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## **Effect of learning goal orientation on work engagement through job crafting: A moderated mediation approach<sup>1</sup>**

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### **Abstract**

**Purpose** – The purpose of this paper is to examine the mechanism by which learning goal orientation (LGO) promotes work engagement through job crafting (seeking challenges).

**Design/methodology/approach** – A moderated mediation model was tested using survey data from 266 public health nurses and hospital nurses in Japan.

**Findings** – The results indicated that job crafting partially mediated the relationship between LGO and work engagement, and that the mediation effect was stronger when reflection was high (vs middle and low).

**Research limitations/implications** – Although common method bias and validity of measurement were evaluated in this paper, the survey data were cross-sectional.

**Practical implications** – The results suggest that selecting people with a stronger sense of LGO may be a useful strategy for promoting job crafting and work engagement in an organization. Additionally, organizations should give employees opportunities to reflect on their jobs and to craft them into more challenging ones in the workplace.

**Originality/value** – Although little is known about mechanisms by which LGO promotes work engagement, this study found that job crafting and reflection play important roles in linking LGO and work engagement.

**Keywords** Quantitative, Reflection, Work engagement, Moderated mediation, Learning goal orientation, Job crafting

**Paper type** Research paper

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## **Introduction**

Work engagement, or a positive, fulfilling, work-related state of mind (Schaufeli et al., 2002), has emerged as a significant construct in the applied psychological and management literature because it has been shown to promote both well-being and performance in employees (Saks, 2006; Van De Voorde et al., 2016). The growing interest in work engagement gives rise to the need for better understanding of its antecedents (Woods and Sofat, 2013). Although numerous factors have been examined as antecedents (e.g. self-regulation behaviors, personality traits, psychological meaningfulness, job autonomy), learning goal orientation (LGO), known as a disposition that intrinsically motivates employees (Cerasoli and Ford, 2014), may be one of the major determinants of work engagement (Adriaenssens et al., 2015; Jones et al., 2017) because work engagement constitutes a form of intrinsic motivation (Demerouti et al., 2015). Despite their importance, little is known, from previous studies, about the factors that mediate the relationship between LGO and work engagement.

To address this gap, the present research examined the LGO–engagement relationship in terms of “job crafting” (seeking challenges), conceptualized based on job demands-resources (JD-R) theory (Demerouti et al., 2001), as well as “reflection,” which plays an important role in the learning process (Kolb, 1984; Mezirow and Taylor, 2011). These two factors were selected based on “self-determination theory (SDT),” which proposes that autonomous motivation with intrinsic goals (as opposed to controlled motivation with extrinsic goals) is associated with greater health, well-being and performance (Deci and Ryan, 2008; Ryan and Deci, 2000). Specifically, this study hypothesized that job crafting (seeking challenges) mediates the relationship between LGO and work engagement, because LGO triggers self-initiated behaviors targeted at seeking challenges (Petrou et al., 2015), from which high work engagement may result. It was also predicted that reflection positively moderated the LGO–job crafting (seeking challenges) relationship, because reflective activities, such as reviewing and re-assessing work processes, could conceivably be understood as effective means for redesigning jobs. Crafting jobs through reflection may be a critical process for intrinsically motivated individuals who want to work autonomously. As such, the main contribution of this study is to explain the mechanisms by which LGO facilitates work engagement in terms of job crafting and reflection using a moderated mediation model.

## **Literature review**

### *Work engagement*

Work engagement is defined as “a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication and absorption” (Schaufeli et al., 2002, p. 74). That is, engaged employees are working energetically (vigor), are highly involved in their work (dedication) and are fully concentrated and happily engrossed in their work (absorption) (Bakker et al., 2008).

It is important to note that work engagement differs conceptually from related constructs such as organizational commitment or job satisfaction, because work engagement explicitly refers to the voluntary behavioral aspects of work (De Clercq et al., 2014). Demerouti et al. (2015) stated that work engagement represents a form of intrinsic motivation, where the behavior is performed for itself to experience the pleasure and enthusiasm inherent in the work activity. Work engagement is a persistent, pervasive and affective cognitive state rather than a momentary and specific state or behavior (Schaufeli et al., 2002).

Past empirical studies have shown that work engagement is positively associated with employee well-being, job satisfaction, affective commitment, the intent to remain employed, less burnout, innovative work behavior and higher job performance (Agarwal, 2014; Dalal et al., 2012; Lu et al., 2014; Saks, 2006; Schaufeli et al., 2006; Yalabik et al., 2015). Similarly, Bakker and Demerouti (2008) argued that work engagement positively influenced performance through the experiences of positive emotions and better health, having a measure of agency over their own jobs and personal resources, and the transfer of their engagement to others.

With regard to its antecedents, work engagement has been shown to be influenced by various factors, such as organizational trust (Agarwal, 2014; Ugwu et al., 2014), job involvement (Scrima et al., 2014), self-regulation behaviors (De Carlo et al., 2014), personality traits, psychological meaningfulness (Woods and Sofat, 2013), job autonomy (Zhang et al., 2017), job crafting (Crawford et al., 2010; Lu et al., 2014; Petrou et al., 2012) and LGO (Adriaenssens et al., 2015; Jones et al., 2017).

The results of these studies can be explained by SDT, which is an empirically based theory of human motivation, development and wellness within social contexts that differentiates between autonomous and controlled motivation (Deci and Ryan, 2011). Within SDT, a learner’s motivational orientation is classified as either autonomous or controlled, while the content of their goals is classified according to intrinsic goals (e.g. community contributions or personal development) and extrinsic goals (e.g. fame or financial success) (Vansteenkiste et al., 2006). Previous studies in SDT indicate that the

more autonomous orientations of intrinsic goals are associated with work engagement, perceived competence and learning (Deci and Ryan, 2008, 2011; Vansteenkiste et al., 2006).

Based on SDT, this study focused on the role of job crafting and LGO in enhancing work engagement. Job crafting is regarded as an autonomous work-related activity, whereas LGO is a type of intrinsic goal. These two factors may promote work engagement, which is a work-related state of mind involving intrinsic motivation (Demerouti et al., 2015; Schaufeli et al., 2002). As mentioned earlier, there is a possibility that job crafting mediates the relationship between LGO and work engagement, because LGO may intrinsically motivate employees to change their jobs to more challenging ones, resulting in high work engagement. Thus, the literature on LGO and job crafting was reviewed in the following sections to set hypotheses.

### *LGO*

Goal orientation has been defined as one's dispositional or situational goal preferences in achievement situations (Payne et al., 2007). There are three types of goal orientation: "learning goal orientation" (a desire to develop oneself by acquiring new skills, mastering new situations and improving one's competences); "performance-prove goal orientation" (the desire to prove one's competence and gain favorable judgments about them); and "performance-avoid goal orientation" (the desire to avoid disapproval and negative judgments with regard to one's competences) (Vandewalle, 1997). A meta-analytic study revealed that LGO was positively correlated, performance-avoid goal orientation was negatively correlated, and performance-prove goal orientation was uncorrelated with learning and performance (Payne et al., 2007). Furthermore, LGO has been shown to have positive impacts on intrinsic motivation, leading to skill improvement (Hirst et al., 2009), self-regulation (Bouffard et al., 1995), seeking out self-improvement information (Janssen and Prins, 2007), innovative performance (Lu et al., 2012) and metacognitive activity, including planning, monitoring and revising goal-appropriate behavior (Ford et al., 1998). These results suggest that LGO is a strong driver of self-regulated learning for improvement and innovation.

Accordingly, previous research has indicated that individuals holding a learning goal view challenging tasks as opportunities to learn, whereas individuals holding a performance goal perceive challenging tasks as inherently risky because they fear that they might fail and reveal their inadequate abilities to others (Dragoni et al., 2009). Consistent with this argument, Adriaenssens et al. (2015) and Jones et al. (2017) reported a positive relationship between LGO and work engagement. Although some studies

demonstrate that performance-prove and performance-avoid orientations have positive effects on performance outcomes, the results were mixed and unclear (e.g. Janssen and Prins, 2007; Porter et al., 2010). Therefore, this study focused on LGO among the three goal orientations and predicted that LGO may directly promote work engagement by enhancing an employee's intrinsic work motivation (Cerasoli and Ford, 2014). Based on the characteristics of LGO and previous empirical findings, the following hypothesis is proposed:

*H1. LGO is positively related to work engagement.*

### *Job crafting*

Wrzesniewski and Dutton (2001) conceptualized the process of job crafting, which refers to the physical and cognitive changes that individuals make in the tasks or relational boundaries of their work. Referring to the following examples: "Hospital cleaners integrated caring for patients and families into the workflow of their floor units" (Wrzesniewski and Dutton, 2001) and "A maintenance technician started proactively to help newcomers to learn the job" (Berg et al., 2010). These examples suggest that job crafting is a self-initiated change in behavior that employees engage in, with the aim of aligning their jobs with their own preferences, motives and passions (Tims et al., 2012).

Based on the "JD-R model" (Bakker and Demerouti, 2007), Bakker et al. (2012) defined job crafting as the changes employees may make regarding their job demands and job resources. Tims et al. (2012) proposed that job crafting consists of four dimensions: increasing structural job resources, increasing social job resources, increasing challenging job demands and decreasing hindering job demands. Regarding the effects of these dimensions, Petrou et al. (2012) conceptualized job crafting as "seeking resources," "seeking challenges" and "reducing demands," and found that seeking challenges was positively associated with work engagement, whereas reducing demands was negatively associated with work engagement. Similarly, Demerouti et al. (2015) reported that seeking resources had a positive indirect relationship with extra-role behavior such as contextual performance and creativity, whereas reducing demands had negative indirect relationships with extra-role behaviors through work engagement.

Of the four dimensions of job crafting, this research focused on increasing job demands as a form of "seeking challenges." This is because the dimension has the most essential characteristics of job crafting, in which employees redesign their jobs by themselves. Seeking challenges refers to redesigning jobs into more challenging ones, whereas seeking resources involves activities that expand personal networks for social supports or rewards that are not directly linked to the job design itself. As work

engagement refers to a work-related state of mind involving intrinsic motivation (Demerouti et al., 2015; Schaufeli et al., 2002), this study only analyzed the seeking out of challenges that may directly affect the characteristics of jobs.

As mentioned above, it is reasonable to hypothesize that job crafting (seeking challenges) may mediate the relationship between LGO and work engagement, because LGO may intrinsically motivate employees to redesign their jobs into more challenging ones, which would then facilitate further engagement in their work. This relationship can be predicted by SDT, which proposes combining goals and autonomous orientations to promote an individual's engagement and learning at work (Deci and Ryan, 2008, 2011; Vansteenkiste et al., 2006). Considering these arguments and past studies on the job crafting–work engagement relationship (Crawford et al., 2010; Lu et al., 2014; Petrou et al., 2012), the following hypothesis is proposed:

*H2. Job crafting (seeking challenges) partially mediates the relationship between LGO and work engagement.*

### *Reflection*

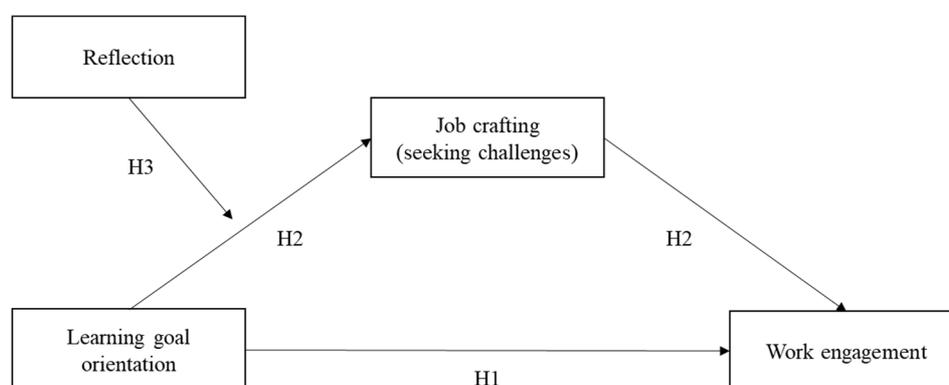
To redesign our jobs, it is necessary to reflect on our activities and practices. According to Kolb's (1984) experiential learning model, reflection is an essential process for learning from experience. Kolb proposed a four-stage cyclical model involving the following steps: concrete experience, reflective observation, abstract conceptualization and active experimentation (Kolb, 1984). Specifically, we extract abstract hypotheses or concepts by reflecting on our personal experience, and the lessons guide us to create new experiences. To gain maximum developmental benefits from work experiences, it is important to reflect on experiences, to extract lessons. Transformative learning theory also assumes that reflection or critical reflection plays a key role in adult learning (Mezirow and Taylor, 2011; Taylor, 2007).

Following West (2000), in the present study, reflection is defined as the extent to which an individual periodically reviews his or her work objectives and methods. This definition suggests that "reflection" is a disposition or tendency to reflect on activities or practices. According to social cognitive theory, reflection is a significant motivational force in self-regulation (Van Seggelen-Damen and Van Dam, 2016). As Kolb's (1984) experiential learning model suggests, individuals who periodically review their work experiences may gain many ideas or lessons on how to change the elements of their jobs. From the viewpoint of SDT and experiential learning theory, reflection may be necessary for individuals aiming to craft their jobs in an autonomous manner. Specifically, individuals must ensure that their work processes or practices line up with their goals to

acquire new skills or knowledge when crafting their jobs. Thus, it seems reasonable to hypothesize that the effect of LGO on job crafting may be stronger when reflection is high (vs low). Thus, the following hypothesis is proposed:

*H3. Reflection positively moderates the relationship between LGO and job crafting (seeking challenges).*

The conceptual framework of this study draws on the literature on job crafting, reflection, goal orientation and work engagement. As shown in Figure 1, the framework posits the moderated mediation model in which LGO directly and indirectly influences work engagement through job crafting (seeking challenges), and reflection moderates the relationship between LGO and job crafting (seeking challenges).



**Figure 1.** Research model

## Methods

### *Procedure and participants*

Participants for this study were public health nurses and hospital nurses who participated in two independent training programs for human resource development. Nurses were chosen as subjects because they are professionals who have a certain level of autonomy in performing their tasks. The first program was administrated by a prefectural government for public health nurses working in northern Japan, whereas the second program was administrated by a medical university for hospital nurses working across a wide range of areas in Japan. Administrative offices of the programs invited participants to answer a questionnaire before the programs began. Questionnaires were sent by e-mail to 303 nurses (144 public health nurses and 159 hospital nurses). The response rate was 87.7 percent with 266 usable responses (123 public health nurses and 150 hospital nurses).

The sample consisted of 91.8 percent females and 8.2 percent males. The distribution of participants' ages was as follows: 29 years and younger (5.9 percent), 30–39 (30.1 percent), 40–49 (46.5 percent) and 50 years and older (16.5 percent). The positions in the organizations were staff (28.7 percent), junior manager (58.2 percent), middle manager (11.2 percent) and senior manager (1.9 percent).

### *Measures*

Reflection was assessed using a five-item scale, from West (2000). Sample items were

“I often review my work objectives,” and “I often review my approach to getting the job done.” Each item measured reflection on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree;  $\alpha = 0.79$ ). The average scores of the items were used in the analyses.

LGO was measured using a five-item scale selected from Vandewalle (1997). Sample items were: “I am willing to select a challenging work assignment that I can learn a lot from,” and “I prefer to work in situations that require a high level of ability and talent.” Each measured LGO on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree;  $\alpha = 0.82$ ). The average scores of the items were used in the analyses.

Job crafting was measured with a five-item scale from Tims et al. (2012), who developed the scales of “increasing challenging job demands.” Sample items were: “If there are new developments, I am one of the first to learn about them and try them out” and “I try to make my work more challenging by examining the underlying relationships between aspects of my job.” Each item measured job crafting on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree;  $\alpha = 0.72$ ). The average scores of the items were used in the analyses.

Work engagement was assessed using a nine-item scale developed by Schaufeli et al. (2006). Sample items were: “At my job, I feel strong and vigorous” and “I am enthusiastic about my job.” Each item measured work engagement on a five-point Likert scale (1 = never, 5 = always). As the scale consists of three dimensions (vigor, dedication, and absorption), items in each dimension were averaged to create dimension scores; then, the averages of these dimension scores were used in the analyses ( $\alpha = 0.85$ ).

Social desirability was measured to prevent potential common method bias, using a five-item scale derived from Paulhus (1991). Sample items were: “I never regret my decisions” and “I am very confident of my judgments.” Each item measured social desirability on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree;  $\alpha = 0.70$ ). The averages of the items were used in the analyses.

As control variables, dichotomous dummy variables for gender (1 = female, 2 = male) and job type (1 = public health nurse, 2 = hospital nurse), organizational position (1 =

staff, 2 = junior manager, 3 = middle manager, 4 = senior manager) and age (1 = 20s, 2 = 30s, 3 = 40s, 4 = 50s, 5 = over 60s) were included in the equation.

### *Validation of measures*

The internal consistency of the constructs was evaluated using Cronbach's  $\alpha$  statistic. Cronbach's  $\alpha$  values for reflection, LGO, job crafting and work engagement were 0.79, 0.80, 0.72 and 0.85, respectively. All of the scales met the recommended reliability coefficient of 0.70 (Nunnally, 1978). To evaluate the convergent validity of the model constructs, a confirmatory factor analysis was conducted with four latent learning constructs (reflection, LGO, job crafting and work engagement) and a total of 23 items. The results showed that all of the items loaded significantly on the respective constructs; the goodness-of-fit statistics for the model were as follows:  $\chi^2 = 233.62$  (df = 129,  $p < 0.001$ ),  $\chi^2/df = 1.811$ , comparative fit index (CFI) = 0.940, root mean square error of approximation (RMSEA) = 0.055 and standardized root mean square residual (SRMR) = 0.055. Considering the cut-off value criteria proposed in previous studies ( $\chi^2/df < 2.0$ , CFI  $> 0.90$ , RMSEA  $< 0.06$  and SRMR  $< 0.08$ ) (Hu and Bentler, 1999; Lane et al., 2006), the fit indices of the model were acceptable.

### *Assessment of common method bias*

Because the data were collected from self-reported questionnaires measured by a single source, there was a possibility that the results of the study would suffer from common method bias. To address the issue, the following four diagnostic analyses were conducted. First, Harman's one-factor method was used. This method assumes that a substantial amount of common method variance is present when a single factor emerges from a factor analysis, or that one general factor accounts for the majority of the covariance among the measures (Podsakoff et al., 2003). A principal component factor analysis with items for all of the variables, including control variables, extracted six factors with the first factor accounting for 24.53 percent of the variance. These results indicate that a serious common method bias was not present in this study.

Second, the partial correlation procedure proposed by Lindell and Whitney (2001) was applied. An item "I have a lot in common with the people around me" of the revised UCLA Loneliness Scale (Russell et al., 1980) was used as the theoretically unrelated marker Effect of learning goal orientation variable. Then, the effects of this variable were partialled out from the relationships among reflection, LGO, job crafting and work engagement. The results indicated that the original correlation matrix among variables was quite similar to the partial correlation matrix, which suggested that common method

bias did not affect the results.

Third, fit indices demonstrated that the four-factor model fit the data much better than the single-factor, two-factor and three-factor models (Table I). These results indicate that the influence of common method bias was minimized in this study (Podsakoff et al., 2003).

Finally, social desirability was assessed as a control variable in the analyses. This was done to reduce the tendency to respond in a socially desirable manner, which causes a common method variance (Podsakoff et al., 2003).

**Table I.** Confirmatory factor analyses comparing alternative measurement models

Models	$\chi^2$	<i>df</i>	$\chi^2/df$	CFI	SRMR	RMSEA
M1: 4-factor model	233.62	129	1.811	0.940	0.055	0.055
M2: 3-factor model (JC+WE, R, LO)	373.39	132	2.829	0.861	0.080	0.083
M4: 3-factor model (LO+WE, JC, R)	487.25	132	3.691	0.795	0.075	0.101
M3: 3-factor model (JC+LO, R, WE)	456.14	133	3.430	0.814	0.075	0.101
M5: 2-factor model (JC+WE, R+LO)	629.39	134	4.697	0.714	0.110	0.118
M6: 2-factor model (LO+WE, JC+R)	680.91	134	5.081	0.685	0.102	0.124
M7: 1-factor model	770.66	135	5.709	0.634	0.108	0.133

Note: N = 266. JC = job crafting; WE = work engagement; R = reflection; LO = learning goal orientation; 4-factor model: each variable was loaded on a single factor; 1-factor: all variables were loaded on a single factor. CFI = comparative fit index; SRMR = standardized root mean square residual; RMSEA = root mean square error of approximation.

**Table II.** Means, standard deviations, reliabilities, and correlations of the study variables (n = 266).

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	
1 Job type	1.54	0.50	-								
2 Gender	1.08	0.28	.11	-							
3 Age	2.73	0.82	.02	-.14 *	-						
4 Position	2.09	0.87	-.13 *	-.11	.41 ***	-					
5 Social desirability	2.59	0.54	.16 *	.05	.16 **	.17 **	(.70)				
6 Learning orientation	3.41	0.63	.21 **	.26 ***	.04	-.11	.24 ***	(.80)			
7 Reflection	3.61	0.50	.01	.03	.10	.15 *	.17 **	.33 ***	(.79)		
8 Job crafting (Seeking challenges)	3.19	0.54	.17 **	.13 *	.10	-.02	.28 ***	.56 ***	.34 ***	(.72)	
9 Work engagement	3.00	0.62	.22 ***	.16 *	.16 *	-.05	.20 **	.45 ***	.23 ***	.52 ***	(.85)

Notes: Cronbach's alphas are reported along the diagonal. Job type: 1 = public health nurse, 2 = hospital nurse. Age: 1 = 20s, 2 = 30s, 3 = 40s, 4 = over 50s. \* p < .05; \*\* p < .01, \*\*\* p < .001.

## Results

Table II lists the means, standard deviations, reliability and correlations of variables. Reflection, LGO, job crafting and work engagement correlated significantly in the expected direction. To examine the moderated mediation model proposed, the SPSS macro PROCESS, developed by Hayes (2012), was used.

**Table III.** Results of regression analyses

Predictor	Job crafting (seeking challenges)			Work engagement		
	$\beta$	<i>SE</i>	<i>t</i>	$\beta$	<i>SE</i>	<i>t</i>
Reflection	.17	.06	3.01 **			
Learning goal orientation	.40	.05	7.96 ***	.20	.06	3.00 **
Reflection $\times$ Learning goal orientation	.21	.08	2.45 *			
Job crafting (seeking challenges)				.42	.07	5.87 ***
<i>Control variable</i>						
Job type	.06	.06	.98	.12	.07	1.80
Gender	.01	.10	.07	.13	.12	1.11
Age	.03	.04	.81	.11	.04	2.53 *
Position	-.01	.04	-.38	-.05	.04	-1.20
Social desirability	.13	.05	2.43 *	.03	.06	.43
$R^2$		.38			.34	
<i>F</i>		19.48 ***			18.87 ***	

Note:  $n = 266$ . \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

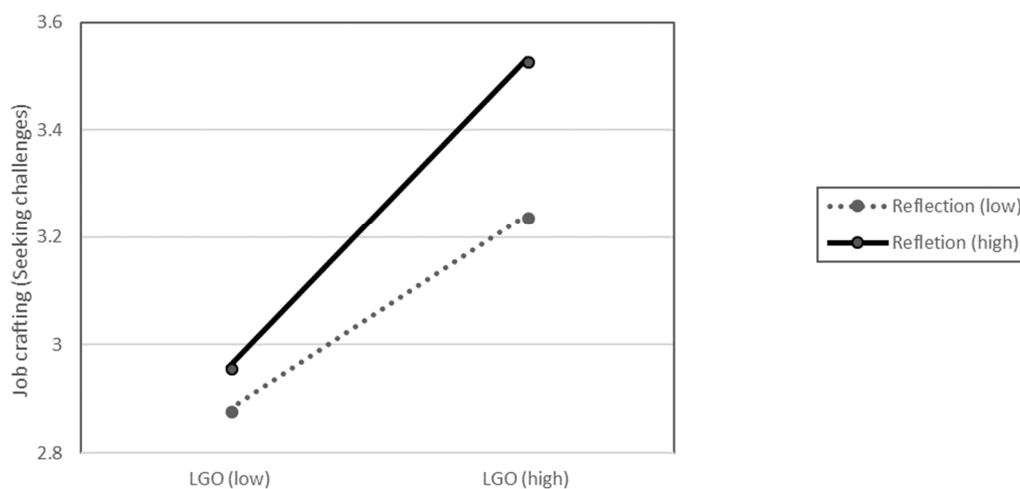
Table III lists the results of the moderated mediation analyses for examining H1–H3. As predicted by H1, LGO was positively related to work engagement ( $\beta = 0.20$ ,  $p < 0.01$ ). Table III also indicates that LGO was positively related to job crafting (seeking challenges) ( $\beta = 0.40$ ,  $p < 0.001$ ), which resulted in higher work engagement ( $\beta = 0.42$ ,  $p < 0.001$ ). The results suggest that job crafting (seeking challenges) mediates the relationship between LGO and work engagement. To assess the significance of the conditional indirect effect of job crafting (seeking challenges), bias-corrected bootstrapped confidence intervals were calculated. Separate models were examined for each moderator that tested the indirect effect between LGO and work engagement under three different values of each moderator ( $-1$  standard deviation, mean,  $+1$  standard deviation). As shown in Table IV, the assumed moderated-indirect relationships were significant for all values. Thus, H2 was supported.

**Table IV.** Conditional indirect effects of LGO on work engagement through job crafting

Value of moderator (reflection)	Conditional indirect effect	SE	95% CI	
			Lower	Upper
-1 SD	.12	.04	0.06	0.21
Mean	.17	.04	0.10	0.25
+1 SD	.21	.05	0.13	0.31

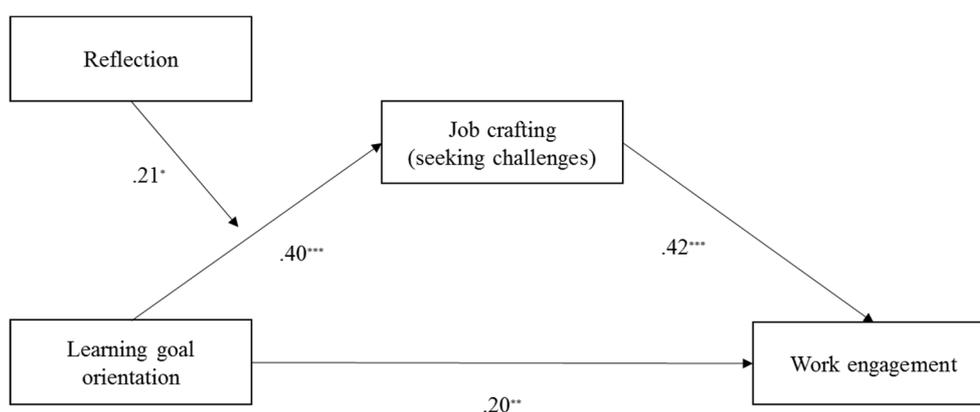
Note: Results are based on 5,000 bootstrap samples. CI = confidence interval.

Table III shows that reflection positively moderated the relationship between LGO and job crafting (seeking challenges) ( $\beta = 0.21, p < 0.05$ ), which supports H3. Specifically, as shown in Figure 2, the relationship between LGO and job crafting (seeking challenges) was stronger when reflection was higher (vs lower).



**Figure 2.**

The moderating effect of reflection on the relationship between LGO and job crafting (seeking challenges)



**Figure 3.** Summary of moderated mediation analyses

Notes: \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

## **Discussion**

Although LGO has been shown to influence work engagement, its mediators have not been sufficiently investigated in previous research. As shown in Figure 3, LGO facilitated work engagement through job crafting (seeking challenges), and the relationship was stronger when reflection was high (vs low). A major contribution of this study was to identify the moderated and mediating relationship whereby LGO promoted work engagement in terms of job crafting and reflection, based on a self-determination perspective.

### *Theoretical implications*

This paper has three theoretical implications. First, the present research extends the literature by showing the mediating effect of job crafting (seeking challenges) between LGO and work engagement. Although previous studies reported a direct link between LGO and work engagement (Adriaenssens et al., 2015; Jones et al., 2017), this study showed that a partial indirect path also exists in the relationship. The results suggest that individuals with high learning goals are engaged in their work not only because they are intrinsically motivated to acquire knowledge or skills but also because they are eager to redesign their jobs toward more challenging ones.

Second, the findings indicate that the combination of LGO and reflection synergistically enhanced behaviors for seeking challenges. These results suggest that individuals with high learning goals can redesign and reassess their jobs when they have habits of reflecting on their work processes. Although Dragoni et al. (2009) and DeRue and Wellman (2009) reported that LGO strengthened the effect of challenging experiences in relation to learning, the present research indicated that LGO alone is not sufficient, but should be combined with reflection (West, 2000) for promoting creative work.

Third, this research confirmed that job crafting, in terms of seeking challenges, had a positive relationship with work engagement. Some empirical studies have found that seeking challenges positively influences work engagement (e.g. Petrou et al., 2012), whereas Demerouti et al. (2015) reported no significant relationships between them. It is possible that a significant relationship was found in this study because the subjects were professionals, such as public and hospital nurses, who tend to be intrinsically motivated by professionalism. Thus, future research should examine the moderating effects of job type on the relationship between seeking challenges and work engagement.

### *Practical implications*

The practical implications of this research are threefold. First, the results suggest that selecting people with a stronger sense of LGO may be a useful strategy to promote job crafting and work engagement in the organization. It may be effective to use a scoring system in measuring LGO for hiring new employees. In addition, “a learning-goal orientation training” developed by Noordzij et al. (2013) could be applied to existing employees to enhance their sense of LGO.

Second, organizations should give employees opportunities to reflect on their jobs to craft them into more challenging ones in the workplace. “After-event reviews,” in which employees draw lessons from their successful and failed experiences, as proposed by Ellis and Davidi (2005), may be useful in enhancing an individual employee’s reflection. In such programs, it may be beneficial to incorporate sessions that encourage employees to craft their jobs in facilitating reflection.

Finally, organizations need to be aware of the fact that an employee’s work engagement is enhanced by promoting job crafting as seeking challenges. Hence, managers should encourage employees to craft their jobs by stimulating their learning goals and providing them opportunities for reflecting on their work processes and practices.

### *Limitations and future research*

There are several limitations to this study. First, the survey data were cross-sectional. Although common method bias and validity of measurement were evaluated in this paper, a longitudinal design should be adopted in future research. Second, this study only analyzed seeking challenges out of the three dimensions of job crafting. Further research should incorporate other types of job crafting such as seeking resources in the model. Third, this research focused only on LGO among three goal orientations. Although previous studies provided mixed results (e.g. Janssen and Prins, 2007; Porter et al., 2010), it is possible that performance-prove goal orientation has a positive effect on work engagement through job crafting. Thus, it would be interesting to include both learning and performance orientations into the model. Fourth, the sample of this study consisted of public health and hospital nurses at Japanese organizations. Because job characteristics might affect the results, the research model should be tested by conducting surveys in various industries and cultures. Finally, this research examined the antecedents of job crafting at the individual level. However, team-level factors may further influence job crafting and work engagement. It would be interesting to explore how team-level factors impact the results.

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