approach, Shaufeli and Bakker (2004) argued that work engagement and burnout are independent of one another, rather than opposite poles of the same dimension. Using CFA, Schaufeli et al. (2002) observed that work engagement consists of vigor, dedication, and absorption, while Shaufeli and Bakker (2004) defined work engagement as "a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption" (p. 295).

Employee engagement was conceptualized by Macey and Schneider (2008) as both a psychological state and a behavior. Based on their study, Shuck and Wollard (2010) defined employee engagement as "an individual employee's cognitive, emotional, and behavioral state directed toward desired organizational outcomes" (p. 103). In many studies, the terms *work engagement* and *employee engagement* are used

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interchangeably, but Schaufeli and Bakker (2010) have distinguished between the two. Schaufeli and Bakker argued that work engagement is a narrower concept than employee engagement because work engagement refers to the relationship between an employee and his or her work, whereas employee engagement includes the employee's relationship with the organization.

Depending on their theoretical orientations, researchers have adopted different terms and definitions for describing engagement. Saks and Gruman (2014) argued that Kahn's definition is more encompassing, distinct, and substantial than the definition of Schaufeli et al. (2002), while Schaufeli and Bakker (2010) argued for using *work engagement* rather than *employee engagement* because of what they perceived as the former's conceptual clarity. Since this study focuses on individual-level engagement with one's job and is based on Schaufeli and Bakker's definition, the term *work engagement* is used throughout.

Given these various conceptualizations of engagement, several measurements have been developed to capture the meaning of the construct. In the early stages of engagement studies, researchers assumed that engagement is the antithesis of burnout. Therefore, the opposite scores of the three dimensions—exhaustion, cynicism, and professional efficacy—of the Maslach-Burnout Inventory (MBI; Maslach & Jackson, 1981) were used to measure engagement. However, Schaufeli et al. (2002) identified problems with using this instrument and developed the Utrecht Work Engagement Scale (UWES). They argued that engagement should be assessed using a dependent measurement. Schaufeli and his colleagues suggested 17 items that measure three engagement dimensions—vigor (six items), dedication (five items), and absorption (six items). *Vigor* refers to "high levels of energy and mental resilience while working" (Schaufeli et al., 2002, p. 74), and *dedication* means "a sense of significance, enthusiasm, inspiration, pride, and challenge" (p. 74). *Absorption* is "being fully concentrated and deeply engrossed in one's work" (p. 75). All of the items use the 7-point frequency rating scale ranging from 0 (*never*) to 6 (*always*), and the reliability for each dimension has been shown to range from .75 to .91.

Schaufeli, Bakker, and Salanova (2006) later developed an abbreviated version of the UWES, which has nine items. This was done pragmatically, as many respondents prefer to answer, and are more likely to complete, brief questionnaires. According to Schaufeli and his colleagues, the results of the CFA for the abbreviated measurement using data (n = 14,521) from ten countries showed good internal consistency and test-retest reliability. Cronbach's  $\alpha$  for the abbreviated version ranged from .85 to .92 across all ten countries, and each engagement dimension of the abbreviated version was highly correlated with the original version, sharing more than 80% of variances (Schaufeli et al., 2006). Seppälä et al. (2009) found that the abbreviated version of the UWES remained unchanged across the samples and times, so they recommended that researchers use the UWES-9 rather than the UWES-17. Based on the results of previous research and in order to help ensure a high response rate, this study used the UWES-9 to measure work engagement.

#### **Conceptualizations and Measurement of Performance**

As a key outcome variable in the HRD field, performance contributes to maintaining or changing organizations (Swanson & Holton, 2009). Generally speaking, performance is a positive and valuable output that can be found at the organizational, team, and individual levels (Griffin, Neal, & Parker, 2007). In this study, however, the boundaries of performance are limited to the individual level.

From their literature review, Rotundo and Sackett (2002) found that job performance can be defined along three dimensions: task, citizenship, and counterproductive performance. Task performance refers to meeting the standards of performance that are set by an organization. In other words, task performance is the fulfillment of the formal responsibilities and duties of a given job. Task performance has also been described as in-role performance in articles (e.g., Joo et al., 2010; Rasheed, Khan, Rasheed, & Munir, 2015). Citizenship performance refers to the completion of extra tasks that contribute to organizational effectiveness. These extra tasks are not listed within one's job description, but are performed autonomously. Citizenship performance is also called extra-role performance. Finally, counterproductive performance refers to voluntary behaviors that harm an organization. These behaviors include destroying facilities, abusing policies, and performing poorly. In this study, the meaning of performance is confined to task performance.

To measure task performance, various methods such as observations, interviews, archival data (organizational records), and questionnaires can be used. Because of its convenience and accessibility, the most frequently used method is the questionnaire. Extending O'Reilly and Chatman's (1986) three items, Williams and Anderson (1991) developed seven items to measure in-role performance. Using 127 manager samples in the professional and technical fields, Williams and Anderson (1991) found that their measurement was valid and reliable. All the factor loadings showed appropriate values (.52 to .88) and the Cronbach's alpha was .91.

### **Relationship Between Job Crafting and Work Engagement**

The relationships between job crafting and work outcomes have been extensively examined by many researchers. Many have argued that job crafting leads to positive individual-level outcomes, such as job satisfaction, improved job performance, better person-job fit, well-being, and work engagement (e.g., Demerouti, 2014; Tims & Bakker, 2010; Tims, Bakker, & Derks 2013). Consistent with these theoretical arguments is empirical evidence showing that there is a positive relationship between job crafting and work engagement. Many researchers have found that job crafting is significantly related to work engagement (see Table 2-3). Furthermore, Vogt et al. (2016) found a causal relationship between job crafting and work engagement using three-wave panel data (three-month intervals) that were collected from 940 employees in three different European countries. To measure each construct, the researchers used the JCS (Tims et al., 2012), Petrou et al.'s (2012) scale for job crafting and the UWES-9 (Schaufeli et al., 2006) instrument to measure work engagement. Vogt et al. (2016) analyzed the data using a full structural equation model, and their model was evaluated using several criteria such as the RMSEA, the CLI, and the TLI. Their full model showed a good fit to the data, and both of the paths from job crafting to work engagement (T1 $\rightarrow$ T2,  $\beta$  = .12, p < .001; T2 $\rightarrow$ T3,  $\beta$  = .13, p < .001) were significant. However, the paths from work engagement to job crafting were not significant. In other words, job crafting predicts employees' work engagement over time, but work engagement does not predict job crafting.

Researchers have also found that job crafting positively influences job performance (see Table 2-3). Rofcanin, Berber, Koch, and Sevinc (2015) found that job crafting was positively related to in-role and extra-role (organization citizenship behavior) performance. From studying healthcare professionals in two countries, Gordon, Demerouti, Le Blanc, and Bipp (2015) found that seeking resources had a positive relationship to task performance, whereas reducing demands had a negative relationship. Seeking challenges had a nonsignificant relationship with task performance. In a longitudinal study of Dutch police officers, Petrou, Demerouti, and Schaufeli (2015) arrived at similar findings: seeking resources predicted task performance, but seeking challenges and reducing demands did not predict task performance. Weseler and Niessen (2016) found that extending task crafting was positively related to supervisor-rated and self-reported performances, whereas reducing task crafting was only negatively related to self-reported performance. Cognitive crafting had statistically nonsignificant relationships to supervisor-rated and self-reported performances.

# **Table 2-3.**

Authors	Sample	Methodologies	Key Findings
Relationship betwe	en job crafting and wo	rk engagement	
Brenninkmeijer & Hekkert-Koning (2015)	383 Dutch employees at a consulting organization	Cross-sectional study Survey Structural equation modeling	Crafting structural and social resources were positively related to work engagement, but crafting hindering demands had a negative relationship to work engagement.
Chen, Yen, & Tsai (2014)	246 front-line employees at hotels in Taiwan	Cross-sectional study Survey Structural equation modeling	Individual and collaborative crafting were related to job engagement. Person-job fit mediated the relationships. Individual crafting was a better predictor of job engagement than collaborative engagement.
Lu, Wang, Lu, Du, & Bakker (2014)	246 Chinese employees at a high-technology company	Longitudinal study (two-wave) Structural equation modeling	Job crafting mediated the relationship between work engagement and demands- abilities fit/needs-supplies fit.
Petrou, Demerouti, Peeters, Schaufeli, & Hetland (2012)	95 employees from several organizations in the Netherlands	Diary study (5 days) Survey and diary booklet Multilevel structural equation modeling	Job crafting was both a general and day-level behavior. There was a positive link between job crafting and work engagement.
Tims, Bakker, & Derks (2015)	288 employees at a chemical plant in the Netherlands	Longitudinal study (three-wave) Survey Structural equation modeling	Job crafting positively predicted work engagement.

Summary of Studies Examining the Relationship Between Job Crafting and Work Engagement and Performance

Tims et al. (2013)	525 individuals, each of whom was working in 1 of 54 teams at a large occupational health service company in the Netherlands	Cross-sectional study Survey Multilevel structural equation modeling	Job crafting was positively related to job performance via work engagement at both the individual and team levels.
Vogt et al. (2016)	940 employees in Germany, Austria, and Switzerland	Longitudinal study (three-wave) Survey Structural equation modeling	Job crafting predicted work engagement and PsyCap. Work engagement did not predict job crafting.
Wingerden, Derks, & Bakker (2017)	102 primary school teachers	Quasi-experimental design (Interventions: three job crafting sessions and three personal resource sessions over six weeks) Survey and structured interview ANOVA	Work engagement can be fostered through a personal resources intervention. Job crafting interventions increased employees' job crafting behavior. Both interventions improved in- role performance.
Relationship betwee	en job crafting and perj	formance	
Bakker, Tims, & Derks (2012)	95 dyads of employees from several organizations in the Netherlands	Cross-sectional study Survey Structural equation modeling	Job crafting mediated the relationship between proactive personality and work engagement. Furthermore, work engagement was significantly related to in-role performance.
Gordon et al. (2015)	70 American and 144 Dutch healthcare professionals	Cross-sectional study Survey Structural equation modeling Multigroup analysis	Seeking challenges showed a nonsignificant relationship with task, creative, and contextual performances. Seeking resources showed statistically significant relationships with task and creative performance. Reducing demands showed a statistically significant negative relationship with task and contextual performances.
Petrou et al. (2015)	580 police officers in the Netherlands	Longitudinal study (two-wave) Survey Structural equation modeling	Seeking resources showed a statistically significant positive relationship with task performance. However, seeking challenges and reducing demands showed statistically nonsignificant relationships with task performance.
Rofcanin et al. (2015)	263 full-time MBA students in Turkey	Cross-sectional study Survey Structural equation modeling	All the job crafting factors— increasing social and structural job resources, increasing challenging job demands, and decreasing hindering job demands—were positively related to affective organizational commitment, organization citizenship

			behavior, intentions to stay, and in-role performance.
Weseler & Niessen (2016)	131 employee- supervisor dyads	Cross sectional study Survey Hierarchical regression analysis	Extending task crafting was positively related to supervisor- rated and self-reported performance. Reducing task crafting showed a statistically nonsignificant negative relationship with supervisor- rated performance but a significant relationship with self-reported performance. Extending relationship crafting showed a statistically nonsignificant relationship with supervisor-rated performance but a significant relationship with self-reported performance. Cognitive task crafting did not show a statistically significant relationship with supervisor- rated and self-rated performances.

## **Conceptual Framework**

After conducting a comprehensive literature review, the following constructs were selected for this study: (a) job autonomy, (b) LMX quality, (c) job crafting, (d) work engagement, and (e) performance. Empirical and conceptual studies have shown that significant relationships among job autonomy, job crafting, work engagement, and performance exist. The conceptual framework of this study is suggested in Figure 2-3. The model indicates that job crafting mediates the relationship between job autonomy and work engagement and performance. Furthermore, LMX quality moderates the relationship between job autonomy and job crafting.



Figure 2-3. Conceptual framework.

Hypothesis 1. Job autonomy predicts work engagement.

Hypothesis 2. Job autonomy predicts performance.

Hypothesis 3. Job autonomy positively affects job crafting.

Hypothesis 4. LMX quality moderates the relationship between job autonomy and job crafting.

Hypothesis 5. Job crafting affects work engagement.

Hypothesis 6. Job crafting affects performance.

Hypothesis 7. Job crafting mediates the relationship between job autonomy and work engagement.

Hypothesis 8. Job crafting mediates the relationship between job autonomy and performance.

### Chapter 3

### METHODOLOGY

The purpose of this study was to investigate the mechanism underlying the relationships between job autonomy and employees' work engagement and job performance. Job crafting and LMX quality were proposed as a mediator and a moderator, respectively. This study investigated the relationships among important variables based on empirical evidence from the literature review. This chapter presents the study's methodology, including its: (a) population and sample, (b) instrumentation, (c) data collection procedure, and (d) data analysis.

## **Population and Sampling**

This study tested its hypothesized model within the Korean business context. The target population of this study was Korean knowledge workers who work at large forprofit companies. Knowledge workers spend substantial working hours thinking, and they are involved in knowledge creation, distribution, and application. Continuous innovation is part of their work, and the quality of their work matters more than the quantity. Employees who perform labor-intensive work, have little responsibility or autonomy in their jobs, and execute highly structured or routine tasks (e.g., sales people, filing clerks, bookkeepers, and bank tellers) were therefore excluded from the sample.

The Korean economy is highly dependent on large for-profit companies—the top ten Korean conglomerates contributed 84% of the gross domestic product (GDP) in 2012 (Jang, 2014)—and knowledge workers significantly contribute to the companies' performances by developing and marketing new products, making strategic plans, and managing their workforces. *The Small and Medium Enterprises*  *Basic Law* (2016) classifies a company's size as either *large* or *small and medium-size* according to the company's total amount of assets and its sales volume. Based on this law, this study limited its sample to knowledge workers at large for-profit Korean companies that meet all three of the following indices: (a) companies that have more than 50 billion won (about \$431 million) in total assets; (b) companies have more than 40 to 80 billion won in sales volume; and (c) companies that have more than 1,000 employees.

This research employed non-probability sampling due to several limitations. First, a list of large companies that meet the criteria above was not available. Second, even if such a list existed, there would be many constraints in acquiring the permission necessary to conduct research on randomly selected companies. Therefore, this study employed a convenience sampling method, using the 14 companies that volunteered to participate this study.

The referral sampling method took the following form. First, the target population was identified by reviewing Korean government statistics. According to Statistics Korea (KOSTAT, 2016), there were 19 industries and 13,259,451 full-time employees in South Korea in 2015. Since this study is interested in knowledge workers who work at large companies, the population was narrowed to include only those employees at large companies in six industries: manufacturing; construction; wholesale and retail trade; publishing, media, information, and communications; financial and insurance activities; and professional, scientific and technical activities. After reviewing the number of employees in each industry, the publishing, media, information, and communications industry was eliminated because there are only a few employees who work at large companies in this industry. The final five industries were selected for the study, leaving the population at 1,136,932 (see Table 3-1).

Second, the sample size was decided upon based on the population. Determining the correct sample size is important when testing a hypothesized model because if the sample size is too small, the appropriate statistical analysis cannot be completed. Furthermore, statistical power is reduced when there is a low sample size (Schwab, 2011). There is no definitive rule for determining the proper sample size, and researchers have suggested various methods for deciding on the size that best represents a given population. Some researchers have suggested 1,067 (sampling error of 3%) or 384 (sampling error of 5%) as the most appropriate sample size for populations over 1,000,000 (Dillman, Smyth, & Christian, 2009; Krejcie & Morgan, 1970). Others have suggested that for survey studies on populations over 6,000, the minimum sample size should be 209 (continuous data, margin of error = .03,  $\alpha = .01$ ; Bartlett, Kotrlik, & Higgins, 2001). In studies like this one that use structural equation modeling, it is usually recommended that sample size is 10 times greater than the number of estimated parameters (Bentler & Chou, 1987; Byrne, 2010; Raykov & Marcoulides, 2000). This study's target population is over 1,000,000 and has 27 estimated parameters, so it was concluded that an appropriate sample size for this study is 1,067 (sampling error of 3%).

Third, after deciding upon the sample size, the sample size was proportionally distributed across the five industries based on the size of the population for each industry (see Table 3-1). Since the manufacturing industry has the largest number of employees, the sample for this industry was the largest, followed by the samples for the professional, scientific, and technical industry; the financial and insurance industry; construction; and wholesale and retail trade.

## **Table 3-1.**

Number of Employees in Large Organizations Based on Korean Standard Industrial

Code	Industry	Number of Employees	Proportional Percent (%)	Proportional Sample
С	Manufacturing	712,961	63%	669
F	Construction	62,875	6%	59
G	Wholesale and retail trade	51,963	5%	49
K	Financial and insurance activities	83,088	7%	78
М	Professional, scientific, and technical activities	226,045	20%	212
		1,136,932	100%	1,067

Classification and Sample Size

*Note*. Data were retrieved from Statistics Korea (KOSTAT), and the number of employees reflects fulltime employees in large organizations. The codes are from the Korean Standard Industrial Classification (KSIC). Sampling error = 3%.

#### Instrumentation

Each variable was measured using a validated survey instrument developed by other researchers. These instruments were the Work Design Questionnaire (WDQ), the LMX 7, the Job Crafting Questionnaire (JCQ), the Utrecht Work Engagement Scale (UWES-9), and In-Role Behavior (IRB). More information about each of the instruments is presented in Table 3-2. The instruments that were employed in this study used 5-point and 7-point Likert-type response scales. All of the measures reported the perceptions of the survey participants.

## **Table 3-2.**

Summary of Instruments

Variable	Instrument	Number of Items	Scale of Measurement
Job Autonomy	Work Design Questionnaire (WDQ) by Morgeson & Humphrey (2006)	9	5-point

Quality of LMX	LMX 7 by Graen & Uhl-Bien (1995)	7	5-point
Job Crafting	Job Crafting Questionnaire (JCQ) by Slemp & Vella-Brodrick (2013)	15	5-point
Work Engagement	Utrecht Work Engagement Scale (UWES) by Schaufeli et al. (2006)	9	7-point
Performance	In-Role Behavior (IRB) by Williams & Anderson (1991)	7	5-point

## Work Design Questionnaire (WDQ)

Job autonomy was measured using nine items that were taken from Morgeson and

Humphrey's (2006) WDQ. The nine items are clustered into three subscales: work-

scheduling autonomy, decision-making autonomy, and work methods autonomy.

These items were assessed using a 5-point scale ranging from 1 (rarely) to 5 (very

often). The items are presented in Table 3-3.

## Table 3-3.

### Autonomy Measures

#### Work-Scheduling Autonomy

- 1. The job allows me to make my own decisions about how to schedule my work.
- 2. The job allows me to decide on the order in which things are done on the job.
- 3. The job allows me plan how I do my work.

#### **Decision-Making Autonomy**

1. The job gives me a chance to use my personal initiative or judgment in carrying out the work.

- 2. The job allows me to make a lot of decisions on my own.
- 3. The job provides me with significant autonomy in making decisions.

#### Work Methods Autonomy

1. The job allows me to make decisions about what methods I use to complete my work.

2. The job gives me considerable opportunity for independence and freedom in how to do the work.

3. The job allows me to decide on my own how to go about doing my work.

### LMX 7

The quality of the relationship between a leader and his or her employee was

measured using the LMX 7 (Graen & Uhl-Bien, 1995). This measurement is a seven-

item measurement that focuses on the effectiveness of an employee's working

relationship with his or her leader (Graen & Uhl-Bien, 1995). The LMX 7's survey

items are presented in Table 3-4, with each item being assessed according to a 5-point

scale ranging from 1 (rarely or none) to 5 (very often or very high).

### **Table 3-4.**

Leader-Member Exchange Measures

1. Do you know where you stand with your leader... do you usually know how satisfied your leader is with what you do?

2. How well does your leader understand your job problems and needs?

3. How well does your leader recognize your potential?

4. Regardless of how much formal authority he/she has built into his/her position, what are the chances that your leader would use his/her power to help you solve problems in your work?

5. Again, regardless of the amount of formal authority your leader has, what are the chances that he/she would "bail you out," at his/her expense?

6. I have enough confidence in my leader that I would defend and justify his/her decision if he/she were not present to do so?

7. How would you characterize your working relationship with your leader?

### Job Crafting Questionnaire (JCQ)

The JCQ was developed by Slemp and Vella-Brodrick (2013) based on the

original job crafting study of Wrzesniewski and Dutton (2001). Slemp and Vella-

Brodrick pointed out that existing job crafting measurements ignored the cognitive

component of job crafting. After conducting EFA and CFA, the researchers found that

job crafting could be measured using 15 items situated along the following three

dimensions: (a) task crafting, (b) cognitive crafting, and (c) relational crafting. All

items correspond to a 5-point Likert-type scale ranging from 1 (hardly ever) to 5 (very

often).

## **Table 3-5.**

Job Crafting Measures

#### **Task Crafting**

- 1. Introduce new approaches to improve your work.
- 2. Change the scope or types of tasks that you complete at work.
- 3. Introduce new work tasks that you think better suit your skills or interests.
- 4. Choose to take on additional tasks at work.
- 5. Give preference to work tasks that suit your skills or interests.

#### **Cognitive Crafting**

- 1. Think about how your job gives your life purpose.
- 2. Remind yourself about the significance your work has for the success of the organization.
- 3. Remind yourself of the importance of your work for the broader community.
- 4. Think about the ways in which your work positively impacts your life.
- 5. Reflect on the role your job has for your overall well-being.

#### **Relational Crafting**

- 1. Make an effort to get to know people well at work.
- 2. Organize or attend work related social functions.
- 3. Organize special events in the workplace (e.g., celebrating a co-worker's birthday).
- 4. Choose to mentor new employees (officially or unofficially).
- 5. Make friends with people at work who have similar skills or interests.

### **Utrecht Work Engagement Scale (UWES)**

While the original version of the UWES includes 17 items, the present study used

an abbreviated version that was developed by the same researchers (see Table 3-6;

Schaufeli et al., 2006). Many researchers have found that the abbreviated version of

the measurement is as reliable as the original and that it contributes to a stronger

response rate. As shown in Table 3-6, the items are categorized into three dimensions:

vigor, dedication, and absorption. The items are measured using a 7-point frequency

scale ranging from 0 (*never*) to 6 (*always*).

## **Table 3-6.**

Work Engagement Measures

### Vigor

- 1. When I get up in the morning, I feel like going to work.
- 2. At my work, I feel bursting with energy.
- 3. At my job, I feel strong and vigorous.

#### Dedication

- 1. My job inspires me.
- 2. I am enthusiastic about my job.
- 3. I am proud of the work that I do.

#### Absorption

- 1. I get carried away when I am working.
- 2. I am immersed in my work.
- 3. I feel happy when I am working intensely.

### **In-Role Behavior**

In-role behavior was developed by Williams and Anderson (1999) to measure employees' task performance. Williams and Anderson distributed this questionnaire to managers for the objectivity of data. However, due to the limitation of access to managers, this study used the self-reported questionnaire method. Until recently, this was one of the most frequently used measurements of task performance in HRD research. The measurement includes seven items, which are presented in Table 3-6. The items were measured using a 5-point frequency scale ranging from 1 (*rarely*) to 5 (*very often*).

## **Table 3-7.**

Performance Measures

- 1. I adequately complete assigned duties.
- 2. I fulfill responsibilities specified in job description.
- 3. I performs tasks that are expected of me.
- 4. I meet formal performance requirements of the job.
- 5. I engage in activities that will directly affect my performance evaluation.
- 6. I neglect aspects of the job I am obligated to perform.
- 7. I fail to perform essential duties.

### **Instrument Translation**

Previous research has validated the JCQ (Lim et al., 2014) and UWES (Kim, Park, & Kown, 2017) in the Korean context; therefore, translated measurements were available from published journal articles. The WAQ, LMX7, and IRB, however, had to be translated into Korean by the researcher. Since many researchers have pointed out equivalence of measurement issues in cross-cultural research (e.g., Brislin, 1986; Sechrest, Fay, & Zaidi, 1972; Van de Vijver & Leung, 2000), the translation was conducted following a rigorous procedure based on these researchers' suggestions. To ensure the accuracy and quality of the translation, back-translation and subjective evaluation were employed.

The back-translation was conducted according to the following process. Two bilingual translators, one of whom was the researcher, independently translated the instruments from English into Korean. Both of the translators are Ph.D. candidates at a university in the United States, and each has more than ten years of experience in the HRD field at large Korean companies. The translated instruments were then compared thoroughly to ensure conceptual equivalence. After modifying items that were inconsistent, the Korean versions of the instruments were translated again into English by another bilingual speaker who is a Ph.D. candidate at a university in the United States.

After the back-translation was completed, an expert conducted a subjective

evaluation by comparing the Korean versions of the instruments to the back-translated versions. The expert has a doctoral degree in education and has more than 20 years of experience in the HRD field. The purpose of this process was to judge whether the items accurately reflect the constructs as they were originally defined and to identify any potential problems (Schwab, 2011). Based on the expert's comments and suggestions, the Korean versions of the instruments were lightly reworded and finalized.

### **Data Collection Procedure**

The data collection procedure entailed three sequential steps: (a) survey questionnaire construction, (b) IRB approval, and (c) survey administration.

## **Survey Questionnaire Construction**

The first step was to construct a survey questionnaire based on the research questions and hypotheses. The WDQ, LMX7, JCQ, UWES-9, and IRB were combined in one survey. In addition to the items for each of the measurements, demographic information questions were included. Demographic information for this study included gender, age, rank, education level, years of work experience, and industry. In total, 55 items were included in the questionnaire. An online survey form was created using Qualtrics via the Penn State Qualtrics website (https://pennstate.qualtrics.com). The researcher purposely created 14 different links and used each link as an identifier for a different company participating in this study to monitor the company's survey progress. For the convenience of the participants, the online survey was designed in two formats so that the participants could answer using either their computers or smartphones with the survey link. After online survey was created, a survey link was sent to an HRD expert who has a Ph. D degree in Education and experiences in the HRD field more than 15 years for a final review.

#### **IRB** Approval

Prior to the survey's administration, this study was reviewed by The Pennsylvania State University Institutional Review Board (IRB) to ensure that the human subjects of this study were protected from any potential risks. After the IRB's preliminary review, it was determined that this study did not need a formal review because of the minimal risks of the study. Therefore, this study was exempted from IRB review (see Appendix A).

#### **Survey Administration**

This survey was administered to knowledge workers in 14 different large Korean for-profit companies. Using the researcher's personal social network, managers who work at the large for-profit companies meeting the criteria of this study were contacted. Ultimately, 14 managers from 14 different companies agreed to participate in this study. The managers distributed the survey links via intranet email on behalf of the researcher. Although the data were collected by the third parties, the researcher closely worked with the managers to control the survey administration process.

In distributing the survey, Dillman et al.'s (2009) guidelines for web survey implementation were applied. In keeping with their suggestions, the survey was provided in advance, and the questions were both brief and easy to complete. Two weeks after distributing the survey, a reminder email was sent to the participants. When a participant had completed all of the survey items, a token of appreciation (an online coffee coupon worth 2 USD) was sent. To maximize the response rate of the survey, the survey period was strategically scheduled after consulting with each manager. In sum, 562 responses were collected through Qualtrics, and the response rate was 52.7%. Detailed information about the sample and response rate is presented in Table 3-8.

## **Table 3-8.**

### Sample and Response Rate

			Resp	oonse
Industry	No. of Company	Sample Size	Number	Rate (%)
Manufacturing	7	669 (62.7%)	438	65.5%
Construction	1	59 (5.5%)	9	15.3%
Wholesale and retail trade	1	49 (4.6%)	12	24.5%
Financial and insurance activities	2	78 (7.3%)	31	38.7%
Professional, scientific and technical activities	3	212 (19.9%)	72	34.0%
Total	14	1,067 (100%)	562	52.7%

Demographic information about the participants is presented in Table 3-9. Of the 562 responses, 517 cases were valid and 45 cases had missing values. Among the valid cases, the percentages of male and female employees were 78.9% and 21.1%, respectively. The majority of the employees were in their 30s (56.4%) and had graduated from a four-year university or graduate school (93.1%). The respondents' overall education level was relatively higher than average for employees in Korea because of the sample characteristics (knowledge workers). More than 60% of the participants held assistant manager or manager positions. The participants' major job areas were business administration (e.g., strategy, HR, and law) and marketing (37.5% and 29.7%, respectively), and the majority of the participants had fewer than five years of experience (65.3%). Most of the samples were from manufacturing companies (77.9%).

## Table 3-9.

*Demographic Characteristics of Participants* (N = 562)

Characteris	tic	n	%	Cumulative %
Gender				
	Male	408	72.6	78.9
	Female	109	19.4	100.0
	Missing	45	8.0	
Age				
	20s	69	12.3	13.3
	30s	292	52.0	69.7
	40s	140	24.9	96.7
	50s	17	3.0	100.0
	Total	518	92.2	
	Missing	44	7.8	
Education				
	High school	9	1.6	1.7
	College	18	3.2	5.2
	Four-year university	376	66.9	77.8
	Graduate school	115	20.5	100.0
	Missing	44	7.8	
Rank	-			
	Staff	84	14.9	16.2
	Assistant manager	139	24.7	43.1
	Manager	193	34.3	80.3
	Assistant general Manager	45	8.0	89.0
	General manager	55	9.8	99.6
	Executive	2	.4	100.0
	Missing	44	7.8	
Job				
	Marketing/Sales	154	27.4	29.7
	Manufacturing	31	5.5	35.7
	R&D	44	7.8	44.2
	IT	28	5.0	49.6
	Strategy/HR/Law	194	34.5	87.1
	Etc.	67	11.9	100.0
	Missing	44	7.8	
Length of c	urrent job experience (years)			
U	0-5	265	47.2	65.3
	6-10	121	21.5	74.5
	11-20	114	20.3	96.5
	20+	18	3.2	100.0
	Missing	44	7.8	
	0			

Industry

	Manufacturing	438	77.9	77.9
	Construction	9	1.6	79.5
	Finance	31	5.5	85.0
	Service	72	12.8	97.8
	Wholesale and retail trade	12	2.1	100.0
Total		562	100.0	

### **Data Analysis Strategies**

The overall purpose of this study was to investigate the relationships among knowledge workers' autonomy, LMX quality, job crafting, work engagement, and performance in the context of large for-profit Korean companies. In addition to examining the direct effects among the variables, this study analyzed indirect and moderated effects. To answer the research questions of this study, SEM was chosen for statistical analysis because of the several advantages it offers. First, SEM is appropriate for testing theoretical models. This is because SEM simultaneously tests theoretical relationships among multiple variables, whereas other basic statistical methods do not. Second, SEM advances in multiplicative study because it provides explicit estimates of measurement error variance parameters (Byrne, 2010; Kline, 2016; Little, Card, Bovaird, Preacher, & Crandall, 2007). Measurement errors are a common problem in survey-based studies, but they are particularly problematic for studies that estimate interactive effects. This is because "the unreliabilities of the constituent variables are compounded in the interactive or higher order term" (Little et al., 2007, p. 219).

There are several steps that must be followed in an SEM analysis: (a) model specification, (b) model identification, (c) model estimation, and (d) model respecification (Kline, 2016). Brief explanations of these steps are given in Table 3-10.

# Table 3-10.

Steps o	f Structural	Equation	Modeling
		1	

Step	Description
Model Specification	Researchers create a conceptual model that provides a visual representation of the variables and the structured relationships among these variables.
Model Identification	The conceptual model that was developed in the model specification step is translated into a statistical model to examine whether "it is theoretically possible for the computer to derive a unique estimate of every model parameter" (Kline, 2016, p. 119). If the conceptual model is identified as an overidentified model—the total number of estimable parameters is fewer than the number of data points—the statistical model can be analyzed using computer tools.
Model Estimation	In this step, model fit and parameter estimates are evaluated. The model fit determines how well the model fits the collected data.
Model Respecification	If statistical analysis shows that the model has a poor fit, the initial model is specified again. However, the respecification should not depend solely on statistical results.

Following the systematic procedure above, the conceptual model of this study was specified, identified, estimated, and evaluated. Based on the literature review, the conceptual model was specified, and the model is presented in Figure 2-3. A detailed analysis of identification, estimation, and evaluation is presented in the next chapter.

### **Chapter 4**

## DATA ANALYSIS AND RESULTS

This chapter illustrates the process and the results of the data analysis. The purpose of this study was to identify the structural relationships among knowledge workers' autonomy, job crafting, LMX quality, work engagement, and job performance in the context of large Korean business organizations. The research questions for the current study are revisited below:

- How does knowledge workers' job autonomy influence the workers' psychological and behavioral outcomes?
- 2. What are the relationships among job autonomy, LMX quality, job crafting, work engagement, and performance?
- 3. How can the findings of this study contribute to the HRD field to enhance knowledge workers' work engagement and performance?

To answer the research questions, the collected data were analyzed using the methods of CFA and SEM and statistical analysis applications SPSS 18.0 and AMOS 18.0.

#### **Descriptive Statistics**

In this section, general information about the collected data is presented. First, the missing data mechanism test and the method by which the missing data were handled are described. Then the normality test result is reported. Means, standard deviations, intercorrelations, and reliabilities of all the research variables follow.

### **Missing Data**

To minimize missing data, the online survey was designed so that the respondents could not access the next page without answering all the items on the current page. In addition, a reminder email was sent to the respondents two weeks after the survey invitation had been sent. Out of a sample of 562 participants, 45 (8%) participants quit participating in the survey before finishing answering all of the items. To test the data loss mechanism, Little's MCAR test was performed using SPSS. The test results showed that the pattern of missing data was missing completely at random,  $\chi^2$  (203, *N* = 562) = 144.834, *p* = .999. Since missing data can bias the conclusions of an empirical study, many researchers argue that missing data must be addressed (e.g., Byrne, 2010).

In SEM, the full information maximum likelihood (FIML) and expectation maximization (EM) estimation are two dominant strategies for handling missing data (Byrne, 2010). The FIML method estimates the missing values without imputation by determining the value that maximizes the likelihood function based on the existing data. The EM imputation method consists of expectation and maximization steps, and two stages iterate until a solution is reached during the steps (Kline, 2016). Both estimations are based on the ML method, which is known to be an efficient and consistent way to handle incomplete data. Although incomplete data can be analyzed using FIML, the missing values were imputed applying the EM method for the current study. This is because AMOS does not allow the researcher to perform bootstrapping if there are missing values in the dataset. Furthermore, in the preliminary data analysis stage, little difference was found between using EM imputation and FIML in fit indices and parameter estimates (see Table 4-1).

## Table 4-1.

Compared Fit Indices and Parameter Estimates of FIML and EM for Structural Model (N = 562)

Model	$\chi^2$	df	$\chi^2/df$	CFI	TLI	RMSEA	SRMR
Model 1 (EM)	318.74***	125	2.5	.97	.96	.06 [.05, .06]	.05
Model 2 (FIML)	277.50***	125	2.2	.97	.96	.05 [.04, .05]	-

*Note*. Model 1 used EM; Model 2 used FIML; CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual. AMOS cannot calculate SRMR if there are missing data.

Doth	Parameter	rEstimates
raui —	EM	FIML
Job Crafting ← Job Autonomy	.37	.36
Job Crafting ← LMX Quality	.41	.39
Job Crafting ← AutoxLeader	.17	.16
Engagement ← Job Crafting	.82	.80
Engagement ← Job Autonomy	.05	.06
Performance ← Job Crafting	.67	.66
Performance ← Job Autonomy	08	.10

## Normality

One assumption associated with SEM is a multivariate normal distribution for continuous outcome variables (Kline, 2016). Put differently, all the univariate distributions should be normal and all the joint distributions of any pair of variables should be bivariate normal. This is a significant assumption because the  $\chi^2$  value becomes excessively large and the standard errors are underestimated under the condition of nonnormality (Byrne, 2010). Typically, three indices are used to examine nonnormality: (a) univariate skew, (b) univariate kurtosis, and (c) multivariate kurtosis (Finney & DiStefano, 2006).

To test the normality of the current data, these indices were examined using AMOS. As shown in Table 4-2, the values for skewness ranged from -1.01 to 0.61 and the values for kurtosis ranged from -0.61 to 2.24. According to Kline (2016), if the

skew index is greater than absolute 3 and the kurtosis index is greater than 8, the data should be described as a severely nonnormal distribution. Given this guideline, the values for skewness and kurtosis in Table 4-2 show that no item was severely skewed or kurtotic.

Multivariate normality was examined using a multivariate kurtosis index and its critical ratio (C.R.). Although the distribution of each item was univariate normal, the multivariate distribution could still have been multivariate nonnormal. Byrne (2010) suggested that a C.R. value—Mardia's (1974) normalized estimate of multivariate kurtosis—greater than 5 indicates that the data are nonnormally distributed. The kurtosis index of the current sample was 485.30, and the C.R. value was 84.76. Therefore, the sample did not show multivariate normality. Since item parceling was used, normality was also tested on the parcel level. The results of the normality test is presented in Table 4-2. The kurtosis index of the current sample was 47.16, and the C.R. value was 24.75. The parcels also did not show multivariate normality.

## **Table 4-2.**

3.7	1.
Norm	ality
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Variable	Min	Max	Skew	Kurtosis	Variable	Min	Max	Skew	Kurtosis
A1	1	5	-0.56	0.06	L1	1	5	-0.52	0.70
A2	1	5	-0.66	0.04	L2	1	5	-0.46	-0.02
A3	1	5	-0.37	-0.27	L3	1	5	-0.61	0.97
A4	1	5	-0.61	0.19	L4	1	5	-0.65	0.72
A5	1	5	-0.33	-0.18	L5	1	5	-0.18	-0.41
A6	1	5	-0.28	-0.40	L6	1	5	-0.54	0.33
A7	1	5	-0.63	0.48	L7	1	5	-0.57	0.45
A8	1	5	-0.18	-0.35	E1	1	7	-0.05	-0.19
A9	1	5	-1.01	2.15	E2	1	7	-0.21	0.94
JC1	1	5	-0.42	0.16	E3	1	7	-0.12	1.08

JC2	1	5	-0.64	-0.04	E4	1	7	0.04	0.10
JC3	1	5	-0.23	-0.37	E5	1	7	-0.12	0.68
JC4	1	5	-0.49	0.38	E6	1	7	0.04	-0.07
JC5	1	5	-0.29	-0.49	E7	1	7	-0.04	0.60
JC6	1	5	-0.24	-0.61	E8	1	7	0.03	0.35
JC7	1	5	-0.61	0.56	E9	1	7	-0.04	0.20
JC8	1	5	-0.18	-0.42	P1	2	5	-0.21	1.08
JC9	1	5	-0.51	0.30	P2	2	5	-0.11	0.55
JC10	1	5	-0.43	0.14	P3	1	5	-0.47	2.1
JC11	1	5	-0.39	0.23	P4	1	5	-0.62	2.24
JC12	1	5	-0.17	-0.17	P5	2	5	-0.44	0.28
JC13	1	5	0.14	-0.20	P6	2	5	-0.68	1.21
JC14	1	5	0.61	0.75	P7	1	5	-0.92	1.35
JC15	1	5	-0.37	0.25					
					Multiva	riate = 4	485.30 (	C.R. value	e = 84.76)
WSA	1.0	5.0	-0.50	0.12	E_V	1.0	7.0	-0.04	0.38
DMA	1.0	5.0	-0.32	-0.30	E_D	1.0	7.0	0.04	0.33
WMA	1.3	5.0	-0.68	0.26	E_A	1.0	7.0	0.07	0.56
JC_TC	1.2	5.0	-0.33	0.22	P_P1	2.0	5.0	-0.41	0.84
JC_CC	1.0	5.0	-0.46	0.31	P_P2	2.5	5.0	-0.71	0.36
JC_RC	1.4	5.0	-0.20	0.30	P_P3	2.5	5.0	-0.29	0.43
LMXP1	1.0	5.0	-0.55	0.53					
LMXP2	1.0	5.0	-0.25	-0.12					
LMXP3	1.0	5.0	-0.50	0.41					
					Multiv	ariate =	47.16 (	C.R. value	e = 24.75)

\_

Because the data and the parcels for this study showed nonnormality, maximum likelihood (ML) with bootstrapping was employed to analyze the data. The bootstrap method creates multiple subsamples from an original dataset. Since the bootstrap sample distributions heavily depend on the original dataset, the sample size of the original dataset should be at least moderately large (N > 200; Kline, 2016). Byrne

(2010) argued that the major advantages of bootstrapping are the stability of parameter estimates and a greater degree of accuracy. In their simulation study, Nevitt and Hancock (2001) found that bootstrapping outperformed ML under nonnormality with large sample sizes. Since the current study had a relatively large sample size and showed multivariate nonnormality, it was determined that the bootstrap method should be employed.

Some researchers have raised concerns about analyzing categorical data using ML. They argue that when researchers analyze ordinal data (e.g., Likert scale) as continuous data, the nature of the measurement introduces nonnormality into the data and biases parameter estimates (e.g., Finney & DiStefano, 2006; West, Finch, & Curran, 1995). They reason that "ordered categorical data are discrete in nature and, therefore, cannot be normally distributed by definition" (Finney & DiStefano, 2006, p. 274). The data for this study were collected as ordinal data using 5-point and 7-point Likert scales, but ML was used to analyze the data. The literature appears to support that when a variable has more than four categories, the issue is negligible (Bentler & Chou, 1987; Byrne, 2010). Finney and DiStefano (2006) also suggested that using bootstrapping is a way to accommodate nonnormal and categorical data. Given this justification, it was concluded that using ML was appropriate.

#### Intercorrelations

The means, standard deviations, and correlations of the observed variables are presented in Table 4-3. The correlation coefficients show that all of the observed variables were positively related (.12 < r < .83). The explanation about how the parcels were formed is presented in the next section. Most of the high correlations (> .70) were between the parcels of one factor.

# Table 4-3.

	М	SD	α	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. WSA	3.46	.70	.76	-													
2. DMA	3.35	.74	.85	.69**	-												
3. WMA	3.76	.66	.79	.69**	.72**	-											
4. JC_TC	3.46	.57	.72	.38**	.39**	.44**	-										
5. JC_CC	3.52	.69	.83	.25**	.26**	.31**	.55**	-									
6. JC_RC	3.43	.66	.80	.20**	.20**	.26**	.40**	.39**	-								
7. LMX_P1	3.61	.65	.76	.44**	.42**	.41**	.35**	.33**	.29**	-							
8. LMX_P2	3.25	.78	.70	.39**	.37**	.35**	.32**	.34**	.21**	.77**	-						
9. LMX_P3	3.61	.71	.71	.42**	.39**	.40**	.34**	.33**	.26**	.81**	.76**	-					
10. E_V	4.03	1.01	.88	.37**	.38**	.45**	.47**	.49**	.44**	.44**	.38**	.46**	-				
11. E_D	4.32	1.03	.87	.34**	.38**	.44**	.54**	.58**	.46**	.46**	.39**	.43**	.80**	-			
12. E_A	4.33	.96	.84	.30**	.35**	.40**	.52**	.52**	.42**	.41**	.37**	.42**	.78**	.83**	-		
13. P_P1	4.07	.47	.71	.16**	.18**	.20**	.33**	.30**	.34**	.33**	.20**	.30**	.34**	.42**	.39**	-	
14. P_P2	4.26	.48	.53	.28**	.29**	.31**	.36**	.38**	.35**	.38**	.28**	.36**	.37**	.45**	.40**	.64**	-
15. P_P3	4.10	.47	.42	.12**	.12**	.20**	.31**	.35**	.30**	.32**	.25**	.33**	.35**	.43**	.38**	.74**	.56**

Means, Standard Deviations, and Intercorrelations of Variables

*Note.* WSA = Work Scheduling Autonomy; DMA = Decision-Making Autonomy; WMA = Work Method Autonomy;  $JC_TC = Job$  Crafting (Task Crafting);  $JC_CC = Job$  Crafting (Cognitive Crafting);  $JC_RC = Job$  Crafting (Relational Crafting);  $LMX_P1 = Leader$ -Member Exchange (Parceled items: Q27, Q30, Q33);  $LMX_P2 = Leader$ -Member Exchange (Parceled items: Q28, Q31);  $LMX_P3 = Leader$ -Member Exchange (Parceled items: Q29, Q 32);  $E_V = Engagement$  (Vigor);  $E_D = Engagement$  (Dedication);  $E_A = Engagement$  (Attitude);  $P_P1 =$  Performance (Parceled items: Q51, Q54, Q57);  $P_P2 =$  Performance (Parceled items: Q53, Q56).

\**p* < .05. \*\* *p* < .01.

### Validity

Validity refers to "the approximate truth of an inference" (Shadish, Cook, & Campbell, 2002, p. 34). This study examined both content validity and construct validity in order to determine whether the instruments accurately reflected the conceptual meaning of each construct. Since "expert opinion is the basis for establishing content validity" (Kline, 2016, p. 94), the content validity of this study was judged by a panel of three subject-matter experts who have doctoral degrees in related fields and each of whom has more than five years of work experience. Construct validity was examined using confirmatory factor analysis.

A field test was also used to establish the validity of this study. The final version of the instrument was distributed to ten Korean knowledge workers who were not included in the sample of this study. They were asked to complete the entire survey via online and provide opinions whether each item measures what it intends to measure from practitioners' perspectives. Based on the field test and the opinions of the experts, the instrument was lightly reworded.

### Reliability

Reliability refers to "the systematic or consistent variance of a measure" (Schwab, 2011, p. 32), and it is associated with consistency and predictability (Traub & Rowley, 1991). There are several methods for estimating reliability, but Cronbach's coefficient alpha, which is the most common approach to estimating internal consistency, was calculated in this study. Strong reliability is critical during SEM because reliability is directly related to statistical power and effect sizes (Kline, 2016). As shown in Table 4-4, the Cronbach's alphas of the measurements ranged from .83 to .94. The coefficients did not improve with the removal of any items in autonomy, LMX, job crafting, and work engagement. It was found, however, that if one item was deleted in

performance, the coefficient would increase from .83 to .84. Since this is trivial, no item was deleted. There is no clear standard regarding acceptable reliability levels, but it is commonly recommended that the Cronbach's coefficient alpha be above .7 (Kline, 2016; Nunnally, 1967; Peterson, 1994). Given this guideline, the Cronbach's coefficient alphas can be said to have shown that the study's instruments are reliable.

# Table 4-4.

Variable	No. of Itoms	Reliability					
variable	NO. OI Items	Original Study	Current Study				
Autonomy	9	.86	.90				
LMX Quality	7	.85	.90				
Job Crafting	15	.91	.86				
Work Engagement	9	.92	.94				
Performance	7	.91	.83				

### Summary of Instruments and Reliabilities

### **Measurement Model**

Structural equation modeling consists of path models and confirmatory factor models. Although the major purpose of this study was to examine the relationships among the research variables, it was important to test the validity of the measurement model before evaluating the structural model. This is because the relationships among the variables were based on the psychometrically sound latent variables. In the present study, five latent variables were included in the proposed conceptual model. Therefore, a measurement model including five latent variables was assessed before the structural model's evaluation.

### **Item Parceling**

A CFA was conducted after the items were parceled. A parcel refers to "an

aggregate-level indicator comprised of the sum (or average) of two or more items, responses, or behaviors" (Little, Cunningham, Shahar, & Widaman, 2002, p. 152). Kline (2016) suggested using an average score instead of a total score because the average score would be in the same metric as the original items. Yang, Nay, and Hoyle (2010) argued that parceling is a desirable option when analyzing variables that have been measured with many individual items. Parceled items more closely exhibit normal distribution than the original items do (West et al., 1995) and have fewer chances for residuals to be correlated or dual loading to emerge (Little et al., 2002). Parceling, however, is recommended only when unidimensionality is assumed (Kline, 2016) or when a factor structure is well-known (Bandalos, 2002). In this study, five latent variables were measured with 47 items. To be as parsimonious as possible, parceling was adopted.

**Autonomy.** Autonomy is known for its three-factor construct: work scheduling autonomy, decision-making autonomy, and work methods autonomy (Morgeson & Humphrey, 2006; Humphrey et al., 2007). Using the WDQ (Morgeson & Humphrey, 2006), autonomy was measured with nine items and each factor was measured with three items. To parcel the items, a homogeneous parceling strategy (Cole, Perkins, & Zelkowitz, 2016)—averaging the items in one factor—was adopted. The parceled model is shown in Figure 4-1.



*Figure 4-1*. Autonomy measurement model with item parceling.

LMX quality. Researchers debate whether LMX is unidimensional or multidimensional. Some researchers have argued that LMX has multiple dimensions (e.g., respect, trust, and obligation), but the most consistent finding suggests homogeneity on a single dimension (Graen & Uhl-Bien, 1991). In this study, LMX quality was considered a unidimensional variable focusing on the quality of relationships between leaders and followers. LMX quality was measured using the LMX 7 (Graen & Uhl-Bien, 1995). This measurement has been used as a unidimensional scale (Brunetto, Farr-Wharton, & Shacklock, 2010; Law, Wang, & Hui, 2010). To parcel the items, a random assignment strategy (Little et al., 2002) was applied. Each item was randomly and without replacement assigned to one of the parcel groupings (LMX\_P1: L1, L4, L7; LMX\_P2: L2, L5; LMX\_P3: L3, L6). The LMX quality measurement model with item parceling is presented in Figure 4-2.



Figure 4-2. LMX quality measurement model with item parceling.

**Job crafting.** Wrzesniewski and Dutton (2001) conceptualized job crafting along three dimensions: task crafting, cognitive crafting, and relation crafting. Later, Slemp and Vella-Brodrick (2013) developed an instrument named the JCQ based on Wrzesniewski and Dutton's theory. The JCQ is composed of three factors and 15 items. Each factor is measured by five items. Since the dimensionality of the items is known from previous research, the homogeneous parceling strategy (Cole et al., 2016) was applied, using the average scores of the items in the subdimensions. Each parcel reflects task crafting, cognitive crafting, and relation crafting. The job crafting model to which parceling was applied is shown in Figure 4-3.


Figure 4-3. Job crafting measurement model with item parceling.

**Work engagement.** Work engagement is known to have three dimensions: vigor, dedication, and absorption (Schaufeli et al., 2002; 2006; 2008). In this study, work engagement was assessed using the UWES-9 (Schaufeli et al., 2006), which measures three dimensions with nine items. Since a factor structure is known from previous research, a homogeneous parceling strategy (Cole et al., 2016) was applied, as shown in Figure 4-4.



Figure 4-4. Work engagement measurement model with item parceling.

# Performance

In this study, performance was limited to the in-role behaviors of employees. Williams and Anderson (1991) developed a 7-item measurement that assesses in-role performance and found that the construct was unidimensional. In this study, performance was measured using Williams and Anderson's seven items, and a random assignment strategy (Little et al., 2002) was applied to parcel the items (see Figure 4-5). The items were parceled into three groups (P\_P1: P1, P4, P7; P\_P2: P2, P5; P\_P3: P3, P6).



Figure 4-5. Performance measurement model with item parceling.

### The Hypothesized Measurement Model

The final measurement model with parceled items is composed of five constructs measuring autonomy, LMX quality, job crafting, work engagement, and performance. Each scale includes three parcels. Since there are 15 observed variables in the model, the sample covariance matrix consisted of 120 (15x16/2) pieces of information. Of these 120, 40 parameters were freely estimated (10 factor loadings, 15 error variances, 5 factor variances, and 10 factor covariances). As a result, the hypothesized measurement model was found to be overidentified with 80 degrees of freedom.

### **Analysis of Measurement Model**

The construct validity of the proposed five-factor measurement model was evaluated using model test statistics, fit indices, and parameter estimates. To assess the fits of the measurement models, a select group of overall model fit indices model chi-square, Comparative Fit Index (CFI), Tucker-Lewis index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR)—were reviewed based on Kline's (2016) recommendation.

The chi-square statistic tests the exact-fit hypothesis. The null hypothesis is that there is no difference between the covariances predicted from a hypothesized model and the population covariances. Therefore, the absence of statistical significance does not contradict the researcher's belief that the model is correct. Whether to reject the model should not be determined solely on the basis of the exact-fit test results, however, because this test is sensitive to sample size. In a small sample, the differences between a model and data can be undetected, but trivial differences can be detected in a large sample.

In this respect, other fit indices should also be considered (Kline, 2016). CFI and TLI are goodness-of-fit indices, whereas RMSEA and SRMR are badness-of-fit indices. Since each fit index assesses a model from a different perspective, all of the indices were simultaneously considered. Hu and Bentler's (1999) recommended cutoff values were adopted: CFI > .95, TLI > .95, RMSEA < .06 and SRMR < .08.

Since the data showed a nonnormal distribution, Bollen-Stine bootstrapping was applied because it generates adjusted *p* values for model test statistics (Kline, 2016). With regard to the overall fit of the measurement model (see Table 4-5), the chi-square was statistically significant using the corrected *p* value from Bollen-Stine bootstrapping,  $\chi^2(80, N = 562) = 214.745$ , *p* < .001. This result indicates that the fit of data to the measurement model was not adequate. However, other fit indices showed that the model fit the data well based on Hu and Bentler's (1999) cutoff criteria. The CFI and TLI values were .98 and .97, respectively. The RMSEA was .055, and the SRMR was .04. Based on the evidence, although the model failed the chi-square test, in terms of the overall model fit, the model could be judged as adequate.

To establish the discriminant validity of the measurement model, the five-factor

measurement model was compared with two alternative models. Model 1 was a onefactor model that combined all five variables into a single factor. Model 2 was a threefactor model that combined the mediator and the moderator into one factor and the dependent variables into one factor. As shown in Table 4-5, none of the alternative models showed a better fit. Therefore, the five-factor model was confirmed for usage.

# Table 4-5.

Fit Indices for CFA Model ( $N = 3$	<i>62)</i>	
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Model	$\chi^2$	df	$\chi^2/df$	CFI	TLI	RMSEA	SRMR
Model 1 (one factor)	2297.08***	90	25.52	.60	.53	.21	.13
Model 2 (three factors)	1202.18***	87	13.88	.80	.75	.15	.13
Model 3 (five factors)	214.75***	80	2.68	.98	.97	.06	.04

*Note*. CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual. \*\*\* Bollen-Stine bootstrap adjusted p < .001.

After reviewing the adequacy of the model as a whole, the model parameter estimates were assessed based on 2,000 bootstrap samples at the 95% confidence interval. The individual parameter estimates are presented in Figure 4-5 and Table 4-6. All the parameter estimates exhibit desirable size, and these estimates are statistically significant since none of the 95% confidence intervals includes zero. No unreasonable estimates (e.g., correlations > 1.00) or negative variances were observed. From the results, it could be concluded that the measurement model is valid.



*Figure 4-6.* Standardized estimates for measurement model. Latent constructs are shown in ellipses, and observed variables are shown in squares. Coefficients are significant at p < .05.

# Table 4-6.

			95% CI		
Correlation	Estimate	SE	LL	UL	Error
Autonomy					
Work scheduling	.81	.02	.77	.85	.17
Decision-making	.84	.02	.79	.88	.16
Work method	.86	.02	.82	.90	.13
Job Crafting					
Task crafting	.74	.03	.68	.79	.15
Cognitive crafting	.72	.03	.66	.78	.23
Relation crafting	.57	.04	.49	.64	.29
LMX Quality					
LMX_P1	.91	.01	.88	.93	.07
LMX_P2	.84	.02	.81	.87	.18
LMX_P3	.90	.01	.87	.92	.10
Work Engagement					
Vigor	.86	.02	.83	.89	.26
Dedication	.93	.01	.91	.95	.14
Absorption	.89	.01	.87	.92	.19
Performance					
PRF_P1	.88	.02	.84	.91	.05
PRF_P2	.75	.03	.69	.80	.13
PRF_P3	.83	.02	.78	.87	.07

# Standardized Estimates of Parameters for Measurement Model

*Note.* SE = standard error; CI = confidence interval; LL = lower limit; UL = upper limit.

# **Structural Model**

Based on the adequate measurement model, an overall structural model was identified and assessed. The relationships among the latent variables in the structural model were then examined.

#### The Hypothesized Structural Model

The structural model is composed of six latent variables, including autonomy, LMX quality, job crafting, work engagement, performance, and an interaction factor between autonomy and LMX (see Figure 4-6). Each latent variable consists of three items. All the items for autonomy and LMX quality were mean centered because zero was not among the original scores (Kline, 2016). To construct the latent interaction factor to examine the moderating effect of LMX, multiple indicators of autonomy and LMX latent variables were combined using a matched-pair strategy (Marsh, Wen, & Hau, 2006). Based on their simulation tests, Marsh et al. (2006) recommended using only one indicator from one factor when construct a latent interaction factor instead of using all the possible cross products as indicators of the interaction factor. Following their recommendation, the indicators for autonomy ( $x_1$ ,  $x_2$ ,  $x_3$ ) and the indicators for LMX ( $w_1$ ,  $w_2$ ,  $w_3$ ) were paired as followed:  $x_1w_1$ ,  $x_2w_2$ , and  $x_3w_3$ .

Since there are 18 observed variables in the model, the sample covariance matrix consists of  $171 (18 \times 19/2)$  pieces of information. Of these 171 pieces, 46 parameters were freely estimated. As a result, the hypothesized model was overidentified with 125 degrees of freedom.



Figure 4-7. Hypothesized structural equation model.

### **Analysis of Structural Model**

The overall fit of the structural model is presented in Table 4-7. The chi-square was statistically significant using the corrected *p* value from Bollen-Stine bootstrapping,  $\chi^2(125, N = 562) = 318.74, p < .001$ . This result indicates that the model does not fit the data, and the exact-fit test was rejected. However, other fit

indices showed desirable values. Both the CFI and TLI values were .96, and both the RMSEA and SRMR values were .06. Given Hu and Bentler's (1999) criteria, it was concluded that the model fits the data adequately.

### **Table 4-7.**

Fit Indices for Structural Model (	N = 562)
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Model	$\chi^2$	df	$\chi^2/df$	CFI	TLI	RMSEA	SRMR
Model 1	318.74***	125	2.5	.97	.96	.06 [.05, .06]	.05

*Note.* CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual. \*\*\* p (Bollen-Stein Bootstrap adjusted p) = .001.

The parameter estimates were calculated from 2,000 bootstrap samples. Two structural parameter paths were found to be statistically nonsignificant (job autonomy  $\rightarrow$  work engagement; job autonomy  $\rightarrow$  performance) since the confidence intervals included zero. All of the remaining estimates were sound and statistically significant, as shown in Table 4-8 (unstandardized estimates) and Figure 4-7 (standardized estimates).

### **Table 4-8.**

	Unstandardized		95% CI	
Parameter	Estimate	SE	LL	UL
Direct Path				
Autonomy $\rightarrow$ Engagement	.07	.08	09	.23
Autonomy $\rightarrow$ Performance	05	.05	15	.03
Autonomy $\rightarrow$ Job Crafting	.23	.04	.15	.32
$LMX \rightarrow$ Job Crafting	.24	.04	.15	.32
Auto x LMX $\rightarrow$ Job Crafting	.16	.07	.05	.34
Job Crafting $\rightarrow$ Engagement	1.92	.20	1.59	2.37
Job Crafting $\rightarrow$ Performance	.71	.09	.55	.92

#### Indirect Path

$LMX \rightarrow Job \ Crafting \rightarrow Performance$	.17	.04	.09	.24
$LMX \rightarrow Job \ Crafting \rightarrow Engagement$	.46	.08	.28	.61
Autonomy $\rightarrow$ Job Crafting $\rightarrow$ Performance	.16	.03	.11	.23
Autonomy $\rightarrow$ Job Crafting $\rightarrow$ Engagement	.44	.09	.28	.61

*Note*. SE = standard error; CI = confidence interval; LL = lower limit; UL = upper limit.

To test the indirect effect rigorously, a bootstrapping analysis was performed. Bootstrapping is considered to be more valid and powerful than Baron and Kenny's (1986) recommendation to test for mediation effects (Hayes, 2009; Shrout & Bolger, 2002). Hayes (2013) also strongly recommended using bootstrap confidence intervals over the Sobel test because bootstrapping "tend[s] to perform best and respect the irregularity of the sampling distribution of the indirect effect" (p. 201). However, bootstrapping needs a relatively large sample size. Fritz and MacKinnon (2007) suggested 462 as the most appropriate sample size if researchers detect a mediated effect maintaining .8 power by using a bias-corrected bootstrap. Since the sample size of this study is larger than the suggested number, the bootstrapping method was selected. Table 4-8 presents the bootstrapped estimates for the indirect effects with 95% confidence intervals. From the bootstrapping, it was found that all the indirect effects were statistically significant, since none of the 95% confidential intervals included zero at the 95% level.

Moreover, according to the squared multiple correlations in the final model, the effect sizes were large based on Cohen's (1988) guidelines. The predictors in the model explained 72% of the variance associated with work engagement and 40% of the variance associated with performance.



Figure 4-8. Standardized coefficients for the hypothesized model.

### **Hypothesis Testing**

Hypotheses 1 and 2 suggested that job autonomy positively influences work engagement and performance, respectively. As shown in Table 4-8, job autonomy did not predict work engagement, b = .07, 95% CI [-.09, .23] or performance, b = -.05, 95% CI [-.15, .03]. Thus, Hypotheses 1 and 2 were not supported. Hypothesis 3 predicted that job autonomy positively affects job crafting. As shown in Table 4-8, job autonomy positively affected job crafting and the relationship was statistically significant since the 95% confidence interval did not include zero, b = .23, 95% CI [.15, .32]. Therefore, Hypothesis 3 was supported. Hypothesis 4 suggested LMX quality moderates the relationship between job autonomy and job crafting. The estimate in Table 4-8 shows that the coefficient path from the product factor to job crafting was statistically significant; therefore, it can be concluded that the effect of job autonomy depends on LMX quality, b = .16, 95% CI [.05, .34]. In other words, the effect of job autonomy on employees' job crafting becomes stronger when the employees have better-quality relationships with their leaders. To visualize this relationship, Figure 4-8 displays the pattern of the moderating effect of the LMX quality. As seen in the figure, there is a stronger relationship between job autonomy and job crafting when LMX quality is high.



*Note.* Low = 1 SD below the mean; High = 1 SD above the mean.

*Figure 4-9.* Moderating effect of LMX quality on the relationship between job autonomy and job crafting.

Hypotheses 5 and 6 predicted that job crafting positively influences work engagement and performance, respectively. As can be seen in Table 4-8, the direct effects of job crafting on work engagement, b = 1.92, 95% CI [1.59, 2.37], and performance, b = .71, 95% CI [.55, .92], were both positive and statistically significant. Put differently, job crafting was found to have significant positive impacts on work engagement and performance.

Hypotheses 7 and 8 suggested that job crafting mediates the relationship between job autonomy and work engagement and performance. To assess these indirect effects, 95% bias-corrected bootstrap confidence intervals based on 2,000 bootstrap samples were used. Supporting Hypothesis 7, the indirect effect of job autonomy to work engagement via job crafting was significant, b = .44, 95% CI [.28, .61]. The indirect effect of job autonomy to performance via job crafting was also significant, b = .16, 95% CI [.11, .23]. Thus, Hypothesis 8 was also supported.

#### Chapter 5

#### SUMMARY, RECOMMENDATIONS, AND CONCLUSION

This chapter summarizes the procedures and findings of the study and discusses the theoretical contributions and practical implications. In addition, the limitations of this study and recommendations for future research are addressed. Finally, this chapter ends with its conclusion.

# Summary

This section summarizes the purpose, research questions, procedures, and findings of this study.

### **Research Purpose and Questions**

The primary purpose of this study was to determine the underpinning paths that link knowledge workers' job autonomy and their work outcomes. Because previous research has shown inconsistent relationships between job autonomy and work outcomes, this study explored a mechanism through which job autonomy influences work engagement and performance. The following three research questions guided this study:

- *RQ 1*. How does knowledge workers' job autonomy influence their psychological and behavioral outcomes?
- *RQ* 2. What are the relationships among job autonomy, LMX quality, job crafting, work engagement, and performance?
- *RQ 3.* How can the findings of this study contribute to the HRD field to enhance knowledge workers' work engagement and performance?

### **Research Procedures**

With the research purpose and questions in mind, instruments for measuring the research variables—job autonomy, job crafting, LMX quality, work engagement, and performance—were selected. With the assistance of two doctoral students and one expert in the HRD field, the instruments were translated into Korean using rigorous procedures. The survey was administered to knowledge workers who are employed at 14 different large Korean companies across five industries—manufacturing; construction; wholesale and retail trade; financial and insurance activities; and professional, scientific, and technical activities—via a Qualtrics web survey system. A total of 562 responses were collected out of 1,067 participants, making the response rate was 52.7%. Since there were 45 missing cases, EM imputation was applied. The imputed dataset was analyzed using descriptive and inferential statistics, primarily SEM.

#### **Findings and Discussions**

Prior to data analysis, the normality and reliability of the measurements were examined. All of the measurements used in the current study showed adequate levels of reliability (Cronbach's  $\alpha = .83 \sim .94$ ). However, the data (multivariate kurtosis = 485.30) and the parcels (multivariate kurtosis = 47.16) showed multivariate nonnormality. To handle this nonnormality, ML with a bootstrapping procedure was employed while analyzing the data.

Before the measurement model was examined, the research variables were parceled based on either a random assignment or a homogeneous parceling strategy depending on each variable's dimensionality. After parceling, each variable had three parceled indicators. Although the measurement model—five factors with 15 indicators—failed the chi-square test, the overall model fit was adequate,  $\chi^2(80, N =$ 562) = 214.745, p < .001, CFI = .98, TLI = .97, RMSEA = .06, SRMR = .04. To test discriminant validity, the one-factor and three-factor models were compared with the five-factor measurement model, but neither the one-factor nor the three-factor model showed a better fit than the five-factor model. All the factor loadings in the five-factor measurement model exhibited desirable estimates (standardized factor loadings ranged from .57 to .93), and the estimates were statistically significant. Given the fit indices, the structural model also reasonably fit the data,  $\chi^2(125, N = 562) = 318.74, p < .001$ , CFI = .97, TLI = .96, RMSEA = .06, SRMR = .05.

Regarding the first research question, the findings of this study reveal that knowledge workers' job autonomy did not directly influence their work engagement or performance. JD-R theory and JCT have led to a widespread belief that job autonomy enhances employees' work engagement and performance. Contrary to this common belief, the findings of this study show statistically nonsignificant relationships. This study replicated the previous research findings (DeVaro, 2006; Van de Voorde et al., 2016). Van de Voorde et al. (2016) found that job autonomy did not predict work engagement in a German healthcare context. Looking at a large Korean company, Joo et al. (2010) found that job autonomy did not predict in-role performance. By analyzing British secondary data, DeVaro (2006) found that teamlevel autonomy did not enhance organizations' financial performances. Although Morgeson et al. (2007) found positive relations between job autonomy and objective ( $\rho = .17$ ) and subjective performance ( $\rho = .18$ ) in their meta-analysis, the correlations were very weak.

With regard to the second research question, eight hypotheses were proposed and tested. Job crafting was proposed as a potential mediator explaining the relationship between job autonomy and work outcomes. Furthermore, LMX quality was proposed as a potential moderator of the relationship between job autonomy and job crafting.

The findings of the current study reveal that job crafting fully mediated the relationship between job autonomy and work engagement and performance. Moreover, LMX quality moderated the relationship between job autonomy and job crafting.

Job autonomy is positively associated with job crafting. In other words, when employees have the freedom to decide how to do their jobs, they tend to change their task and relational boundaries and perceptions of their work. This finding corroborates the findings of previous research. Sekiguchi, Li, and Hosomi (2017) found that job autonomy positively predicted job crafting in both part-time and fulltime employees. Leana et al. (2009) similarly found that if childcare workers had more autonomy, they tended to craft their jobs. From their meta-analysis, Tornau and Frese (2013) found that job autonomy facilitated personal initiative. Job autonomy increased employees' feelings of motivation and responsibility towards their jobs (Hackman & Oldham, 1976); therefore, it can be said that if employees sense freedom and opportunity, they take the initiative to make changes.

Furthermore, it was found that LMX quality moderated the relationship between job autonomy and job crafting. Berg, Dutton, and Wrzesniewski (2007) argued that trusting relationships with managers stimulate positive job crafting because trust helps employees feel comfortable to take risks in crafting their jobs. The findings of the current study show that the relationship between job autonomy and job crafting was stronger for employees who have high-quality relationships with their leaders. However, if employees had low-quality relationships with their leaders, little difference in their job crafting practices were found regardless of whether they had a high or low level of job autonomy. This study found that job crafting enhanced work engagement. Many researchers have found that when employees craft their work, they feel more engaged (Bakker et al., 2012; Brenninkmeijer & Hekkert-Koning, 2015; Vogt et al., 2016). This is because by crafting their work, employees can satisfy their own needs and take control of their work. By crafting their work, employees can change their work situations (e.g., increasing job resources and decreasing job demands) to increase their psychological well-being (Tims, Bakker, & Derks, 2013).

In the current study, job crafting also predicted job performance, and this result is aligned with those of previous studies (e.g., Gordon et al., 2015; Rofcanin et al., 2016; Weseler & Niessen, 2016). Wrzesniewski and Dutton (2001) argued that the results of job crafting can be either positive or negative for an organization because some employees craft their jobs only to meet their own interests. However, the results of the current study reveal that knowledge workers' job crafting predicted positive job performance. Mattarelli and Tagliaventi (2012) also found from their case study that individual job crafting increased organizational performance through the redesign of existing subsystems, introduction of new products, and entry into new industries.

The findings also revealed that job crafting fully mediated the relationships between job autonomy and work engagement and performance. If employees have job autonomy, it positively affects their job crafting. The results of their job crafting, in turn, increase their work engagement and performance. Therefore, employees' job crafting (changing tasks, cognitive tasks, and relational boundaries) is one mechanism that links work characteristics and work outcomes. This mediation effect of job crafting between job autonomy and performance is consistent with the findings of Morgeson et al. (2005). Morgeson et al. (2005) found that role breadth (the number of tasks performed) mediated the relationship between job autonomy and performance.

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From their meta-analysis, Tornau and Frese (2013) found that job autonomy influenced personal initiative and personal proactivity influenced supervisor-rated and objective performance (e.g., salary or business success).

The last research question regarding the theoretical and practical implications of this study for the HRD field is addressed in the next section.

#### **Theoretical and Practical Implications**

The findings of the current study make significant contributions to the HRD field both theoretically and practically. First of all, the significance of this study lies in its finding of an underpinning mechanism that links job autonomy and work outcomes. This study expanded the traditional job characteristics model by exploring the mediation effect of job crafting. Previous research has examined several traditional motivating characteristics as mediators (Parker, Morgeson, & Johns, 2017), but this study moved beyond these boundaries. Furthermore, JCT was developed at a time when work design was considered a top-down approach, but this study included job crafting, which is a bottom-up work design. The findings of this study serve as evidence that job autonomy influences work engagement and performance via job crafting.

Second, this study integrated existing research about work characteristics, job crafting, leadership, and engagement research. Whereas the links between job characteristics, work engagement, and performance have been widely investigated based on JD-R theory and JCT, job crafting has been underexplored, especially among researchers in the HRD field. Although work design is one of HRD's significant theoretical foundations (Swanson, 2001) and interventions (Jacobs, 1990; Wilmoth et al., 2002), HRD researchers have paid little attention to work design theory. In this regard, this study illustrates the significance of job crafting by providing evidence that it contributes to work engagement and performance.

Third, by exploring the moderating role of LMX quality and the mediating role of job crafting, this study enhances researchers' understanding of the relationships among the research variables. Mediation and moderation analyses are helpful for theory-building in the HRD field because they lead to improved understandings of relationships among variables and allow for the meaningful interpretation of theories (Song & Lim, 2015). This study provides rich theoretical knowledge regarding the relationships among the variables through its empirical approach.

Fourth, many previous job crafting studies have operationalized the concept of job crafting using JD-R theory and Tims et al.'s (2012) measurement (e.g., Cenciotti et al., 2016; Chinelato, Ferreira, & Valentini 2015; Dierdorff & Jensen 2017; Gordon et al., 2015). However, this study used Slemp and Vella-Brodrick's (2013) measurement, which was developed based on the original concept of job crafting that Wresneski and Dutton proposed. Tims's measurement does not include a cognitive crafting factor, but this study incorporates both cognitive and behavioral aspects of job crafting.

The results of the study offer practical implications for the HRD field. HRD practitioners and managers can use the results of this study to facilitate work engagement and increase employee performance. The present study found that job crafting is a promising concept for organizations because it promotes employees' psychological well-being and self-rated performance. Therefore, managers and HRD professionals should strive to create work environments that facilitate employees' job crafting. Given that the current study found that autonomy influenced work engagement and performance via job crafting, creating autonomous work environments is also important.

To maximize the positive outcomes of job crafting, HRD professionals could

consider training employees on the nature of job crafting and how they can craft their jobs. Several studies have reported that job crafting interventions positively influence job crafting behaviors and performance. From their quasi-experimental study, Van Wingerden, Bakker, and Derks (2017) found that job crafting interventions increased employees' job crafting behaviors and contributed to their work engagement and inrole performance. Demerouti, Xanthopoulou, Petrou, and Karagkounis (2017) also found that job crafting interventions had a positive effect on openness to change.

Managers as well as employees need to understand the concept of job crafting and be aware of employees' job crafting behaviors to help and encourage job crafting that aligns with organizational goals. Since leaders provide significant relationship context, they should understand and guide employees' job crafting. If managers are not familiar with job crafting, they may prevent job crafting behaviors that could bring positive outcomes to their organizations. Several researchers have argued that not all the job crafting is beneficial to organizations (e.g., Demerouti et al., 2015; Wrzesniewski & Dutton, 2001); therefore, managers' guidance or support is necessary. However, managers should not demand that employees redesign their jobs because this would be in contradiction to the concept of job crafting (Kim & Beehr, 2017). This study provided evidence that if employees have job autonomy and highquality relationships with their leaders, they craft their jobs more frequently than employees who have low-quality relationships with their leaders. Therefore, this study suggests that leaders play an important role in employees' job crafting. In this regard, leaders need to develop various leadership skills to facilitate quality relationships with their employees.

### **Limitations and Future Research Directions**

Although this study makes theoretical and practical contributions to the HRD

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field, there are several limitations that subsequent research should address.

First, the collected data was cross-sectional and self-reported. Since this study is neither a longitudinal study nor an experimental work, there is limited ability to infer causal relationships among the variables. Cole and Maxwell (2003) warned that testing mediational hypotheses with cross-sectional data may provide biased and misleading estimates. Even though the conceptual model hypothesizes only unidirectional relationships among variables, there is a possibility that reverse causality exists. To strengthen the findings, future research might consider employing a longitudinal research design.

Likewise, it is commonly believed that self-reported data have little validity. Put differently, the data are thought to incorrectly measure the intended construct and are thus unable to provide accurate parameter estimates of inter-construct relationships. However, Chan (2009) argued that self-reported data are not inherently problematic and in fact have advantages. Since all of the constructs included in the hypothesized model for this study are subjective, self-reporting was a suitable method of data collection. However, future research might consider using a mix of objective data (e.g., managerial or peer ratings of performance) to strengthen the findings of this study.

The convenience sampling method could be considered another limitation as well. Since it was almost impossible to randomly collect samples and obtain permission from each company in the study, the convenience sampling method was used for the recruited companies that volunteered to participate this study. This sampling method may limit the generalizability of the findings. Furthermore, the response rate was relatively low. Knowledge workers in Korea have hectic schedules during working hours, and they tend to work overtime. They receive many survey requests and tend to ignore them. The major problem of nonresponse is the estimation of population characteristics may be biased (Bethlehem & Kersten, 1985). To handle the nonresponse problem, some researchers suggest to identify nonrespondents, randomly select some of them, resurvey, and then compare respondents' and nonrespondents' data (e.g., Rogelberg & Luong, 1998). Since the data for current study were collected by the third parties, the researchers could not identify nor contact the people who did not respond to the survey to make extra effort to collect data from them.

Finally, the concept of a knowledge worker is broad. Although knowledge workers have distinguishable traits, not all knowledge workers are alike. Davenport (2005) classified knowledge workers into four groups—transaction workers, expert workers, integration workers, and collaboration workers—based on their levels of work complexity and degrees of collaboration. He also suggested other ways to segment knowledge workers in his book, *Thinking for a Living*. In large corporations, different groups of knowledge workers work together. It is difficult to capture the diversity of knowledge workers using only a few categories. In future studies, it would be interesting and meaningful to observe the variances among the groups.

#### Conclusion

In today's knowledge information society, knowledge workers' work engagement and performance are the most critical factors for organizations' sustainable development and success. JCT and JD-R theory have led to the belief that job autonomy increases work engagement and performance. However, previous research has shown inconsistent results. Thus, this study aimed to identify the pathways that underpin the relationship between knowledge workers' job autonomy and work engagement and performance. The findings of this study reveal that job crafting fully mediated the relationship between job autonomy and work engagement and performance. Furthermore, the current study provides evidence of the significant role of leaders in employees' job crafting. These results point to the importance of knowledge workers' job crafting and their leaders' role.

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### Appendix A. IRB Exemption Decision Letter



Vice President for Research The Pennsylvania State University 205 The 330 Building University Park, PA 16802 Phone : (814) 865-1775 Fax: (814) 863-8699 Email : <u>orprotections@psu.edu</u> Web : <u>www.research.psu.edu/orp</u>

#### **EXEMPTION DETERMINATION**

Date: September 11, 2017

From: Jodi Mathieu, IRB Analyst

To: Jae Young Lee

Type of Submission:	Initial Study	
Title of Study:	Moderated mediation in the relationship among job crafting, leader-member exchange, and work engagement of Korean knowledge workers at large for-profit organizations	
Principal Investigator:	Jae Young Lee	
Study ID:	: STUDY00006623 : STUDY00006623 : Not Applicable : • IRB_HRP591_v4.pdf (0.03), Category: IRB Protocol • Survey.docx (0.02), Category: Data Collection Instrument	
Submission ID:		
Funding:		
Documents Approved:		

The Office for Research Protections determined that the proposed activity, as described in the above-referenced submission, does not require formal IRB review because the research met the criteria for exempt research according to the policies of this institution and the provisions of applicable federal regulations.

Continuing Progress Reports are **not** required for exempt research. Record of this research determined to be exempt will be maintained for five years from the date of this notification. If your research will continue beyond five years, please contact the Office for Research Protections closer to the determination end date.

Changes to exempt research only need to be submitted to the Office for Research Protections in limited circumstances described in the below-referenced Investigator Manual. If changes are being considered and there are questions about whether IRB review is needed, please contact the Office for Research Protections.

Penn State researchers are required to follow the requirements listed in the Investigator Manual (<u>HRP-103</u>), which can be found by navigating to the IRB Library within CATS IRB (<u>http://irb.psu.edu</u>).

This correspondence should be maintained with your records.

Appendix B. Instrument (Korean)

# 1. 업무자율성

다음은 본인의 직무 특성 중 업무자율성에 대한 질문입니다. 본인의 생각에 가장 알맞은 번호를 선택하여 주시기 바립니다. (1: 전혀 그렇지 않다, 2: 거의 그렇지 않다, 3: 중간이 다, 4: 그런 편이다, 5: 자주 그런 편이다)

내 업무는 내가 일정을 조정할 수 있다.
 내 업무는 내가 우선 순위를 결정할 수 있다.
 내 업무는 내가 일을 어떻게 처리할 것인지에 계획을 세울 수 있다.
 내 업무는 내가 주도권을 가지거나 판단할 기회를 준다.
 내 업무는 내가 스스로 결정할 수 있는 부분이 많다.
 내 업무는 의사결정 하는 데 있어 상당한 자율성을 제공한다.
 내 업무는 업무를 완수하기 위해 어떤 방법을 쓸지 내가 의사결정을 할 수 있다.
 내 업무는 상당한 독립성과 자율성이 보장된다.
 내 업무는 내가 일하는 방식을 결정할 수 있다.

#### 2. 자기주도 업무설계

다음은 자기주도 직무설계에 대한 질문입니다. 본인의 생각에 가장 알맞은 번호를 선택하 여 주시기 바립니다. (1: 전혀 그렇지 않다, 2: 거의 그렇지 않다, 3: 중간이다, 4: 그런 편이 다, 5: 자주 그런 편이다)

나는 업무개선을 위해 새로운 방식을 시도해 본다.
 필요에 따라 맡은 업무의 범위나 종류를 변경해 가며 일 한다.
 내 능력이나 관심 분야를 잘 활용할 수 있는 새로운 업무를 시도해 본다.
 일을 할 때 추가적인 업무를 기꺼이 맡는다
 내 능력이나 흥미가 잘 반영될 수 있는 업무를 우선시한다.
 내 일이 내 삶의 목적과 어떻게 연결될 수 있는지 생각 한다.
 내 일이 우리 사회에 기여하는 바를 생각 한다.
 내 일이 내 삶에 어떤 긍정적인 영향을 미칠 수 있는지 생각 한다.
 내 일이 내 삶의 행복에 어떤 역할을 하는지 생각 한다.
 지상에서 사람들과 잘 지내려고 노력한다.
 업무와 관련된 친목활동과 모임 등을 주도하거나 참석한다.

- 13. 직장에서 특별한 이벤트(예, 동료의 생일파티)를 주도한다.
- 14. 공식적으로나 비공식적으로 기꺼이 후배나 신입 직원의 멘토 가 된다.
- 15. 회사에서 나와 유사한 기술이나 흥미를 가진 사람들과 가깝게 지내려고 노력한다.

### 3. 리더-구성원 교환관계

다음은 리더(직속상사)와의 관계에 대한 질문입니다. 여기서 리더는 조직 내에서 본인의 성과를 1차적으로 평가하는 사람입니다. 본인의 생각에 가장 알맞은 번호를 선택하여 주 시기 바립니다.

1. 나의 상사는 내가 하고 있는 일에 만족해 한다.

- 2. 리더는 나의 업무관련 어려움이나 요구에 대해 잘 알고 있다.
- 3. 리더는 나의 가능성을 인정한다.
- 리더는 내 업무문제 해결을 위해 리더가 가진 권한에 구애 받지 않고 기꺼이 나를 도와준다.
- 5. 리더는 자신의 희생을 감수하면서까지 나를 도와준다.
- 나는 리더가 없는 상황에서도 리더의 결정을 옹호하고 정당화 할 정도로 리더를 신뢰한다.
- 7. 나는 리더와 업무적으로 효율적인 관계에 있다.

#### 4. 업무몰입

다음은 현재 조직에서 느끼는 본인의 업무몰입에 대한 질문입니다. 본인의 생각에 가장 알맞은 번호를 선택하여 주시기 바립니다. (1: 전혀 그렇지 않다, 2: 거의 그렇지 않다, 3: 중간이다, 4: 그런 편이다, 5: 자주 그런 편이다)

나는 아침에 일어나면 회사에 출근하고 싶다.
 나는 업무를 할 때 에너지가 넘친다.
 나는 업무를 할 때 힘차고 활기 있다고 느낀다.
 내 일은 나를 고무시킨다.
 나는 내 일에 열정적이다.
 나는 내가 하는 일이 자랑스럽다.
 나는 일을 할 때 완전히 빠져든다.
 나는 나의 일에 매료되어 있다.
 나는 집중해서 일을 할 때 행복감을 느낀다.

### 5. 업무성과

다음은 본인의 업무성과에 대한 설문입니다. 본인의 생각에 가장 알맞은 번호를 선택하여 주시기 바립니다. (1: 전혀 그렇지 않다, 2: 거의 그렇지 않다, 3: 중간이다, 4: 그런 편이다, 5: 자주 그런 편이다)

나는 내게 맡겨진 일을 적절하게 완수한다.
 나는 직무 명세서에 명시된 책임을 완수한다.
 나는 내게 기대되는 업무를 수행한다.
 나는 공식적인 업무 성과 기준을 충족시킨다.
 나는 성과평가에 직접적으로 영향을 주는 업무를 한다.
 나는 해야 하는 일을 등한시 한다.
 나는 필수적인 업무를 수행하지 못한다.

#### 6. 인적정보

- 1. 귀하의 성별은 무엇입니까? 🗆 남 🗆 여
- 2. 귀하의 나이는 어떻게 되십니까? 만 ( )세
- 3. 귀하의 최종학력은 무엇입니까?
   □ 고등학교 졸업 □ 2년제 대학 □ 4년제 대학 □ 대학원 이상
- 4. 회사 내 귀하의 현재 직급은 무엇입니까?
  - □ 임원
  - □ 부장/차장
  - 🗆 과장
  - 🗆 대리
  - 🗆 사원
- 5. 현재 회사에서 언제 입사하셨습니까? ( )년
- 6. 현재 맡고 있는 업무를 시작하신지 얼마나 되셨습니까?
  □ 1년 미만
  □ 1년 이상 5년 미만
  □ 5년 이상 10년 미만
  □ 10년 이상 15년 미만
  □ 15년 이상 20년 미만

□ 20년 이상

7. 현재 직속 상사와 몇 년도부터 함께 일하셨습니까?())년

- 8. 귀하는 어떤 직무를 수행하고 계십니까?
  - □ 마케팅/영업/판매
  - □ 제조/생산
  - □ 연구/개발
  - 🗌 IT
  - □ 경영지원 (전략/기획/재무/인사/교육/법무/감사 등)
  - 🗆 기타
- 9. 귀하가 근무하는 회사는 다음 중 어느 산업형태에 해당합니까?
  - 🗆 제조
  - □ 건설업
  - □ 도매 및 소매업
  - □ 금융 및 보험업
  - □ 전문과학/기술/서비스업
  - □ 기타

# VITA

# Jae Young Lee

## **EDUCATION**

The Pennsylvania State University, University Park, PA Ph. D. in Workforce Education and Development	2018
Ewha Woman's University, Seoul, South Korea M. Ed. in Educational Technology	2013
Ewha Woman's University, Seoul, South Korea B.A. in Educational Technology and International Office Management	2004

#### PUBLICATIONS

Lee, J., & Kim, T. (in press). Balancing individual and organizational development: Revisiting the purpose of HRD using an ethical framework. <i>International Journal of Human Resources</i> Development and Management			
Lee, J., Park, S., & Baker, R. (2017). The moderating role of top management support on employees' attitudes in response to human resource development efforts. <i>Journal of Management &amp; Organization</i> , 1-19. doi:10.1017/jmo.2017.37			
Lee, J., Macko, P., & Al Khadhuri, J. (2017). An academic program profile: The w and development program at The Pennsylvania State University. <i>Performa</i> 56(5), 37-45. doi: 10.1002/pfi.21713	orkforce education ance Improvement,		
Rothwell, W., Park, J., & Lee, J. (2017). Marketing organization development consulting: How to guide for OD consultant. CRC Press.			
Yang, G., & Lee, J. (2016, May). Learning while playing. Talent Development, 48	-52.		
AWARDS AND HONORS			
John Coné ATD Student Scholarship Awarded by Association for Talent Development (formerly ASTD)	2017		
<b>The Dr. Kenneth E. Ruch Award</b> Awarded by College of Education at Penn State	2015 & 2016		
<b>Research Paper Award</b> Awarded by Korean Academy of Human Resource Development in Americas	2016 & 2018		
The Graham Fellowship Award	2014		

Awarded by Graduate School at Penn State