

Article

Examining Structural Relationships between Work Engagement, Organizational Procedural Justice, Knowledge Sharing, and Innovative Work Behavior for Sustainable Organizations

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Abstract: Despite the importance of the human/social dimension of organizational sustainability, this area of scholastic endeavor has received relatively little attention when compared to the economic and environmental dimensions of sustainability. On the basis of social exchange theory, this study posited the important role that employee work engagement is a key component for improving human performance for organizational sustainability. In order to do so, it suggests the important role that employee work engagement has on the relationships among various factors in the organization, including organizational procedural justice, knowledge sharing, and innovative work behaviors. A total of 400 complete responses from full-time employees in Korean organizations were used for the purpose of data analysis with structural equation modeling (SEM). The results demonstrated that organizational procedural justice is positively related with employee work engagement, knowledge sharing, and innovative work behavior. In addition, work engagement enhances employee knowledge sharing and innovative work behavior, and knowledge sharing enhances innovative work behavior. With regard to the mechanisms of these relationships, work engagement and knowledge sharing acted as significant mediators. Based on the findings, we suggested relevant research implications and recommendations for future research on sustainable organizations.

Keywords: work engagement; procedural justice; knowledge sharing; innovative work behavior

1. Introduction

Over two decades, the topic of organizational sustainability has continuously and increasingly received considerable attention from both academia and business because it is relevant to not only organizational performance (e.g., high profitability and enhanced employee work-related attitude or behavior including work engagement, knowledge sharing, and innovative work behavior) [1–6] but it is also crucial to long-term organizational success [1,7,8]. It is empirically supported by the results of a survey conducted for three consecutive years from 2009 to 2011 with a sample of more than 2000 managers and executives from over 100 countries. The results revealed that there has been a dramatic increase (i.e., from 25% in 2009 to 68% in 2011) in managers' commitment to organizational sustainability. In addition, the results of the survey in 2011 indicated that 67% of participants viewed sustainability as a vital issue for organizations' competitive advantage in today's market place [9].

Sustainable organizations are thought to have the capability of simultaneously achieving good economic, environmental, and social (i.e., human) performance in a collective manner called the triple

bottom line [8,10]. Economic performance is related to financial performance and good products or services; environmental performance is related to environmental integrity and protection (e.g., protection from resource exploitation and environmental damage); while social performance is related to the well-being of organizational employees. Thus, if organizations want to achieve and maintain sustainable development, it is important to consider environmental, economic, and social (i.e., human) dimensions in a comprehensive and enduring way [1].

However, among the three dimensions of organizational sustainability, the social dimension (i.e., human dimension) has received relatively less attention when compared to economic and environmental dimensions of sustainability [1,7,8]. This shows that more attention should be paid to the human dimension of organizational sustainability. With regard to the human dimension, the existing literature claims that this dimension is related to the processes of generating social health and enhancing employee well-being (i.e., employee engagement at work) in organizations, and as such, employee work engagement could be a key component of the human dimension of organizational sustainability [1,7,9,11].

Employee work engagement refers to “a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption” ([12], p. 74). Scholars and practitioners in many fields—including psychology, business, organization development, human resource development and management—have paid considerable attention to employee work engagement because organizations desire engaged employees who are energetic, dedicated, and absorbed in their work. Employee work engagement makes a positive contribution to the fundamental line of any business and is echoed in services they provide to customers and clients [6]. Specifically, employee work engagement leads to enhanced individual and/or group performance. In addition, engaged employees generate more customer loyalty. Consequently, engaged customers purchase more services and products from a company and recommend other potential customers to the same company, which ultimately helps to improve the company’s profitability and therefore lead to a more sustainable organizational environment [6,13,14].

In addition to the link between employee work engagement and organizational sustainability, the extant literature indicates that organizational procedural justice, employee knowledge sharing, and employee innovative work behavior are relevant to organizational sustainability [5,15–17]. Organizational justice consists of three components—procedural justice, distributive justice, and interactional justice—which positively influence employee’s psychological well-being, lowering employee stress levels and turnover by establishing a fair work environment [16,18]. Procedural justice refers to the perceived fairness of the procedures used in decision-making; distributive justice refers to the perceived fairness of the outcomes that the individual employees receive; and interactional justice, as an extension of procedural justice, refers to the perceived fairness of interactional communication and treatment [16,19–22]. Regarding the three components of organizational justice, Karkoulian et al. [16] empirically found that procedural justice and interactional justice positively influenced organizational sustainability (i.e., they are strong predictors of organizational sustainability), whereas distributive justice did not. In addition, with regard to the relationship between procedural justice and interactional justice, procedural justice focuses on the exchange or relationship between employees and their organization, while interpersonal justice focuses on the exchange or relationship between employees and supervisors [20]. Although procedural justice and interactional justice are relevant to organizations, this study intends to examine the effects of perceived fairness in the general context of the exchange between employees and their organization rather than the specific context of the exchange between supervisors and their subordinates. Based on the empirical and conceptual rationale mentioned earlier, this study focused on organizational procedural justice.

With regard to knowledge sharing and innovative work behavior, knowledge sharing refers to the process of exchanging task information, expert knowledge, and feedback regarding a procedure or product in order to create new knowledge or ideas, deal with issues, and achieve common goals [3,23–25]. Since knowledge is an essential organizational resource offering a competitive

advantage for organizational sustainability [3,24], knowledge sharing is considered to be a fundamental means through which employees make positive contributions to knowledge application and innovation among individual employees and teams (e.g., by increasing firm innovation capabilities and reducing production costs), ultimately leading to the sustainable development of the organization [3,4]. Innovative work behavior is defined as “the intentional creation, introduction and application of new ideas within a work role, group, or organization, in order to benefit role performance, the group, or the organization” ([26], p. 288). Janssen also described innovative work behavior as being comprised of three different behavioral tasks: idea generation, idea promotion, and idea realization [5,26]. Since innovation tends to rely greatly on employee behavior within organizations and is viewed as critical for organizational success and survival in this knowledge-based society, it is conceivable that innovative employee work behavior is pivotal to organizational sustainability [5].

Organizational procedural justice, knowledge sharing, and/or innovative work behavior have also been examined in association with employee work engagement [24,27,28]. The findings suggest that the serious efforts of organizations to be fair during the decision-making process (i.e., procedural justice) may positively influence employee work engagement. Engaged employees are more likely to have a strong intention to share their work-related knowledge and to put significant effort into innovative work behavior for their organizations. These behaviors ultimately and positively influence organizational sustainability.

Although the four research constructs (i.e., work engagement, organizational procedural justice, knowledge sharing, and innovative work behavior) are relevant to organizational sustainability and some previous research [27–31] has partially examined the relationships among them, there seems to be a lack of research that comprehensively and simultaneously investigates the relationships between them [14]. Therefore, the current study primarily aims to comprehensively examine employee work engagement and its structural relationships with organizational procedural justice, employee knowledge sharing, and employee innovative work behavior as they relate to the human dimension of organizational sustainability.

2. Conceptual Framework and Research Hypotheses Development

2.1. Conceptual Framework

Social exchange theory, as a widely used conceptual framework in organizational research [32], can be utilized to support the relationships among the four research constructs used in our study. Social exchange theory is one of the most influential perspectives for understanding employee behavior in the workplace based on a number of social science disciplines, including management, social psychology, and anthropology [32,33]. Social exchanges refer to transactions or relationships between two or more parties (e.g., relationships between employees and their organization) that involve unspecified future obligations through a reciprocal process of exchanging resources (i.e., reciprocity as interdependent exchanges) for which some future repayment or return is expected for the positive contribution made [21,32,33]. Thus, if an organizational actor (i.e., organization, supervisor, or co-worker) provides positive initiating actions (e.g., fair and transparent organizational procedures), targets (e.g., individual employees) will tend to choose to reciprocate these initiating actions with positive responses through a high-quality social exchange relationship [32]. That is, if employees perceive the organizational procedures used in the decision-making process to be fair, they are more likely to repay their organization by not only cognitively, emotionally, and physically engaging in their work (i.e., psychological engagement and behavioral engagement) but by also forming positive work attitudes and voluntary cooperation toward their organization (i.e., enhancing employee work engagement, encouraging knowledge sharing among employees either within teams or across teams, and facilitating innovative work behavior) [20,21,32,34,35].

2.2. The Effects of Organizational Procedural Justice

Research on organizational justice found that employee perceptions about procedural justice are related to various organizational outcomes (e.g., job satisfaction, trust, organizational commitment, and organizational citizenship behaviors) [36]. More particularly, the current literature shows that organizational procedural justice has a strong and positive impact on employee work engagement both directly and indirectly [22,27,34,37]. As stated earlier, based on the perspective of the social exchange theory, the feeling of being fairly treated by an organization can make employees more engaged in their work because fair organizational procedures enhance the level of trust and confidence they have in the organization, which in turn sees them reciprocate by displaying positive attitudes and behaviors in their work [22,34]. Similarly, organizational procedural justice also enhances employee knowledge sharing [3,30,38] because the employee discretionary behaviors, such as sharing skills and expertise with their co-workers, are intrinsically encouraged due to perceptions of reciprocity when employee expectations about being fairly treated by the organization are met [30]. In addition, according to several empirical studies [15,28,39], organizational procedural justice has a significant and positive direct and indirect effect on innovative work behavior by employees. When individuals believe that their organizations care and provide fair treatment, their obligation toward performing their jobs successfully may increase, which, in turn, makes them involved in work-related idea generation, development, and application. More particularly, a recent study, which examined the effect of five dimensions of organizational justice (i.e., distributive, procedural, interactional, temporal, and spatial organizational justice) on employee innovative work behavior, revealed that procedural justice among five dimensions of organizational justice was the most strongly and positively correlated with employee innovative behavior [15]. However, despite the importance of procedural justice acting as a symbolic resource that fosters reciprocative behaviors of employees on the basis of the social exchange theory [40], there have been only a few studies that thoroughly investigated the effects of procedural justice on an organization (e.g., [41]). Therefore, this study attempts to investigate the impacts of procedural justice on employee work attitudes and behaviors, namely work engagement, knowledge sharing, and employee innovative work behavior. We hypothesize the following:

Hypothesis 1. *Organizational procedural justice positively influences employee work engagement, knowledge sharing, and innovative work behavior.*

2.3. The Effects of Work Engagement and Knowledge Sharing

With the rapid expansion of interest in the work/employee engagement concept, various conceptualizations and definitions have been developed over the last few decades (for a review, see [42]). The most popular and accepted definition of work engagement, developed by Schaufeli et al. ([12], p. 74), states that employee work engagement refers to “a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption”. When individuals are highly engaged in their work, they typically show high levels of energy and mental resilience, and voluntarily invest considerable effort (vigor) in the relevant tasks that they carry out. In addition, engaged employees have a sense of significance, enthusiasm, inspiration, pride, and challenge (dedication), and are deeply engrossed in their work (absorption). As Shuck and Wollard [42] pointed out, similar definitions of work engagement, such as personal engagement, behavior engagement, and trait engagement, exist in the literature, and each presents a unique perspective and framework. However, for the purpose of this research, the term “work engagement” is elected and defined according to the terms mentioned earlier. When compared to other similar terms, work engagement encompasses various aspects of the employee experience of engagement (e.g., cognitive, emotional, and behavioral levels) [42]. This definition has been widely adopted in a majority of engagement-related studies [14] and is consistent the measures used by Schaufeli and his colleagues [12].

A handful of previous studies have demonstrated that employee work engagement has a significant and positive effect on employee intentions to share knowledge [24,31,43]. As knowledge sharing itself is a self-motivated and proactive behavior, employees will be more likely to share work-related ideas and expertise with their co-workers only when they are dedicated to their work and enthusiastic about it [31]. Studies have also shown that employee work engagement is significantly and positively related to employee innovative work behavior [28,44,45]. With a great deal of attention being focused on the work engagement domain, many researchers have agreed that work engagement is a strong factor affecting organizational performance and success. Moreover, empirical studies have offered sufficient proof to confirm the effect of work engagement on organizational outcomes, such as job satisfaction, organizational commitment, organizational citizenship behavior, and intention to quit [14,46,47]. However, researchers have found that relatively little attention is assigned to the relationship that may exist between work engagement and knowledge sharing [31].

In addition, research has found that employee's knowledge sharing has a significant and positive influence on their innovative work behavior [29,48,49]. Radaelli et al. [29] explained that when employees share their knowledge, they are more likely to elaborate, integrate, and translate information rather than simply passing on information to recipients. This exercise promotes employee involvement in innovative work behavior, including searching for opportunities for change and applying new ideas to existing organizational practices. Taken together, it is conceivable that employee enhanced work engagement has a positive impact on their knowledge sharing and innovative behavior and that employee innovative work behavior is positively influenced by their knowledge sharing. Thus, we hypothesize the following:

Hypothesis 2. *Employee work engagement positively influences their knowledge sharing and innovative work behavior.*

Hypothesis 3. *Employee knowledge sharing positively influences their innovative work behavior.*

2.4. The Mediating Effects of Work Engagement and Knowledge Sharing

A great deal of the extant literature has emphasized the mediating role that work engagement plays in the relationships between antecedents and consequences in organizational settings [50,51]. Regarding the mediating effects of work engagement on the relationships among organizational procedural justice, knowledge sharing, and innovative work behavior, the existing literature [3,24,28–30,52] indicates that if organizations seriously care about fairness in the decision-making process, their efforts will facilitate and support employee work engagement. The support given to employee work engagement, in turn, increases the willingness of employees to share their work-related knowledge with other organizational members and/or actively suggest new ideas for their organization and transform the new ideas into applications by obtaining peer or managerial support (i.e., innovative work behavior).

The theoretical framework which draws on social exchange theory also supports this proposition. According to the review of social exchange theory on the justice literature and meta-analysis [40], the voluntary and discretionary behaviors of employees can be encouraged by organizational justice through various social exchange qualities. In this regard, it was found that social exchange quality, with characteristics such as trust, leader–member exchange, and perceived organizational support, acts as a mediating factor between justice and positive behavior outcomes by strengthening the obligation and reciprocity in the exchange relationships. Although this study did not attempt to test the effects of work engagement explicitly in Colquitt et al.'s meta-analysis [40], it has the potential to serve as a mediator in the justice-discretionary behavior relationship because researchers found that mutual and exchange relationships between employees and the organization (i.e., supervisors/leaders; [28,44,53]) positively influence employees' work engagement, and hence, it may lead to an increase in positive employee behavior (i.e., knowledge sharing and innovative work behavior).

Furthermore, based on the perspective of social exchange theory and the findings of previous studies regarding the mediating role of knowledge sharing in the association between organizational procedural justice and innovative work behavior, employee perceptions of organizational procedural justice are positively related to knowledge sharing [3,30,37]. We propose that this positive relationship can further influence the development of employee innovative work behavior. The proactive behavior (i.e., sharing task-relevant knowledge) promoted by fair treatment in work procedures may increase opportunities to engage in innovative work behaviors because employees can be involved in various exercises that provoke innovative thinking and actions while sharing knowledge (e.g., internalization, integration, translation, externalization, and socialization) [29,43]. Perceiving the fairness of procedures in the workplace sparks a willingness to share their knowledge with co-workers, leading to creation, introduction, and application of new ideas. Therefore, we hypothesize the following:

Hypothesis 4. *Employee work engagement plays a mediating role in the relationship between organizational procedural justice and employee knowledge sharing and innovative work behavior.*

Hypothesis 5. *Employee knowledge sharing plays a mediating role in the relationship between organizational procedural justice and employee innovative work behavior.*

3. Methods

3.1. Sample and Procedure

The target population analyzed in this study was comprised of full-time employees from organizations in South Korea. A self-reported survey approach with a Korean version of questionnaires was utilized in this study. The survey questionnaires were designed by using an online survey domain and conducted by a professional survey company in Korea with a convenient sampling approach. Since the survey company has an online panel with over a million members in Korea, a link to the online survey was distributed to the online panel (i.e., potential participants) in November 2015. Through a screen item, only full-time employees were allowed to take part in the survey. In addition, participants who finished the survey, leaving no responses incomplete, were rewarded with participation points. As a result, 400 complete responses were gathered over three weeks and included in the final data set.

The following demographic information was collected from participants: gender, age, education level, industry, work position, job area, and length of current company employment. Approximately 81% of respondents were men. Of the total respondents, about 80% were in their 30s or 40s (30–39 years: 35.8%; 40–49 years: 43.8%); approximately 79% of the total sample had graduated from a 4-year college or higher (4-year college: 60.5%; graduate school: 18.3%). In addition, in regards to industry of employment, the majority of the respondents (72.1%) worked in four industries: manufacturing (30.5%), service (18.8%), information technology (11.5%), and construction (11.3%). With regard to work position, approximately 77% of the total respondents worked either as assistant managers (17.8%) or as managers (managers: 22.5%; general assistant managers: 13.5%; and general managers: 22.8%). About 76% of the total sample worked in four job areas: management support (38.8%), R&D (14%), marketing and sales (13%), and manufacturing (10.5%). Regarding the work year, approximately 62% of respondents had worked in their current organizations for 10 years or less (less than one year: 7.5%; 1–5 years: 27.8%; and 6–10 years: 26.5%).

3.2. Measurements

Organizational procedural justice was assessed with seven items of formal procedural justice using a 5-point Likert scale developed by Moorman [54]. A sample item is “My organization uses procedures designed to collect accurate information necessary for making decisions.” The Cronbach’s alpha for this measurement varied from 0.90 to 0.98 across several studies [55–57].

Work engagement was assessed with the Utrecht Work Engagement Scale with nine items (UWES-9) developed by Schaufeli and colleagues [12]. The UWES-9 has three sub-scales, such as vigor, dedication, and absorption, and each sub-scale consists of three items. All items of the UWES-9 were presented with a 7-point Likert scale. An example item is “My job inspires me.” The Cronbach’s alpha for the total UWES-9 varied from 0.85 to 0.92 across 10 different national samples [58].

Knowledge sharing was assessed with a five-item measurement using a 5-point Likert scale developed by Bock and colleagues [59]. This instrument measures two types of knowledge-sharing intentions: (1) intention to share explicit knowledge; (2) intention to share tacit knowledge. The Cronbach’s alpha for this measurement was 0.93 [59]. A sample item of this measure is “My knowledge sharing with other organizational members is good.”

Innovative work behavior was assessed with a nine-item measurement with a 7-point Likert scale developed by Janssen [26]. This instrument measures three aspects of innovative work behavior: (1) generating a new idea; (2) acquiring support from others; and (3) transforming an idea into an application. The Cronbach’s alpha for this scale was 0.92 [44]. A sample item includes “I am creating new ideas for difficult issues.”

3.3. Data Analysis

The current study employed structural equation modeling (SEM) with descriptive statistics such as normality, reliability, and correlation, and a common method bias (CMB) test to ensure basic assumptions. To assess the overall model fit of the research model, this research examined the Satorra–Bentler (SB) scaled chi-square for robust maximum likelihood (ML) estimation to handle the non-normality of data [60], the root mean square error of approximation (RMSEA), the standardized root mean square residual (SRMR), the non-normed fit index (NNFI, also known as the Tucker–Lewis index [TLI]), and the comparative fit index (CFI) with cutoff criteria (RMSEA < 0.08, SRMR < 0.08, NNFI > 0.95, and CFI > 0.95) [61–64]. In order to check any indications of possible improper solutions of the model, individual parameter estimates and their estimated standard errors were also investigated [64]. Furthermore, to test research hypotheses, this study utilized standardized path coefficients (SPC) with t-values and bootstrap estimates of the mediation effects.

4. Results

4.1. Common Method Bias, Normality, Reliability, and Correlation

Common method bias, normality, reliability, and the correlation matrix were investigated during a preliminary analysis. First of all, since common method bias may have potentially significant influences on the research findings, two statistical techniques, including Harman’s single factor test and the confirmatory factor analysis for the single factor model were utilized to address the issue of common method bias [65]. The results of Harman’s single-factor test (i.e., about 45.77% of total variance explained) demonstrated that all of the observed items from the measurements obtained in this study did not load onto one common and major factor. Also, the results of confirmatory factor analysis for the single factor model indicated that the single factor model had a poor fit with the data ($\chi^2(252) = 4668.812, p < 0.001$; RMSEA = 0.210; SRMR = 0.152; NNFI = 0.777; CFI = 0.797), meaning that no single factor accounted for all of the variance in our data. Both of these results showed that our collected data was not likely contaminated by the common method bias of the study. Thus, it might be reasonable to conclude that common method bias is not a major problem in this study.

In addition, the normality (i.e., both univariate and multivariate normality) of the variables was examined by values of skewness and kurtosis provided from PRELIS in LISREL. Based on the results of the univariate test ($|\text{skewness}| < 2, |\text{kurtosis}| < 7$) [66], as well as multivariate normality (p values of skewness and kurtosis < 0.05) with the relative multivariate kurtosis (1.310 (< 3)) [67], it can be concluded that, overall, our data set had a moderate non-normality, which can be dealt with the robust ML using the SB correction method. In regards to reliability and correlation, both internal consistency,

found using Cronbach's alpha, and bivariate correlations among latent variables were calculated and are displayed in Table 1. The results show that all measures in this study had an acceptable level of reliability (α ranged from 0.882 to 0.959). In addition, given that all bivariate correlations were less than 0.85 ($|r| < 0.85$), the Pearson correlations indicated no multicollinearity issue [64].

Table 1. Descriptive statistics and reliabilities among latent variables.

Variable	M	SD	α	1	2	3	4
1. Procedural Justice	2.87	0.738	0.924	1			
2. Work Engagement	3.53	1.252	0.946	0.403	1		
3. Knowledge Sharing	3.45	0.641	0.882	0.411	0.497	1	
4. Innovative Work Behavior	3.66	1.013	0.959	0.464	0.694	0.601	1

Note. α = Cronbach's alpha; M = mean; SD = standard deviation. All correlations are significant at the 0.01 level.

4.2. Item Parceling of Innovative Work Behavior

Since the measurement part of our research model in this study included a large number of variables, a model of innovative work behavior was investigated to reconstruct it through item parceling. The results of the overall fit displayed in Table 2 indicate that although the SB scaled chi-square values of the confirmatory factor analysis (CFA) models were statistically significant, $\chi^2(24) = 72.568, p < 0.001$, indicating that the models were not consistent with their covariance data. Other overall fit indices such as RMSEA (< 0.08), SRMR (< 0.08), NNFI (> 0.95), and CFI (> 0.95) met the cutoff criteria. Therefore, the measurement model of innovative work behavior was found to be statistically acceptable.

Table 2. Overall fit of the confirmatory factor analysis (CFA) model of innovative work behavior.

	SB Scaled Chi-Square (df)	RMSEA	SRMR	NNFI	CFI
Innovative Work Behavior	$\chi^2(24) = 72.568, p < 0.001$	0.0712	0.0257	0.990	0.994

SB: Satorra–Bentler; RMSEA: root mean square error of approximation; SRMR: standardized root mean square residual; NNFI: non-normed fit index; CFI: comparative fit index.

In regard to any indications of possible improper solutions of the CFA model of innovative work behavior, the results revealed that all factor loadings and path coefficients in the model were statistically significant ($|t| > 1.96, p < 0.05$). In addition, all signs and magnitudes of parameter estimates in the model made sense as there were neither negative error variances nor out-of-range (i.e., $r < 1$) findings, while the standard errors were also reasonable. Taken together, it can be assumed that there were no indications of possible improper solutions. Thus, this study uses the parceling model of innovative work behavior as shown in Figure 1 [68].

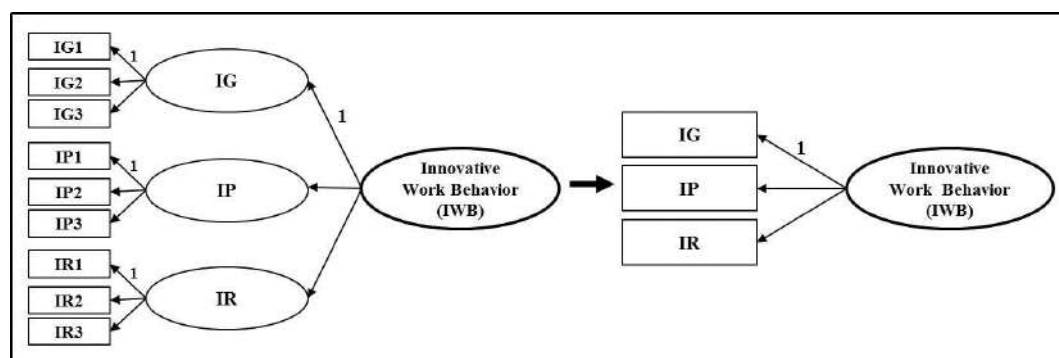


Figure 1. Measurement model of innovative work behavior with item parceling.

Since we utilized the parceling model of innovative work behavior, the normality of the model was rechecked. The results of the study showed that, overall, our data set had a moderate non-normality ($| \text{skewness} | < 2$, $| \text{kurtosis} | < 7$, relative multivariate kurtosis = 1.319 (< 3)), which we handled by utilizing robust ML [66].

4.3. Assessment of Model Fit

The overall fit statistics of the measurement model (i.e., CFA model) and the full model, including both measurement and structural models, were evaluated in turn. The overall fit indices in Table 3 indicate that the SB scaled chi-square of the measurement model was statistically significant (χ^2 (246) = 819.925, $p < 0.001$), showing that the exact-fit hypothesis was rejected. Other fit indices, however, met the cutoff criteria (RMSEA = 0.0765 (< 0.08), SRMR = 0.0448 (< 0.08), NNFI = 0.970 (> 0.95), and CFI = 0.974 (> 0.95)). In addition, the parameter estimates (sign and magnitude) and their reasonable standard errors were examined to check possible improper solutions. When it comes to parameter estimates, all factor loadings in the measurement equations were statistically significant ($| t | > 1.96$, $p < 0.05$). Signs and magnitudes of the parameter estimates in the measurement model made sense and had neither negative variances nor out-of-range ($r < 1$). Standard errors in the model were also reasonable. Taken together, the overall fit and the estimation solution demonstrated that the measurement model was an adequate fit for the data.

Table 3. Overall fit of the measurement and full models.

	SB Scaled Chi-Square (df)	RMSEA	SRMR	NNFI	CFI
Measurement Model	χ^2 (246) = 819.925, $p < 0.001$	0.0765	0.0448	0.970	0.974
Full Model	χ^2 (247) = 830.766, $p < 0.001$	0.0770	0.0560	0.970	0.973

Because the measurement model was acceptable, the overall fit statistics of the full model were evaluated. According to the results of the overall fit in Table 3, the SB scaled chi-square of the full model was statistically significant, χ^2 (247) = 830.766, $p < 0.001$, indicating that the exact-fit hypothesis was rejected. Other absolute and relative fit indices, however, met the cutoff criteria (RMSEA = 0.0770 (< 0.08), SRMR = 0.0560 (< 0.08), NNFI = 0.970 (> 0.95), and CFI = 0.973 (> 0.95)). Regarding any indications of possible improper solutions, the results of parameter estimates, including signs and magnitudes and their standard errors, indicated that there was no indication of improper solutions in the full model. Based on the results of the overall fit and the estimation solution, it can be concluded that the full model was an adequate fit for the data.

4.4. Hypothesis Testing

Based on the results from the evaluation of the full model fit, all proposed research hypotheses were tested. SPC estimates were primarily used to measure the magnitudes of the paths among four of the proposed latent research variables, as displayed in Figure 2. Bootstrap estimates were also examined to determine the mediating effects of work engagement and knowledge sharing in the proposed model.

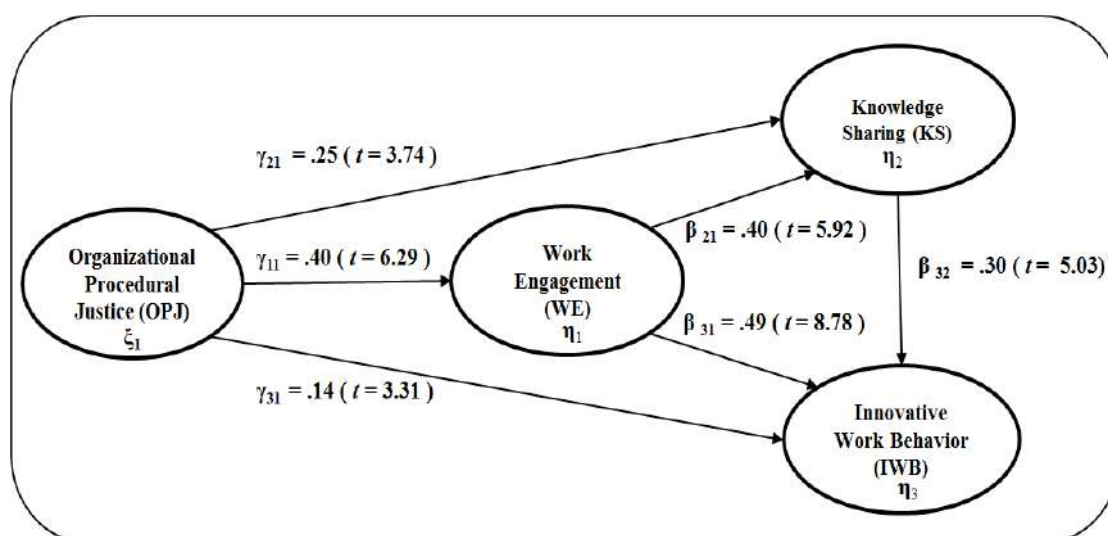


Figure 2. Structural model with standardized estimates.

With regard to hypothesis 1, the results of the structural model showed that the positive and direct effects of organizational procedural justice on employee work engagement ($\gamma_{11} = 0.40$ (γ = path coefficient between an exogenous variable and an endogenous variable), $t = 6.29$), knowledge sharing ($\gamma_{21} = 0.25$, $t = 3.74$), and innovative work behavior ($\beta_{31} = 0.14$ (β = path coefficient between endogenous variables), $t = 3.31$) were statistically significant. Thus, hypothesis 1 was supported. For hypothesis 2, the results indicated that the positive and direct effects of employee work engagement on their knowledge sharing ($\beta_{21} = 0.40$, $t = 5.92$) and innovative work behavior ($\beta_{31} = 0.49$, $t = 8.78$) were statistically significant. Thus, hypothesis 2 was supported. Regarding hypothesis 3, the positive and direct effect of employee knowledge sharing on their innovative work behavior ($\beta_{32} = 0.30$, $t = 5.03$) was statistically significant. Thus, hypothesis 3 was supported. With regard to hypotheses 4 and 5, a bootstrap estimate approach was performed to test the mediating effects of work engagement and knowledge sharing.

According to Preacher and Hayes [69], the bootstrapping approach is the most powerful test method for specific indirect effects under most sample conditions and utilizes a non-parametric re-sampling procedure without a normal distribution assumption of variables. Furthermore, since Preacher and Hayes [69] strongly recommended the bias-corrected (BC) bootstrapping procedure, the current study tested the mediating effects through the BC bootstrapping procedure with 1000 bootstrap samples. The results of the bootstrap estimates are presented in Table 4. The results demonstrate the statistically significant mediating effects of work engagement in the relationship between organizational procedural justice and the innovative work behavior of employees (completely standardized estimate of the mediating effect, $ab = 0.196$, $p < 0.01$, 99% confidence interval, CI (0.115, 0.278)) as well as also the relationship that exists between organizational procedural justice and employee knowledge sharing ($ab = 0.159$, $p < 0.01$, 99% CI (0.082, 0.236)). In addition, the results of the bootstrap estimate show that the standardized mediating effect of knowledge sharing in the relationship between organizational procedural justice and employee innovative work behavior ($ab = 0.075$, $p < 0.01$, 99% CI (0.018, 0.133)) was statistically significant. Furthermore, the results reveal that the multi-mediating effects of work engagement and knowledge sharing in the relationship between organizational procedural justice and the innovative work behavior of employees ($ab = 0.048$, $p < 0.01$, 99% CI (0.014, 0.082)) were statistically significant. Taken together, hypotheses 4 and 5 were supported. Therefore, all research hypotheses proposed in this study were supported by the data.

Table 4. Bootstrap estimates of the mediating effects of work engagement and knowledge sharing.

Path: IV → MV → DV	ab	Product of Coefficients		BC 99% CI *	
		SE	Z	Lower	Upper
OPJ → WE → IWB	0.196	0.032	6.194	0.115	0.278
OPJ → WE → KS	0.159	0.030	5.338	0.082	0.236
OPJ → KS → IWB	0.075	0.022	3.378	0.018	0.133
OPJ → WE → KS → IWB	0.048	0.013	3.606	0.014	0.082

Note. IV: independent variable; MV: mediating variable; DV: dependent variable; ab: completely standardized estimate of the mediating effect; SE: standard error; BC: bias corrected; CI: confidence interval; OPJ: organizational procedural justice; WE: work engagement; KS: knowledge sharing; IWB: innovative work behavior. * This 99% confidence interval excludes zero; therefore, the mediating effects are statistically significant at $p < 0.01$.

5. Discussion

The main purpose of the current study was to examine the structural relationships among four research variables—organizational procedural justice, work engagement, knowledge sharing, and innovative work behavior—in a Korean organizational context. Given that the results of this study supported all proposed research hypotheses, the current research provides implications for researchers and practitioners.

5.1. Theoretical Implications

Firstly, the current study contributes to the existing literature by empirically investigating and validating relationships among four research constructs (i.e., organizational procedural justice, work engagement, knowledge sharing, and innovative work behavior). The results of the study demonstrate empirically that the direct and positive relationships among four research variables are all statistically significant. Among the direct relationships, it reveals that organizational procedural justice has a more powerful effect on employee work engagement when compared to its effect on knowledge sharing and innovative work behavior and that employee knowledge sharing and innovative work behavior are more strongly influenced by their work engagement. Furthermore, the results of the mediating effects among them show that employee work engagement has a strong indirect impact on the relationships among organizational procedural justice, knowledge sharing, and innovative work behavior. Based on the research findings, researchers could replicate the proposed research model in other settings and extend the results of this study by including other antecedent and consequent variables, which are related to organizational sustainability, in order to better comprehend and generalize the results of this study. Moreover, considering the significant mediating role of employee work engagement with support from extant literature [50,70], researchers could focus on investigating roles of employee work engagement in various settings (e.g., individual/team/organizational level of work engagement, different level of positions, and crossover of engagement overtime) by employing a quantitative or qualitative approach.

Secondly, although it is important for organizations to consider the economic, environmental, and human (social) dimensions of organizational sustainability in balanced and enduring ways, the existing literature indicates that the human dimension has received relatively less attention [1,7,8]. Given that the human dimension entails the processes of generating social health and improving employee well-being (i.e., employee engagement at work) within an organizational context, the current study attempts to investigate employee work engagement as a key component of the human dimension [1,7,9,11] and its relationship with three organizational variables (i.e., organizational procedural justice, knowledge sharing, and innovative work behavior), which are assumed to be relevant both conceptually and empirically to work engagement and the human dimension of organizational sustainability. The results of the study show that all of the direct and indirect effects that exist among work engagement, organizational procedural justice, knowledge sharing, and innovative work behavior are statistically significant. Moreover, the results demonstrate that employee work

engagement plays a central role among the various structural relationships in several ways. Firstly, organizational procedural justice has a stronger impact on work engagement and secondly, because the direct and indirect effects of work engagement on knowledge sharing and innovative work behavior are stronger than those of the other variables examined. It is implied that the proposed research model is a valid model, and it suggests a meaningful link to the human dimension of organizational sustainability. However, it should be noted that since the current study claims the link between the proposed research model and the human dimension of organizational sustainability from a more conceptual perspective, it might be limited in providing more in-depth implications for organizational sustainability. Thus, researchers could extend the research model by empirically linking the results to the human dimension of organizational sustainability based on a robust theoretical framework. Furthermore, researchers could consider the link between extended or modified research models and organizational sustainability not only in terms of the human dimension but also in terms of the economic and environmental dimensions of organizational sustainability, e.g., increased work engagement (human dimension) positively affects saving and creating organizational core resources (environmental dimension), which ultimately leads to increased revenues (economic dimension).

5.2. Practical Implications

Firstly, given the positive influence of organizational procedural justice on work engagement, knowledge sharing, and innovative work behavior, organizations should make significant efforts to improve and maintain the level of formal procedural justice within organizations by not only sharing relevant information and providing useful feedback about their decision-making processes in transparent and fair ways, but also by actively listening to employee opinions and involving employee groups that encompass various work positions and the job areas involved in the process of making decisions. In addition, the results of the study reveal that the effects of organizational procedural justice on employee innovative work behavior and knowledge sharing are stronger when they are mediated by employee work engagement. It implies that if organizations set up and implement transparent and fair procedures in decision-making, employees are more likely to repay them not only by being more engaged in their work but also by facilitating and encouraging knowledge sharing and innovative work behavior. Thus, it is noteworthy that organizational efforts regarding organizational procedural justice would be more effective and efficient when aligned with supporting work engagement.

Secondly, organizations should consider on- and off-line environments to facilitate, support, and share job-related tacit knowledge, as well as explicit knowledge among employees or teams/groups. It is important to reduce or remove organizational silos, catalyze the sharing of relevant knowledge or ideas to address work-related issues among engaged employees or teams/groups without any barriers, and systematically manage any kinds of knowledge created within an organization. For example, organizations could create a virtual collective intelligence platform where employees share knowledge, ideas, and opinions related to their projects and management challenges and collectively explore innovative ideas and problem-solving interventions, which, in turn, could lead to relevant value creation to organizational sustainability.

Thirdly, organizations need to pay continuous attention to maintaining and strengthening employee innovative work behavior, which is positively influenced by organizational and individual efforts (i.e., procedural justice, work engagement, and knowledge sharing). Specifically, Human Resources (HR) practitioners should consider either creating or modifying HR-related policies (e.g., creative culture, incentives for innovative work behavior) to link employee innovative behavior (i.e., human performance) to economic performance to create sustainable organizations. For instance, if employees have innovative and realistic ideas and high degree of enthusiasm for developing them into real services and products, organizations could consider providing employees with substantive opportunities so as to improve organizational performance levels (e.g., new patents and business projects).

6. Conclusions, Limitations, and Future Research

This research has made a significant effort to investigate employee work engagement and its relationship with organizational procedural justice, knowledge sharing, and innovative work behaviors in organizations in terms of the human dimension of organizational sustainability. The results of the study demonstrate that all of the direct and indirect relationships among work engagement, organizational procedural justice, knowledge sharing, and innovative work behavior are positively and statistically significant, supporting all proposed hypotheses. However, several limitations should be noted and considered when conducting future research.

Firstly, since this study used the self-reported survey approach to collect the data, response bias may exist, even though the CMB test was implemented through the single factor test and the single factor model. In order to deal with this potential issue and increase the objectivity of the data, using advanced measurements (e.g., cross-rating approach) or a longitudinal research design (e.g., latent growth model) with a multi-level or more complex model is recommended.

Secondly, the data were collected from organizations in South Korea through a convenience sampling approach, which may restrict the generalizability of the study results. Moreover, among the research sample, about 81% of the total sample were male, and 79% of the participants had a 4-year college degree or higher, which may limit the generalization of the results. To obtain more precise results and increase generalizability of the study findings, the stratified sampling (e.g., gender, age, industry, and/or job area) or the random sampling method is recommended. In addition, as this research was conducted in organizations within the Asian context, future research could be replicated to examine the current research model in various settings (e.g., Western or European countries) and explore any similarities and differences that may exist between the research findings from the current study and those from other settings.

Last, the current study focused on only the structural relationships that exist among four latent variables (i.e., organizational procedural justice, work engagement, knowledge sharing, and innovative work behavior) from the perspective of organizational sustainability. However, given that organizational sustainability was not directly measured and examined in this study, future studies should consider measuring the concept of organizational sustainability [16] and investigate its relationship with the aforementioned four latent variables or other existing constructs that are related to organizational sustainability (e.g., organizational commitment and organizational support or objective tangible outcome variables) or the associated moderating variables (e.g., position, organization size, and gender).

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